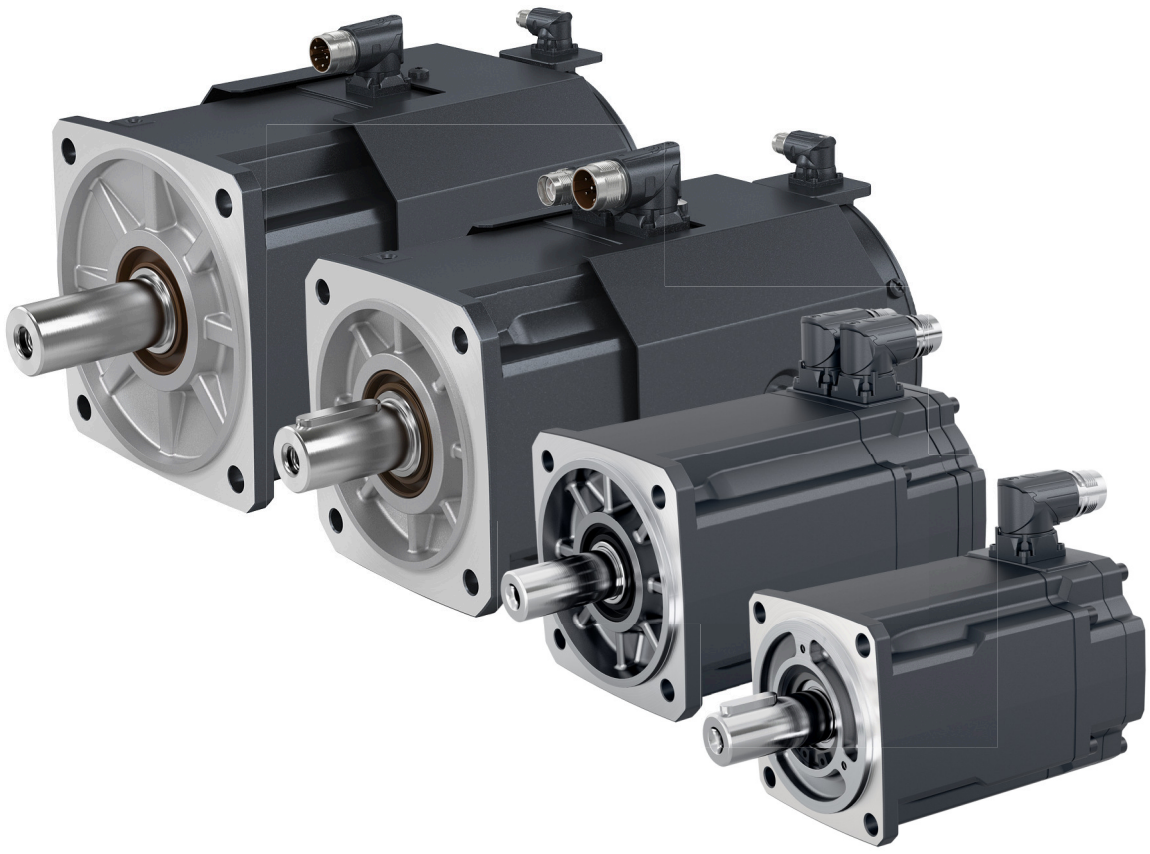


Edition 09/2026

EQUIPMENT MANUAL

SIMOTICS

S-1FT2 and S-1FK2 synchronous motors

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SIMOTICS

Drive technology 1FT2 and 1FK2 synchronous motors

Equipment Manual

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ **DANGER**
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **WARNING**
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **CAUTION**
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified persons are those who, because of their training and experience, are familiar with the installation, assembly, commissioning, operation, decommissioning and disassembly of the product and can recognize risks and avoid possible hazards.

Proper use of Siemens products

Note the following:

⚠ **WARNING**
Siemens products may only be used for the application described in the catalog and the associated usage information. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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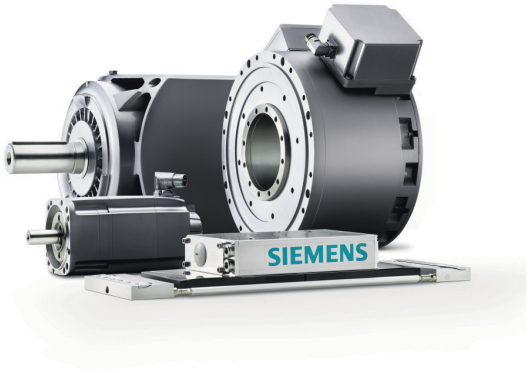
Introduction

1

1.1 About SIMOTICS

SIMOTICS electric motors are based on synchronous or asynchronous technology. The following variants are available:

- SIMOTICS S servomotors
- SIMOTICS M main motors
- SIMOTICS L linear motors
- SIMOTICS T torque motors
- SIMOTICS E extra low-voltage motors



The range also includes built-in motors and motor spindles. Every motor for motion control is harmonized to operate with a SINAMICS frequency converter.

1.2 About this usage information

This Equipment Manual provides information about the motor and its components. You will learn how to correctly and safely handle the motor from delivery to disposal:

- Transport and storage
- Setup and mounting
- Connecting
- Commissioning
- Testing
- Operating
- Searching for and eliminating faults

- Disassembly
- Disposal

To illustrate possible application areas for our products, typical use cases are listed in this product documentation and in the online help. These are purely exemplary and do not constitute a statement on the suitability of the respective product for applications in specific individual cases. Unless explicitly contractually agreed, Siemens assumes no liability for such suitability. Suitability for a particular application in specific individual cases must be assessed by the user, taking into account all technical, legal, and other requirements on a case-by-case basis. Always observe the descriptions of the technical properties and the applicable constraints of the respective product provided in the product documentation.

1.2.1 Target group

This Equipment Manual is intended for:

- Planning engineers
- Design engineers
- Mechanical design engineers
- Installation personnel
- Commissioning engineers
- Machine operators
- Service and maintenance personnel
- Warehouse personnel
- Personnel that decommission the motor
- Personnel that dispose of the motor

1.2.2 Standard scope

The functions of the system as delivered can only be found in the order documents.

Further functions may be executable in the system, which are not explained in this documentation. However, there is no entitlement to these functions in the case of a new delivery or service.

This documentation does not contain all detailed information on all types of the product. Furthermore, this documentation cannot take into consideration every conceivable type of installation, operation and service/maintenance.

The machine manufacturer must document any additions or modifications they make to the product themselves.

1.2.3 Use of third-party products in this documentation

Siemens does not accept any warranty for the use of third-party products. Suppliers recommended by Siemens are listed on the following Internet page (https://www.siemens.com/global/en/company/partners/product-partners-industry.html).

1.2.4 Websites of third-party companies

This document may contain hyperlinks to third-party websites. Siemens is not responsible for and shall not be liable for these websites and their content. Siemens has no control over the information which appears on these websites and is not responsible for the content and information provided there. The user bears the risk for their use.

1.3 SIMOTICS documentation

Comprehensive documentation on SIMOTICS and the SINAMICS converter family is provided on the Internet (https://support.industry.siemens.com/cs/ww/en/view/109813641).

You can display documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

Table 1-1 SIMOTICS documentation

Information	**Documentation class**[1)]	**Content**	**Target group**
General information	Equipment Manual	Includes all the contents of the configuration guide and operating instructions. Detailed collection of all information required for the safe operation of products, plant/system parts and complete plants (IEC 82079). Rules, guidelines, and tools for configuring products, systems, and plants. Also contains information on the operating and ambient conditions for hardware and software, use of functions, as well as on circuit diagrams and terminal diagrams and the installation of software insofar as this is necessary for commissioning.	Planners Project engineers Installation personnel Commissioning engineers Service and maintenance personnel
	Configuration guide	Rules, guidelines, and tools for configuring products, systems, and plants. Also contains information on the operating and ambient conditions for hardware and software, use of functions, as well as on circuit diagrams and terminal diagrams and the installation of software insofar as this is necessary for commissioning.	Planners, project engineers
Device information	Installation instructions	All relevant information on setting up, installing and cabling, as well as the required dimensional drawings and circuit diagrams	Installation personnel Commissioning engineers Service and maintenance personnel

Information	Documentation class[1)]	Content	Target group
Basic information	Operating instructions	Detailed collection of all information required for the safe operation of products, plant/system parts, and complete plants (IEC 82079).	Machine operators, plant operators
	Compact instructions	Essential contents of the operating instructions in a reduced and condensed form	Machine operators Plant operators
	Product information	Information that only becomes known shortly before or even after start of delivery and is therefore not included in the associated user documentation	Planners Project engineers Technologists Installation personnel Constructors Commissioning engineers Machine operators Programmers Service and maintenance personnel
	Readme	New supplementary information that is not yet included in the current version of the user documentation.	Planners Project engineers Technologists Installation personnel Constructors Commissioning engineers Machine operators Programmers Service and maintenance personnel
	Online help	Instructions for configuring, programming, and commissioning	Project engineers Programmers Commissioning engineers
Specific information	Commissioning instructions	Detailed description for commissioning a plant, system or product	Commissioning engineers
	Service manual	Comprehensive compilation of all information required for service and maintenance	Service and maintenance personnel

[1)] Not all documentation classes are available for every SIMOTICS product.

1.4 Service and support

1.4.1 ID link and Siemens Online Support

You can find additional information about the product:

- via ID link
- using the Siemens Industry Online Support
  - Website: SiePortal (https://support.industry.siemens.com/cs/ww/en/)
  - App Industry Online Support (for Apple iOS and Android)

Product-specific information via ID link

There is a QR code on your product and the product packaging which contains an identification link (ID link).
The ID link serves as a Digital Nameplate (DNP) and is a globally unique identifier in accordance with IEC 61406-1. It links the product to the associated information from the Digital Product Passport (DPP).

Scan the QR code on the product or the packaging label with a smartphone camera, barcode scanner, or suitable app.

The ID link gives you access to relevant product information such as:

- Product data
- Manuals
- Declarations of Conformity
- Certificates



Figure 1-1 QR code with ID link

The ID link is characterized by a frame with a black corner at the bottom right.

Content of Siemens Online Support

- Product support
- Global forum for information and best practice sharing between users and specialists
- Local contact persons via the contact person database (→ Contact)
- Product information

- FAQs (frequently asked questions)
- Application examples
- Manuals
- Downloads
- Compatibility tool
- Newsletter with product selection
- Catalogs/brochures
- Certificates

1.4.2 Spare parts services

The "Spares on Web (https://www.sow.siemens.com)" online spare parts service offers spare parts for specific products.

1.4.3 Extended Warranty – Service Protect

Service Protect provides an extended warranty period for your registered hardware product, covering repair or replacement. The specific duration(s) of the extended warranty offering and the terms for repair or replacement are determined by the product type. Product registration @ myReg (https://myregistration.siemens.com/) is required.

1.5 Intended use/foreseeable misuse

S9 operation

This motor is designed for operation on the converter with non-periodic load and speed variations.

Typical applications include machine tools or production machines with non-periodic speed and duty cycles. This complies with IEC 60034-1 operating mode S9.

Intended use

⚠ WARNING

Non-proper usage

If you do not use the motors correctly, there is a risk of death, severe injury and/or material damage.

- Only use the motors for their intended purpose.
- Do not use the motors in hazardous areas (where there is a risk of explosion) if the motors are not expressly released and authorized for this purpose. Comply with the separately added supplementary notes.
- Make sure that the conditions at the location of use comply with all the rating plate data.
- Make sure that the conditions at the location of use comply with the conditions specified in this documentation. Take into consideration deviations regarding approvals or country-specific regulations.

The motor is intended for industrial or commercial plants.

The motor is designed for operation in sheltered areas under normal climatic conditions, such as those found on shop floors.

More detailed information is provided in Chapter Environmental conditions (Page 45).

Operating the motor in a hazardous zone is prohibited unless the motor is approved for this purpose.

The motor is only approved for converter operation.

Any other application of the motor is considered to be not as intended.

Correct and intended use includes compliance with all of the specifications in the product documentation.

Observe the data on the rating plate.

Contact your sales partner if you have questions regarding proper and intended use, or if you wish to use special versions and design variants.

⚠ WARNING

Danger to life and material damage when not used as intended

There is a risk of death, serious injury and/or material damage when direct drives or their components are used for a purpose for which they were not intended.

- Only use the motors for industrial or commercial plants and systems.
- Do not install the motors in hazardous zones if the motors have not been expressly and explicitly designed and authorized for this purpose. Carefully observe any special additional notes provided.
- Only use direct drives and their components for applications that Siemens has explicitly specified.
- Protect the motors against dirt and contact with corrosive substances.
- Ensure that the installation conditions comply with the rating plate specifications and the condition specifications contained in this documentation. Where relevant, take into account deviations regarding approvals or country-specific regulations.
- If you have any questions regarding intended use, please contact your local sales partner.
- If you wish to use special versions and design versions whose technical details vary from the motors described in this document, then you must contact your local sales partner.

⚠ WARNING

Danger to life for wearers of active implants due to magnetic and electrical fields

Electric motors pose a danger to people with active medical implants, e.g. cardiac stimulators, who come close to the motors.

- If you are affected, stay a minimum distance of 300 mm from the motors (tripping threshold for static magnetic fields of 0.5 mT according to the Directive 2013/35/EU).

Description

Avoid the following incorrect uses:

- Disregarding safety information and instructions in this manual
- Directly connecting the motor power connection to the line supply
- Directly connecting temperature sensors to the converter
- Untrained or non-authorized personnel working at the motor
- Working on a motor that is not adequately secured
- Handling the motor carelessly or in a deliberately negligent way
- Underestimating the magnetic force of attraction of permanent magnets
- Disregarding safety clearances for persons with pacemakers, implanted defibrillators and/or metal implants

- Underestimating voltages at cable connections caused by induction
- Incorrect commutation setting when installing and replacing the encoder
- Contact with hot surfaces
- Handling the motor without personal protection equipment
- Disregarding any damage
- Using the motor
  - For non-industrial or commercial applications
  - In impermissible environmental conditions
  - In hazardous zones
  - In a dirty state
  - When in contact with aggressive substances
  - With inadequate cooling
- Disregarding data on the rating plate
- Incorrect packaging, storage and/or incorrect transport
- Opening the motor
- Incorrect disposal of the motor

Fundamental safety instructions

2

2.1 General safety instructions



⚠ WARNING

Electric shock and danger to life due to other energy sources

Touching live components can result in death or severe injury.

- Only work on electrical devices when you are qualified for this job.
- Always observe the country-specific safety rules.

Generally, the following steps apply when establishing safety:

1. Prepare for disconnection. Notify all those who will be affected by the procedure.
2. Isolate the drive system from the power supply and take measures to prevent it being switched back on again.
3. Wait until the discharge time specified on the warning labels has elapsed.
4. Check that there is no voltage between any of the power connections, and between any of the power connections and the protective conductor connection.
5. Check whether the existing auxiliary supply circuits are de-energized.
6. Ensure that the motors cannot move.
7. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems, or water. Switch the energy sources to a safe state.
8. Check that the correct drive system is completely locked.

After you have completed the work, restore the operational readiness in the inverse sequence.



⚠ WARNING

Electric shock due to connection to an unsuitable power supply

When equipment is connected to an unsuitable power supply, exposed components may carry a hazardous voltage. Contact with hazardous voltage can result in severe injury or death.

- Only use power supplies that provide SELV (Safety Extra Low Voltage) or PELV- (Protective Extra Low Voltage) output voltages for all connections and terminals of the electronics modules.



⚠ WARNING

Electric shock from a damaged product

Improper handling can damage the product. If a product is damaged, hazardous voltages may be present on the housing or exposed components, which can result in serious injury or death if touched.

- Ensure compliance with the limit values specified in the technical data during transport, storage and operation.
- Never use a damaged product.



⚠ WARNING

Electric shock due to unconnected cable shield

Hazardous touch voltages can occur through capacitive cross-coupling due to unconnected cable shields.

- As a minimum, connect cable shields and the conductors of power cables that are not used (e.g. brake cores) at one end at the grounded housing potential.



⚠ WARNING

Electric shock in the absence of grounding

For products with protection class I, a faulty protective conductor connection means that the product is not grounded in conformance with the applicable regulations. In the absence of grounding, high voltages may be present in open, exposed parts, which can result in serious injury or death if touched.

- Ground the product in conformance with the applicable regulations.



⚠ WARNING

Arcing when a plug connection is opened during operation

Opening a plug connection when a system is in operation can result in arcing that may cause serious injury or death.

- Only open plug connections when the equipment is in a voltage-free state, unless it has been explicitly stated that they can be opened in operation.

NOTICE

Property damage due to loose power connections

An insufficient tightening torque or vibrations can result in loose power connections. This can result in damage due to fire, product defects, or malfunctions.

- Tighten all power connections to the prescribed torque.
- Regularly check all power connections, particularly after equipment has been transported.

NOTICE

Product damage caused by an unsuitable screw-tightening tool

Unsuitable screw-tightening tools or tightening methods can damage the product screws.

- Use a screw-tightening tool that fits the screw head exactly.
- Tighten the screws with the torque specified in the technical documentation.
- Use a torque wrench or a mechanical precision nut runner with a dynamic torque sensor and speed limitation system.
- Regularly calibrate the screw-tightening tool used.

⚠ WARNING

Unexpected machine motion caused by radio devices or cell phones

Radio devices, cell phones, or mobile WLAN devices in the immediate vicinity of the product can cause the product to malfunction or damage the product. The malfunction may impair the functional safety of machines and can therefore endanger persons or result in material damage.

- Avoid operating radio devices, cell phones, and mobile WLAN devices in the direct vicinity of converters and operating units.
- Scan the machine readable code, e.g. a QR code at least 0.4 m away from the converter, or switch off the converter power supply before scanning.
- Only operate built-in devices with the control cabinet doors closed.
- When the control cabinet doors are open, only qualified personnel may perform service and maintenance work.

⚠ WARNING

Unrecognized dangers due to missing or illegible warning labels

Dangers might not be recognized if warning labels are missing or illegible. Unrecognized dangers may cause accidents resulting in serious injury or death.

- Check that the warning labels are complete based on the documentation.
- Attach any missing warning labels to the components, where necessary in the national language.
- Replace illegible warning labels.

⚠ WARNING

Unexpected movement of machines caused by inactive safety functions

Inactive or non-adapted safety functions can trigger unexpected machine movements that may result in serious injury or death.

- Observe the information in the appropriate product documentation before commissioning.
- Carry out a safety inspection for functions relevant to safety on the entire system, including all safety-related components.
- Ensure that the safety functions used in your drives and automation tasks are adjusted and activated through appropriate parameterizing.
- Perform a function test.
- Only put your plant into live operation once you have guaranteed that the functions relevant to safety are running correctly.

Note

Important Safety instructions for Safety Integrated

If you want to use Safety Integrated functions, you must observe the Safety instructions in the Safety Integrated documentation.

⚠ WARNING

Active implant malfunctions due to electromagnetic fields

Electromagnetic fields (EMF) are generated by the operation of electrical power equipment, such as transformers, converters, or motors. People with pacemakers or implants are at particular risk in the immediate vicinity of this equipment.

- If this applies to you, maintain the minimum distances to the respective motors as specified in the Information for use.



⚠ WARNING

Active implant malfunctions due to permanent-magnet fields

Even when switched off, electric motors with permanent magnets represent a potential risk for persons with heart pacemakers or implants if they are close to converters/motors.

- If this affects you, maintain the minimum distances specified in the Information for use.
- When transporting or storing permanent-magnet motors, always use the original packing materials.
- Clearly mark the storage locations with the appropriate warning labels.
- IATA regulations must be observed when transported by air.



⚠ WARNING

Improper lifting and transportation operations

Improper lifting and transportation of the motor may cause death, severe bodily injury, or damage to property.

- When disassembling the motor, watch out for imminent movements when the motor is released.
- Use all lifting equipment, industrial trucks, and load handling devices in accordance with the regulations.
- Only use lifting equipment and load handling devices with maximum capacities which match the weight of the motor.
- Do not attach any additional loads to the lifting equipment.
- To hoist the motor, use suitable cable-guidance or spreading equipment, particularly if the motor is equipped with built-on assemblies.
- Do not attach lifting equipment to the power connector or signal connector of the motor.
- Do not stand in the slewing range of hoisting gear or under suspended loads.
- When placing down the motor, ensure that it cannot roll away.
- If anything is unclear, please contact the machine manufacturer, stating the machine type and serial number.

NOTICE

Shaft sealing rings damaged by solvent

Solvents can damage the shaft sealing rings of the motor.

- When removing preservation agents or when carrying out cleaning work, avoid that any solvent comes into contact with the shaft sealing rings.

⚠ WARNING

Injury caused by moving or ejected parts

Contact with moving motor parts or drive output elements and the ejection of loose motor parts (e.g. feather keys) out of the motor enclosure can result in severe injury or death.

- Remove any loose parts or secure them so that they cannot be flung out.
- Do not touch any moving parts.
- Safeguard all moving parts using the appropriate safety guards.

⚠ WARNING

Danger to life caused by machine movement and loose objects

Machine movement and loose objects that can fall out or be ejected can cause death or severe bodily injury.

- Be sure to complete all assembly and adjustment work on the machine.
- Ensure that there are no people in the danger zone of the machine before it is switched on.
- Before switching on, check that there are no loose objects in or on the motor that can fall or be flung off.
- Before switching on, check that all safety guard covers for touch protection are installed and all safety equipment functions correctly.

⚠ WARNING

Uncovered rotating or live parts

Covers over rotating or live parts and covers that ensure the motor degree of protection or are required for air guidance, and thus for cooling, must be closed during operation.

Death, serious bodily injury, or material damage may result if the required covers are removed.

- Do not remove covers while the motor is running.

⚠ WARNING

Danger to life due to a changed operating behavior of the machine

Changes in the operating behavior of the machine compared with normal operation indicate that the function of the machine is impaired. Changes in the operating behavior of the machine can be seen, for example, in one or more of the following effects:

- An increased power consumption
- Higher temperatures
- Vibration
- Unusual noises
- Unusual smells
- The monitoring devices respond

Impaired machine functioning can cause faults that may result directly or indirectly in death, serious bodily injury, or property damage.

- Immediately inform the maintenance personnel.
- If in doubt, shut down the motor immediately, taking into account the plant-specific safety regulations.

NOTICE

Motor damage in the event of uneven running or abnormal noises

Improper handling during transportation, storage, or assembly can damage the motor. A damaged motor may run unevenly or make abnormal noises during operation. If you operate a damaged motor, this may result in damage to the winding or bearings, or even total destruction of the system.

- Switch the motor off in case of uneven running or abnormal noises.
- Identify the cause.

NOTICE

Motor damage when the maximum speed is exceeded

The maximum speed n_{max} is the highest permissible motor operating speed. The maximum speed is specified on the rating plate (nameplate).

Impermissible speeds can cause damage to the motor.

- Enable speed setpoint monitoring in the control unit or drive so as not to exceed the maximum speed n_{max}.

⚠ WARNING

Fire due to incorrect operation of the motor

When incorrectly operated and in the case of a fault, the motor can overheat resulting in fire and smoke. This can result in severe injury or death. Further, excessively high temperatures destroy motor components and result in increased failures as well as shorter service lives of motors.

- Operate the motor according to the relevant specifications.
- Only operate the motors in conjunction with effective temperature monitoring.
- Immediately switch off the motor if excessively high temperatures occur.

NOTICE

Wear of the holding brake due to impermissible voltage supply

Operating the holding brake outside the permissible voltage range at the motor connection will damage the brake.

- Only operate the holding brake within its permissible voltage range.



⚠ CAUTION

Burns and thermal damage caused by hot surfaces

Temperatures above 100 °C may occur on the surfaces of motors, converters, and other drive components.

Touching hot surfaces may result in burns. Hot surfaces may damage or destroy temperature sensitive parts.

- Ensure that temperature-sensitive parts do not come into contact with hot surfaces.
- Mount drive components so that they are not accessible during operation.

Measures when maintenance is required:

- Allow drive components to cool off before starting any work.
- Use appropriate personnel protection equipment, e.g. gloves.

2.2 Product damage due to electric fields or electrostatic discharge

Electrostatic sensitive devices (ESDs) are electronic devices, modules, or individual components with freely accessible contacts, e.g. products with signal and communication interfaces or modules without an enclosed housing, which can be damaged by electrostatic fields or electrostatic discharges.



NOTICE

Product damage due to electric fields or electrostatic discharge

Electric fields or electrostatic discharge can damage individual electronic components, integrated circuits, and modules. A pre-damaged or damaged product causes malfunctions, which in turn increase the probability of failure and a shortened service life.

- Only pack, store, transport, and ship individual electronic components, modules, or products in their original packaging or in other suitable materials, e.g. conductive ESD foam or aluminum foil.
- When you open the product, e.g. to replace a component or a module, or if you touch electrical contacts, then ground yourself using one of the following measures:
  - Wear an ESD armband
  - Wear ESD shoes or ESD grounding straps in ESD areas with conductive flooring
- Only place electronic modules or individual components on a conductive surface, e.g. on an ESD surface, on ESD foam, on an ESD packaging bag, or an ESD transport container.

2.3 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
https://www.siemens.com/cybersecurity-industry.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
https://www.siemens.com/cert.

Further information is provided on the Internet:

Configuration Manual Industrial Cybersecurity (https://support.industry.siemens.com/cs/ww/en/view/109975311)

⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a state-of-the-art, integrated industrial cybersecurity concept for the installation or machine.
- Make sure that you include all installed products in the integrated industrial cybersecurity concept.
- Protect files stored on exchangeable storage media from malicious software with suitable protection measures, e.g. virus scanners.
- Carefully check all cybersecurity-related settings once commissioning has been completed.

2.4 Residual risks of power drive systems

When assessing the machine or system-related risk in accordance with the respective local regulations (e.g. EC Machinery Directive), the machine manufacturer or system integrator must take into account the following residual risks emanating from the control and drive components of a drive system:

1. Unintentional movements of driven machine or system components during commissioning, operation, maintenance, and repairs caused by, for example,
   - Hardware faults and/or software errors in the sensors, control system, actuators, and connections
   - Response times of the control system and of the drive
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - Parameterization, programming, cabling, and installation errors
   - Use of wireless devices/mobile phones in the immediate vicinity of electronic components
   - External influences/damage
   - X-ray, ionizing radiation and cosmic radiation
2. Unusually high temperatures inside and outside the components, including open flames, as well as emissions of light, noise, particles, gases, etc. due to fault conditions, e.g.:
   - Component failure
   - Software errors
   - Operation and/or environmental conditions outside the specification
   - External influences/damage
   - Short circuits or ground faults in the intermediate DC circuit of the converter
3. Hazardous shock voltages caused by, for example:
   - Component failure
   - Influence during electrostatic charging
   - Induction of voltages in moving motors
   - Operation and/or environmental conditions outside the specification
   - Condensation/conductive contamination
   - External influences/damage
4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc., if they are too close
5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly

6. Influence of network-connected and wireless communications systems, e.g. ripple-control transmitters or data communication via the network or mobile radio, WLAN or Bluetooth.
7. Motors for use in potentially explosive areas:
   When moving components such as bearings become worn, this can cause enclosure components to exhibit unexpectedly high temperatures during operation, creating a hazard in areas with a potentially explosive atmosphere.

For more information about the residual risks of the drive system components, see the relevant sections in the technical user documentation.

Description

3

3.1 Product overview

Overview

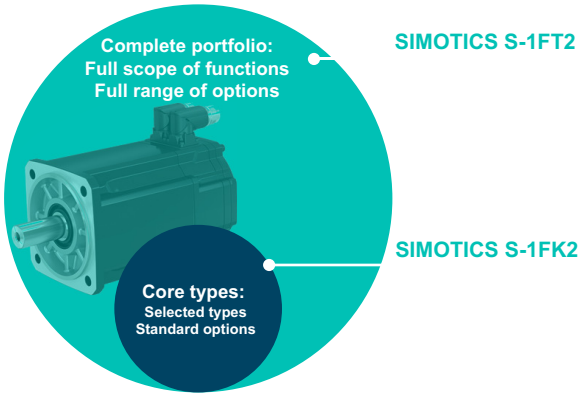
In this manual, the SIMOTICS S-1FK2 and S-1FT2 servomotors are referred to as 1Fx2 when the information applies to both motors.

SIMOTICS S-1FT2

SIMOTICS S-1FT2 servomotors offer a comprehensive range of finely graduated torque levels, rated speeds, and numerous options and variants to provide tailored solutions for the diverse challenges encountered in drive technology. 1FT2 motors are also a complete solution for demanding tasks or applications in challenging environments.

SIMOTICS S-1FK2

SIMOTICS S-1FK2 is a core product range comprising defined basic types of the 1FT2 servomotors with fewer options and variants. These motors can handle the key challenges in servo drive technology. They form the core of the new servomotor portfolio.



Dynamic versions

High Dynamic (Article Nos. 1FT21... and 1FK21...)

1Fx2 High Dynamic servomotors with low inertia are suitable for applications in which small masses must be moved with high dynamic response and precision. The lightweight, low-friction gearboxes enable high cycle rates in the application.

Compact (Article Nos. 1FT22... and 1FK22...)

When large loads must be moved precisely yet dynamically, the motor inertia is important. Through their medium inertia, 1Fx2 Compact servomotors improve the control characteristics without excessively limiting dynamic response. In combination with planetary

gearboxes with higher gear ratios, they make critical inertia ratios manageable from a control engineering perspective.

High Inertia (Article Nos. 1FT23... and 1FK23...)

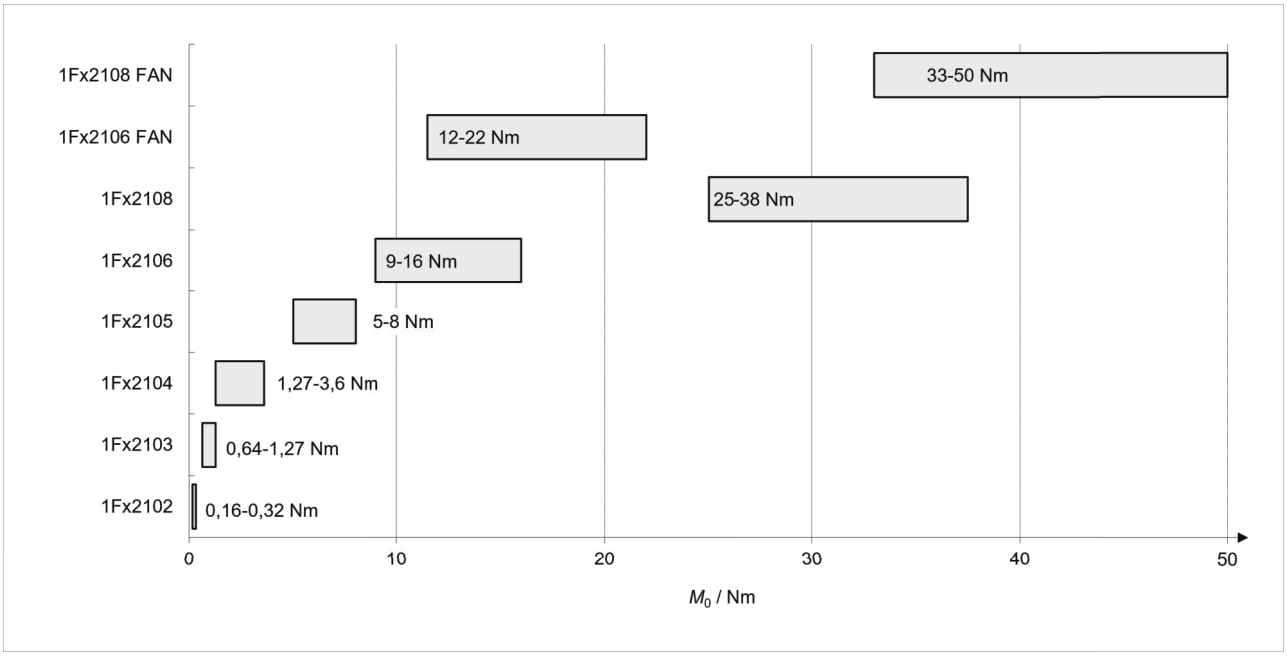
High Inertia motors have an increased moment of inertia. In applications with variable or very high load inertia, 1Fx2 High Inertia servomotors improve the inertia ratio and reduce the optimization effort required for stable and robust control.

Cooling method

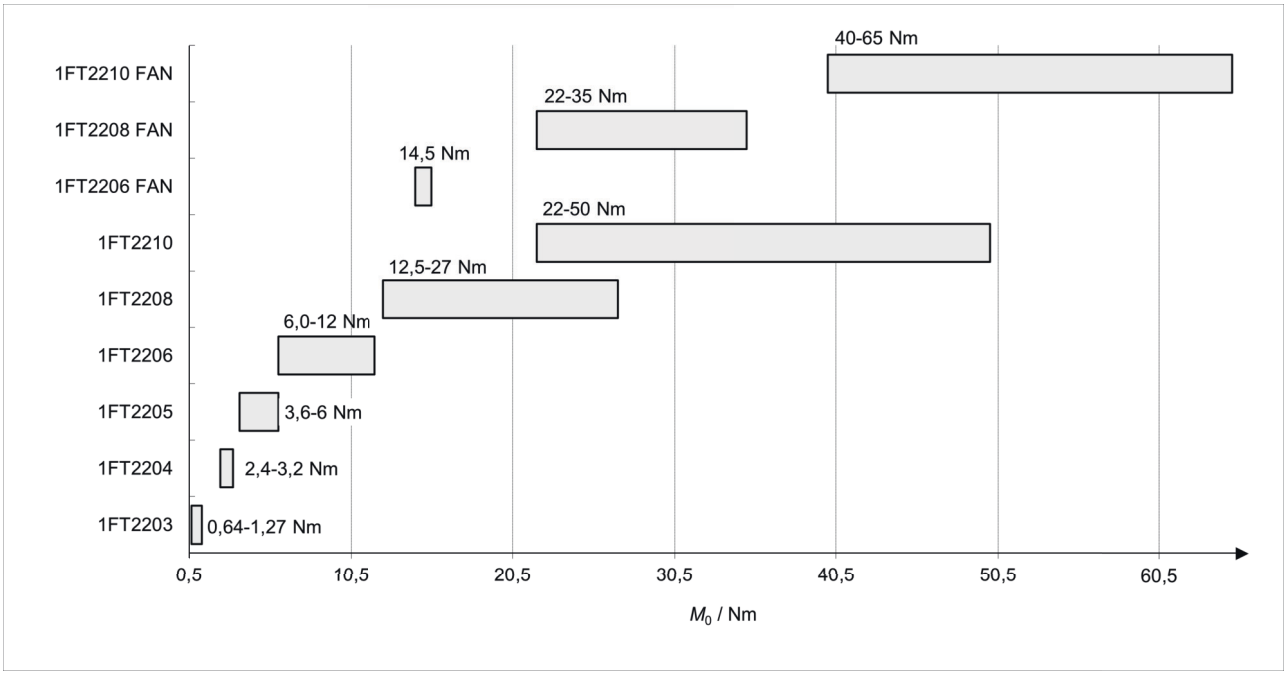
The motors are available as naturally cooled or force-ventilated version.

Torque range

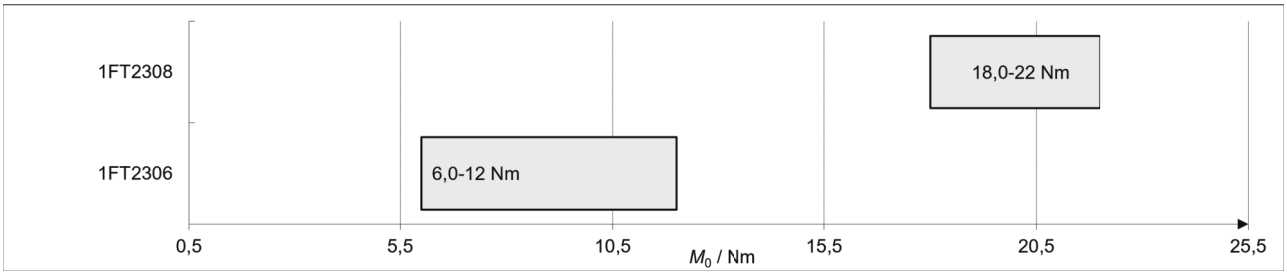
1Fx2 High Dynamic



1Fx2 Compact



1Fx2 High Inertia



Holding brake

The motors are available with an integrated holding brake as an option.

The holding brake closes in the current-free state and locks the motor shaft at a standstill. When current flows, the holding brake opens and releases the motor shaft.

Degree of protection

The motors are available with the following degrees of protection:

- IP64
- IP65 with radial shaft sealing ring
- IP67 with radial shaft sealing ring

Shaft extension

The motors are designed with a cylindrical shaft extension with or without a feather key. For certain frame sizes, a version with a reduced diameter is also available as an alternative to the standard shaft extension diameter.

Encoder

The encoder resolution is selectable as 22 bits or 26 bits per revolution (singleturn).

An optional multiturn encoder is available that is equipped with an additional 12-bit revolution counter (traversing range of 4096 revolutions).

Connection system

For electrical connection, the motors are equipped with rugged, rotatable angle plugs. Depending on the converter used, the connection options available are One Cable Connection (OCC) with one connector or two-cable connection with two connectors.

Planetary gearboxes

The motors are available with various mounted planetary gearboxes.

Typical applications

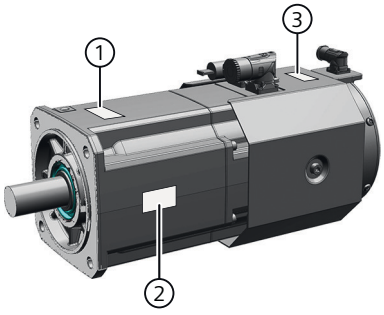
1Fx2 synchronous motors are typically used in the following application areas:

- Feed axes and auxiliary axes in machine tools
- Robots and handling devices
- Packaging machines
- Handling equipment
- Feed and withdrawal equipment
- Stacking units
- Automatic assembly machines
- Laboratory automation
- Woodworking, glass and ceramic industries

3.2 Data on the conformity and rating plate

Positions of the conformity and rating plates on the motor

The following plates are attached to the motor.



① Conformity plate
② Motor rating plate
③ Fan rating plate (only for force-ventilated motors)

Figure 3-1 Position of the plates (example illustration)

3.2.1 Rating plate data

Motor rating plate

The rating plate contains the article number and the technical data of the motor.

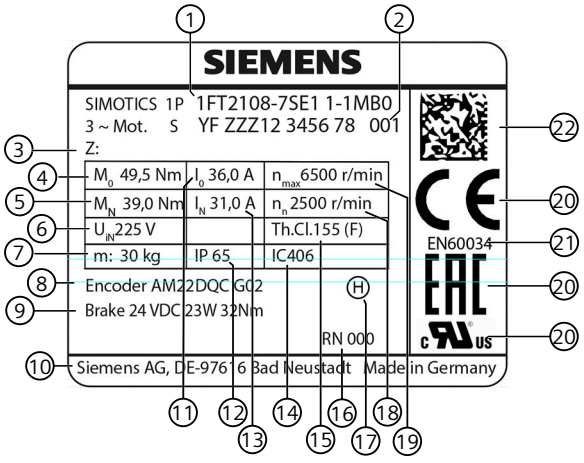
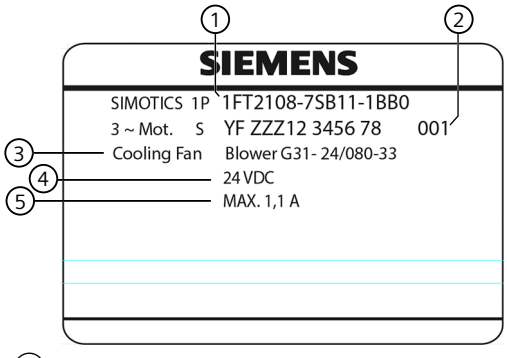


Figure 3-2 Rating plate 1FT2 for S120 (example illustration)

Position	Description / technical specifications	Position	Description / technical specifications
1	Article number	12	Degree of protection
2	ID No., serial number	13	Rated current I_N

3	Order codes as a supplement to the article number.	14	Cooling method according to EN 60034-6
4	Static torque M_0	15	Temperature class of the insulation system
5	Rated torque M_N	16	Revision
6	Induced voltage at rated speed U_{IN}	17	Type of balancing (only for motors with feather key)
7	Motor weight *m*	18	Rated speed n_N
8	Marking of encoder type	19	Maximum permissible mechanical speed of the motor n_{max}
9	Data of the holding brake	20	Certifications
10	Manufacturer's address	21	Standard for all rotating electrical machines
11	Stall current I_0	22	Data matrix code

Fan rating plate (only for force-ventilated motors)



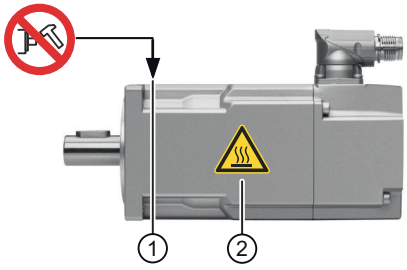
① Motor Article No.
② Serial number of the motor
③ Fan designation
④ Nominal voltage of the fan
⑤ Maximum permissible current of the fan

Figure 3-3 Rating plate for the fan (example illustration)

3.3 Safety symbols on the motor

3.3.1 Safety symbols on the motor_1FK2_B_1FT2

The following warning and information signs are attached to the motor:



1 Warning sign: "Do not hit with a hammer or similar tool"

2 "Hot surfaces" warning sign. The warning sign is on one side of the housing.

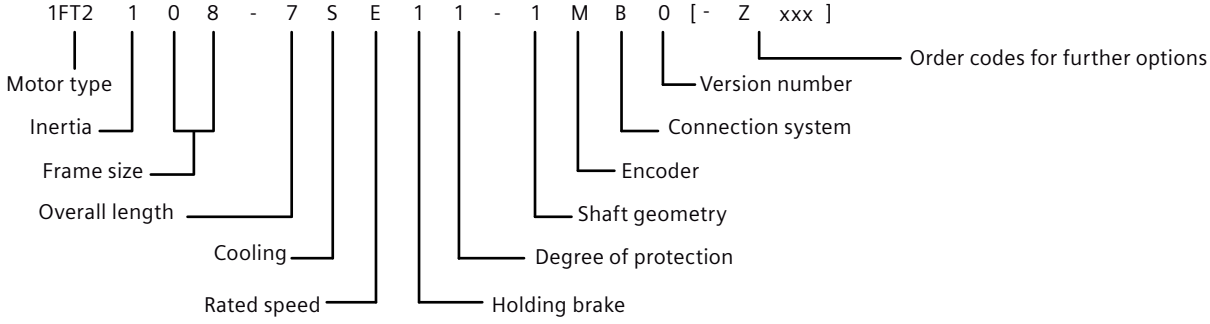
Note

Information and warning signs

If included with delivery, position the information and warning signs in such a way that the user can see them clearly.

3.4 Identification based on the article number

The article number describes the motor with the following structure.



You can find possible combinations in the relevant catalog.
Please note that not every theoretical combination is possible.

Description	Position in the article number																					
	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16				
Series	**1**	**F**	T	2																		
	1	**F**	K	2																		
Version / inertia	High Dynamic				1																	
	Compact				2																	
	High Inertia				3																	
Frame size/shaft height	SH 20					0	2															
	SH 30					0	3															
	SH 40					0	4															
	SH 48 / 52					0	5															
	SH 63					0	6															
	SH 80					0	8															
	SH 100					1	0															
Overall length	0 ... 8							-	☐													
Cooling	Natural cooling									A												
	Forced ventilation									S												
Rated speed	1500 r/min @ 400 V					750 r/min @ 230 V					B											
	2000 r/min @ 400 V					1000 r/min @ 230 V					C / Q											
	2500 r/min @ 400 V					1250 r/min @ 230 V					E											
	3000 r/min @ 400 V					1500 r/min @ 230 V					F											
	-					3000 r/min @ 230 V					G											
	4500 r/min @ 400 V					2500 r/min @ 230 V					H											
	6000 r/min @ 400 V					3000 r/min @ 230 V					K											
Holding brake	without											0										
	with											1										
	Reinforced brake											2										
Degree of protection	IP64												0									
	IP65 with radial shaft sealing ring without spring												1									
	IP67 with radial shaft sealing ring												2									
Shaft geometry	Plain shaft (without keyway)														0							
	Shaft with feather key														1							
	Plain shaft, alternative shaft geometry														2							
	Shaft with feather key, alternative shaft geometry														3							
Encoder	Absolute encoder, singleturn, 22-bit (encoder AS22DQC)															S						
	Absolute encoder singleturn, 26-bit (encoder AS22DQC)															B						
	Absolute encoder 22-bit + 12-bit multiturn (encoder AM22DQC)															M						
	Absolute encoder, 26-bit + 12-bit multiturn (encoder AM26DQC)															C						
	Resolver, 2 pole															R						
Connection system	OCC (One Cable Connection)																A					
	2CC (Two Cable Connection)																B					
Version number	Start																	0				

Description	Position in the article number																				
	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16			
Optional order codes for further variants and options																			-	Z	x	x	x

3.5 Directives and standards

3.5.1 Directives

Below is an overview of directives for the SIMOTICS motor series.

Conformité Européenne (CE)

The SIMOTICS motor series is CE certified.

European Low-Voltage Directive

SIMOTICS motors comply with Low-Voltage Directive 2014/35/EU.

European RoHS Directive

The SIMOTICS motor series complies with the Directive 2011/65/EU regarding limiting the use of certain hazardous substances.

European Directive on Waste Electrical and Electronic Equipment (WEEE)

SIMOTICS motors comply with the 2012/19/EU directive on taking back and recycling waste electrical and electronic equipment.

Note

The SIMOTICS motor series does not fall within the scope of the following directives:

European Machinery Directive

SIMOTICS motors do not fall within the scope covered by the Machinery Directive.

However, the use of the products in a typical machine application has been fully assessed for compliance with the main regulations in this directive concerning health and safety.

European EMC Directive

SIMOTICS motors do not fall within the scope covered by the EMC Directive. The products are not considered as devices in the sense of the directive. Installed and operated with a converter, the motor - together with the Power Drive System - must comply with the requirements laid down in the applicable EMC Directive.

European Directive 2005/32/EC defining requirements for environmentally friendly design of electric motors

The SIMOTICS motor series is not subject to (EC) Regulation No. 640/2009 for implementation of this directive.

European Directive 2009/125/EC defining ecodesign requirements of electric motors and speed controls

The SIMOTICS motor series is not subject to (EU) Regulation 2019/1781 for implementation of this directive.

Eurasian conformity

SIMOTICS motors comply with the requirements of the Russia/Belarus/Kazakhstan (EAC) customs union.

UKCA - United Kingdom Conformity Assessed

SIMOTICS motors fulfill the conformity requirements for England, Wales and Scotland.

China RoHS

SIMOTICS motors comply with the China RoHS requirements.



The number indicated in the logo, e.g. 50, indicates the Environmentally Friendly Use Period (EFUP) in years.

When used as intended, the product does not release any hazardous substances during its environmentally friendly service life.

The EFUP does not constitute a guarantee or warrantee period, however.



The green label means that the product does not contain any hazardous substances above the set Chinese limits.

Note

China Compulsory Certification

SIMOTICS motors do not fall within the scope covered by the China Compulsory Certification (CCC).

Underwriters Laboratories



SIMOTICS motors generally comply with UL and cUL requirements as components of motor applications, and are appropriately listed.

Specifically developed motors and functions are the exceptions in this case. Here, it is crucial that you carefully observe the content of the quotation and that there is a UL or cUL mark on the rating plate!

China Energy Label

Table 3-1 The motors meet the requirements for the "China Energy Label".

China National standard	Minimum allowable values of energy efficiency and energy efficiency grades for permanent-magnet synchronous motors (GB 30253).
Date of entry into force	January 1, 2026
Affected motors	Permanent-magnet synchronous motors with a rated power of 0.55 kW to 1 250 kW and a rated speed of 45 r/min to 6 000 r/min, and which are operated by a variable frequency converter at a power supply of up to 1 140 V.
Motor requirements	From the implementation date of the standard, all affected motors must be provided with the "China Energy Label".

Technical features

4

4.1 Permissible line system types

Description

In combination with the drive system, the motors are generally designed for grounded TN and TT line systems and non-grounded IT line systems.

Depending on the motor/converter combination and the planned installation altitude, the following constraints must be taken into account regarding the line connection.

Motor	Converter	Converter input voltage	Permissible line system configurations
All 1Fx2 motors	1 AC	200 ... 240 V 1 AC ±10%	• TN, TT line systems with grounding at any potential • IT line systems
	3 AC	200 ... 240 V 3 AC ±10%	• TN, TT line systems with grounding on neutral point or line conductor • IT line systems Installation of upstream isolation transformer and grounding the secondary side at the neutral point
All 1Fx2 motors except 1Fx2xxx-xx**G**...	3 AC	380 ... 480 V 3 AC ±10%	• TN, TT line systems with grounding on neutral point • IT line systems Installation of upstream isolation transformer and grounding the secondary side at the neutral point

NOTICE

Damage to motor insulation due to excessive voltages

In the event of a ground fault in the IT supply system, the motor insulation can be damaged by the higher voltage to ground.

- Use a ground fault monitor
- Eliminate the ground fault as quickly as possible.

4.2 Permissible DC link voltage

The limit values for the maximum DC link voltage of the motors at installation altitudes below 2000 m above sea level are listed in the following table:

Motors with the following rated speed in the article number 1Fx2xxx-xx□xx..., □ =	Max. permissible converter DC link voltage in V
G	375
B, C, E, F, H, K, Q	720

Factors for reducing the DC link voltage depending on the installation altitude

At installation altitudes of 2000 m above sea level and higher, the permissible DC link voltage is reduced as shown in the following table:

Table 4-1 Derating factors of the DC link voltage depending on the air pressure

Installation altitude above sea level in m	Air pressure in hPa	Derating factor
2000	784	1
3000	689	0.887
4000	606	0.775
5000	533	0.656
6000	469	0.588

Check whether a reduction of the actual DC link voltage is required for the given installation altitude, line voltage, and type of infeed.

Compare the actual DC link voltage with the value of the maximum permissible DC link voltage for this purpose.

Table 4-2 Typical DC link voltage of the SINAMICS converters

Network	Infeed	DC link voltage in V
230 V 1 AC	unregulated/SLM/BLM	248
240 V 3 AC	unregulated/SLM/BLM	307
400 V 3 AC	unregulated/SLM/BLM	528
480 V 3 AC	unregulated/SLM/BLM	634
400 V 3 AC	ALM	600
480 V 3 AC	ALM	720

Calculation example:

- given:
  - Motor 1Fx2xxx-xx**F**xx...
  - Installation altitude: 3000 m above sea level: 0.877
  - Max. permissible DC link voltage according to the table "Limit values for DC link voltages...": 720 V

1. Calculate the permissible DC link voltage as follows: 0.877 • 720 V = 631 V
2. Determine the intended line voltage + converter for 400 V 3 AC with non-stabilized infeed or SLM according to the table "Typical DC link voltages...": DC link voltage 528 V

Note

Observe the specifications for the installation altitude of the converter

Observe the specifications for the installation altitude of the converter used. The information can be found in the manuals of the respective product.

As the DC link voltage is reduced, the converter output voltage also decreases. This reduces the operating range in the M-n diagram.

The torque-speed diagrams are provided in Chapter "Technical specifications and characteristics (Page 107)".

4.3 Environmental conditions

In its basic version, the motor complies with climate class 3K4 according to EN 60721-3-3:1995-09 (historical) for stationary use at weather-protected locations, except with regard to the environmental parameters "low air temperature", "low air pressure", and "condensation".

Table 4-3 **Permissible ambient conditions for the motor based on climate class 3K4**

Environmental parameter		Unit	Value
a)	Low air temperature	°C	- 15
b)	High air temperature	°C	+ 40
c)	Low relative humidity	%	5
d)	High relative humidity	%	95
e)	Low absolute humidity	g/m³	1
f)	High absolute humidity	g/m³	29
g)	Rate of temperature change [1)]	°C/min	0.5
h)	Low air pressure [4)]	kPa	89
i)	High air pressure [2)]	kPa	106
j)	Solar radiation	W/m²	700
k)	Thermal radiation	-	-
l)	Air movement [3)]	m/s	1.0
m)	Condensation	-	Not permissible
n)	Wind-driven precipitation (rain, snow, hail, etc.)	-	-

Environmental parameter		Unit	Value
o)	Water (other than rain)	-	See protection class
p)	Formation of ice	-	-

1) *Averaged over a period of 5 min*

2) *Conditions in mines are not considered.*

3) *A cooling system based on natural convection can be disturbed by unforeseen air movements.*

4) *The limit value of 89 kPa covers applications at altitudes up to 1000 m.*

Note

Installation instructions

The basic version of the motor is not suitable for operation

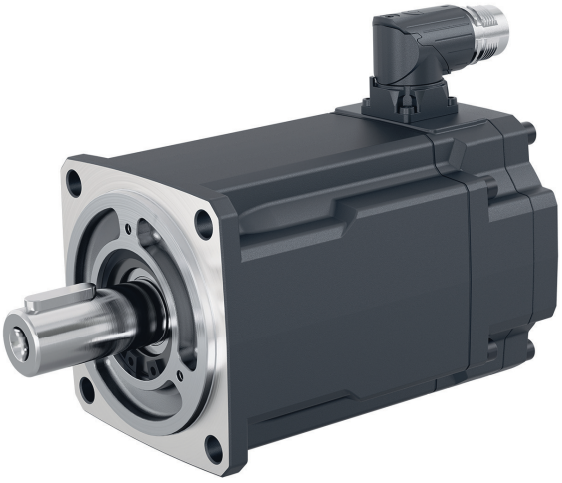
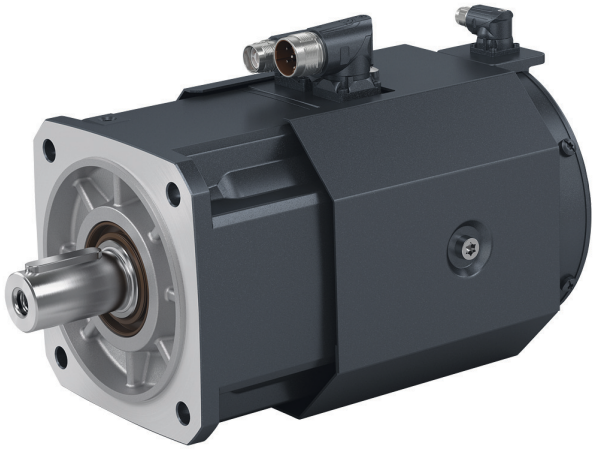
- In salt-laden or aggressive atmospheres
- Outdoors
- In a vacuum
- In hazardous areas with a danger of explosion

You will find additional data on the ambient conditions, such as for transport and storage of the motor, in Chapter "Preparation for use (Page 363)".

4.4 Cooling

Overview

Some of the waste heat generated by the motor is dissipated from the motor surface to the ambient air through radiation and natural convection. In force-ventilated motors, the forced air flow allows significantly more heat to be dissipated from the motor surface. Some of the waste heat is also dissipated by thermal conduction through the mounting flange to the surface on which the motor is mounted.

Naturally cooled motors	Force-ventilated motors
	

4.4.1 Mounting conditions

The specification data for naturally cooled and force-ventilated motors apply subject to the following installation conditions:

- Ambient temperature of 40 °C
- Installation altitude 1000 m above sea level
- The motor is thermally coupled to the machine via a flange plate with the following dimensions:

Shaft height	Steel plate, width x height x thickness (in mm)
1Fx2x02	200 x 200 x 6
1Fx2x03	250 x 250 x 6
1Fx2x04	
1Fx2x05	300 x 300 x 12

Shaft height	Steel plate, width x height x thickness (in mm)
1Fx2x06	450 x 370 x 30
1Fx2x08	
1Fx2x10	

Note

For naturally cooled motors, a minimum clearance of 100 mm from adjacent components must be maintained on three sides to ensure sufficient heat dissipation.

4.4.2 Effect of installation conditions and derating factors

Description

If the cooling of the naturally cooled or force-ventilated motor is impaired by a higher ambient temperature, a higher installation altitude, or thermally insulated mounting, you must take this into account in the thermal design and reduce the specified characteristic for the permissible effective torque (S1 characteristic) accordingly.

Installation altitude and ambient temperature

$$M_{S1\ red}\ (n) = x_d \bullet M_{S1}\ (n\ /\ x_d)$$

$M_{S1\ red}$ Reduced motor torque for S1 operation at the required installation altitude and ambient temperature

M_{S1} Motor torque for S1 operation at ambient temperature of 40 °C and 1000 m above sea level (see Chapter "Data sheets and characteristic curves" in the Configuration Manual)

n Motor speed

x_d Derating factor for installation altitude and ambient temperature

Installation altitude above sea level in m	Ambient temperature in °C				
	30	40	45	50	55
1000	1.05	1	0.95	0.89	0.84
2000	1	0.95	0.86	0.8	0.73
3000	0.95	0.89	0.76	0.69	0.62
4000	0.89	0.84	0.65	0.57	0.47

For ambient temperatures and installation altitudes that are not shown and are below the maximum values, calculate the derating factor by interpolation, e.g. 40 °C at 1500 m above sea level = derating factor 0.975

Graphic display of the derating factors

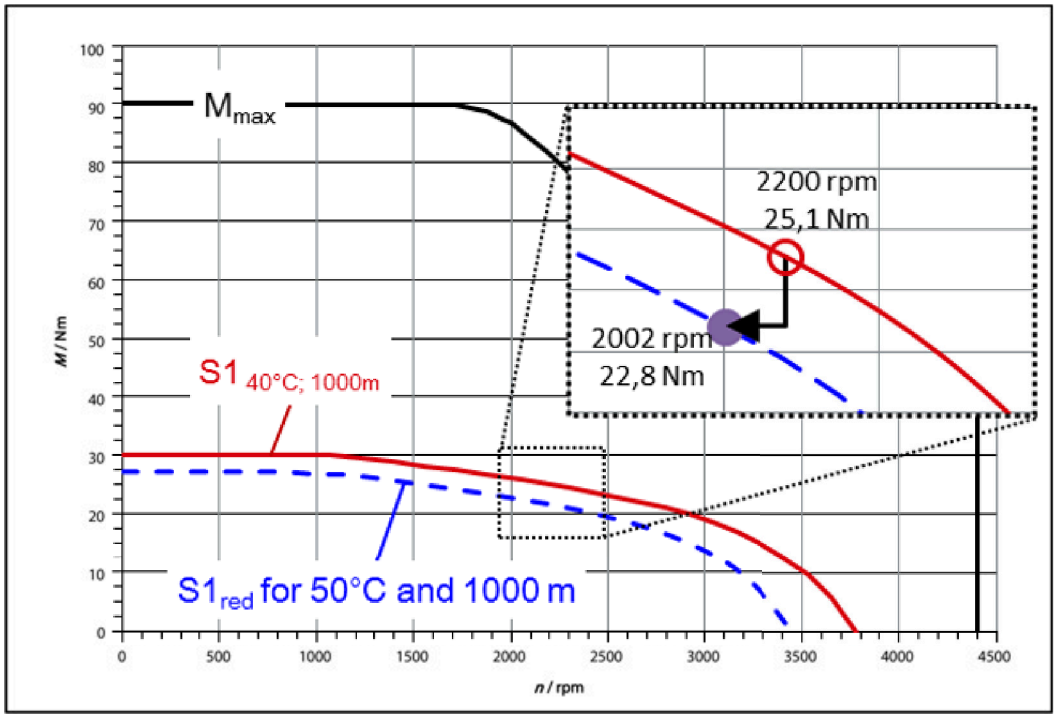


Figure 4-1 Example of a derating factor 0.91

Thermally insulated mounting

If naturally cooled or force-ventilated motors are mounted so that they are thermally insulated, then heat cannot dissipate via the flange.

Therefore reduce the M_{S1} characteristic as follows:

- Reduce the motor static torque by 20 % to 30 %.
- Reduce the torque at 3000 r/min by 40 % to 50 %.

4.4.3 Motors with forced ventilation

Description

This cooling method is achieved using a separate ventilation unit with a fan that is driven independently of the motor.

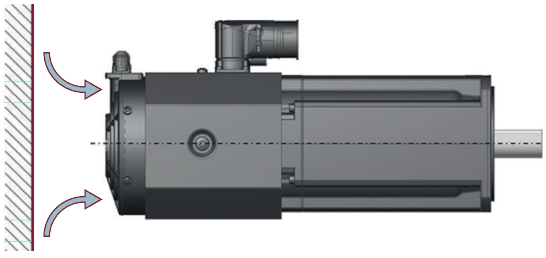
NOTICE
Motor damage caused by operation without forced ventilation The motors with forced ventilation overheat when operated without forced ventilation. This can cause motor damage. • Only operate the motor with the fan switched on and all external ventilation attachments properly fitted.

The fan has degree of protection IP66.

⚠ **WARNING**
Danger of explosion when operated in hazardous zones Operating the fan in an environment with inflammable, chemically corrosive, electrically conductive, or explosive dust or gases can cause explosions and result in death or serious injury. • Operate the motor with forced ventilation only in an environment that is free of inflammable, chemically corrosive, electrically conductive, or explosive dust or gases.

Only operate the fan with normal ambient air.

Direction of the fan air flow



(NDE → DE drive output)

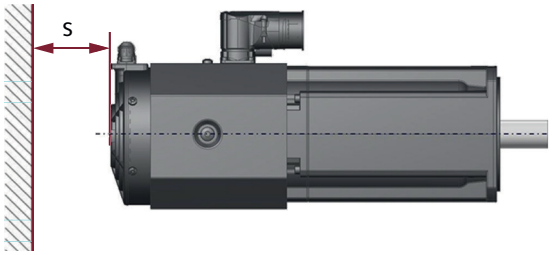
Notes for operating the motor with forced ventilation

Note

Ensure that the motor is only operated when the external fan is running.

- Position the motor so that the cooling air can freely flow in and out.
- Make sure that no heated discharged air is drawn in.
- Maintain the minimum clearance between the air intake and discharge openings and adjacent components (see the "Minimum clearance" figure).

Minimum clearance to neighboring components or surfaces



s The minimum clearance is 30 mm.

Figure 4-2 Minimum clearance 1FT2, force-ventilated

4.5 Thermal motor protection

Thermal motor protection

The converter monitors the motor temperature based on a thermal motor model and issues the alarm "Motor overtemperature" before the maximum temperature is reached. If the motor exceeds the maximum temperature, the converter switches off the motor with the fault message "Motor overtemperature". If the ambient temperature exceeds 40 °C, you need to set the ambient temperature at the converter so that the motor is reliably protected.

- To do this, select parameter p0613 at the converter.
- Set the maximum occurring ambient temperature.

Parameter r0034 indicates the thermal load of the motor as a percentage. The reading is influenced by the ambient temperature selected in parameter p0613.

More information is provided in the converter manual.

The motors have temperature sensors in the encoder electronics (for DRIVE-CLiQ encoders). If motor utilization is too high and the ambient temperature is higher than specified in parameter p0613 (factory setting 40 °C), the motors can be shut down with an overtemperature fault message without the "Motor overtemperature" prewarning being issued.

4.6 Mechanical interfaces

Description

The motors are supplied with cylindrical shaft extensions. The shaft extension usually has a centering thread according to DIN 332, form DR.

Optionally, a shaft extension with a keyway and feather key can be supplied. For certain motor frame sizes (see table), a shaft extension with a reduced diameter can also be ordered as an option.

For the 1Fx2x02, 1Fx2x03 and 1Fx2x04 with degree of protection IP65 or IP67, the radial shaft sealing ring shortens the usable shaft extension.

Motor	Shaft end with IP64 Diameter x length in mm	Shaft end with IP65 or IP67 Diameter x length in mm	Fitted key Width x height x length in mm	Centering thread
1Fx2x02	8 (h6) × 25	8 (h6) × 18	2 × 2 × 10	M3
1Fx2x03	14 (h6) × 30	14 (h6) × 21.5	5 × 5 × 16	M5
	11 (k6) × 23 [1]	-	-	M4
1Fx2x04	19 (k6) × 40	19 (k6) × 32	6 × 6 × 22	M6
	14 (k6) x 22	14 (k6) x 22	5 × 5 × 16	M5
1Fx2x05	19 (k6) × 40		6 × 6 × 32	M6
1Fx2x06	24 (k6) × 50		8 × 7 × 40	M8
1Fx2x08	32 (k6) × 58		10 × 8 × 45	M12
	24 (k6) × 50		8 × 7 × 40	M8
1Fx2x10	38 (k6) × 80		10 × 8 × 70	M12
	32 (k6) × 58		10 × 8 × 45	M12

[1] The optional 11 mm x 23 mm shaft end is only available with plain shaft and IP64.

4.7 Degree of protection

Overview

1FK2 motors are available with degree of protection IP64 or IP65.

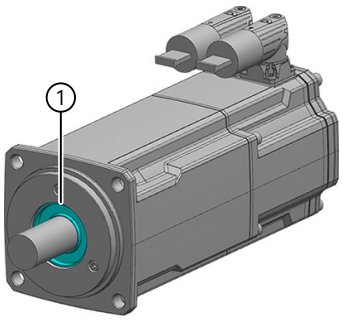
1FT2 motors are available with IP64, IP65 or IP67 degree of protection.

The fan for force-ventilated motors has degree of protection IP66.

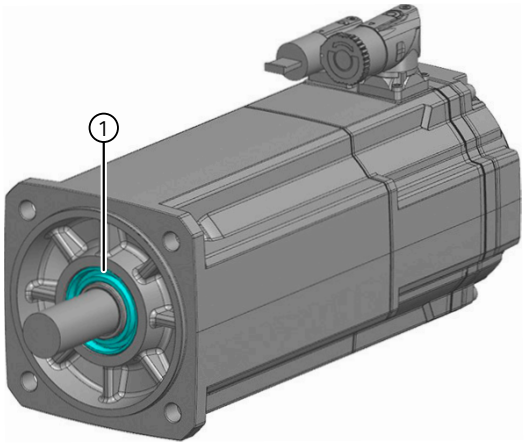
The degree of protection if stated on the rating plate.

The motors with degree of protection IP65 or IP67 feature a radial shaft seal ring.

The service life of the radial shaft sealing ring is listed in the table in Section "Sealing the motor shaft".



1Fx2x02 ... 1FT2x04



1FT2x05 ... 1FT2x10

① Radial shaft seal ring

The radial shaft sealing ring shortens the usable shaft extension of the 1Fx2x02, 1Fx2x03 and 1Fx2x04.

Note

If degree of protection IP65 is selected, dry running of the radial shaft seal ring is permissible. If degree of protection IP67 is selected, dry running of the shaft sealing ring can lead to increased wear and premature leakage.

With degree of protection IP65, it is not permissible for liquid to collect in the flange.

- Make sure that the friction partners are wetted with a lubricant if degree of protection IP67 is selected.

A suitable degree of protection must be selected according to the operating and environmental conditions to protect the motor against damage caused by the ingress of liquids, as well as dust and foreign bodies.

The protection class designation according to IEC 60034-5 is derived from the abbreviation IP (for International Protection) and two code numbers:

First code number:

6: Protection against dust ingress and complete protection against touching

Second code number:

4: Protection against splashwater from any direction

5: Protection against water jets from any direction

7: Protection against short-term immersion in water

Recommended degrees of protection for three-phase motors

When cooling lubricants are used, protection against water alone does not suffice. The IP rating should only be considered as a guide value in this case. The motors may have to

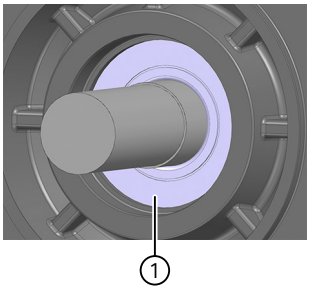
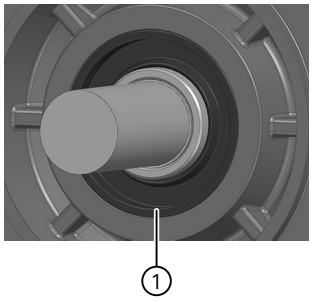
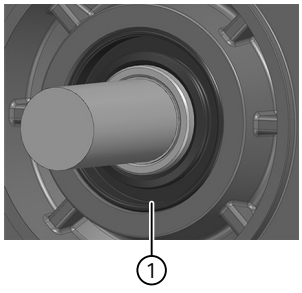
be protected by suitable covers. Attention must be paid to providing suitable sealing of the motor shaft for the selected degree of protection for the motor. For mounting position IM V3 (with the shaft extension facing upward), accumulation of liquid on the flange must be avoided.

The following table provides support when selecting the appropriate degree of protection for motors.

Effect / environment	**General workshop environment**	**Water, general cooling lubricants (95% water, 5% oil)**
Dry	IP64	-
Liquid-laden environments	-	IP64
Spray mist	-	IP65
Spraying	-	IP65
Jet	-	IP67
Splash, brief immersion	-	IP67

Motor shaft sealing

The motors are sealed differently to achieve degrees of protection according to IEC60034-5.

IP64	**IP65**	**IP67 (only 1FT2)**
		
① Ball bearing with sealing washers Moisture in the area around the shaft and the flange is not permissible. Note: For IP64, it is not permissible that liquid collects in the flange.	① Radial shaft sealing ring without annular spring Sealing of the shaft outlet against splashwater and/or cooling-lubricating medium. Dry running of the radial shaft sealing ring is permissible. Service life approx. 25000 h (guide value). With degree of protection IP65, it is not permissible for liquid to collect in the flange.	① Radial shaft sealing ring For gearbox mounting (for gearboxes that are not sealed) to seal against oil. The sealing lip must be adequately cooled and lubricated by the gearbox oil in order to guarantee reliable function. Service life approx. 10000 h (guide value). If a radial shaft sealing ring runs dry, then this has a significant negative impact on the functionality and the service life.

More information is provided in Chapter "Mechanical interfaces (Page 52)".

4.8 Encoder

Encoders with DRIVE-CLiQ interface

Motors with DRIVE-CLiQ interface are designed to operate with the SINAMICS converter system.

The signal is digitally transferred to the converter.

The motors have an electronic rating plate that simplifies commissioning and diagnostics.

The motor and encoder are automatically identified and all motor parameters are automatically set.

You will find further information in the relevant SINAMICS manual.

NOTICE
Damage to electrostatic sensitive devices The contacts of the DRIVE-CLiQ interface have direct contact with components that can be destroyed by electrostatic discharge (ESDS). • Avoid touching the terminals directly with hands or tools. They could be charged electrostatically and damage components.

1Fx2 is available with the following DRIVE-CLiQ encoders.

The encoders are suitable for the Extended and Advanced Safety functions.

Encoder designation	AS22DQC	AM22DQC	AS26DQC (only 1FT2)	AM26DQC (only 1FT2)
Description	Absolute encoder 22-bit singleturn	Absolute encoder 22-bit + 12-bit multiturn	Absolute encoder 26-bit singleturn	Absolute encoder 26-bit + 12-bit multiturn
Identifier at the 14th position of the Article No.	S	M	B	C
Operating voltage	24 V	24 V	24 V	24 V
Maximum current consumption	70 mA	70 mA	70 mA	70 mA
Resolution	4,194,304 = 22 bit	4,194,304 = 22 bit	67,108,864 = 26 bit	67,108,864 = 26 bit
Absolute position	Yes, one revolution	Yes, 4096 revolutions (12 bits)	Yes, one revolution	Yes, 4096 revolutions (12 bits)
Maximum angular error	± 100"	± 100"	± 40"	± 40"

Resolvers

The resolver is a rugged analog angle measuring system for commutation and acquisition of the speed actual value.

Frame size		Number of poles	Excitation voltage rms, excitation frequency	Angle error	Transmission ratio *i*
of the motor	of the resolver				
1FT2x03 1FT2x04 1FT2x05	15	2	2 ... 8 V, 5 ... 10 kHz	20 arcmin	0.5 ± 5 %
1FT2x06 1FT2x08 1FT2210	21	2	2 ... 8 V, 5 ... 10 kHz	14 arcmin	0.5 ± 5 %

Calculation of the output signals

Transformation ratio $i = 0.5 \pm 5\ \%$

$U_{\text{sinusoidal track}} = i \bullet U_{\text{excitation}} \bullet \sin \alpha$

$U_{\text{cosinusoidal track}} = i \bullet U_{\text{excitation}} \bullet \cos \alpha$

$\alpha = \arctan (U_{\text{Sinusoidal track}} / U_{\text{Cosinusoidal track}})$

4.9 Holding brake

4.9.1 Properties

Description

The holding brake is used to clamp the motor shaft when the motor is at a standstill. The holding brake is **not** a working brake for braking the rotating motor. When the motor is at a standstill, the holding brake is designed for at least 5 million switching cycles.

Restricted EMERGENCY-STOP operation is permissible. Take into account the maximum permissible single operating energy as well as service life, total operating energy of the brake.

⚠ WARNING

Unpredictable movements of the machine or system because of inadequate braking performance

If you use the holding brake inappropriately, e.g. as an operating brake or you ignore the permissible operating energy of the brake, then the brake will be subject to excessive and impermissible wear. As a consequence, there may be no braking effect at all. Unintentional movements of the machine or system can result in death or serious injury.

- Observe the permissible operating energy and EMERGENCY STOP properties.
- Operate the motor only in conjunction with an intact brake.
- Avoid repeated brief acceleration of the motor against a holding brake that is still closed.

NOTICE
Damage to the motor due to axial forces on the shaft extension Axial forces on the shaft extension can damage motors with an integrated holding brake. • Avoid impermissible forces on the shaft extension. You can find the permitted axial forces in Chapter "Radial and axial forces (Page 61)".

The type of the holding brake installed depends on the motor frame size.

Spring-loaded brake	Permanent magnet brake
1Fx2x02 ... 1Fx2x04	1Fx2x05 ... 1Fx2x10
The spring causes a compressive force on the brake armature disk. This means that in the current-free state, the brake is closed and the motor shaft is held.	The magnetic field of the permanent magnets exerts a tensile force on the brake armature disk. This means that in the current-free state, the brake is closed and the motor shaft is held.
When the brake is energized, the coil generates an opposing field. This neutralizes the spring force and the brake opens without residual torque.	When the brake is energized, the coil generates an opposing field. This neutralizes the force of the permanent magnets and the brake opens without residual torque.
The spring-loaded brake has a torsional backlash of less than 1.5°.	The permanent-magnet brake is connected to the motor rotor with high torsional rigidity and is backlash-free.

4.9.2 Technical specifications

Types of control

Some of the holding brake's operating parameters depend on the type of brake control. There are 2 types of control:

1. **Conventional control:**
   The rated voltage of the holding brake with conventional control is 24 V DC ±10%. Voltages outside this tolerance range can cause faults. When connected directly to the brake output of a SINAMICS converter, no additional circuitry is required. With separate brake control, a varistor (e.g. SIOVS14K30) must be connected in parallel with the brake to suppress overvoltages.

NOTICE
Premature wear of the motor holding brake when operated outside its permissible voltage range Operating the motor holding brake outside its permissible voltage range at the motor connection will damage the brake. • Ensure that the motor holding brake is only operated within its permissible voltage range.

2. **High-performance control:**
   By increasing the release voltage, the wear limit of spring-applied brakes can be extended. The subsequent voltage reduction reduces current consumption and self-heating of the brake. In an emergency stop situation, the brake responds more quickly and reduces unwanted axis movements.

The following data apply for conventional control with 24 V DC.

Conventional control 24 V +-10%								
Motor type	M_4	M_{1m}	M_{1max}	W_{max} [1]	t_{open}	t_{close}	W_{tot}	I_{rated}
	Nm	**Nm**	**Nm**	**J**	**ms**	**ms**	**kJ**	**A**
1Fx2x02-xxx1	0.32	0.32	1	7.4	50	20	0.5	0.3
1Fx2x03-xxx1	1.3	1.3	3.9	62	90	30	5	0.4
1Fx2x04-xxx1	3.3	3.3	9	270	110	40	35	0.5
1Fx2x05-xxx1	8	5	18	568	90	25	284	0.6
1Fx2106-xxx1	16	9	35	1065	100	50	774	0.7
1Fx2206-xxx1	13	6.5	35	1548	100	50	774	0.7
1Fx2208-2xx1 1Fx2x08-3xx1	19	12	37	2000	100	40	1800	0.8
1Fx2108-xxx1	36	15	70	1300	200	60	2400	0.9
1Fx2210-2xx1 1Fx2x10-3xx1	32	17	70	6658	200	60	2400	0.9
1Fx2x10-4xx1 1Fx2x10-5xx1	55	26	100	8700	220	80	3800	1.0
Reinforced brake								
1FT2108-xxx2	32	17	70	4800	200	60	2400	0.9
1FT2208-2xx2 1FT2208-3xx2	32	17	70	4800	200	50	2400	0.9
1FT2210-2xx2 1FT2210-3xx2	55	26	100	4800	220	80	3800	1.0

[1] Maximum of 3 consecutive EMERGENCY STOP procedures. Maximum 25% of all EMERGENCY STOP procedures as high-energy stops with W_{max}.

The following data apply for high-performance control.

High-performance control on the SINAMICS S210										
Motor type	M_4	M_{1m}	M_{1max}	W_{max} [1]	t_{open}	t_{close}	W_{tot}	I_h	I_{open}	t_{over}
	Nm	**Nm**	**Nm**	**J**	**ms**	**ms**	**kJ**	**A**	**A**	**ms**
1Fx2x02-xxx1	0.32	0.32	1	7.4	25	20	1.75	0.1	0.6	50
1Fx2x03-xxx1	1.3	1.3	3.9	62	40	30	17.5	0.15	0.8	60
1Fx2x04-xxx1	3.3	3.3	9	270	50	40	120	0.2	1.2	80
1Fx2x05-xxx1	8	5	18	568	35	20	284	0.3	1.1	120
1Fx2206-xxx1	13	6.5	35	1548	70	35	774	0.35		
1Fx2106-xxx1	16	9		1065						
1Fx2x08-2xx1 1Fx2x08-3xx1	19	12	37	2000			1800	0.4	1.2	
1FT2108-xxx1	36	15	70	1300	120	40	2400	0.5	1.4	180
1Fx2x08-4xx1 1Fx2x08-5xx1	32	17		4800						
1Fx2x10-2xx1 1Fx2x10-3xx1	32	17	70	6658	120	40	2400	0.5	1.4	180

High-performance control on the SINAMICS S210										
Motor type	M_4	M_{1m}	M_{1max}	W_{max} [1]	t_{open}	t_{close}	W_{tot}	I_h	I_{open}	t_{over}
	Nm	**Nm**	**Nm**	**J**	**ms**	**ms**	**kJ**	**A**	**A**	**ms**
1Fx2x10-4xx1 1Fx2x10-5xx1	55	26	100	8700	130	65	3800	0.5	1.5	200
Reinforced brake										
1FT2108-xxx2	32	17	70	4800	120	40	2400	0.5	1.4	180
1FT2208-2xx2 1FT2208-3xx2										
1FT2210-2xx2 1FT2210-3xx2	55	26	100	8700	130	65	3800	0.5	1.5	200

[1] Maximum of 3 consecutive EMERGENCY STOP procedures. Maximum 25% of all EMERGENCY STOP procedures as high-energy stops with W_{max}.

Holding torque M_4

The holding torque M_4 is the highest permissible torque for the closed brake in steady-state operation without slip (holding function when motor is at standstill). The data applies for the state at operating temperature (120 °C).

Dynamic braking torque M_{1m}

The dynamic braking torque M_{1m} is the smallest mean dynamic braking torque that can occur for an EMERGENCY STOP.

Maximum dynamic braking torque M_{1max}

The maximum dynamic braking torque M_{1max} is the greatest dynamic braking torque that can occur during EMERGENCY-STOP operation.

Based on M_{1max}, you can assess whether mounted mechanical elements, e.g. a gearbox, can withstand the maximum possible peak torques occurring on EMERGENCY STOP.

Opening time t_{open} and **closing time** t_{close}

The delay times that occur when switching the brake t_{open} and t_{close} are saved in the motor and are automatically taken into consideration.
After activation of the holding brake (open), the speed/velocity setpoint remains at "Zero" during opening time t_{open}. The speed/velocity setpoint is only enabled after the opening time t_{open} has elapsed.

After OFF1 or OFF3 and activation of the holding brake (closing), the drive still remains in closed-loop control with speed/velocity setpoint "Zero" during closing time t_{close}. The pulses are only canceled after this.

Maximal permissible EMERGENCY STOP switching energy W_{max}

The maximum permissible EMERGENCY STOP switching energy of an individual EMERGENCY STOP operation.

After an EMERGENCY STOP with the maximum EMERGENCY STOP switching energy, allow a cooling time of at least 3 minutes before you operate the motor again.

Total operating energy (service life) W_{tot}

The total operating energy is the sum of the EMERGENCY STOP switching energy (operating energy for each EMERGENCY STOP procedure). If you exceed the total operating energy, problem-free functioning of the brake can no longer be guaranteed.

Rated current I_N

The rated current of the brake applies to conventional control with 24 V at a brake temperature of 20 °C.

Holding current I_h

The holding current I_h keeps the holding brake open. After the time t_{over} has elapsed, the holding current I_h loads the 24 V supply of the converter for as long as the brake is open.

Typical release current I_{open} for overexcitation time t_{over}

After activation of the holding brake (open), the release current I_{open} places a load on the 24 V power supply of the converter for the specified overexcitation time t_{over}. This release current applies to a brake temperature of approx. 20 °C.
At a brake temperature of -15 °C, the release current can increase by up to 30%.

Formula to calculate the operating energy per braking operation

$$W_{BR} = (J_{Mot\ Br} + J_{load}) \bullet n_{mot}^{2} / 182.4$$

W_{Br} in J	Operating energy per braking operation
n_{Mot} in r/min	Speed at which the brake is engaged
$J_{Mot\ Br}$ in kgm²	Rotor moment of inertia of the motor with brake
J_{Load} in kgm²	Load moment of inertia of the mounting part on the motor with brake (kgm²)
182.4	Constant for calculating the circular frequency and SI units

You can find the appropriate data in Chapter "Technical specifications and characteristics (Page 107)".

4.10 Bearing versions

The motors have deep-groove ball bearings with permanent grease lubrication.

The average bearing lifetime is designed for 25000 operating hours.

The motors have spring-loaded bearings in the NDE direction. For version with holding brake, the NDE bearing is a locating bearing.

The permissible axial and radial forces can be found in the technical specifications in Chapter "Radial and axial forces (Page 61)".

4.11 Radial and axial forces

4.11.1 Axial forces

Description

The following axial forces on the shaft extension are permitted.

Motor	Axial forces in N
1Fx2x02	30
1Fx2x03	75
1Fx2x04	100
1Fx2x05	120
1Fx2x06	200
1Fx2x08	300
1Fx2210	450

The specified axial forces are determined by the spring loading and therefore also apply to motors with holding brake.

Note

When, for example, helical toothed wheels are used as the drive element, an axial force is exerted on the motor bearings in addition to the radial force.

Applications with a helical geared pinion directly mounted on the motor shaft are not permitted if the maximum permissible axial forces are exceeded.

⚠ WARNING

Material damage if axial forces are exceeded

If you exceed the axial forces in the direction from the NDE to the DE, the spring preloading of the bearings and therefore the holding torque of the brake may be eliminated. This can result in irreversible damage to the brake and unwanted axis movements.

- Do not exceed the axial forces.

4.11.2 Radial forces

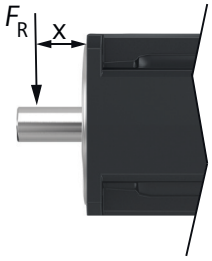
Description

Due to the bearing arrangement, the 1Fx2 is designed for forces acting in a fixed direction. Forces such as these occur for belt drives, for example.

All radial forces refer to aligned forces.

NOTICE
Motor damage caused by rotating forces
Circulating forces can cause bearing motion, and therefore damage the motor. • Avoid rotating forces.

Point of application of radial forces F_R at the shaft extension



F_R	Point of application of the radial force
x	Distance between where the radial force is applied and the shaft shoulder in mm

Description

The following diagrams indicate the maximum permissible radial force for the corresponding motor frame size. It depends on the point of force application and the average speed and applies to a nominal bearing life (L10h) of 25000 h.

Radial force diagram 1Fx2x02

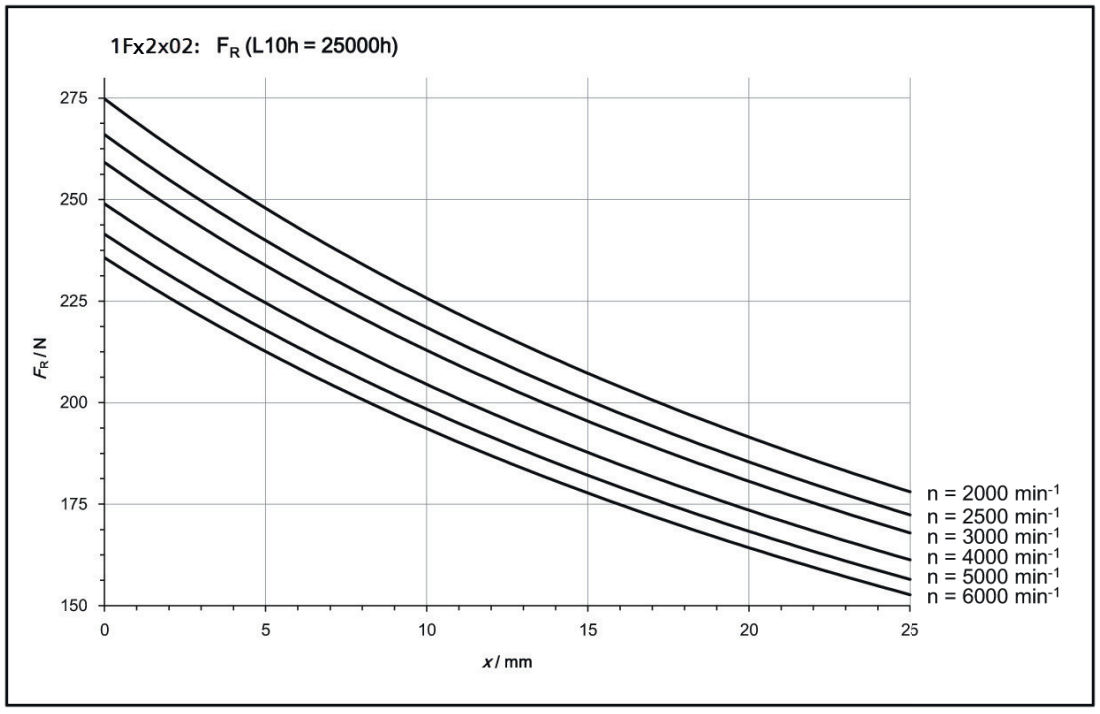


Figure 4-3 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2x03

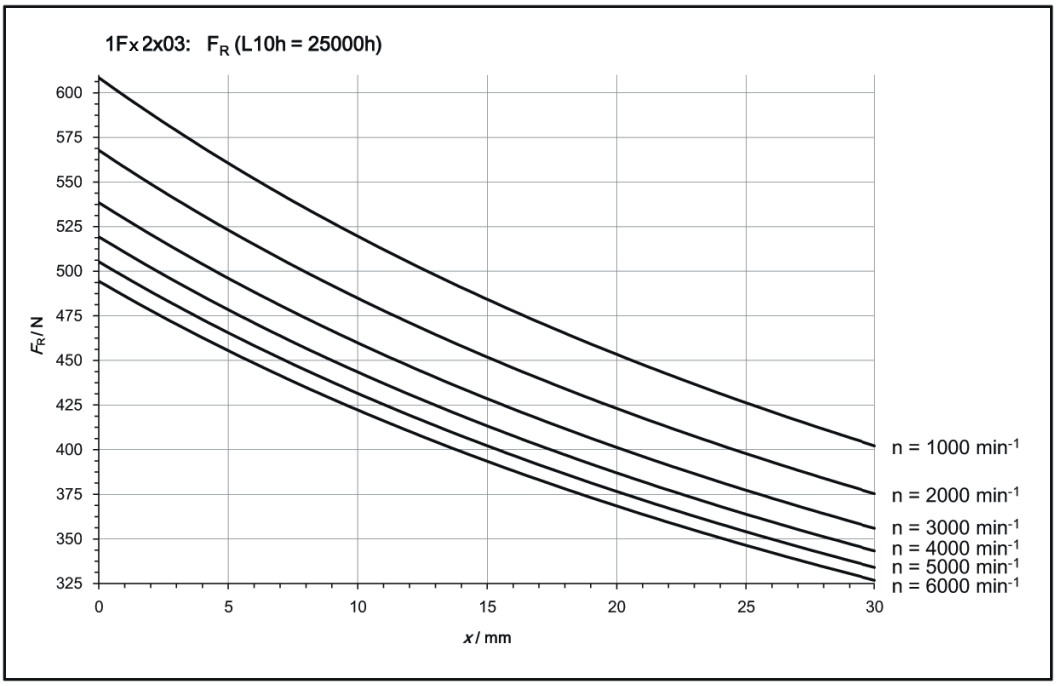


Figure 4-4 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2x04

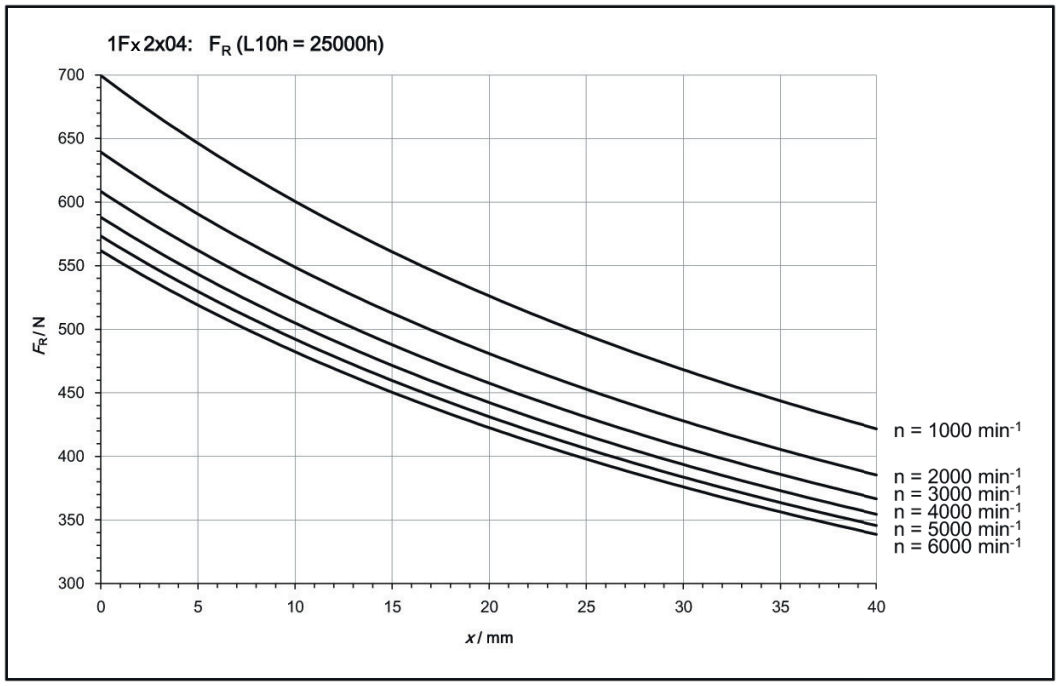


Figure 4-5 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2105

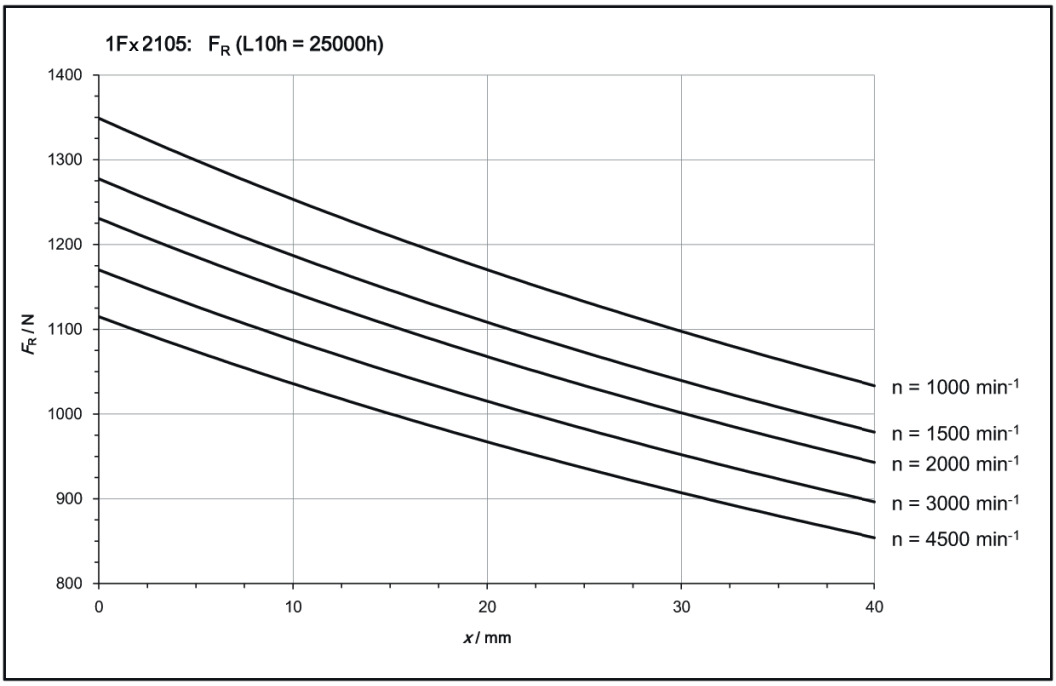


Figure 4-6 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2205

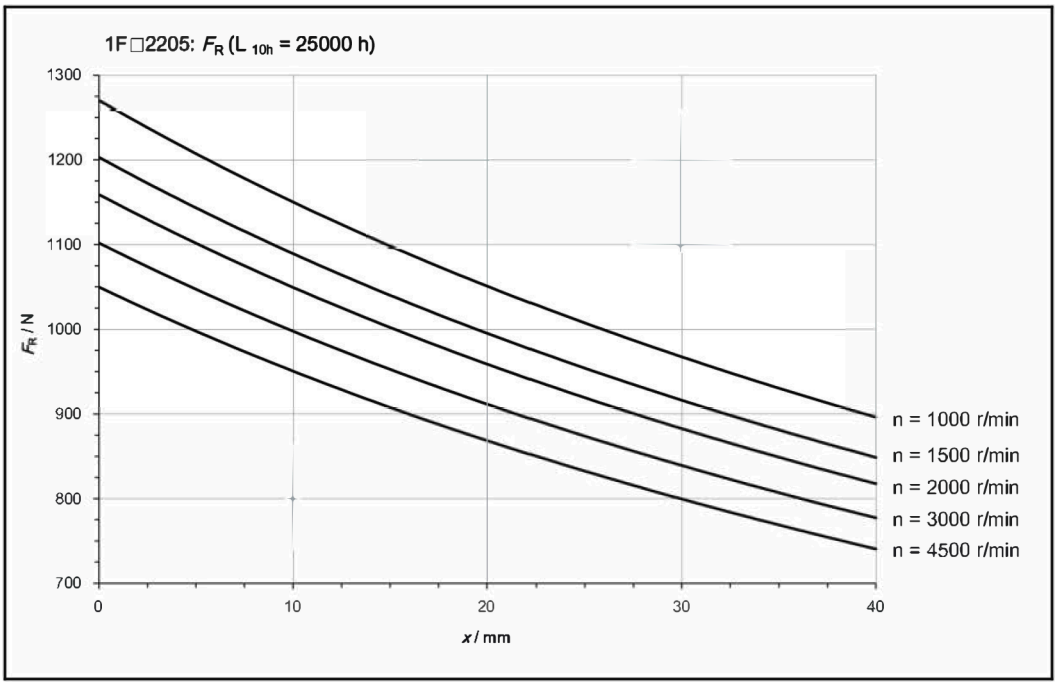


Figure 4-7 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2x06

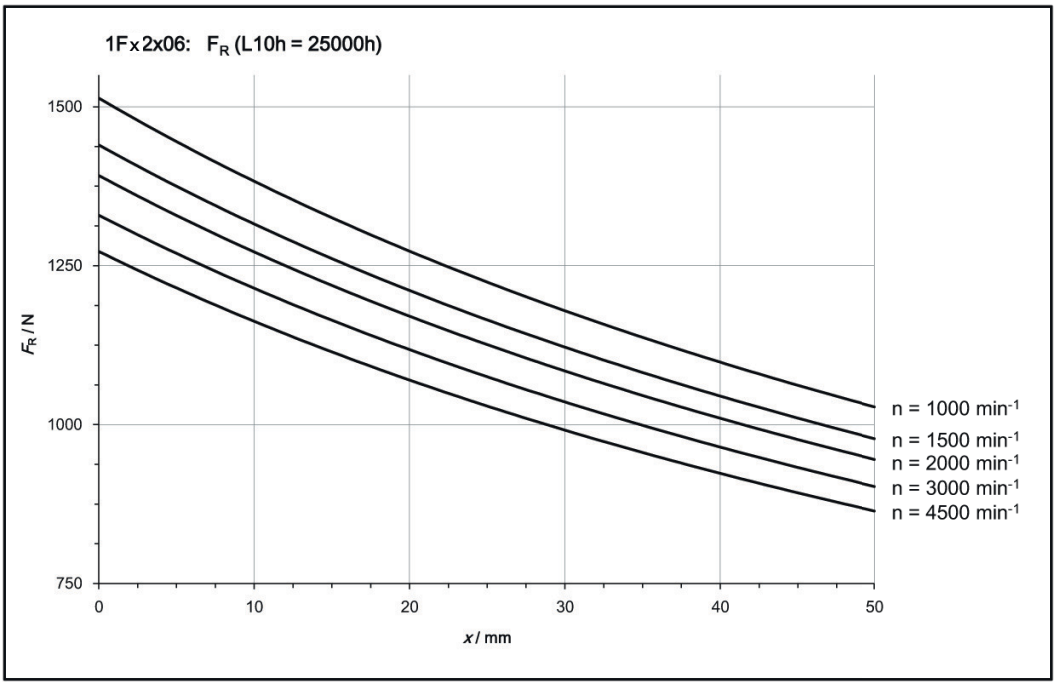


Figure 4-8 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2208-2

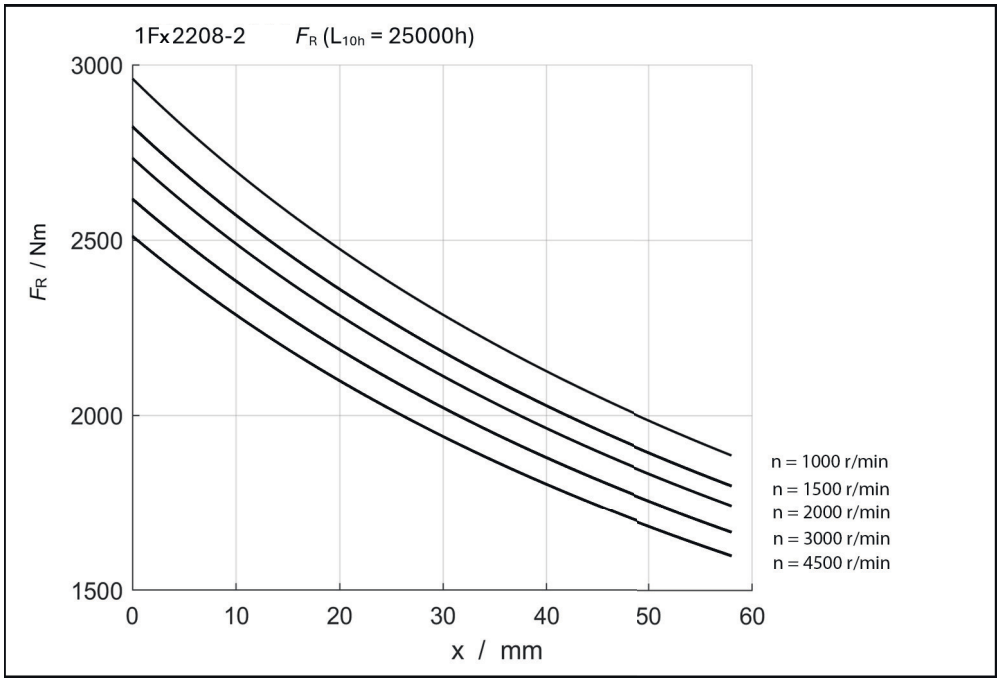


Figure 4-9 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2x08-3, 1Fx2x08-4, 1Fx2x08-5

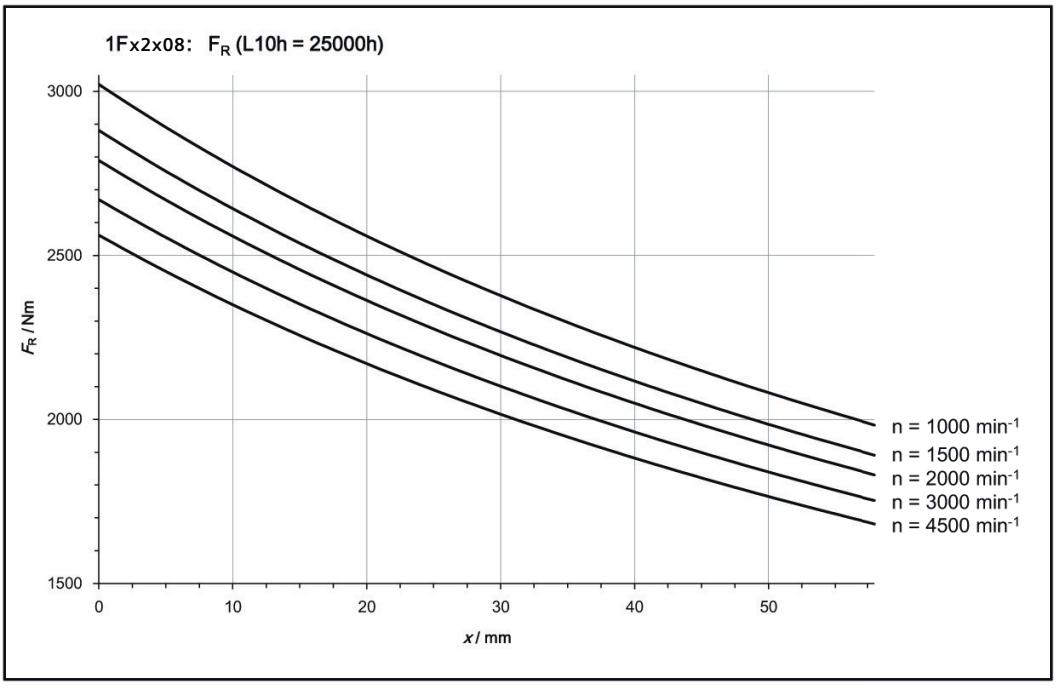


Figure 4-10 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2210-2

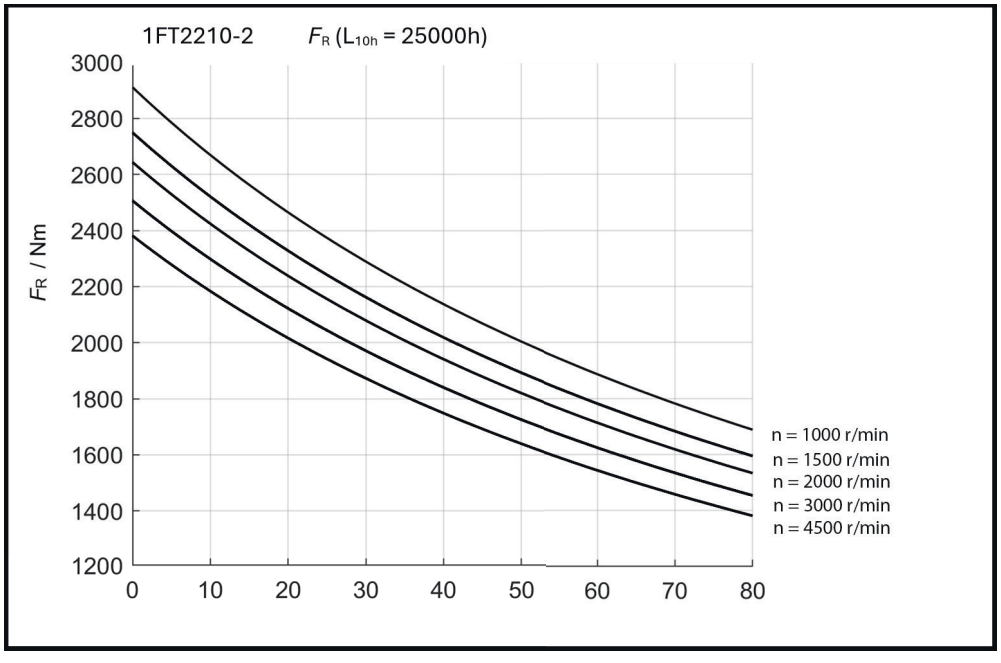


Figure 4-11 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

Radial force diagram 1Fx2210-3, 1Fx2210-4, 1Fx2210-5

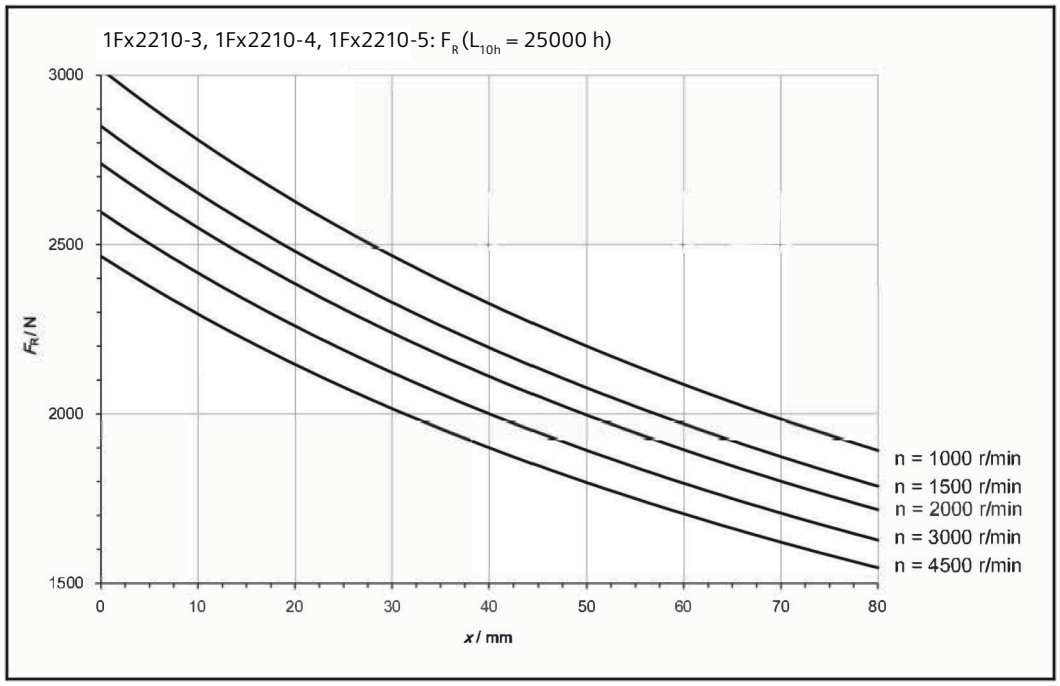


Figure 4-12 Maximum permissible radial force F_R at a distance x from the shaft shoulder for a nominal bearing lifetime of 25000 h.

4.11.3 Sample calculation of the belt pre-tension

Sample calculation of the belt pretension

You can calculate the aligned radial forces that occur for belt drives using the formula below.

Note

Carefully comply with the guidelines provided by the belt manufacturer

- Carefully comply with the guidelines provided by the belt manufacture when configuring the motor for radial forces at the shaft extension.
- Adjust the belt tension using the appropriate measuring instruments.

Requirement

You know the following variables:

- The motor static torque M_0 of your motor.
  The motor static torque is stamped on the rating plate of your motor or is specified in Chapter "Technical data".
  Effective diameter of the belt pulley d_R
- The maximum permissible radial force $F_{R\,perm.}$
  Determine the maximum permissible radial force using the radial force diagrams in Chapter "Radial forces (Page 61)"

Procedure

Proceed as follows to calculate the aligned radial forces that occur for belt drives.

1. Calculate the maximum permissible belt pretension F_V using the following formula.
   $F_V = 2 \cdot M_0 \cdot c \,/\, d_R$

F_V / N	Belt pretension
M_0 / Nm	Motor static torque
c	Pre-tensioning factor; this factor is an empirical value provided by the belt manufacturer. It can be assumed as follows: for toothed belts: c = 1.5 to 2.2 for flat belts c = 2.2 to 3.0
d_R / m	Effective diameter of the belt pulley
$F_{R,\,perm}$ / N	Permissible radial force

2. Compare the pretension that you determined with the maximum permissible pretension force
   $F_V \leq F_{R,\,perm}$

NOTICE
Bearing damage caused by inadmissible radial forces Only use the application if the determined pretension $F_V \leq$ the maximum permissible radial force $F_{R\,perm}$.

Note

When using other configurations, you must take into account the actual forces generated from the torque being transferred.

4.12 Radial eccentricity, concentricity and axial eccentricity

Description

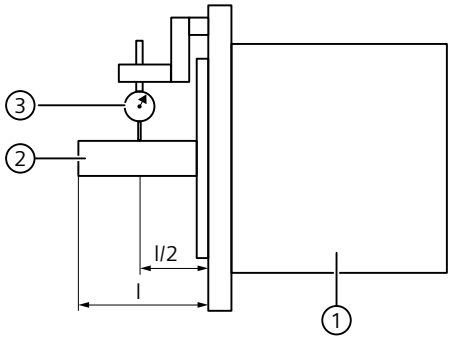
The shaft and flange accuracy of the motors complies with IEC 60072-1 as standard (normal class).

You can determine the maximum permissible tolerances with the measurement arrangements provided as example.

Radial eccentricity tolerance of the shaft to the frame axis (referred to cylindrical shaft ends)

Motor	Standard (Normal class)
1Fx2x02	0.03 mm
1Fx2x03	0.035 mm
1Fx2x04	0.04 mm
1Fx2x05	
1Fx2x06	
1Fx2x08	0.05 mm
1Fx2x10	

Measurement arrangement for the radial runout check



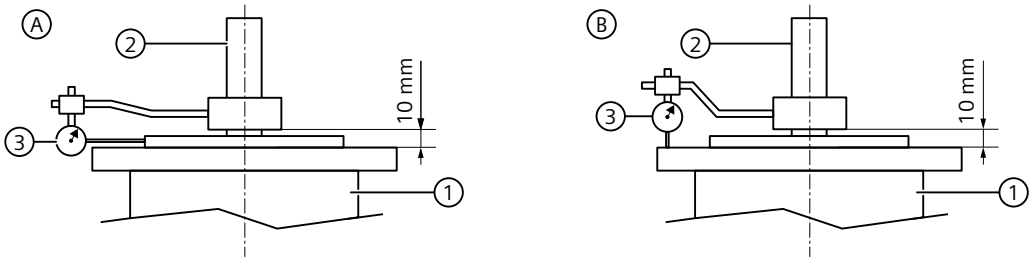
① Motor
② Motor shaft
③ Dial gauge

Concentricity and axial eccentricity tolerance of the flange surface to the shaft axis (referred to the centering diameter of the mounting flange)

Motor	Standard (Normal class)
1Fx2x02	0.08 mm
1Fx2x03	
1Fx2x04	
1Fx2x05	

Motor	Standard (Normal class)
1Fx2x06	0.1 mm
1Fx2x08	
1Fx2x10	

Measurement arrangement for concentricity and axial runout tolerance



A	Check for concentricity	①	Motor
B	Check for axial eccentricity	②	Motor shaft
		③	Dial gauge

4.13 Balancing

The motor rotor is balanced according to IEC 60034-14.

Motors with featherkey in the shaft are half-key balanced.

- A mass equalization for the protruding half key must be taken into account for the output elements.

4.14 Vibrational behavior

Vibration severity grade

Motors with keyway are balanced by the manufacturer using a half-key.

The vibration response of the system at the location of use is influenced by output elements, any built-on parts, the alignment, the installation, and external vibrations. This can change the vibration values of the motor.

The motors conform to vibration severity grade A according to EN 60034-14 (IEC 60034-14).

The specified values refer only to the motor. The installation-dependent system vibration behavior can increase these values at the motor.

The vibration severity grade is maintained up to the rated speed (n_N)

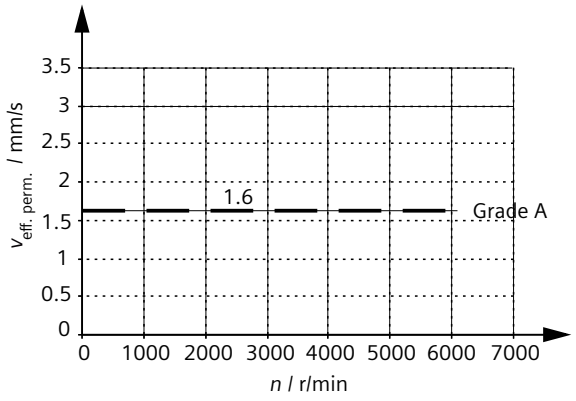


Figure 4-13 Vibration severity levels

4.15 Permissible vibration during operation

Vibration response

Comply with the vibration values in the following table to ensure perfect functioning of the motor and a long service life.

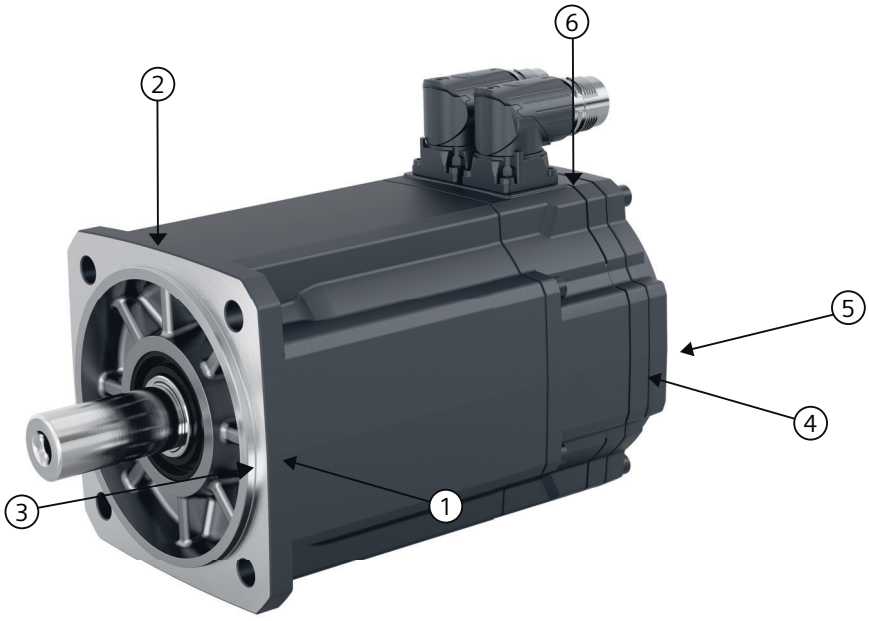
Cooling method	Motor	Vibration acceleration a_{peak} axial	Vibration acceleration a_{peak} radial	Vibration velocity Vrms acc. to ISO 10816-1:1997-08 (historical)
Naturally cooled	1Fx2x02	50 m/s²	50 m/s²	Max. 4.5 mm/s
	1Fx2x03			
	1Fx2x04			
	1Fx2x05			
	1Fx2x06			
	1Fx2x08	25 m/s²		
	1Fx2210	25 m/s²		
Force ventilated	1FT2x06	25 m/s²	25 m/s²	
	1FT2x08			
	1FT2210			

The measuring equipment must fulfill the requirements of ISO 2954 to evaluate the vibration velocity

Select the measuring points based on ISO 10816-1: 1997-08 (historical), Section 3.2.

The vibration acceleration is evaluated in the frequency range from 10 Hz ... 2000 Hz. The maximum peak in the measurement time range is taken into consideration.

The vibration values must not exceed the specified limits at any measuring location.



1	End shield DE radial	4	End shield NDE radial
2	End shield DE radial	5	End shield NDE axial
3	End shield DE axial	6	End shield NDE radial

Figure 4-14 Measuring points for vibration values

4.16 Noise emission

Sound pressure level

When operated in the speed range 0 to rated speed, motors of the 1Fx2 series can reach the following enveloping surface sound pressure level L_p.

Cooling method	Frame size	Enveloping surface sound pressure level L_p
Naturally cooled	1Fx2x02 1Fx2x03 1Fx2x04	55 dB (A) + 3 dB tolerance
	1Fx2x05 1Fx2x06	65 dB (A) + 3 dB tolerance
	1Fx2x08 1Fx2x10	70 dB (A) + 3 dB tolerance
Force-ventilated	1FT2x06 1FT2x08 1FT2x10	73 dB (A) + 3 dB tolerance

The motors are approved for numerous installation and operating conditions. These conditions such as rigid or vibration-isolated foundation design influence noise emission, sometimes significantly.

4.17 Further options

Overview

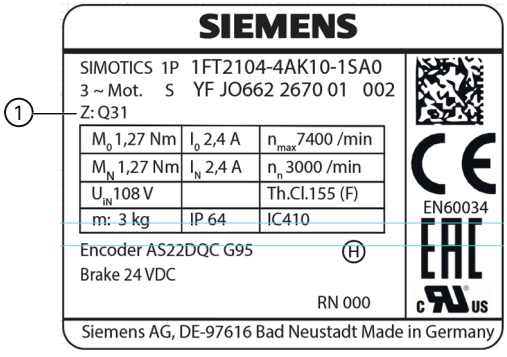
The following options are available for the 1FK2 and 1FT2:

- Planetary gearbox Economy, coaxial (order code Axx, Bxx, Cxx)

The following options are available for the 1FT2:

- Planetary gearboxes (order code Axx, Bxx, Cxx, Jxx or Hxx)
- Paint finish (order code X0x)
- Increased chemical resistance (order code N16)
- Pressure equalization (order code Q20)
- Use down to -30 °C (order code Q30)
- Metal rating plate (order code Q31)
- Suitable for dry room conditions and certification for clean rooms (order code Q40)
- Customer data on the rating plate (order code Y84)

The selected options are stamped on the rating plate as order codes.



① Order codes for the selected options

Figure 4-15 Rating plate of 1FT2 with order codes for the options (example diagram)

4.17.1 Option, planetary gearbox (order code Axx, Bxx, Cxx, Jxx and Hxx)

Overview of the planetary gearboxes for S-1Fx2 servomotors

The servomotors can be combined with various planetary gearboxes to form compact servo planetary geared motors.

Coaxial and angled economy planetary gearboxes as well as coaxial precision gearboxes are available.

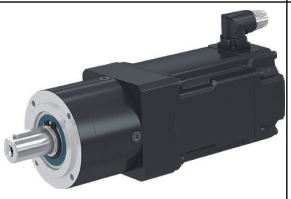
Economy gearboxes have straight gearing with grease lubrication and have a low torsional backlash. The angled version is implemented using a preliminary bevel gear stage; a "W" is added to the end of the gearbox designation.

Precision gearboxes have helical gearing, are oil lubricated and have a further reduced torsional backlash when compared to economy gearboxes.

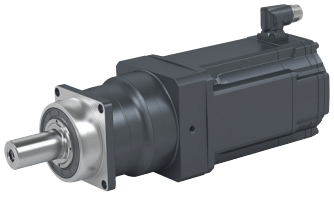
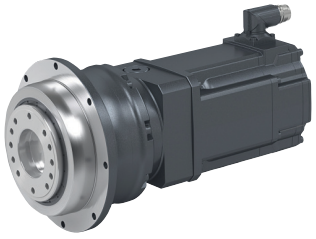
1Fx2 geared motors are specified and delivered as complete units. All outstanding performance data are matched to the motor-gearbox combination. An S1 characteristic is available for thermal dimensioning, which already takes into account the thermal interaction between the motor and gearbox. This means that it is not necessary to reduce the power of the motor or gearbox any further depending on the operating point.

All planetary gearboxes are maintenance-free due to their lifetime lubrication and can be mounted in any mounting position without restriction.

The following table lists the options when combining planetary gearboxes with 1Fx2 servomotors.

ECO coaxial gearbox for 1FK2 and 1FT2	**NRB**	**NRK**	**NLC**
			

ECO gearboxes, angled, for 1FT2	**NRBW**	**NRKW**	**NLCW**
			

Precision gearboxes, coaxial, for 1FT2	**SP+**	**TP+**
		

Motor versions

2 motor versions are available for the 1Fx2 geared motor.

High Dynamic (Article Nos. 1FT21... and 1FK21...)

S-1Fx2 High Dynamic servomotors with low inertia demonstrate their full strengths when small masses must be moved with maximum dynamic response and precision. The lightweight and low-friction gearboxes in conjunction with inertia-optimized clamping systems allow the highest cycle rates in the application.

Compact (Article Nos. 1FT22... and 1FK22...)

If larger loads need to be moved with precision and dynamically, a motor version with higher inertia is absolutely necessary so that the closed-loop control can be adequately handled. 1Fx2 Compact servo motors with medium inertia, combined with planetary gearboxes with higher gear ratios, make it possible to handle even challenging inertia ratios from a control engineering perspective.

Planetary gearbox: Economy, coaxial

NRB

NRB is the lightest gearbox with the highest power density. Due to its low friction bearing design, it is suitable for high speeds and generates very little heat.

The gearboxes are suitable for the following applications:

- Packaging
- Food industry
- Pharmaceutical and medical technology
- Auxiliary axes in machine tools

NRK

The NRK series gearbox is suitable for higher radial and axial forces due to the large output bearing. This gearbox is also suitable for higher speeds thanks to low internal friction.

The gearboxes are suitable for the following applications:

- Automation and assembly technology
- Packaging
- Auxiliary axes in machine tools

NLC

Due to the preloaded tapered roller bearing, the NLC gearbox has a high degree of stiffness and is suitable for high radial and axial loads. The IP65 seal provides protection against dust and water.

The gearboxes are suitable for the following applications:

- Automation and assembly technology
- Packaging
- Food industry
- Pressure
- Auxiliary axes in machine tools

Planetary gearbox: Economy, angle

As a result of the preliminary bevel gear stage, NRB, NRK and NLC planetary gearboxes are also available as NRBW, NRKW or NLCW angled gearboxes.

The angled versions are ideal when space is restricted. Due to the additional angle stage, the losses in the angled gearboxes are somewhat higher and the rated specifications are reduced in comparison to the corresponding coaxial version.

Precision gearbox: Precision gearboxes, coaxial

SP+

The low-backlash SP+ precision gearbox has high positioning accuracy and is suitable for dynamic cyclic operation. Due to the preloaded tapered roller bearing, it is suitable for high radial and axial loads. The IP65 seal provides protection against dust and water.

The gearboxes are suitable for the following applications:

- Automation and assembly technology
- Packaging
- Pharmaceutical and medical technology
- Food industry
- Auxiliary axes in machine tools
- Woodworking
- Plastics processing machines
- Pulp and paper industry

TP+

The low-backlash TP+ precision gearbox features a compact design with an output flange. It offers low torsional backlash combined with high torsional rigidity and is designed for high torques and high external loads.

The gearboxes are suitable for the following applications:

- Main axes in machine tools
- Packaging
- Pressure
- Robotics

Table 4-4 Design and technical features of planetary gearboxes

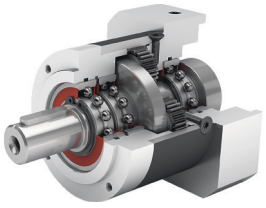
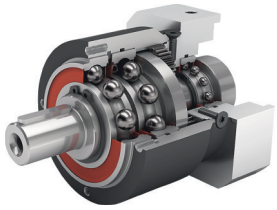
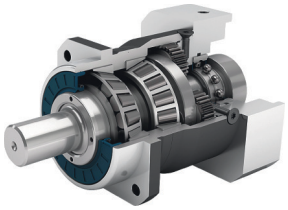
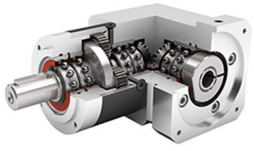
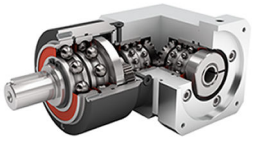
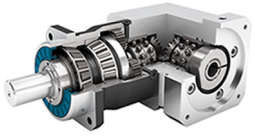
Planetary gearboxes	**NRB, NRBW**	**NRK, NRKW**	**NLC, NLCW**
Diagrams showing NRB, NRK and NLC coaxial planetary gearboxes			
Diagrams showing NRBW, NRKW and NLCW angled planetary gearboxes			
Transmission ratio *i*	3 ... 512	3 ... 100	3 ... 100
Gearbox stages *z*	1-, 2- and 3-stage, NRB160 only 2 stage	1 and 2-stage	1 and 2-stage
Torsional backlash φ_2 of the planetary gearbox in arcmin	6 ... 22 for NRB	6 ... 19 for NRK	7 ... 12 for NLC
	11 ... 28 for NRBW	11 ... 25 for NRKW	11 ... 18 for NLCW
Type of construction	IMB14 / IMV18 / IMV19	IMB14 / IMV18 / IMV19	IMB5 / IMV1 / IMV3
Degree of protection	IP64	IP64	IP65
Power density	+++	++	++
Bearing loading capacity	+	++	+++
Suitable for high speeds	++	++	+
Options	• Plain shaft or solid shaft with feather key • Standard lubrication or food-safe lubricant (grease)		

Table 4-5 Design and technical features of precision gearboxes

Precision gearbox	**SP+**	**TP+**
Transmission ratio *i*	3 ... 100	4 ... 100
Gearbox stages *z*	1-, 2-stage	1 and 2-stage
Torsional backlash φ_2 of the planetary gearbox in arcmin	3 ... 6	3 ... 4
Reduced torsional backlash φ2 of the planetary gearbox in arcmin	1 ... 4	1 ... 2
Type of construction	IMB5 / IMV1 / IMV3	IMB5 / IMV1 / IMV3
Degree of protection	IP65	IP65
Power density	+++	++++
Bearing loading capacity	+++	++++

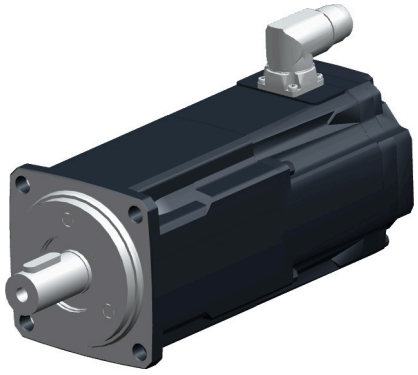
Precision gearbox	SP+	TP+
Suitable for high speeds	+++	+++
Options	• Plain shaft or solid shaft with feather key • Standard lubrication or food-safe lubricant (oil) • Splined shaft and reduced backlash	• Standard and food-safe lubrication (oil) and reduced backlash

More information about the planetary gearboxes is available in the equipment manual "Planetary gearboxes for 1FK2 and 1FT2 servomotors (https://support.industry.siemens.com/cs/ww/en/view/109989183)".

4.17.2 Option - Paint finish (only 1FT2)

Description

Unless a specific color or paint finish is specified, the motor is painted in the standard color anthracite gray (RAL 7016).



The motor is available in various colors.

The standard paint finishes meet the requirements for ambient conditions of climate class 3K4 according to IEC 60721-3-3 with the exception of the environmental factors "low air temperature", "condensation" and "low air pressure".

The standard paint finish meets the requirements of corrosivity category C1 according to ISO 12944-2.

For higher corrosion protection categories, you require option "Option - Increased chemical resistance (order code N16) (only 1FT2) (Page 84)".

Note

You will find more information in Chapter "Environmental conditions (Page 45)".

Special colors

Designation	Order code	Color pattern
Unpainted*	X00	
RAL 9005, jet black, matte	X01	
RAL 9001, cream white	X02	
RAL 6011, reseda green	X03	
RAL 7032, pebble gray	X04	
RAL 5015, sky blue	X05	
RAL 1015, light ivory	X06	
RAL 9006, white aluminum	X08	
Special paint finish corresponding to the ambient conditions for the standard paint finish and for condensation on the outer motor surfaces, primer and paint finish in RAL 7016, anthracite grey	K23	
Special paint finish as for K23; however, special color according to color table	K23 + Xxx	

* Cannot be combined with mounted gearbox

4.17.3 Option - Increased chemical resistance (order code N16) (only 1FT2)

Description

You can order motors with increased chemical resistance.

The motor is classified according to the corrosivity categories specified in ISO 12944-2.

With this option, the motor has corrosion protection according to Class C4(M).

This option is available for 1FT2 for all frame sizes from 1FT2x03.

Additional characteristics of the motor with option "Increased chemical resistance"

- 4-layer paint finish (PS Premium paint system), has the properties of a paint finish with additional primer K23
- Nickel-plated plug connectors
- Resistant to greases, mineral oils, aliphatic solvents (10%), caustic soda (10%)

Permissible environmental conditions when using the motor

- Indoor and outdoor installations,
  when installing motors outdoor, we recommend that the motors are protected using a suitable weather protection cover. Especially prevent solar radiation from excessively increasing the motor temperature.
- Chemical plants, swimming pools, wastewater treatment plants
- Electroplating facilities and boathouses above seawater
- Industrial areas and coastal areas with moderate salt levels

Motor applications

Plants and systems in the food industry or machine tools are typical applications for these types of device versions.

The paint system for these motors is resistant to a wide range of common cleaning and disinfecting agents.

Note

The ECOLAB Deutschland GmbH company verified the resistance to cleaning and disinfecting agents based on a material resistance test. The certificate is provided in the product information for Option N16 (https://support.industry.siemens.com/cs/ww/de/view/58657336/en).

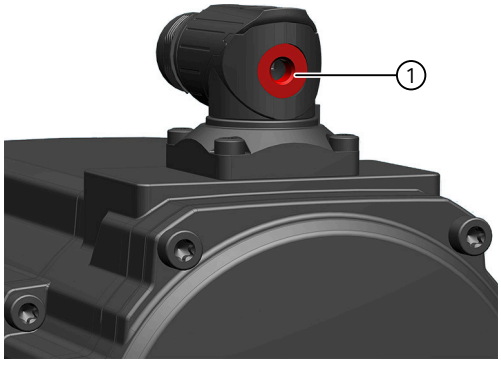
- Check the resistance of your complete system comprising motor, connections and cables before use.

4.17.4 Option - Pressure equalization (order code Q20) (only 1FT2)

Description

With this option, motors are equipped with a pressure compensation connection.

Pressure equalization is available for all 1FT2 frame sizes except 1FT2102-xxxxx.



① Pressure compensation connection (closed with a plug if not used)

Figure 4-16 Connector with pressure equalization on the 1FT2 (example diagram) applicable for single and dual cable technology.

The pressure compensation connector has an M5 female thread and is located in the power connector.

Purpose of the pressure compensation

When the motor cools down after operation, underpressure can build up in the motor. This may result in moisture ingress.

You can prevent such moisture ingress with an air supply provided by a connected pressure compensation tube.

NOTICE
Motor damage due to continuous overpressure The motor must not be subjected to continuous overpressure resulting from the pressure compensation connection. Continuous overpressure leads to motor leaks and may cause motor damage. • Use the pressure compensation connection only for pressure compensation.

Air quality requirements for pressure compensation

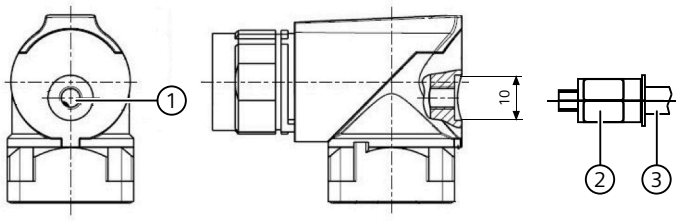
Note

The connected pressure compensation tube must supply dry and dust-free air.

Use a suitable filter if necessary.

Maximum residual water content in g/m³	0.12
Maximum residual oil content in g/m³	0.01
Maximum residual dust in mg/m³	0.1
Particle size for optical encoder in µm	< 3

Technical specifications of the pressure compensation connection



① M5 pressure compensation connector
② Connector nipple, e.g. Festo QSM-B-M5-4-20
③ Tube, outside diameter 4 mm, inside diameter 2.5 mm.

The connection tightening torque is 3.5 .... 5 Nm.

When supplied, the M5 thread is sealed with a treated hexagon socket head cap screw with flat head. The screw was sealed with TEROSON® VR 410, known as Fluid-D. The Fluid-D remains pasty and does not harden.

Note

If necessary, remove Fluid-D using a lint-free cloth and a some ethanol.

If there is no other way for you to seal the pressure equalization connection, e.g. using a flat seal, then use Fluid-D for sealing, for example.

4.17.5 Option - Temperature extension down to -30 °C (order code Q30) (only 1FT2)

Description

With option "Extended temperature range down to -30 °C", the motors are suitable for operation in temperatures down to -30 °C, for example for applications in refrigerated warehouses.

Exceptions

The extended operating temperature range option is not possible for the following variants:

- IP67 degree of protection
- Motors with gearbox
- Motors with forced ventilation

4.17.6 Option - Metal rating plate on motor (order code Q31) (only 1FT2)

Description

The motor rating plate is usually an adhesive label made of plastic.

You can use the order code Q31 to order a metal rating plate made of aluminum instead. The laser engraving stays legible even in difficult ambient conditions.

4.17.7 Option - Suitability for dry rooms and certification for clean rooms (order code Q40) (only 1FT2)

Description

The motors with order code Q40 are clean room compatible and classified and certified according to ISO 14644-1.

These motors are suitable for operation in extremely dry environments down to a relative atmospheric humidity of 0.3% at 20 °C (dew point -50 °C).

The following clean room classes are achieved according to ISO 156441-14, and have been appropriately certified by the TÜV (German Technical Inspectorate):

Table 4-6 Certification of the motors according to clean room classes

Clean room class 7 or better	Clean room class 6 or better
All motors with degree of protection IP64	All motors with degree of protection IP65 without planetary gearbox
All motors with planetary gearbox with degree of protection IP64	

Certificates

The certificates can be downloaded at the following link.

Clean room certification according to ISO 14644-1 (https://support.industry.siemens.com/cs/ww/de/view/109815586)

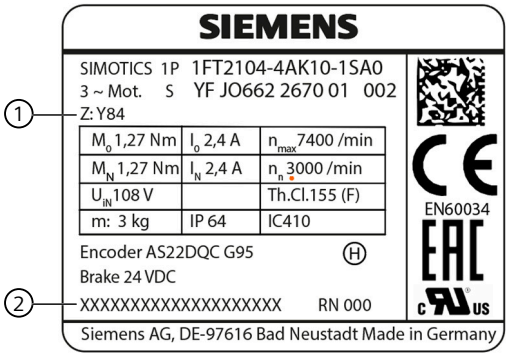
4.17.8 Option - Customer data on rating plate (order code Y84) (only 1FT2)

Option Y84 permits customer data on the rating plate of the motor. If you are ordering electronically, you can enter the text for the rating plate when you select option Y84.

Note

The text can be up to 20 characters long. Excess characters will be cut off. Option Y84 does not have any effect on the delivery time.

The customer data are printed on the rating plate and on the type labels for the product packaging.



① Identification of the order code

② Field for customer data (max. 20 characters, any distribution)

Figure 4-17 Example of a rating plate with option "Customer data on the rating plate", Y84

Configuration

5

5.1 Configuring software

5.1.1 TST engineering tool (TIA-Selection-Tool)

The TIA Selection Tool (TST) is an engineering tool which supports you when dimensioning the hardware and firmware components required for your drive application.

TST supports the following configuration steps:

- Configuring the power supply
- Designing the motor and gearbox, including calculation of mechanical transmission elements
- Configuring the drive components
- Compiling the required accessories
- Selection of the line-side and motor-side power options

The configuration process produces the following results:

- A bill of materials for the required components (export to Excel)
- Technical specifications of the system
- Characteristic curves
- Statements on line harmonic distortion
- Installation information for the drive and control components
- Energy considerations of the configured drive systems

The TIA Selection Tool can be used both cloud-based and offline.

You can find more information that you can download in the Internet at TST (https://support.industry.siemens.com/cs/ww/en/view/109767888).

5.2 Configuring procedure

Description

"MOTION-CONTROL" drives are optimized for addressing motion control applications. They execute linear or rotary movements within a defined movement cycle. All movements should be optimized in terms of time.

As a result, drives must meet the following requirements:

- High dynamic response, i.e. short rise times
- Capable of overload, i.e. a high reserve for accelerating
- Wide control range, i.e. high resolution for precise positioning.

The following table "Configuring procedure" is valid for synchronous and induction motors.

Procedure when configuring

The function description of the machine provides the basis for configuration.

The components are selected according to physical interdependencies and the selection process is usually carried out in the following sequence of steps:

step	Description of the configuring activity	
1.	Clarify the drive type	See the next chapter
2.	Define the constraints and incorporate them into the automation system	
3.	Define the load case, calculate the maximum load torque and determine the motor	
4.	Define the converter required	See catalog
5.	Repeat steps 3 and 4 for additional axes	
6.	Determine line-side power options (main switch, fuses, line filters, etc.)	
7.	Define other system components (e.g. braking resistors)	
8.	Calculate the current demand of the components for the 24 V DC power supply - and specify the power supplies (SITOP devices, Control Supply Modules)	
9.	Determine the connection system components	
10.	Configure the drive line-up components	
11.	Calculate the required cable cross sections for power supply and motor connections	
12.	Inclusion of mandatory installation clearances	

Observe the recommended combinations of converters and motors with the associated connecting cables in Chapters "Motor overview / Motor Module assignment (Page 111)".

5.2.1 Clarify the drive type

Procedure

- Select the motor on the basis of the required torque (load torque), which is defined by the application, e.g. traveling drives, hoisting drives, test stands, centrifuges, paper and rolling mill drives, feed drives or main spindle drives.
  Gearboxes to convert motion or to adapt the motor speed and motor torque to the load conditions must also be taken into account when selecting the motor.
- Determine the torque to be provided by the motor based on the following mechanical data:
  - The load torque specified by the application
  - Masses to be moved
  - Diameter of the drive wheel
  - Leadscrew pitch, gear ratios
  - Frictional resistance data
  - Mechanical efficiency
  - Traversing distances
  - Maximum velocity
  - Maximum acceleration and maximum deceleration
  - Cycle time

5.2.2 Define the boundary conditions and incorporate them into the automation system

Description

When configuring, take into account the following:

- The line system configuration when using specific motor types and/or line filters
- Rated values of the motor
- The ambient temperatures and the installation altitude of the motors and drive components
- Heat dissipation from the motors

Other conditions apply when integrating the drives into an automation environment such as SINUMERIK, SIMATIC or SIMOTION.

For motion control and technology functions (e.g. positioning), as well as for synchronous operation functions, the corresponding automation system, e.g. SIMATIC S7-1500 or SIMOTION D is used.

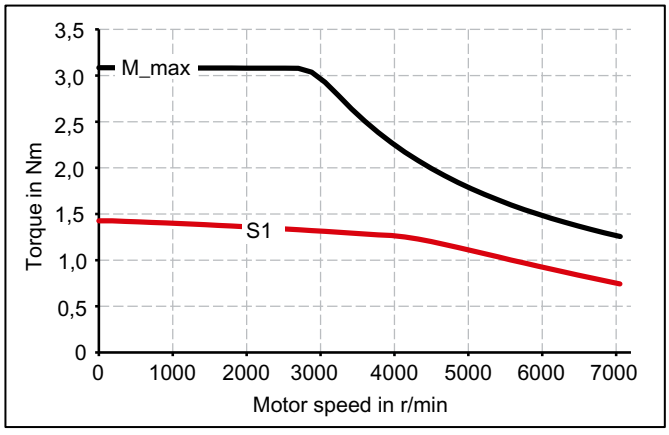
5.2.3 Define the load case, calculate the maximum load torque and determine the motor

Description

The motors are defined based on the motor type-specific limiting characteristics.

The characteristics define the torque or power curve with respect to the speed.
The characteristics are available in Chapter "Technical specifications and characteristics (Page 107)".

The characteristics take into account the motor limits based on the DC link voltage. The DC-link voltage is dependent on the line voltage.



*M*_max Curve of the maximum torque
S1 S1 characteristic
Figure 5-1 Characteristics for synchronous motors

Procedure

1. Determine the load that is specified by the application itself.
   Use different characteristics for the different loads.
   The following operating scenarios have been defined:
   - Duty cycle with constant ON duration
   - Free duty cycle
2. Determine the characteristic torque and speed operating points of the motor for the defined load.

3. Calculate the acceleration torque of the motor.
   Add the load torque and the acceleration torque. to obtain the maximum required torque.
4. Verify the maximum motor torque with the limiting characteristic curves of the motors.
   The following criteria must be taken into account when selecting the motor:
   - Compliance with the dynamic limits
     All torque-speed points of the load must be below the relevant limiting characteristic curve.
   - Compliance with the thermal limits
     At average motor speed, the effective motor torque must be below the S1 characteristic (continuous motion) during the load.

Duty cycles with constant ON duration

For duty cycles with constant ON duration, there are specific requirements for the torque characteristic curve as a function of the speed, for example:

M = constant, $M \sim n^2$, $M \sim n$ or P = constant

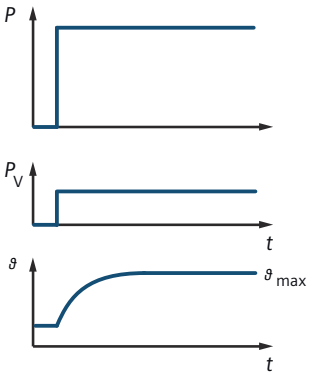
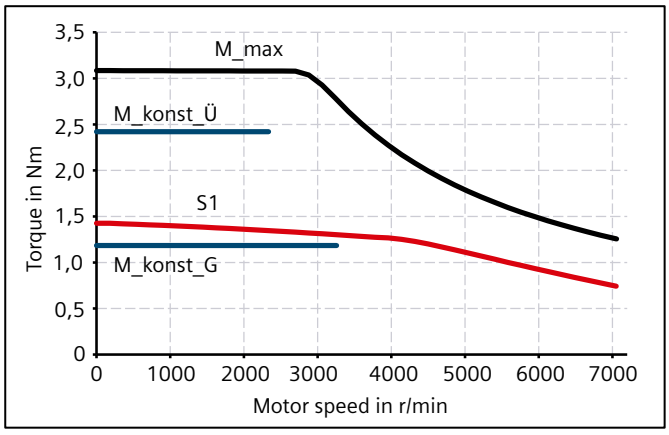


Figure 5-2 S1 duty (continuous motion)

The drives with this load cycle typically operate at a stationary operating point.

Procedure

1. Configure a base load for the stationary operating point. The base load torque must lie below the S1 characteristic.
2. In the event of transient overloads (e.g. during acceleration), configure an overload. Calculate the overload current in relation to the required overload torque. The overload torque must lie below the M_max characteristic.
   In summary, the motor is configured as follows:



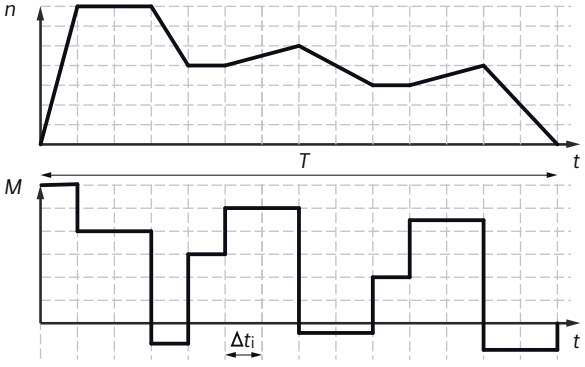
*M*_max	Curve of the maximum torque	*M*_const_O	Curve of the overload torque
S1	S1 characteristic	*M*_const_B	Curve of the base load torque

Figure 5-3 Motor selection for a duty cycle with constant switch-on duration

3. Select a motor that satisfies the requirements of S1 duty.

Free duty cycle

A free duty cycle defines the curve of the motor speed and the torque over time.



n	Speed	*T*	Cycle time
M	Torque	Δt_i	Time interval
t	Time		

Figure 5-4 Example of free duty cycle

Procedure

Determine the required motor torque as follows:

- Define a load torque for each time slice. For acceleration phases, also take into account the average load moment of inertia and motor moment of inertia. If required, take a frictional torque into account that opposes the direction of motion.
- With mounted gearbox:
  Determine the load torque and the acceleration torque that must be supplied by the motor. Take the gear ratio and gear efficiency into account.

Note

A higher gear ratio increases positioning accuracy in terms of encoder resolution. For any given encoder resolution, as the gear ratio increases, so does the resolution of the machine position to be detected.

The following formulas can be used for duty cycles outside the field-weakening range.

For the motor torque in a time slice Δt_i the following applies:

$$M_{\text{Mot, i}} = (J_M + J_G) \cdot \frac{2\pi}{60} \cdot \frac{\Delta n_{\text{Last, i}}}{\Delta t_i} \cdot i + \left(J_{\text{Last}} \cdot \frac{2\pi}{60} \cdot \frac{\Delta n_{\text{Last, i}}}{\Delta t_i} + M_{\text{Last, i}} + M_R\right) \cdot \frac{1}{i \cdot \eta_G}$$

The motor speed is:

$$n_{\text{Mot, i}} = n_{\text{Last, i}} \cdot i$$

The effective torque is obtained as follows:

$$M_{\text{Mot, eff}} = \sqrt{\frac{\sum M_{\text{Mot, i}}^2 \cdot \Delta t_i}{T}}$$

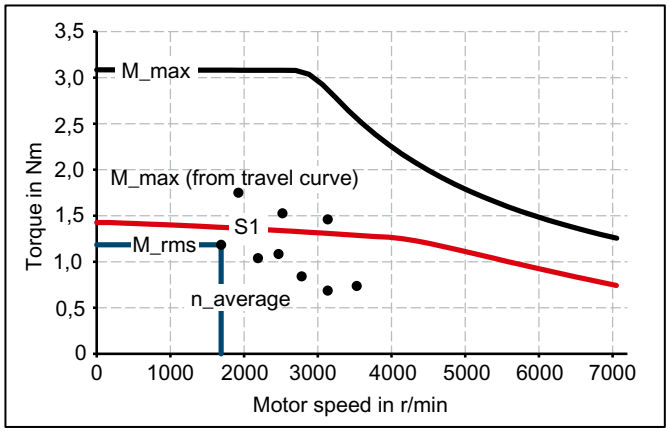
The average motor speed is calculated as follows:

$$n_{\text{Mot, mittel}} = \frac{\sum \frac{n_{\text{Mot, i, A}} + n_{\text{Mot, i, E}}}{2} \cdot \Delta t_i}{T}$$

J_M	Motor moment of inertia
J_G	Gearbox moment of inertia
J_{load}	Load moment of inertia
n_{load}	Load speed
i	Gear ratio
η_G	Gearbox efficiency
M_{load}	Load torque
M_R	Frictional torque
T	Cycle time
A; E	Initial value, final value in time slice Δt_i
t_e	ON duration
Δt_i	Time interval

The effective torque M_{eff} must lie below the S1 characteristic.

The maximum torque M_{max} is produced during the acceleration operation. M_{max} must lie below the voltage limiting characteristic curve. In summary, the motor is configured as follows:



*M*_max	Curve of the maximum torque	S1	S1 characteristic = M_0
*M*_eff	Effective torque	●	Points from the traversing profile
,*n*_mean	Mean speed		

Figure 5-5 Motor selection for duty cycle

Defining the motor

By varying, you can find the motor that satisfies the conditions of the operating mode (duty cycle).

- Determine the motor current at base load. The calculation depends on the type of motor (synchronous motor or induction motor) and the operating mode (duty cycle) used.

  Note

  When configuring according to duty cycle with constant ON duration with overload, the overload current is calculated in relation to the required overload torque.

- Comply with the thermal limits of the motor.
- Configure the other properties of the motor through the available motor options.

5.3 Output coupling

Description

NOTICE
Motor damage caused by rotating forces
Output couplings, especially stiff metal bellows-type couplings can exercise rotating forces on the shaft. These forces can result in bearing motion and in turn damage the motor. • Rotating forces are not permissible.

5.4 Brake resistances (armature short-circuit braking)

5.4.1 Description of function braking resistor

Description

The motor cannot be electrically braked if, for converters

- The permissible DC link voltage values are exceeded
- The electronics fails

Then, the motor that is coasting down can only be braked using an armature short circuit.

You can switch the armature short-circuit braking internally via the converter or externally using a contactor circuit with braking resistors.

Armature short-circuit braking must be initiated at the latest by the limit switch in the traversing range of the feed axis.

NOTICE
Damage to the drive at the end of the traversing range To avoid mechanical damage, mount mechanical stops at the end of the absolute traversing range.

NOTICE
Destruction of the converter as the armature short-circuit contactor incorrectly switches Incorrect switching of the armature short-circuiting contactor can erode the contactor contacts and destroy the converter. • Program the converter so that pulses are first canceled and this is actually implemented before an armature short-circuit contactor is closed or opened.

In servomotors with an integrated holding brake, you can produce additional braking torque with the holding brake.

Note

The holding brake is not a working brake to brake a rotating motor. Restricted EMERGENCY-STOP operation is permissible.

More information is provided in Chapter "Holding brake (Page 56)".

Note

Braking under normal operating conditions must always be performed via the setpoint input.

For more information, see the configuration manual of the converter.

Circuit diagram with braking resistors

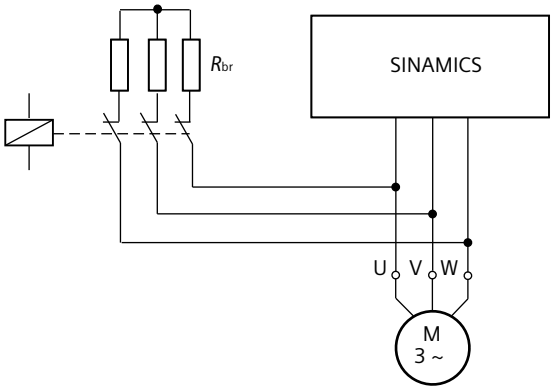


Figure 5-6 Circuit (schematic) with brake resistors

5.4.2 Dimensioning of the construction of braking resistors

Rating

NOTICE
Destruction of the braking resistors
Braking from the rated speed is not permitted any more frequently than every 2 minutes; otherwise the resistors will be destroyed. • Maintain a time interval of at least 2 minutes or longer between braking operations. • When required, specify other braking cycles when ordering.

You can dimension the braking resistor so that a surface temperature of 300 °C can occur briefly (max. 500 ms).

The external moment of inertia and the intrinsic motor moment of inertia are decisive when dimensioning the braking resistors.

When ordering the braking resistors, determine the kinetic energy involved.

Kinetic energy	$W = (\omega^2 \cdot J) / 2$	W in Ws = kinetic energy J in kgm^2 = moment of inertia
Angular velocity	$\omega = (2 \cdot \pi / 60) \cdot n$	ω *in* 1/s = angular velocity n in r/min = speed

Match the ratings of the braking resistors to the ability to withstand I^2t.

Calculating the braking time

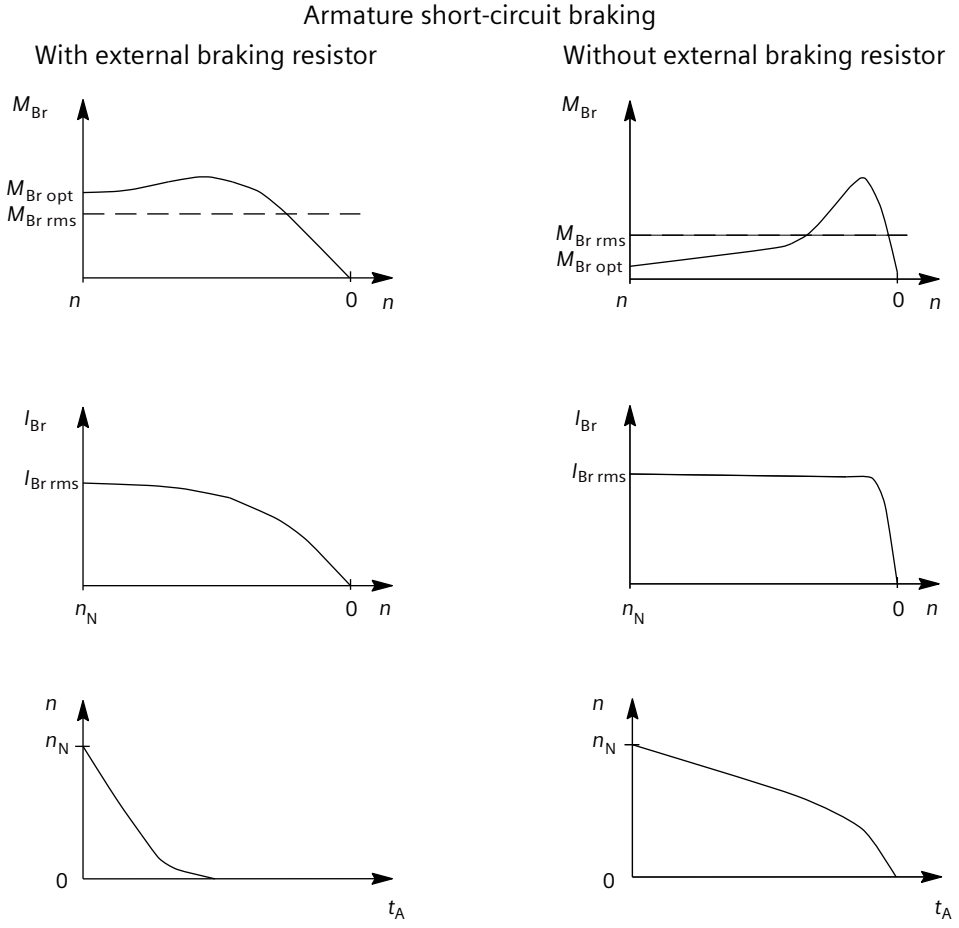
The values for calculation are provided in Chapter "Technical specifications and characteristics (Page 130)".

Braking time	$t_B = J_{tot} \cdot n / (9.55 \cdot M_{Br})$	t_B / s = braking time n / r/min = operating speed M_{Br} / Nm = average braking torque
Moment of inertia	$J_{Tot} = J_{Mot} + J_{Ext}$	J_{Tot} / kgm^2 = moment of inertia J_{Mot} / kgm^2 = motor moment of inertia J_{Ext} / kgm^2 = external moment of inertia

Note

In determining the run-on distance, consider the friction of the mechanical transmission elements (included in the calculation as an allowance in M_B) and the switching delay times of the contactors.

To avoid mechanical damage to the drive, mount mechanical stops at the end of the absolute traversing range of the machine axes.



M_{Br} = braking torque
$M_{Br\ rms}$ = average braking torque
$M_{Br\ opt}$ = optimum braking torque
I_{Br} = brake current
$I_{Br\ rms}$ = rms brake current
t_A = coast-down time
n = speed
n_{rated} = rated speed

5.4.3 Dimensioning of braking resistors

Description

Appropriately dimensioning the braking resistors ensures an optimum braking time.

The braking torques obtained are also listed in the tables. The data applies to braking operations from the rated speed.
Calculate the braking time using the formula in section "Dimensioning of the construction of braking resistors (Page 100)".

The data in the following tables is calculated for rated values according to the data sheet. The variance during production as well as iron saturation have not been taken into account here. Higher currents and torques than those calculated can occur as a result of the saturation.

⚠ WARNING

Risk of fire caused by continuous overload

If the external braking resistor is continuously overloaded, for example as the result of a defective braking chopper, this can cause an explosion or fire - resulting in death or severe injury and/or could cause the housing to melt.

- Use only braking resistors that are intrinsically safe.

Data for dimensioning the braking resistors

Motor type	Braking resistor, external R_{opt} / Ω	Average braking torque		Maximum braking torque $M_{br\,max}$ / Nm	rms braking current	
		Without external braking resistor $M_{br\,rms}$ / Nm	With external braking resistor $M_{br\,rms}$ (R_{opt}) / Nm		Without external braking resistor $I_{br\,rms}$ / A	With external braking resistor $I_{br\,rms}$ (R_{opt}) / A
High Dynamic, naturally cooled						
1Fx2102-0AG	0	0.2	0.2	0.26	1.75	1.75
1Fx2102-1AG	0	0.43	0.43	0.55	1.9	1.9
1Fx2103-2AG	4.9	0.5	0.6	0.75	2.7	2.5
1Fx2103-2AH	15	0.47	0.6	0.75	2.1	1.9
1Fx2103-4AG	3.7	1	1.2	1.5	4.9	4.4
1Fx2103-4AH	10	0.9	1.2	1.5	3.9	3.5
1Fx2104-4AF	21	0.75	1.1	1.35	2.2	2
1Fx2104-4AK	5	0.7	1.1	1.35	4.6	4.1
1Fx2104-5AF	12.5	1.35	2.3	2.9	4.3	3.9
1Fx2104-5AK	2.8	1.35	2.3	2.8	9	8
1Fx2104-6AF	8.5	1.75	3.1	3.8	6	5.5
1Fx2104-6AH	6	1.4	3.1	3.8	9	8
1Fx2105-4AF	6.5	1.7	4	5	8.5	7.5
1Fx2105-4AH	4.8	1.35	4	5	12.5	11
1Fx2105-6AF	5	2.7	6.5	8	12	11
1Fx2106-3AF	3.4	2.6	6.5	8.5	15	13.5
1Fx2106-4AF	3.1	3.2	9	11	18.5	16.5
1Fx2106-6AF	2.2	4.7	13.5	16.5	26	24
1Fx2108-4AC	1.8	10	24	30	31	28
1Fx2108-5AB	2.5	14	29	36	25	22
1Fx2108-5AC	1.45	12	29	36	39	35
1Fx2108-7AB	2.1	18.5	38	47	32	28
1Fx2108-7AC	1.2	15	38	47	50	45

Motor type	Braking resistor, external R_{opt} / Ω	Average braking torque		Maximum braking torque $M_{br\ max}$ / Nm	rms braking current	
		Without external braking resistor $M_{br\ rms}$ / Nm	With external braking resistor $M_{br\ rms}$ (R_{opt}) / Nm		Without external braking resistor $I_{br\ rms}$ / A	With external braking resistor $I_{br\ rms}$ (R_{opt}) / A
1Fx2108-7AE	0.95	13.5	38	47	65	55
High Dynamic, force-ventilated						
1FT2106-3SF	3.4	2.6	6.5	8.5	15	13.5
1FT2106-4SF	3.1	3.2	9	11	18.5	16.5
1FT2106-6SF	2.2	4.7	13.5	16.5	26	24
1FT2108-4SC	1.8	10	24	30	31	28
1FT2108-5SB	2.5	14	29	36	25	22
1FT2108-5SC	1.45	12	29	36	39	35
1FT2108-7SB	2.1	18.5	38	47	32	28
1FT2108-7SC	1.2	15	38	47	50	45
1FT2108-7SE	0.95	13.5	38	47	65	55
Compact, naturally cooled						
1Fx2203-2AG	2.1	0.95	1	1.25	4.5	4.2
1Fx2203-2AK	12.5	0.75	1	1.25	3.6	3.3
1Fx2203-4AG	1.75	1.75	2	2.5	8.5	8
1Fx2203-4AK	7	1.4	2	2.5	7	6.5
1Fx2204-5AF	6	2.4	3.3	4.1	7	6
1Fx2204-5AK	1.5	2.4	3.3	4.1	13.5	12.5
1Fx2204-6AF	4.6	3.1	4.4	5.5	9.5	8.5
1Fx2205-2AC	3.8	5	6.5	8	11	10
1Fx2205-2AF	3.8	5	6.5	8	11	10
1Fx2205-4AF	2.6	8	10.5	13	18	16.5
1Fx2205-2AH	4.2	4.2	6.5	8	14.5	13
1Fx2206-2AC	9.8	3.3	5.5	6.9	6.1	5.5
1Fx2206-2AF	6.5	2.6	5.4	6.8	9.6	8.6
1Fx2206-2AH	6.5	2.1	5.5	7	12.5	11
1Fx2206-3AB	8.5	6.5	9	11.5	7	6.5
1Fx2206-3AF	7	4.3	9	11.5	12.5	11
1Fx2206-4AC	7	7.4	12.9	16.1	11.2	10.1
1Fx2206-4AF	3.85	5.9	12.8	15.9	19.3	17.3
1Fx2206-4AH	2.9	4.3	12	15	27	24
1Fx2208-2AF	4.1	4.9	12.5	16	19	17
1Fx2208-3AB	4.8	9.5	17.6	22	13.9	12.5
1Fx2208-3AC	4	7.4	16.5	20.5	17.6	15.7
1Fx2208-3AF	3.1	6.5	18	22	26	24
1Fx2208-3AH	2.1	5.5	18	23	37	33
1Fx2208-4AB	3.9	12.6	23.5	29.5	18	16.2
1Fx2208-4AC	2.3	9.7	22.5	28	27	24.5

Motor type	Braking resistor, external R_{opt} / Ω	Average braking torque		Maximum braking torque $M_{br\,max}$ / Nm	rms braking current	
		Without external braking resistor $M_{br\,rms}$ / Nm	With external braking resistor $M_{br\,rms}$ (R_{opt}) / Nm		Without external braking resistor $I_{br\,rms}$ / A	With external braking resistor $I_{br\,rms}$ (R_{opt}) / A
1Fx2208-4AF	2.1	8.5	24	30	37	33
1Fx2208-5AB	3.4	17	32	39	22	20
1Fx2208-5AC	1.74	12.3	28.5	35.5	35.5	31.5
1Fx2210-2AC	4.1	7.5	21	26	20	18
1Fx2210-2AF	3.4	6	21	26	27	25
1Fx2210-3AB	4.5	12.2	30.5	38	19.7	17.7
1Fx2210-3AC	1.99	10.2	30.5	38	35	31
1Fx2210-3AF	1.7	8.5	32	39	47	42
1Fx2210-4AB	3.1	15.9	41.5	52	28	25
1Fx2210-4AC	2.6	13.1	41.5	51	35.5	32
1Fx2210-4AF	1.7	11	43	55	55	50
1Fx2210-5AB	2.2	22	55	70	39	35
1Fx2210-5AC	1.43	16.7	53	66	54	48.5
1Fx2210-5AF	1.15	14	55	70	75	70
Compact, force-ventilated						
1FT2206-4SF	3.85	5.9	12.8	15.9	19.3	17.3
1FT2206-4SH	2.9	4.3	12	15	27	24
1FT2208-3SB	4.8	9.5	17.6	22	13.9	12.5
1FT2208-3SC	4	7.4	16.5	20.5	17.6	15.7
1FT2208-3SF	3.1	6.5	18	22	26	24
1FT2208-3SH	2.1	5.5	18	23	37	33
1FT2208-4SB	3.9	12.6	23.5	29.5	18	16.2
1FT2208-4SC	2.3	9.7	22.5	28	27	24.5
1FT2208-4SF	2.1	8.5	24	30	37	33
1FT2208-5SB	3.4	17	32	39	22	20
1FT2208-5SC	1.74	12.3	28.5	35.5	35.5	31.5
1FT2210-3SC	1.99	10.2	30.5	38	35	31
1FT2210-3SF	1.55	8	32	39	50	45
1FT2210-4SB	3.1	15.9	41.5	52	28	25
1FT2210-4SC	2.6	13.1	41.5	51	35.5	32
1FT2210-4SF	1.6	7	43	42	45	50
1FT2210-5SB	2.2	22	55	70	39	35
1FT2210-5SC	1.2	18	55	70	60	55
1FT2210-5SF	1.15	14	55	70	75	70
High Inertia, naturally cooled						
1FK2306-2AC	9.8	3.3	5.5	6.1	5.5	6.9
1FK2306-2AF	6.5	2.6	5.4	9.6	8.6	6.8
1FK2306-4AC	7	7.4	12.9	11.2	10.1	16.1

Motor type	Braking resistor, external R_{opt} / Ω	Average braking torque		Maximum braking torque $M_{br\ max}$ / Nm	rms braking current	
		Without external braking resistor $M_{br\ rms}$ / Nm	With external braking resistor $M_{br\ rms}$ (R_{opt}) / Nm		Without external braking resistor $I_{br\ rms}$ / A	With external braking resistor $I_{br\ rms}$ (R_{opt}) / A
1FK2308-3AB	4.8	9.5	17.6	13.9	12.5	22
1FK2308-4AB	3.9	12.6	23.5	18	16.2	29.5

Note

Braking resistor with temperature monitoring

Use only a braking resistor with temperature monitoring.

Technical specifications and characteristics

6

6.1 Explanations

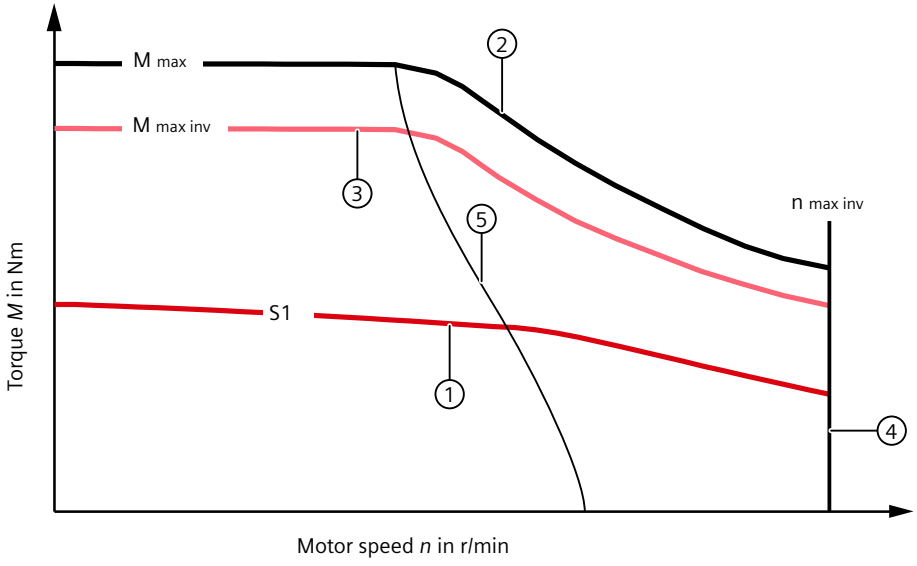
Permissible operating range

The permissible motor operating range is thermally, mechanically and electromagnetically limited. The data provided in the motor data and characteristics are applicable for an ambient temperature of 40 °C.

The losses in the motor (current-dependent losses, no-load losses, friction losses) cause the motor temperature to increase.

To maintain the temperature limits, the permissible S1 torque – starting from static torque M_0 – decreases as the speed increases.

Motor characteristics



1	S1 characteristic	4	$n_{max\ inv}$ line
2	M_{max} characteristic	5	Voltage limit characteristic curve
3	$M_{max\ inv}$ characteristic		

Figure 6-1 Torque characteristic 1Fx2

S1 characteristic

The S1 characteristic ① shows the limits of the permissible temperature range for continuous operation according to the specified temperature class of the motor.

The rms value of the output torque at the average cycle speed must be below the S1 characteristic curve.

More information is provided in Chapter "Configuration (Page 91)".

NOTICE
Motor damage due to overheating Continuous operation in the area above the S1 characteristic results in motor overheating and subsequent damage. • Operate the motor within the values of the S1 characteristic.

M_{max} characteristic

The M_{max} characteristic ② defines the operating range for transient overloads.

$M_{max\ inv}$ characteristic

The $M_{max\ inv}$ characteristic ③ limits the possible overload range in combination with a specific maximum converter current. The $M_{max\ inv}$ characteristic takes field weakening into consideration. The $M_{max\ inv}$ characteristic is not available for all motor type and converter sizes.

$n_{max\ inv}$ line

The mechanical variables of the motor and the properties of the converter limit the speed range of the motor.
The $n_{max\ Inv}$ line ④ limits the maximum permitted speed of the motor in the SINAMICS system.

NOTICE
Damage to the converter due to excessively high speeds A motor speed higher than $n_{max\ inv}$ can result in a voltage being induced in the winding that exceeds the maximum permissible voltage at the converter. This induced voltage can destroy the converter. • Operate the motor at speeds below $n_{max\ inv}$.

Voltage limit characteristic curve

Field weakening starts from the voltage limit characteristic ⑤.

As the speed increases, an increasing percentage of the current is used for field weakening, and therefore no longer generates a torque. This is the reason that the M_{max} characteristic and the S1 characteristic have a steep downward gradient in the field-weakening range.

Note

The voltage limiting characteristic curve is not included in the following documentation.

Converter output voltages

Every speed-torque diagram includes different characteristics for different converter output voltages.

Drive system	Infeed module	Line voltage	DC link voltage	Output voltage
		V_{line}	$V_{DC\ LINK}$	V_{mot}
SINAMICS 380 - 480 V 3 AC	ALM / regulated ALM / regulated BLM/SLM / unregulated BLM/SLM / unregulated	400 V 480 V 400 V 480 V	600 V 720 V 540 V 650 V	425 V 510 V 380 V 460 V
SINAMICS 200 - 240 V 1 AC	unregulated	230 V	248 V	175 V
SINAMICS 200 - 240 V 3 AC	unregulated	240V	315 V	211 V

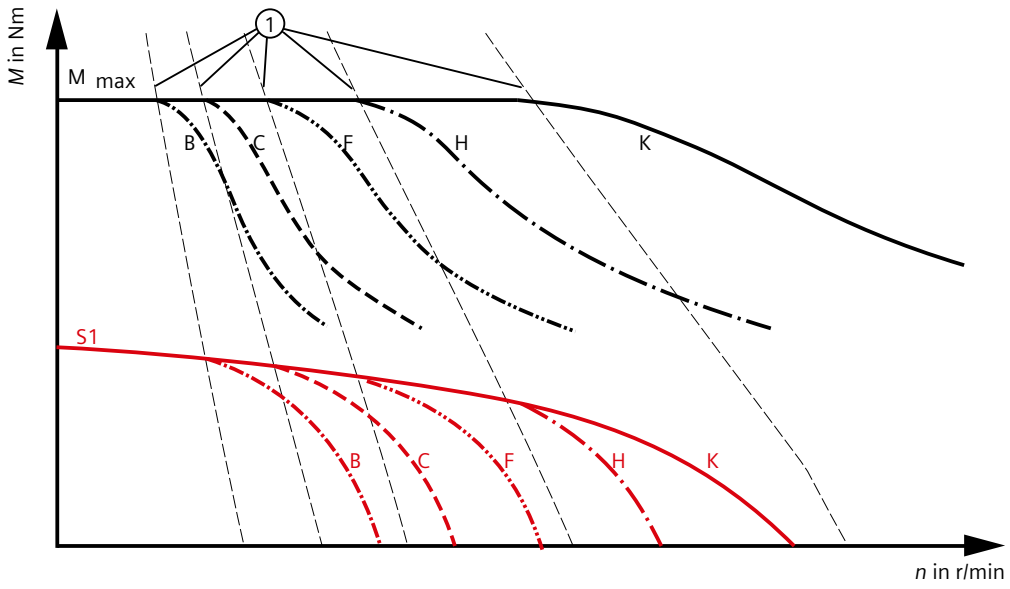
In some illustrations, the motor characteristic curve for operation on converters with an unregulated infeed at 480 V 3 AC is shown in simplified form for a converter output voltage of 425 V.

Winding versions

Several winding versions for different rated speeds n_N are possible within a motor frame size.

Table 6-1 Code letter, winding version

Rated speed n_N in r/min		Winding version for line voltage between 200 V and 480 V (10th position of the Article No.)	Winding version for line voltage up to 240 V (10th position of the Article No.)
380 - 480 V 3 AC	200 - 240 V 1 AC / 3 AC		
1500	750	B	
2000	1000	C	
2000	1000	Q	
2500	1200	E	
3000	1500	F	
4500	2500	H	
6000	3000	K	G



① Voltage limit characteristics

Figure 6-2 Speed-torque diagram

The winding version of a motor defines the position of the natural voltage limit characteristic ①, and therefore defines the operating range limit.

Motors with a higher code letter for the winding permit a wider speed range in the S1 and overload ranges. However, these motors require a higher current for the same torque.

The preferred choice is the motor with the lowest code letter for the winding, which still addresses the speed requirements for the application.

This is how you optimize the output current required, and therefore the converter size (rating).

Recommended Motor Module

For every motor, Chapter "Motor overview / Motor Module assignment (Page 111)" recommends a converter corresponding to its stall current.

The maximum torque that can be briefly achieved using this converter is listed in the tables of this manual as $M_{max\ conv}$.

- When configuring intermittent or overload operation, check whether a higher rating converter is required to provide the necessary peak current.

Tolerance data

The characteristic data listed in the data sheets are subject to a certain amount of scatter. The following tolerances apply to the characteristic data:

Motor list data		Typ. value	Max. value
Current values	$I_{0,}\, I_{rated,}\, I_{max}$	± 3 %	± 7.5 %
Torque values	$M_{0,}\, M_{rated,}\, M_{max}$	± 3 %	± 7.5 %
Moment of inertia	J_{Mot}	± 2 %	± 10 %

Tolerance data in the motor list data

The torque-speed characteristics specified in the following chapter relate to the nominal values at operating temperature.

6.2 Motor overview / Motor Module assignment

SINAMICS S120 / S220 Motor Module Booksize, type C/D, DC link voltage 510 V to 720 V DC, line voltage, 380 V to 480 V 3 AC

The following table shows recommendations for suitable converters and the torques M_0 and M_{max} that can be achieved with them.

Motor data			Combination with Motor Module Booksize type C/D	
Article number	Moment of inertia	Static torque / max. torque	Rated current / max. current of the Motor Module	Static torque / max. torque with Motor Module
	J_{mot} in kg cm²	M_0 / M_{max} in Nm	I_{rated} / I_{max} in A	M_0 / M_{max} in Nm
HIgh Dynamic, naturally cooled				
1Fx2103-2AH	0.093	0.64 / 1.95	3 / 9	0.64 / 1.95
1Fx2103-4AH	0.14	1.27 / 4.05	3 / 9	1.27 / 4.05
1Fx2104-4AF	0.35	1.27 / 3.75	3 / 9	1.27 / 3.75
1Fx2104-4AK	0.35	1.27 / 3.85	3 / 9	1.27 / 3.85
1Fx2104-5AF	0.56	2.4 / 7.5	3 / 9	2.4 / 7.5
1Fx2104-5AK	0.56	2.4 / 7.6	3 / 9 5 / 15	1.6 / 4.66 2.4 / 7.22
1Fx2104-6AF	0.76	3.2 / 10	3 / 9 5 / 15	3.2 / 8.58 3.2 / 10
1Fx2104-6AH	0.76	3.6 / 10	5 / 15 9 / 27	3.6 / 9.4 3.6 / 10
1Fx2105-4AF	1.7	5 / 15	3 / 9 5 / 15 9 / 27	3.2 / 8.97 5 / 13.3 5 / 15
1Fx2105-4AH	1.7	5 / 15	5 / 15 9 / 27	3.6 / 9.85 5 / 15
1Fx2105-6AF	2.7	8 / 24	5 / 15 9 / 27	6 / 16.5 8 / 24

Motor data			Combination with Motor Module Booksize type C/D	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1Fx2106-3AF	4.6	9 / 26	9 / 27	8.8 / 21.1
			18 / 36	9 / 24.6
			18 / 54	9 / 26
1Fx2106-4AF	6	12 / 33	9 / 27	10 / 25.6
			18 / 36	12 / 30.6
			18 / 54	12 / 33
1Fx2106-6AF	8.7	16 / 45.5	9 / 27	10 / 28.3
			18 / 36	16 / 36
			18 / 54	16 / 45.5
1Fx2108-4AC	18	25 / 87	18 / 36	25 / 53.9
			18 / 54	25 / 72.2
			24 / 48	25 / 66.8
			24 / 72	25 / 84.6
			30 / 90	25 / 87
1Fx2108-5AB	22	30 / 105	18 / 36	30 / 77
			18 / 54	30 / 99.3
			24 / 72	30 / 105
1Fx2108-5AC	22	30 / 105	18 / 36	29 / 54.3
			18 / 54	29 / 74.7
			24 / 48	30 / 68.4
			24 / 72	30 / 90.7
			30 / 56	30 / 76.7
			30 / 90	30 / 102
1Fx2108-7AB	28	37.5 / 140	18 / 36	37.5 / 85.5
			18 / 54	37.5 / 115
			24 / 48	37.5 / 106
			24 / 72	37.5 / 135
			30 / 90	37.5 / 140
1Fx2108-7AC	28	37.5 / 140	24 / 48	37.5 / 74.8
			24 / 72	37.5 / 103
			30 / 56	37.5 / 84.8
			30 / 90	37.5 / 119
			60 / 120	37.5 / 139
1Fx2108-7AE	28	37.5 / 140	30 / 56	37.5 / 69.6
			30 / 90	37.5 / 101
			60 / 120	37.5 / 123
			85 / 141	37.5 / 134
			85 / 170	37.5 / 140
High Dynamic, force-ventilated				
1FT2106-3SF	4.6	11.5 / 26	11 / 43	11.5 / 24.9
1FT2106-4SF	6	16 / 33	13.6 / 42	16 / 30.7
				16 / 33

Motor data			Combination with Motor Module Booksize type C/D	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1FT2106-6SF	8.7	22 / 45.5	18.3 / 49	22 / 36.5 22 / 45.5
1FT2108-4SC	18	33 / 87	18 / 36 18 / 54 24 / 72 30 / 90	31 / 55.7 31 / 73.7 33 / 85 33 / 87
1FT2108-5SB	22	40 / 105	18 / 36 18 / 54 24 / 72	40 / 79 40 / 100 40 / 105
1FT2108-5SC	22	40 / 105	24 / 48 24 / 72 30 / 90	40 / 70.8 40 / 92.5 40 / 103
1FT2108-7SB	28	50 / 140	18 / 36 18 / 54 24 / 48 24 / 72 30 / 90	49 / 88.7 49 / 118 50 / 109 50 / 136 50 / 140
1FT2108-7SC	28	50 / 140	30 / 56 30 / 90 60 / 120	50 / 87.1 50 / 121 50 / 139
1FT2108-7SE	28	49.5 / 140	45 / 90 60 / 120 85 / 141	49.5 / 104 49.5 / 125 49.5 / 135
Compact, naturally cooled				
1Fx2203-2AK	0.2	0.64 / 1.85	3 / 9	0.64 / 1.85
1Fx2203-4AK	0.35	1.27 / 3.75	3 / 9	1.27 / 3.75
1Fx2204-5AF	1.2	2.4 / 7.1	3 / 9	2.4 / 7.1
1Fx2204-5AK	1.2	2.4 / 7.1	3 / 9 5 / 15	1.6 / 4.72 2.4 / 7.1
1Fx2204-6AF	1.6	3.2 / 9.5	3 / 9 5 / 15	3.2 / 8.76 3.2 / 9.5
1Fx2205-2AC	3.2	3.6 / 10.8	3 / 9	3.6 / 10.8
1Fx2205-2AF	3.2	3.6 / 10.8	3 / 9	3.6 / 10.3
1Fx2205-2AH	3.2	3.6 / 10.8	3 / 9 5 / 15	2.8 / 8.22 3.6 / 10.8
1Fx2205-4AF	5.1	6 / 18	3 / 9 5 / 15	3.8 / 11.2 6 / 17.9
1Fx2206-2AC	7.8	6 / 18	3 / 9 5 / 15	6 / 16.3 6 / 18
1Fx2206-2AF	7.8	6.5 / 18	3 / 9 5 / 15 9 / 27	3.9 / 10.9 6.5 / 16.1 6.5 / 18

Motor data			Combination with Motor Module Booksize type C/D	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1Fx2206-2AH	7.8	6.5 / 18	5 / 15	5 / 13.4
			9 / 27	6.5 / 18
1Fx2206-3AB	12	9 / 27	3 / 9	8.6 / 22.6
			5 / 15	9 / 27
1Fx2206-3AF	12	9 / 27	3 / 9	5 / 14.3
			5 / 15	8.3 / 22
			9 / 27	9 / 27
1Fx2206-4AC	15	12 / 38	3 / 9	8 / 22.6
			5 / 15	12 / 34.6
			9 / 27	12 / 38
1Fx2206-4AF	15	12 / 36	5 / 15	7.6 / 21.3
			9 / 27	12 / 33.9
			18 / 36	12 / 36
1Fx2206-4AH	15	12 / 36	9 / 27	9 / 24.7
			18 / 36	12 / 31.1
			18 / 54	12 / 36
1Fx2208-2AF	23	12.5 / 38	5 / 15	7.5 / 21.3
			9 / 27	12.5 / 34.4
			18 / 36	12.5 / 38
1Fx2208-3AB	30	18 / 51	5 / 15	15 / 39.7
			9 / 27	18 / 51
1Fx2208-3AC	30	18 / 51	5 / 15	11 / 30.2
			9 / 27	18 / 48
			18 / 36	18 / 51
1Fx2208-3AF	30	18 / 51	9 / 27	14 / 37.4
			18 / 36	18 / 47.1
			18 / 54	18 / 51
1Fx2208-3AH	30	18 / 51	18 / 36	18 / 35.9
			18 / 54	18 / 49.1
			24 / 72	18 / 51
1Fx2208-4AB	39	22 / 66	5 / 15	15 / 43.4
			9 / 27	22 / 66
1Fx2208-4AC	39	22 / 66	9 / 27	17 / 46.1
			18 / 36	22 / 57.7
			18 / 54	22 / 66
1Fx2208-4AF	39	22 / 66	9 / 27	13 / 37.4
			18 / 36	22 / 47.8
			18 / 54	22 / 65.2
			24 / 72	22 / 66
1Fx2208-5AB	48	27 / 80	5 / 15	16 / 45.1
			9 / 27	27 / 74.6
			18 / 36	27 / 80

Motor data			Combination with Motor Module Booksize type C/D	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1Fx2208-5AC	48	27 / 80	9 / 27	17 / 47.2
			18 / 36	27 / 60.4
			18 / 54	27 / 80
			24 / 72	27 / 80
1Fx2210-2AC	62	22 / 60	9 / 27	21 / 53.5
			18 / 36	22 / 60
1Fx2210-2AF	62	22 / 60	9 / 27	15 / 41.7
			18 / 36	22 / 52
			18 / 54	22 / 60
1Fx2210-3AB	89	30 / 90	5 / 15	18 / 50.1
			9 / 27	30 / 80.7
			18 / 36	30 / 90
1Fx2210-3AC	89	30 / 90	9 / 27	18 / 51.1
			18 / 36	30 / 65.1
			18 / 54	30 / 88.9
			24 / 72	30 / 90
1Fx2210-4AB	120	40 / 120	9 / 27	31 / 83.4
			18 / 36	40 / 105
			18 / 54	40 / 120
1Fx2210-4AC	120	40 / 120	9 / 27	24 / 68.1
			18 / 36	40 / 86.8
			18 / 54	40 / 118
			24 / 72	40 / 120
1Fx2210-5AB	150	50 / 150	9 / 27	30 / 85.1
			18 / 36	50 / 109
			18 / 54	50 / 148
			24 / 72	50 / 150
1Fx2210-5AC	150	50 / 150	18 / 36	40 / 76.7
			18 / 54	40 / 108
			24 / 48	50 / 98.3
			24 / 72	50 / 136
			30 / 56	50 / 112
1Fx2210-5AF	150	50 / 150	24 / 48	40 / 76.6
			24 / 72	40 / 108
			30 / 56	50 / 87.7
			30 / 90	50 / 129
			60 / 120	50 / 150
Compact, force-ventilated				
1FT2206-4SF	15	14.5 / 36	9 / 27	14 / 33.9
			18 / 36	14.5 / 36
1FT2206-4SH	15	14.5 / 36	18 / 36	14.5 / 31.4
			18 / 54	14.5 / 36

Motor data			Combination with Motor Module Booksize type C/D	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1FT2208-3SB	30	22 / 51	9 / 27	22 / 51
1FT2208-3SC	30	22 / 51	18 / 36	22 / 51
1FT2208-3SF	30	22 / 51	18 / 36 18 / 54	22 / 47.5 22 / 51
1FT2208-3SH	30	22 / 51	18 / 36 18 / 54 24 / 72	20 / 36.6 20 / 49.3 22 / 51
1FT2208-4SB	39	28 / 66	9 / 27	27 / 66
1FT2208-4SC	39	28 / 66	18 / 36 18 / 54	28 / 58.4 28 / 66
1FT2208-4SF	39	28 / 66	18 / 36 18 / 54 24 / 72	27 / 48.8 27 / 65.2 28 / 66
1FT2208-5SB	48	35 / 80	18 / 36	35 / 80
1FT2208-5SC	48	35 / 80	18 / 36 18 / 54	34 / 61.2 34 / 80
1FT2210-3SC	89	40 / 90	18 / 36 18 / 54 24 / 72	36 / 66.2 36 / 88.9 40 / 90
1FT2210-3SF	89	40 / 90	24 / 48 24 / 72 30 / 90	35 / 64 35 / 85.6 40 / 90
1FT2210-4SB	120	53 / 120	18 / 36 18 / 54	53 / 106 53 / 120
1FT2210-4SC	120	53 / 120	18 / 36 18 / 54 24 / 72	48 / 88.2 48 / 119 53 / 120
1FT2210-4SF	120	53 / 120	30 / 56 30 / 90	51 / 87.2 51 / 120
1FT2210-5SB	150	65 / 150	18 / 36 18 / 54 24 / 72	61 / 110 61 / 148 65 / 150
1FT2210-5SC	150	65 / 150	30 / 56 30 / 90	64 / 109 64 / 150
1FT2210-5SF	150	65 / 150	45 / 90 60 / 120	65 / 130 65 / 150

SINAMICS S120 / S220 Motor Module Booksize Compact, DC link voltage 510 V to 720 V DC, line voltage, 380 V to 480 V 3 AC

The following table shows recommendations for suitable converters and the torques M_0 and M_{max} that can be achieved with them.

Motor data			Combination with Motor Module Booksize Compact	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
HIgh Dynamic, naturally cooled				
1Fx2103-2AH	0.093	0.64 / 1.95	1.7 / 5.1 3 / 9	0.64 / 1.95 0.64 / 1.95
1Fx2103-4AH	0.14	1.27 / 4.05	1.7 / 5.1 3 / 9	1.2 / 3.12 1.27 / 4.05
1Fx2104-4AF	0.35	1.27 / 3.75	1.7 / 5.1 3 / 9	1.27 / 3.75 1.27 / 3.75
1Fx2104-4AK	0.35	1.27 / 3.85	1.7 / 5.1 3 / 9	0.9 / 2.51 1.27 / 3.85
1Fx2104-5AF	0.56	2.4 / 7.5	1.7 / 5.1 3 / 9	1.9 / 5.39 2.4 / 7.5
1Fx2104-5AK	0.56	2.4 / 7.6	3 / 9 5 / 15	1.6 / 4.66 2.4 / 7.22
1Fx2104-6AF	1.6	3.2 / 9.5	1.7 / 5.1 3 / 9 5 / 15	1.8 / 5.27 3.2 / 8.58 3.2 / 10
1Fx2104-6AH	0.76	3.6 / 10	5/15 9/27	3.6 / 9.4 3.6 / 10
1Fx2105-4AF	1.7	5 / 15	3 / 9 5 / 15 9 / 27	3.2 / 8.97 5 / 13.3 5 / 15
1Fx2105-4AH	1.7	5 / 15	5 / 15 9 / 27	3.6 / 9.85 5 / 15
1Fx2105-6AF	2.7	8 / 24	5 / 15 9 / 27	6 / 16.5 8 /24
1Fx2106-3AF	4.6	9 / 26	9 / 27 18 / 54	8.8 / 21.1 9 / 26
1Fx2106-4AF	6	12 / 33	9 / 27 18 / 54	10 / 25.6 12 / 33
1Fx2106-6AF	8.7	16 / 45.5	9 / 27 18 / 54	10 / 28.3 16 / 45.5
1Fx2108-4AC	18	25 / 87	18 / 54	25 / 72.2
1Fx2108-5AB	22	30 / 105	18 / 54	30 / 99.3
1Fx2108-5AC	22	30 / 105	18 / 54	29 / 74.7
1Fx2108-7AB	28	37.5 / 140	18 / 54	37.5 / 115
High Dynamic, force-ventilated				

Motor data			Combination with Motor Module Booksize Compact	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1FT2106-3SF	4.6	11.5 / 26	9 / 27 18 / 54	8.9 / 21 11.5 / 26
1FT2106-4SF	6	16 / 33	18 / 54	16 / 33
1FT2108-4SC	18	33 / 87	18 / 54	31 / 73.7
1FT2108-5SB	22	40 / 105	18 / 54	40 / 100
1FT2108-7SB	28	50 / 140	18 / 54	49 / 118
Compact, naturally cooled				
1Fx2203-2AK	0.2	0.64 / 1.85	1.7 / 5.1 3 / 9	0.64 / 1.85 0.64 / 1.85
1Fx2203-4AK	0.35	1.27 / 3.75	1.7 / 5.1 3 / 9	1.1 / 2.96 1.27 / 3.75
1Fx2204-5AF	1.2	2.4 / 7.1	1.7 / 5.1 3 / 9	1.8 / 2.54 2.4 / 7.1
1Fx2204-5AK	1.2	2.4 / 7.1	3 / 9 5 / 15	1.6 / 4.72 2.4 / 7.1
1Fx2204-6AF	1.6	3.2 / 9.5	1.7 / 5.1 3 / 9 5 / 15	1.8 / 5.27 3.2 / 8.76 3.2 / 9.5
1Fx2205-2AC	3.2	3.6 / 10.8	1.7 / 5.1 3/9	3.3 / 9.35 3.6 / 10.8
1Fx2205-2AF	3.2	3.6 / 10.8	1.7 / 5.1 3 / 9	2.1 / 6.15 3.6 / 10.3
1Fx2205-2AH	3.2	3.6 / 10.8	3 / 9 5 / 15	2.8 / 8.22 3.6 / 10.8
1Fx2205-4AF	5.1	6 / 18	3 / 9 5 / 15	3.8 / 11.2 6 / 17.6
1Fx2206-2AC	7.8	6 / 18	1.7 / 5.1 3 / 9 5 / 15	3.6 / 10.3 6 / 16.3 6 / 18
1Fx2206-2AF	7.8	6.5 / 18	3 / 9 5 / 15 9 / 27	3.9 / 10.9 6.5 / 16.1 6.5 / 18
1Fx2206-2AH	7.8	6.5 / 18	5 / 15 9 / 27	5 / 13.4 6.5 / 18
1Fx2206-3AB	12	9 / 27	3 / 9 5 / 15	8.6 / 22.6 9 / 27
1Fx2206-3AF	12	9 / 27	3 / 9 5 / 15 9 / 27	5 / 14.3 8.3 / 22 9 / 27
1Fx2206-4AC	15	12 / 38	3 / 9 5 / 15 9 / 27	8 / 22.6 12 / 34.6 12 / 38

Motor data			Combination with Motor Module Booksize Compact	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1Fx2206-4AF	15	12 / 36	5 / 15 9 / 27 18 / 54	7.6 / 21.3 12 / 33.9 12 / 36
1Fx2206-4AH	15	12 / 36	9 / 27 18 / 54	7.69 / 24.7 12 / 36
1Fx2208-2AF	23	12.5 / 38	5 / 15 9 / 27 18 / 54	7.5 / 21.3 12.5 / 34.4 12.5 / 38
1Fx2208-3AB	30	18 / 51	5 / 15 9 / 27	15 / 39.7 18 / 51
1Fx2208-3AC	30	18 / 51	5 / 15 9 / 27 18 / 54	11 / 30.2 18 / 48 18 / 51
1Fx2208-3AF	30	18 / 51	9 / 27 18 / 54	14 / 37.4 18 / 51
1Fx2208-3AH	30	18 / 51	18 / 54	18 / 49.1
1Fx2208-4AB	39	22 / 66	5 / 15 9 / 27	15 / 43.4 22 / 66
1Fx2208-4AC	39	22 / 66	9 / 27 18 / 54	17 / 46.1 22 / 66
1Fx2208-4AF	39	22 / 66	9 / 27 18 / 54	13 / 37.4 22 / 65.2
1Fx2208-5AB	48	27 / 80	5/15 9/27 18/54	16 / 45.1 27 / 74.6 27 / 80
1Fx2208-5AC	48	27 / 80	9 / 27 18 / 54	17 / 47.2 27 / 80
1Fx2210-2AC	62	22 / 60	9 / 27 18 / 54	21 / 53.5 22 / 60
1Fx2210-2AF	62	22 / 60	9 / 27 18 / 54	15 / 41.7 22 / 60
1Fx2210-3AB	89	30 / 90	5 / 15 9 / 27	18 / 50.1 30 / 80.7
1Fx2210-3AC	89	30 / 90	9 / 27 18 / 54	18 / 51.1 30 / 88.9
1Fx2210-3AF	89	30 / 90	18 / 54	27 / 71.6
1Fx2210-4AB	120	40 / 120	9 / 27 18 / 54	31 / 83.4 40 / 120
1Fx2210-4AC	120	40 / 120	18 / 54	24 / 68.1 40 / 118
1Fx2210-4AF	120	40 / 120	9 / 27 18 / 54	32 / 86.3

Motor data			Combination with Motor Module Booksize Compact	
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current of the Motor Module**	**Static torque / max. torque with Motor Module**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**M_0 / M_{max} in Nm**
1Fx2210-5AB	150	50 / 150	9 / 27 18 / 54	30 / 85.1 50 / 148
1Fx2210-5AC	150	50 / 150	18 / 54	40 / 108
Compact, force-ventilated				
1FT2206-4SF	15	14.5 / 36	9 / 27 18 / 54	14 / 33.9 14.5 / 36
1FT2208-3SB	30	22 / 51	9 / 27	22 / 51
1FT2208-3SC	30	22 / 51	18 / 54	22 / 51
1FT2208-3SF	30	22 / 51	18 / 54	22 / 51
1FT2208-4SB	39	28 / 66	9 / 27	27 / 66
1FT2208-4SC	39	28 / 66	18 / 36 18 / 54	28 / 58.4 28 / 66
1FT2208-4SF	39	28 / 66	18 / 54	27 / 65.2
1FT2208-5SB	48	35 / 80	18 / 54	35 / 80
1FT2208-5SC	48	35 / 80	18 / 54	34 / 80
High Inertia, naturally cooled				
1FK2306-2AC	12	6 / 18	3/9 5/15	6 / 16.3 6 / 18
1FK2306-2AF	12	6.5 / 18	5/15 9/27	6.5 / 16.1 6.5 / 18
1FK2306-4AC	30	12 / 38	5/15 9/27	12 / 34.6 12 / 38
1FK2308-3AB	60	18 / 51	9/27	18 / 51
1FK2308-4AB	69	22 / 66	9/27	22 / 66

SINAMICS S120 Combi Power Module, DC link voltage 510 V to 720 V DC, line voltage 380 V to 480 V 3 AC

The following table shows the torques M_0 and M_{max} that can be achieved at the available servo outputs of the SINAMICS S120 Combi.

Motor			Converter: SINAMICS S120 Combi Power Module			
Article number	**Moment of inertia**	**Static torque / max. torque**	**Static torque / max. torque**			
			I_N = 9 A I_{max} = 18 A	**I_N = 9 A I_{max} = 27 A**	**I_N = 12 A I_{max} = 24 A**	**I_N = 12 A I_{max} = 36 A**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**
High Dynamic, naturally cooled						
1Fx2103-2AH	0.093	0.64 / 1.95	0.64 / 1.95	0.64 / 1.95	0.64 / 1.95	0.64 / 1.95
1Fx2103-4AH	0.14	1.27 / 4.05	1.27 / 4.05	1.27 / 4.05	1.27 / 4.05	1.27 / 4.05
1Fx2104-4AF	0.35	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75
1Fx2104-4AK	0.35	1.27 / 3.85	1.27 / 3.85	1.27 / 3.85	1.27 / 3.85	1.27 / 3.85

Motor			Converter: SINAMICS S120 Combi Power Module			
Article number	**Moment of inertia**	**Static torque / max. torque**	**Static torque / max. torque**			
			I_N = 9 A I_{max} = 18 A	**I_N = 9 A I_{max} = 27 A**	**I_N = 12 A I_{max} = 24 A**	**I_N = 12 A I_{max} = 36 A**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**
1Fx2104-5AF	0.56	2.4 / 7.5	2.4 / 7.5	2.4 / 7.5	2.4 / 7.5	2.4 / 7.5
1Fx2104-5AK	0.56	2.4 / 7.6	2.4 / 7.6	2.4 / 7.6	2.4 / 7.6	2.4 / 7.6
1Fx2104-6AF	1.6	3.2 / 10	3.2 / 10	3.2 / 10	3.2 / 10	3.2 / 10
1Fx2104-6AH	0.76	3.6 / 10	3.6 / 10	3.6 / 10	3.6 / 10	3.6 / 10
1Fx2105-4AF	1.7	5 / 15	5 / 15	5 / 15	5 / 15	5 / 15
1Fx2105-4AH	1.7	5 / 15	5 / 11.4	5 / 15	5 / 13.9	5 / 15
1Fx2105-6AF	2.7	8 / 24	8 / 19.2	8 / 24	8 / 24	8 / 24
1Fx2106-3AF	4.6	9 / 26	8.8 / 15.9	8.8 / 21.1	9 / 16.6	9 / 24.6
1Fx2106-4AF	6	12 / 33	10 / 18.8	10 / 25.6	12 / 23.5	12 / 30.6
1Fx2106-6AF	8.7	16 / 45.5	10 / 19.8	10 / 28.3	13 / 25.6	13 / 36
1Fx2108-4AC	18	25 / 87	15 / 29.9	15 / 42.6	20 / 38.6	20 / 53.9
1Fx2108-5AB	22	30 / 105	23 / 43.9	23 / 61.8	30 / 56.1	30 / 77
1Fx2108-7AB	28	37.5 / 140	24 / 47	24 / 67	32 / 61	32 / 85
High Dynamic, force-ventilated						
1FT2106-3SF	4.6	11.5 / 26	8.9 / 16.4	8.9 / 21.6	11.5 / 20.1	11.5 / 24.9
1FT2108-5SB	22	40 / 105	23 / 45.6	23 / 63.8	31 / 58.1	31 / 79
Compact, naturally cooled						
1Fx2203-2AK	0.2	0.64 / 1.85	0.64 / 1.85	0.64 / 1.85	0.64 / 1.85	0.64 / 1.85
1Fx2203-4AK	0.35	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75	1.27 / 3.75
1Fx2204-5AF	1.2	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1
1Fx2204-5AK	1.2	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1	2.4 / 7.1
1Fx2204-6AF	1.6	3.2 / 9.5	3.2 / 9.5	3.2 / 9.5	3.2 / 9.5	3.2 / 9.5
1Fx2205-2AC	3.2	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8
1Fx2205-2AF	3.2	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8
1Fx2205-2AH	3.2	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8	3.6 / 10.8
1Fx2205-4AF	5.1	6 / 18	6 / 18	6 / 18	6 / 18	6 / 18
1Fx2206-2AC	7.8	6 / 18	6 / 18	6 / 18	6 / 18	6 / 18
1Fx2206-2AF	7.8	6.5 / 18	6.5 / 18	6.5 / 18	6.5 / 18	6.5 / 18
1Fx2206-2AH	7.8	6.5 / 18	6.5 / 15.4	6.5 / 18	6.5 / 18	6.5 / 18
1Fx2206-3AB	12	9 / 27	9 / 27	9 / 27	9 / 27	9 / 27
1Fx2206-3AF	12	9 / 27	9 / 25.3	9 / 27	9 / 27	9 / 27
1Fx2206-4AC	15	12 / 38	12 / 38	12 / 38	12 / 38	12 / 38
1Fx2206-4AF	15	12 / 36	12 / 24.8	12 / 33.9	12 / 31.1	12 / 36
1Fx2206-4AH	15	12 / 36	9 / 17.4	9 / 24.7	12 / 22.4	12 / 31.1
1Fx2208-2AF	23	12.5 / 38	12.5 / 25	12.5 / 34.4	12.5 / 31.5	12.5 / 38
1Fx2208-3AB	30	18 / 51	18 / 46.1	18 / 51	18 / 51	18 / 51
1Fx2208-3AC	30	18 / 51	18 / 35.2	18 / 48	18 / 44.1	18 / 54
1Fx2208-3AF	30	18 / 51	14 / 26.3	14 / 37.4	18 / 33.8	18 / 47.1
1Fx2208-4AB	39	22 / 66	22 / 50.7	22 / 66	22 / 64	22 / 66
1Fx2208-4AC	39	22 / 66	17 / 32.6	17 / 46.1	22 / 41.8	22 / 57.7
1Fx2208-4AF	39	22 / 66	13 / 26	13 / 37.4	18 / 33.8	18 / 47.8

Motor			Converter: SINAMICS S120 Combi Power Module			
Article number	**Moment of inertia**	**Static torque / max. torque**	**Static torque / max. torque**			
			I_N = 9 A I_{max} = 18 A	**I_N = 9 A I_{max} = 27 A**	**I_N = 12 A I_{max} = 24 A**	**I_N = 12 A I_{max} = 36 A**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**	**M_0 / M_{max} in Nm**
1Fx2208-5AB	48	27 / 80	27 / 53	27 / 74.6	27 / 67.8	27 / 80
1Fx2208-5AC	48	27 / 80	17 / 32.8	17 / 47.2	22 / 42.6	22 / 60.4
1Fx2210-2AC	62	22 / 60	21 / 39.2	21 / 53.5	22 / 49.1	22 / 60
1Fx2210-2AF	62	22 / 60	15 / 29.7	15 / 41.7	20 / 37.9	20 / 52
1Fx2210-3AB	89	30 / 90	30 / 58.5	30 / 80.7	30 / 73.8	30 / 90
1Fx2210-3AC	89	30 / 90	18 / 35.5	18 / 51.1	24 / 46	24 / 65.1
1Fx2210-4AB	120	40 / 120	31 / 58.8	31 / 83.4	40 / 75.5	40 / 105
1Fx2210-4AC	120	40 / 120	24 / 47.3	24 / 68.1	32 / 61.4	32 / 86.8
1Fx2210-5AB	150	50 / 150	30 / 59.2	30 / 85.1	40 / 76.7	40 / 109
1Fx2210-5AC	150	50 / 150	20 / 40.6	20 / 59.2	27 / 53.1	27 / 76.7
Compact, force-ventilated						
1FT2206-4SF	15	14.5 / 36	14 / 25	14 / 33.9	14.5 / 31.2	14.5 / 36
1FT2208-3SB	30	22 / 51	22 / 46	22 / 51	22 / 51	22 / 51
1FT2208-3SC	30	22 / 51	19 / 35.3	19 / 48	22 / 44.2	22 / 51
1FT2208-3SF	30	22 / 51	- / -	- / -	19 / 34.8	19 / 47.5
1FT2208-4SB	39	28 / 66	27 / 50.5	27 / 66	28 / 63.9	28 / 66
1FT2208-4SC	39	28 / 66	- / -	- / -	23 / 42.9	23 / 58.4
1FT2208-5SB	48	35 / 80	- / -	- / -	35 / 69	35 / 80

SINAMICS Motor Module S210

The following table shows recommendations for suitable converters and the torques M_0 and M_{max} that can be achieved with them.

Motor			SINAMICS S210	
			200-480 V 3 AC	**200-240 V 1 AC**
Article number	**Moment of inertia**	**Static torque / max. torque**	**Rated current / max. current for S210**	**Rated current / max. current for S210**
	J_{mot} in kg cm²	**M_0 / M_{max} in Nm**	**I_{rated} / I_{max} in A**	**I_{rated} / I_{max} in A**
High Dynamic, naturally cooled				
1Fx2102-0AG	0.0245	0.16 / 0.56	1.2 / 4.2	0.8 / 3.1
1Fx2102-1AG	0.036	0.32 / 1.11	1.2 / 4.2	0.8 / 3.1
1Fx2103-2AG	0.093	0.64 / 1.95	2.3 / 7.6	1.36 / 4.8
1Fx2103-2AH	0.093	0.64 / 1.95	1.2 / 4.2	1.36 / 4.8
1Fx2103-4AG	0.139	1.27 / 4.05	3 / 10.9	2.4 / 8.7
1Fx2103-4AH	0.139	1.27 / 4.05	2.3 / 7.6	2.4 / 8.7
1Fx2104-4AF	0.35	1.27 / 3.75	1.2 / 4.2	1.36 / 4.8
1Fx2104-4AK	0.35	1.27 / 3.85	3 / 10.9	2.4 / 8.7
1Fx2104-5AF	0.56	2.4 / 7.5	2.3 / 7.6	2.4 / 8.7

Motor			SINAMICS S210	
			200-480 V 3 AC	200-240 V 1 AC
Article number	Moment of inertia	Static torque / max. torque	Rated current / max. current for S210	Rated current / max. current for S210
	J_{mot} in kg cm²	M_0 / M_{max} in Nm	I_{rated} / I_{max} in A	I_{rated} / I_{max} in A
1Fx2104-5AK	0.56	2.4 / 7.6	5 / 19	4.4 / 16
1Fx2104-6AF	0.76	3.2 / 10	3 / 10.9	4.4 / 16
1Fx2104-6AH	0.76	3.6 / 10	5 / 19	-
1Fx2105-4AF	1.71	5 / 15	5 / 19	-
1Fx2105-4AH	1.71	5 / 13.9	7 / 24	-
1Fx2105-6AF	2.65	8 / 24	7 / 24	-
1Fx2106-3AF	4.6	9 / 26	12 / 44	-
1Fx2106-4AF	6	12 / 33	12 / 44	-
1Fx2106-6AF	8.7	16 / 45.5	15 / 55	-
1Fx2108-4AC	18.3	25 / 73	15 / 55	-
1Fx2108-5AB	21.6	30 / 88.2	12 / 44	-
1Fx2108-7AB	28.2	37.5 / 116	15 / 55	-
High Dynamic, force-ventilated				
1FT2106-3SF	4.6	11.5 / 26	12 / 55	-
1FT2106-4SF	6	16 / 33	15 / 55	-
1FT2108-5SB	21.6	38.7 / 101	15 / 55	-
Compact, naturally cooled				
1Fx2203-2AG	0.2	0.64 / 1.85	2.3 / 7.6	-
1Fx2203-2AK	0.2	0.64 / 1.85	1.2 / 4.2	1.36 / 4.8
1Fx2203-4AG	0.35	1.27 / 3.75	3 / 10.9	-
1Fx2203-4AK	0.35	1.27 / 3.75	2.3 / 7.6	2.4 / 8.7
1Fx2204-5AF	1.23	2.4 / 7.1	2.3 / 7.6	2.4 / 8.7
1Fx2204-5AK	1.23	2.4 / 7.1	5 / 19	4.4 / 16
1Fx2204-6AF	1.61	3.2 / 9.5	3 / 10.9	4.4 / 16
1Fx2205-2AC	3.15	3.6 / 10.8	2.3 / 7.6	2.4 / 8.7
1Fx2205-2AF	3.15	3.6 / 10.8	3 / 10.9	4.4 / 16
1Fx2205-2AH	3.15	3.6 / 10.8	5 / 19	4.4 / 16
1Fx2205-4AF	5.1	6 / 18	5 / 19	-
1Fx2206-2AC	7.8	6 / 18	3 / 10.9	-
1Fx2206-2AF	7.8	6.5 / 18	5 / 19	-
1Fx2206-2AH	7.8	6.5 / 18	7 / 24	-
1Fx2206-3AB	11.5	9 / 27	5 / 19	-
1Fx2206-3AF	11.5	9 / 27	7 / 24	-
1Fx2206-4AC	15.1	12 / 38	5 / 19	-
1Fx2206-4AF	15.1	12 / 36	9 / 33	-
1Fx2206-4AH	15.1	12 / 36	12 / 44	-
1Fx2208-2AF	22.5	12.5 / 38	9 / 33	-
1Fx2208-3AB	29.6	18 / 51	7 / 24	-

Motor			SINAMICS S210	
			200-480 V 3 AC	200-240 V 1 AC
Article number	Moment of inertia	Static torque / max. torque	Rated current / max. current for S210	Rated current / max. current for S210
	J_{mot} in kg cm²	M_0 / M_{max} in Nm	I_{rated} / I_{max} in A	I_{rated} / I_{max} in A
1Fx2208-3AC	29.6	18 / 51	9 / 33	-
1Fx2208-3AF	29.6	18 / 51	12 / 44	-
1Fx2208-4AB	38.8	22 / 66	9 / 33	-
1Fx2208-4AC	38.8	22 / 66	12 / 44	-
1Fx2208-4AF	38.8	22 / 66	15 / 55	-
1Fx2208-5AB	48.1	27 / 80	9 / 33	-
1Fx2208-5AC	48.1	27 / 80	15 / 55	-
1Fx2210-2AC	61.7	22 / 60	12 / 44	-
1Fx2210-2AF	61.7	22 / 60	15 / 55	-
1Fx2210-3AB	88.8	30 / 90	9 / 33	-
1Fx2210-3AC	88.8	30 / 90	15 / 55	-
1Fx2210-4AB	117	40 / 120	12 / 44	--
1Fx2210-4AC	117	40 / 120	15 / 55	-
1Fx2210-5AB	145	50 / 150	15 / 55	-
Compact, force-ventilated				
1FT2206-4SF	15.1	14.5 / 36	12 / 33	-
1FT2206-4SH	15.1	14.5 / 36	15 / 33	-
1FT2208-3SB	29.6	22 / 51	9 / 33	-
1FT2208-3SC	29.6	22 / 51	12 / 44	-
1FT2208-3SF	29.6	22 / 51	15 / 55	-
1FT2208-4SB	38.8	28 / 66	12 / 44	-
1FT2208-4SC	38.8	28 / 66	15 / 55	-
1FT2208-5SB	48.1	35 / 80	12 / 44	-
1FT2210-4SB	117	51.3 / 120	15 / 55	-

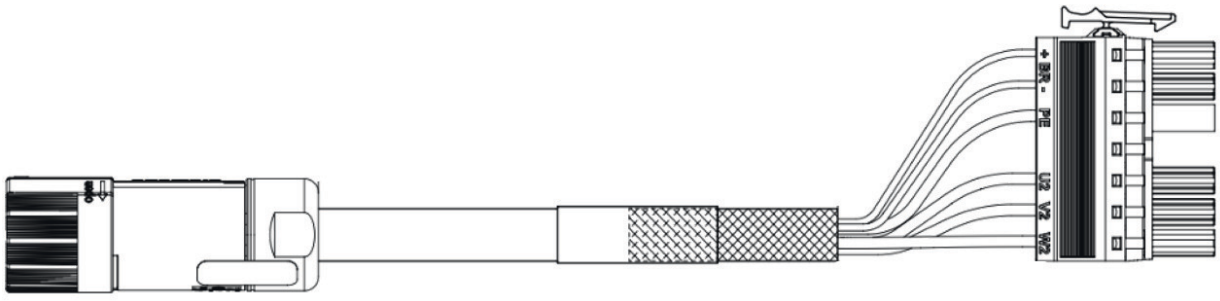
Power cable between motor and SINAMICS S120 Booksize, DC link voltage 510 V to 720 V DC, (line voltage, 3 AC 380 V to 480 V)

The following table outlines the available options for the MOTION-CONNECT power cable between the motor and converter.

Power cable between motor and SINAMICS S120/S220 Booksize type C/D converter, 3-30 A, optionally with brake conductors

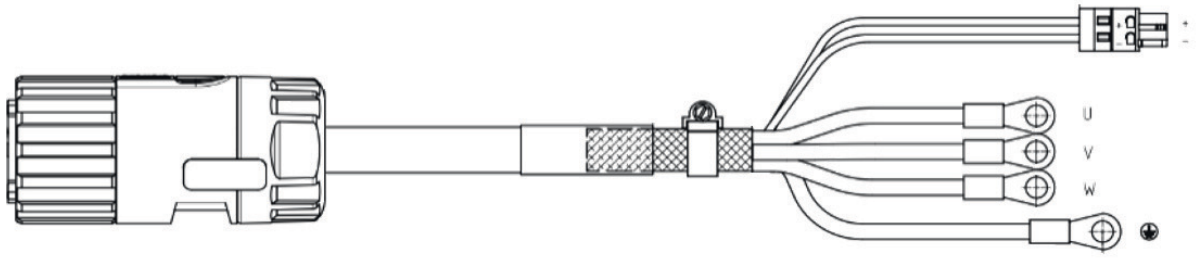
Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M17	4 x 1.5 mm²	6FXx002-5xN27-xxxx
M23	4 x 1.5 mm²	6FXx002-5xN06-xxxx

Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M23	4 x 2.5 mm²	6FXx002-5xN16-xxxx
M23	4 x 4 mm²	6FXx002-5xN76-xxxx
M40	4 x 2.5 mm²	6FXx002-5xN36-xxxx
M40	4 x 4 mm²	6FXx002-5xN46-xxxx
M40	4 x 6 mm²	6FXx002-5xN56-xxxx



Power cable between motor and SINAMICS S120/S220 Booksize type C/D converter, 45-60 A, optionally with brake conductors

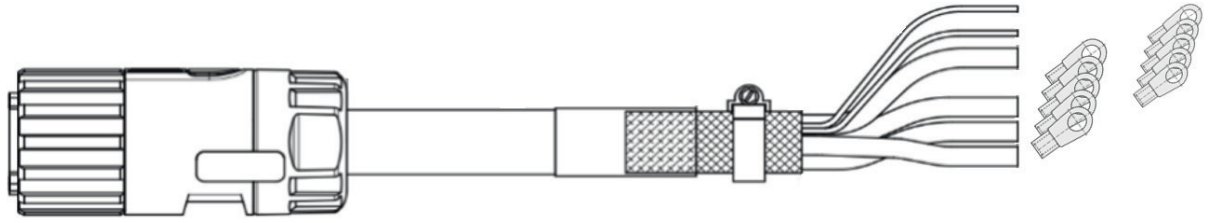
Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M40	4 x 4 mm²	6FXx002-5xG42-xxxx*)
M40	4 x 6 mm²	6FXx002-5xN54-xxxx



*) Customer-side assembly with 4x M6 ring cable lugs for U, V, W, PE and, if applicable, a brake connector required.

Power cable between motor and SINAMICS S120/S220 Booksize type C/D converter, 85-200 A, optionally with brake conductors

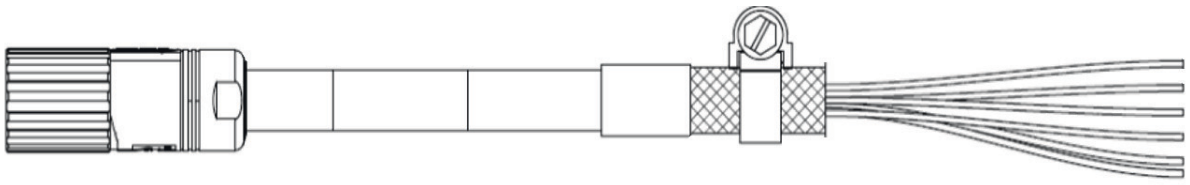
Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M40	4 x 6 mm²	6FXx002-5xN54-xxxx**)



** Customer-side assembly with 3x ring cable lugs for M8 (for U, V, W) and 1x for M6 (for PE) and, if applicable, a brake connector required.

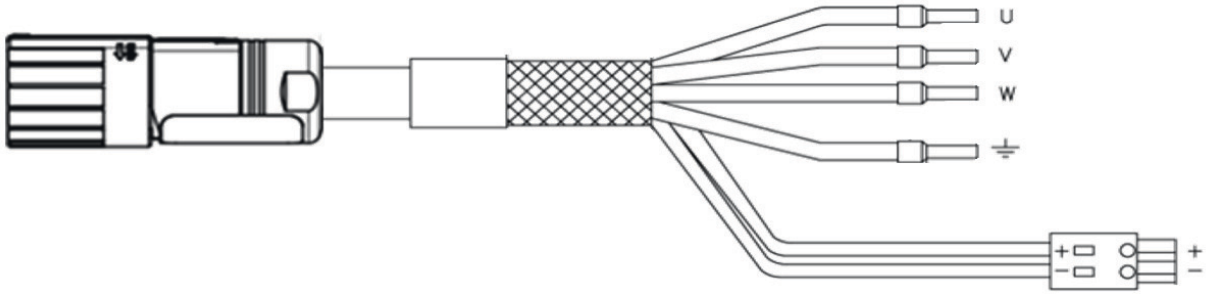
Power cable between motor and converter SINAMICS S120 Booksize Compact and Power Modules Blocksize, optionally with brake conductors

Connector motor end	Connector converter end	Article number of the signal cable
M17	4 x 1.5 mm²	6FXx002-5DN30-xxxx
M23	4 x 1.5 mm²	6FXx002-5xG10-xxxx
M23	4 x 2.5 mm²	6FXx002-5xG12-xxxx
M40	4 x 2.5 mm²	6FXx002-5xG32-xxxx
M40	4 x 4 mm²	6FXx002-5xG42-xxxx
M40	4 x 6 mm²	6FXx002-5xG52-xxxx



Power cable between motor and converter SINAMICS S120 Combi Power Module, optionally with brake conductors

Connector motor end	Connector converter end	Article number of the signal cable
M17	4 x 1.5	6FXx002-5xF07-xxxx
M23	4 x 1.5	6FXx002-5xF10-xxxx



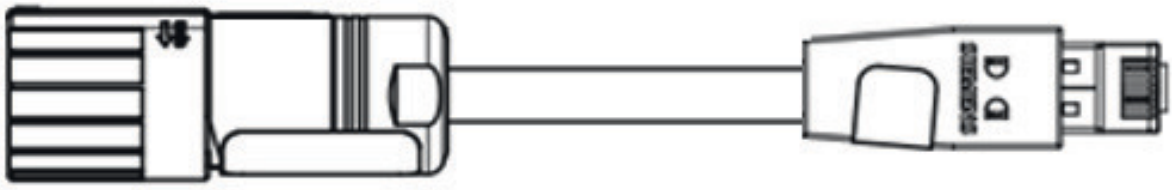
Extension for power cable, optionally with brake conductors

Connector motor end	Connector converter end	Article number of the signal cable
M17	4 x 1.5 mm²	6FXx002-5MN05-xxxx
M23	4 x 1.5 mm²	6FXx002-5xN05-xxxx
M23	4 x 2.5 mm²	6FXx002-5xQ15-xxxx
M23	4 x 4 mm²	6FXx002-5xN25-xxxx
M40	4 x 2.5 mm²	6FXx002-5xQ38-xxxx
M40	4 x 4 mm²	6FXx002-5xQ48-xxxx
M40	4 x 6 mm²	6FXx002-5xQ58-xxxx



DRIVE-CLiQ signal cable between motor and SINAMICS converter S120 / S220 (2CC)

Connector motor end	Connector converter end	Article number of the signal cable
M17	RJ45, IP20	6FXx002-2DC40-xxxx



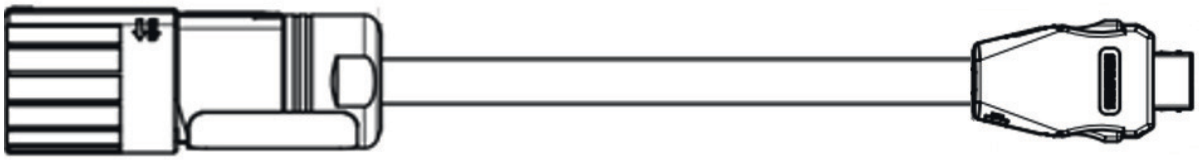
DRIVE-CLiQ extension cable for signal line

Connector motor end	Connector converter end	Article number of the signal cable
M17	M17	6FXx002-2DC44-xxxx



DRIVE-CLiQ signal cable between motor and SINAMICS converter S210 (2CC)

Connector motor end	Connector converter end	Article number of the signal cable
M17	Sinamics-IX	6FXx002-2DX40-xxxx

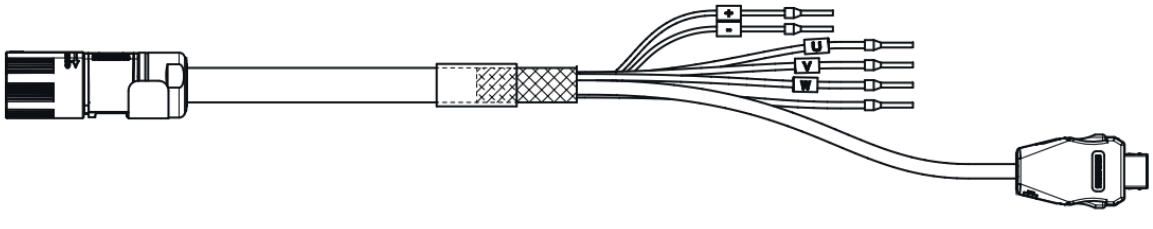


Note

This cable can be used if two-cable motors are to be connected to SINAMICS S210. However, we recommend one-cable motors with the corresponding OCC cable for SINAMICS S210.

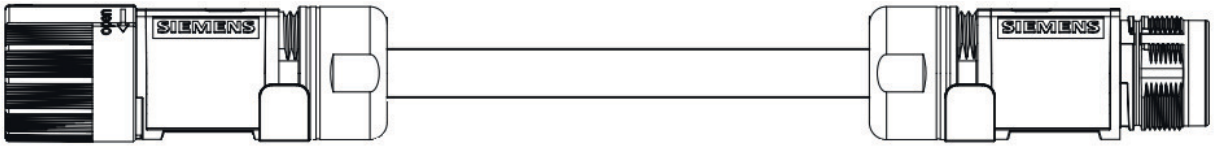
Connection cable between motor and converter SINAMICS S210 (OCC)

Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M12	4 x 0.38 mm²	6FXx002-8QN04-xxxx
M12	4 x 0.82 mm²	6FX8002-8QN06-xxxx
M17	4 x 0.75 mm²	6FXx002-8QN08-xxxx
M23	4 x 1.5 mm²	6FXx002-8QN11-xxxx
M23	4 x 2.5 mm²	6FXx002-8QN21-xxxx



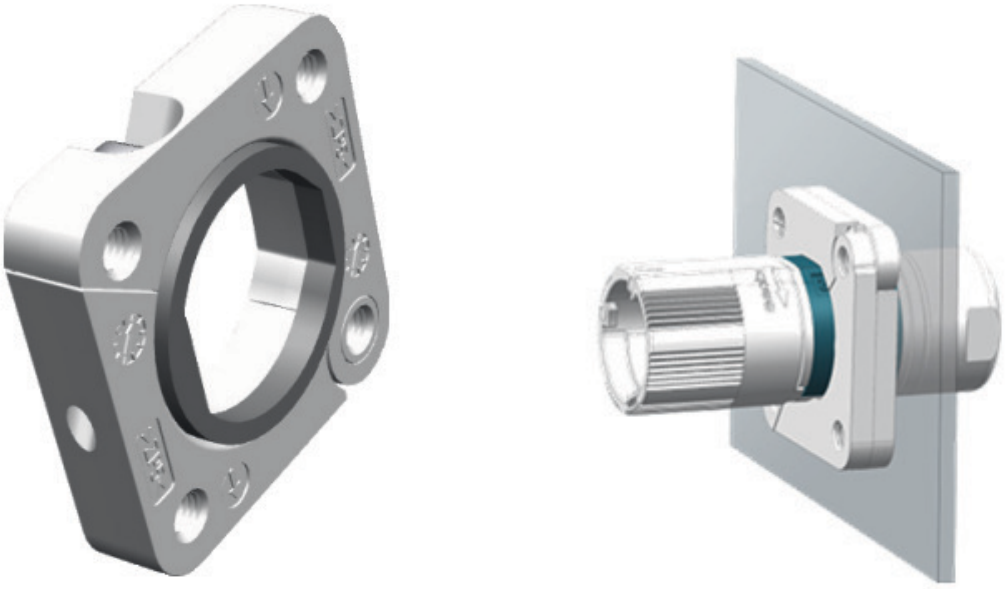
Extension cable between motor and converter SINAMICS S210 (OCC)

Motor plug size	Cross-section of power cable conductors	Article number of the power cable
M12	4 x 0.38 mm²	6FXx002-8QE04-xxxx
M12	4 x 0.82 mm²	6FX8002-8QE06-xxxx
M17	4 x 0.75 mm²	6FXx002-5QE08-xxxx
M23	4 x 1.5 mm²	6FXx002-8QE11-xxxx
M23	4 x 2.5 mm²	6FXx002-8QE21-xxxx



Mounting flange for M12, M17, M32 connectors as cabinet bushing

For connector size	Article number
M12	6FX2003-7JX00
M17	6FX2003-7HX00
M23	6FX2003-7BX00

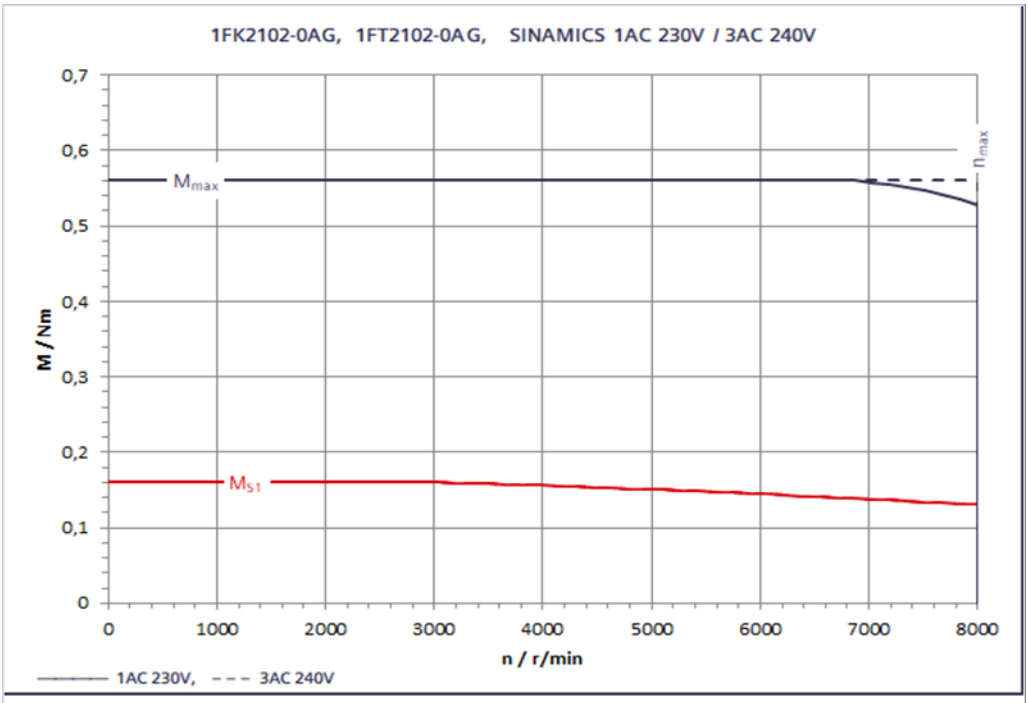


6.3 Technical specifications and characteristics

6.3.1 High Dynamic, naturally cooled

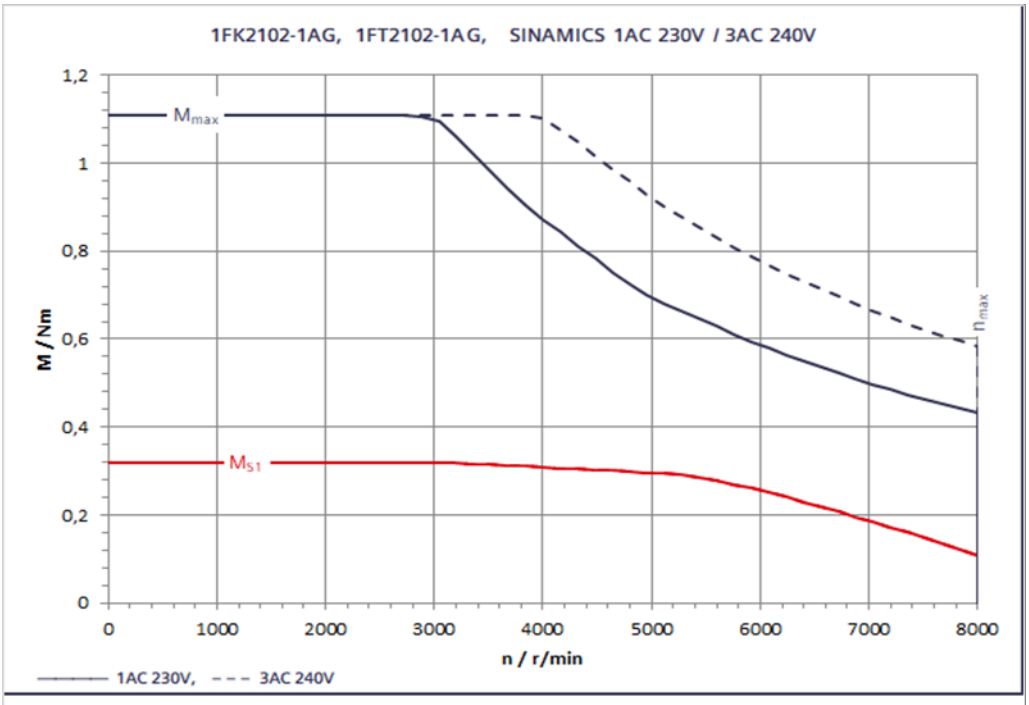
6.3.1.1 1FK2102-0AG, 1FT2102-0AG

1FK2102-0AG, 1FT2102-0AG three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.16
Stall current	I_0	A	0.75
Maximum torque	M_{max}	Nm	0.56
Maximum current	I_{max}	A	3.1
Thermal time constant	T_{th}	min	14
Moment of inertia	J_{Mot}	kg cm²	0.0245
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.0285
Weight	m_{Mot}	kg	0.47
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	0.73
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	0.16
Rated current	I_{rated}	A	0.75
Rated power	P_{rated}	kW	0.05
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2102-0AG, 1FT2102-0AG, SINAMICS 1AC 230V / 3AC 240V
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
M / Nm
M_max
n_max
M_S1
0
1000
2000
3000
4000
5000
6000
7000
8000
n / r/min
1AC 230V, 3AC 240V

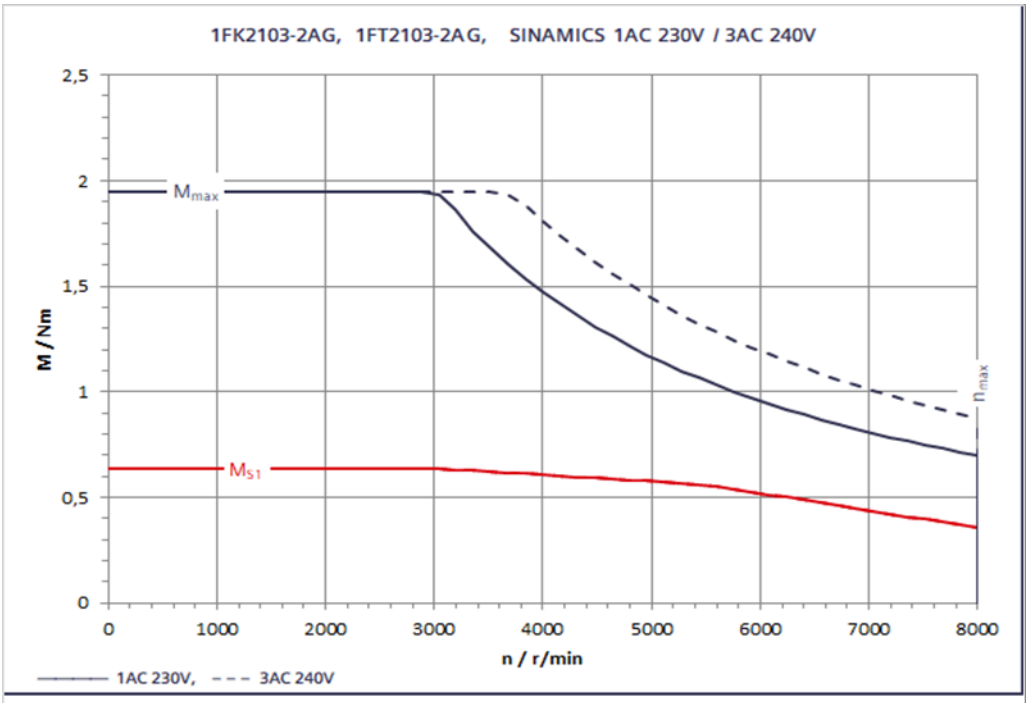
6.3.1.2 1FK2102-1AG, 1FT2102-1AG

1FK2102-1AG, 1FT2102-1AG three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.32
Stall current	I_0	A	0.76
Maximum torque	M_{max}	Nm	1.11
Maximum current	I_{max}	A	2.95
Thermal time constant	T_{th}	min	16
Moment of inertia	J_{Mot}	kg cm²	0.036
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.04
Weight	m_{Mot}	kg	0.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	0.86
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	0.32
Rated current	I_{rated}	A	0.76
Rated power	P_{rated}	kW	0.1
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2102-1AG, 1FT2102-1AG, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_max
M_S1
n_max
1,2
1
0,8
0,6
0,4
0,2
0
0
1000
2000
3000
4000
5000
6000
7000
8000
1AC 230V, 3AC 240V

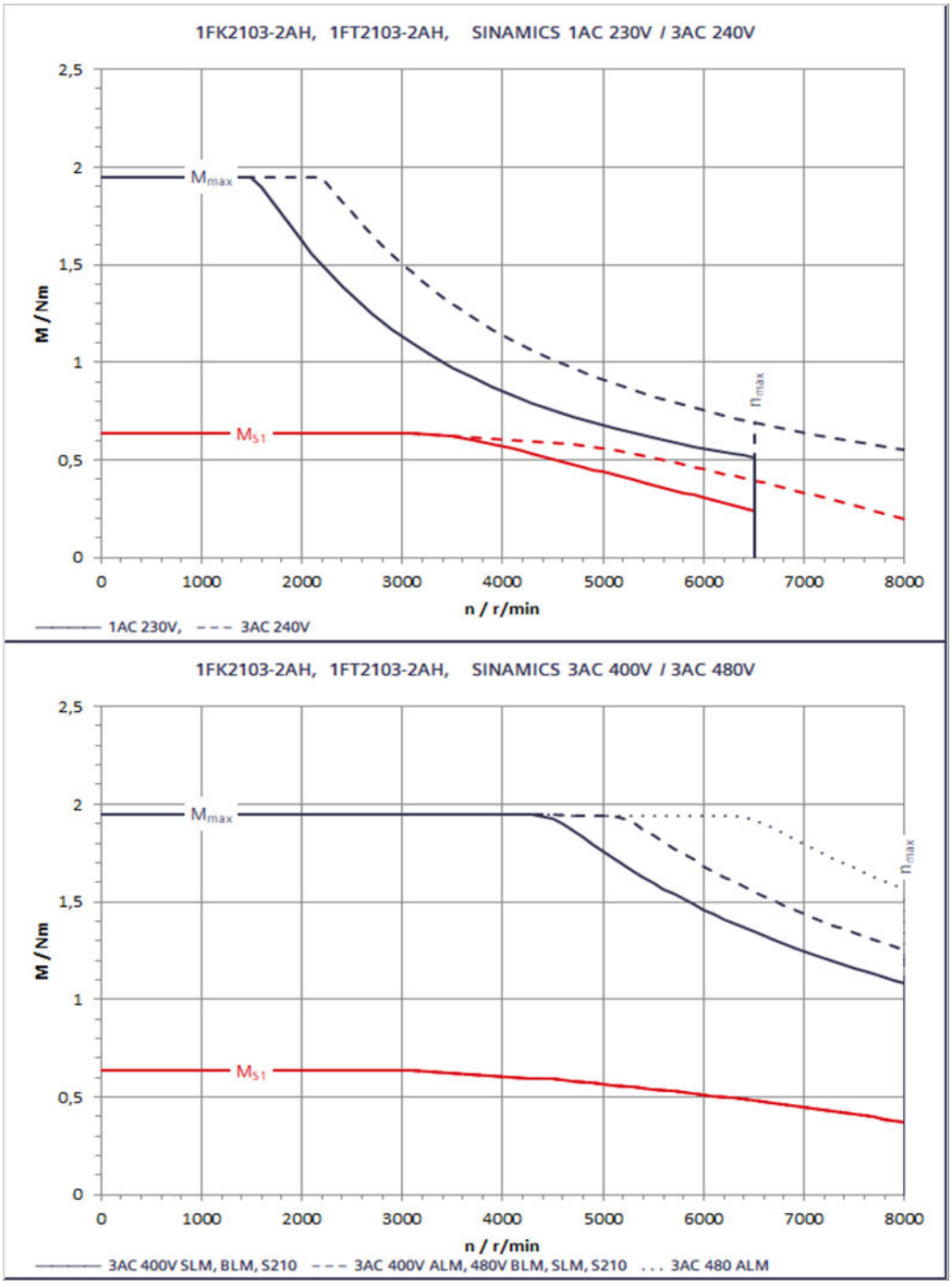
6.3.1.3 1FK2103-2AG, 1FT2103-2AG

1FK2103-2AG, 1FT2103-2AG three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.64
Stall current	I_0	A	1.36
Maximum torque	M_{max}	Nm	1.95
Maximum current	I_{max}	A	4.8
Thermal time constant	T_{th}	min	17
Moment of inertia	J_{Mot}	kg cm²	0.093
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.112
Weight	m_{Mot}	kg	1.17
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.54
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	0.64
Rated current	I_{rated}	A	1.36
Rated power	P_{rated}	kW	0.2
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2103-2AG, 1FT2103-2AG, SINAMICS 1AC 230V / 3AC 240V
2,5
2
1,5
1
0,5
0
M / Nm
M_max
M_S1
n_max
0
1000
2000
3000
4000
5000
6000
7000
8000
n / r/min
1AC 230V, 3AC 240V

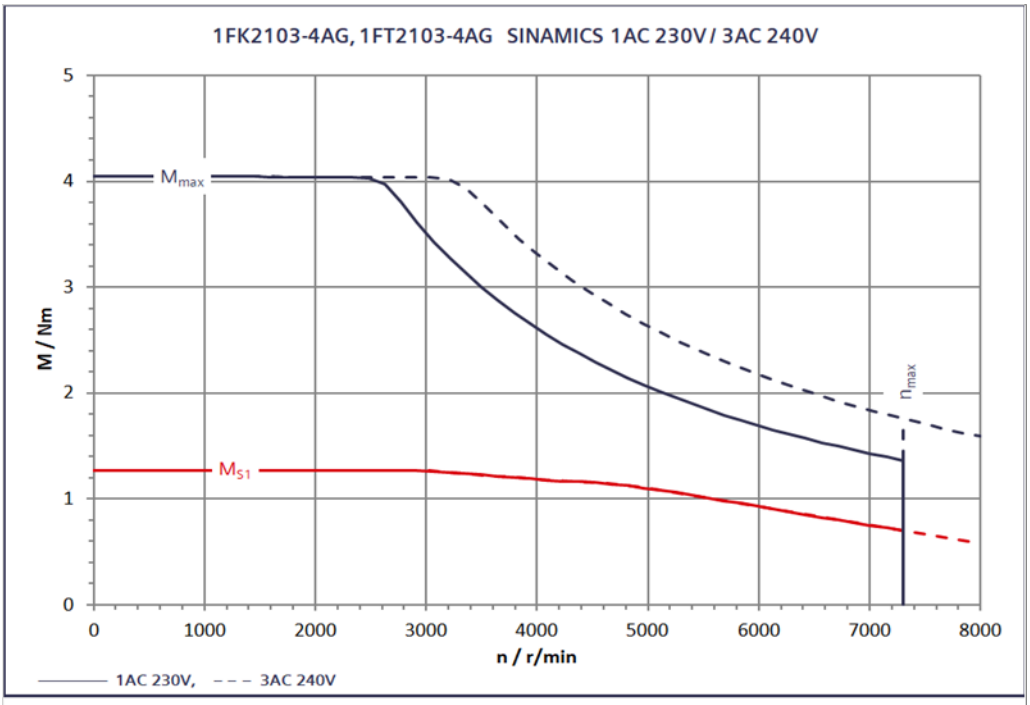
6.3.1.4 1FK2103-2AH, 1FT2103-2AH

1FK2103-2AH, 1FT2103-2AH three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.64
Stall current	I_0	A	1.06
Maximum torque	M_{max}	Nm	1.95
Maximum current	I_{max}	A	3.95
Thermal time constant	T_{th}	min	17
Moment of inertia	J_{Mot}	kg cm²	0.093
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.112
Weight	m_{Mot}	kg	1.18
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.55
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6500
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	0.64
Rated current	I_{rated}	A	1.1
Rated power	P_{rated}	kW	0.167
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	0.59
Rated current	I_{rated}	A	1.05
Rated power	P_{rated}	kW	0.28
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2103-2AH, 1FT2103-2AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2103-2AH, 1FT2103-2AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

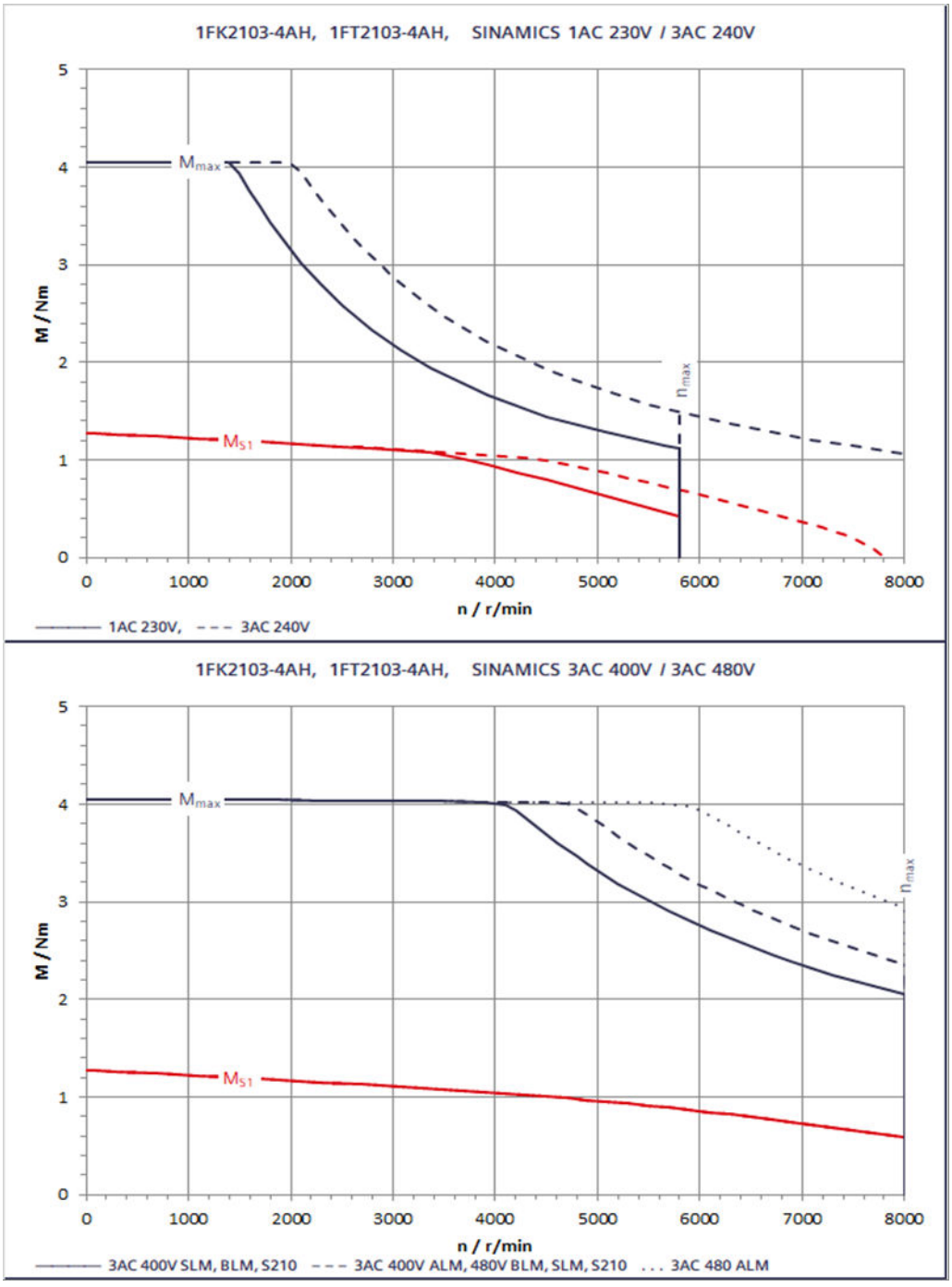
6.3.1.5 1FK2103-4AG, 1FT2103-4AG

1FK2103-4AG, 1FT2103-4AG three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	2.4
Maximum torque	M_{max}	Nm	4.05
Maximum current	I_{max}	A	8.7
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	0.139
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.158
Weight	m_{Mot}	kg	1.64
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.98
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7300
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	1.27
Rated current	I_{rated}	A	2.4
Rated power	P_{rated}	kW	0.4
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2103-4AG, 1FT2103-4AG SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
1
2
3
4
5
0
1000
2000
3000
4000
5000
6000
7000
8000
1AC 230V,
3AC 240V

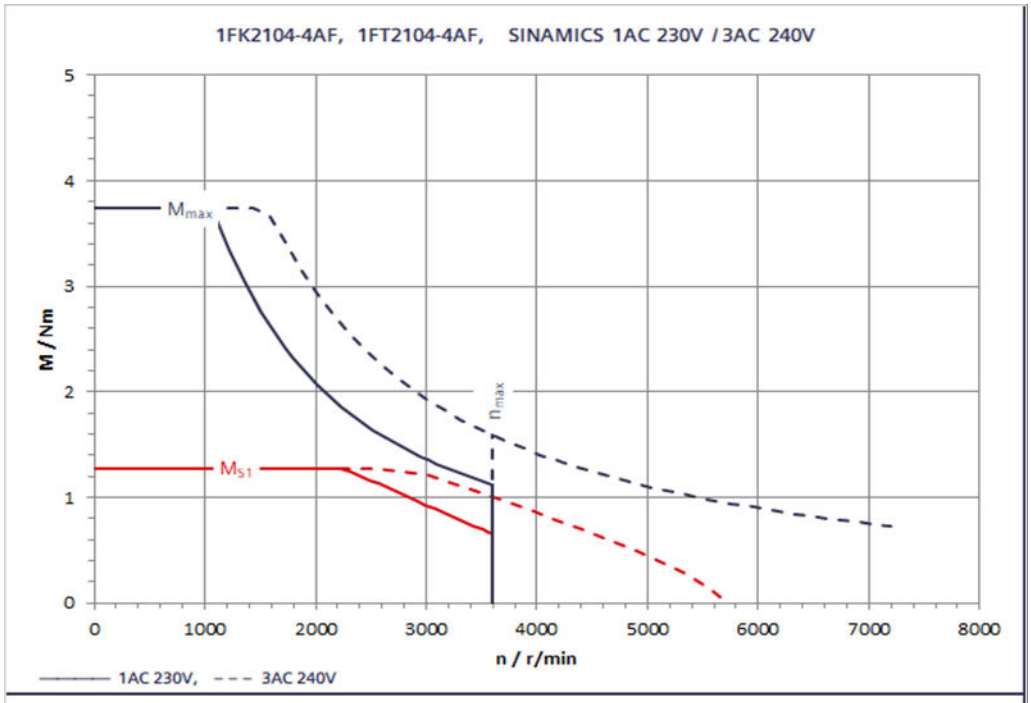
6.3.1.6 1FK2103-4AH, 1FT2103-4AH

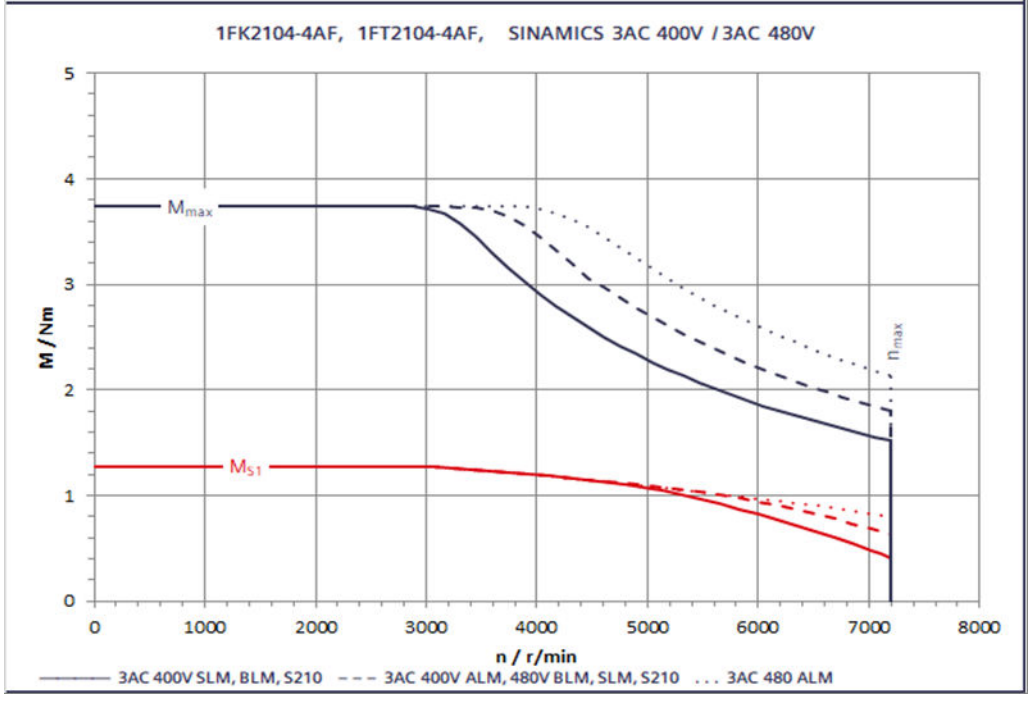
1FK2103-4AH, 1FT2103-4AH three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	1.87
Maximum torque	M_{max}	Nm	4.05
Maximum current	I_{max}	A	7.1
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	0.139
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.158
Weight	m_{Mot}	kg	1.65
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.99
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5800
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	1.14
Rated current	I_{rated}	A	1.72
Rated power	P_{rated}	kW	0.3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	1.01
Rated current	I_{rated}	A	1.56
Rated power	P_{rated}	kW	0.48
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2103-4AH, 1FT2103-4AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2103-4AH, 1FT2103-4AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.7 1FK2104-4AF, 1FT2104-4AF

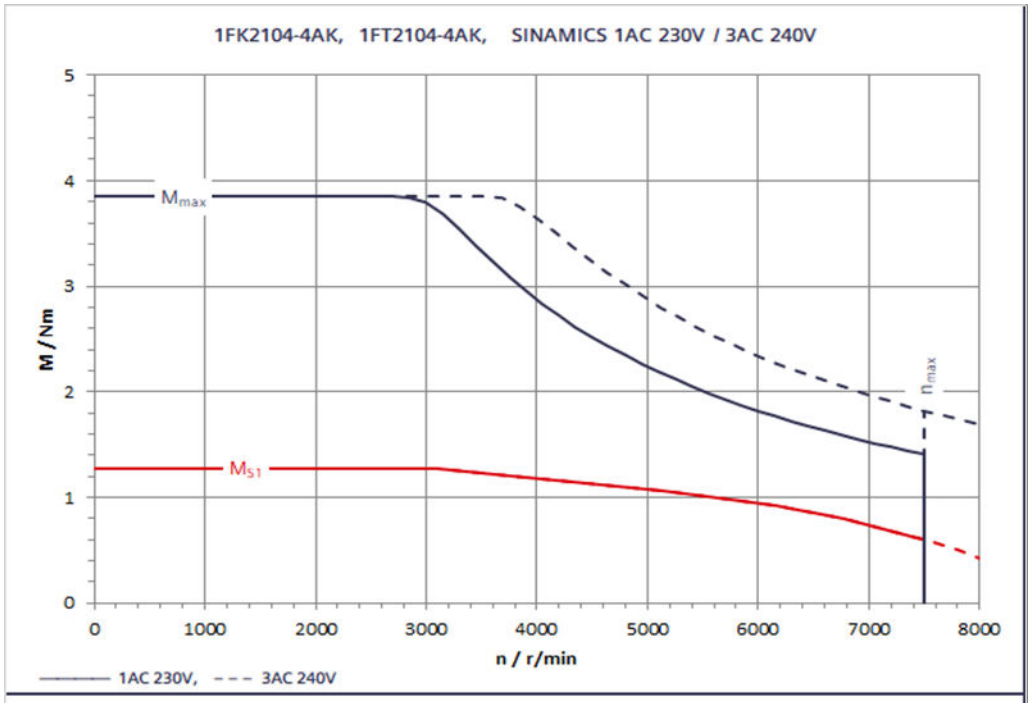
1FK2104-4AF, 1FT2104-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	1.19
Maximum torque	M_{max}	Nm	3.75
Maximum current	I_{max}	A	4.2
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	0.35
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.43
Weight	m_{Mot}	kg	2.05
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	2.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3600
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	1.27
Rated current	I_{rated}	A	1.19
Rated power	P_{rated}	kW	0.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7200
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	1.27
Rated current	I_{rated}	A	1.19
Rated power	P_{rated}	kW	0.4
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		

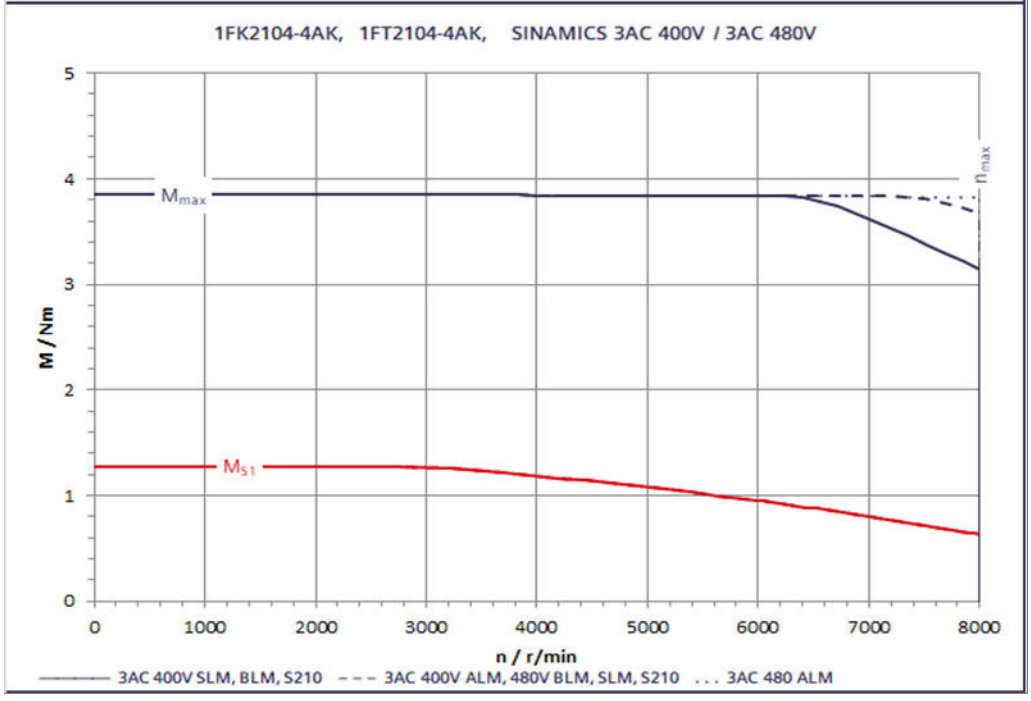

1FK2104-4AF, 1FT2104-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V


1FK2104-4AF, 1FT2104-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.8 1FK2104-4AK, 1FT2104-4AK

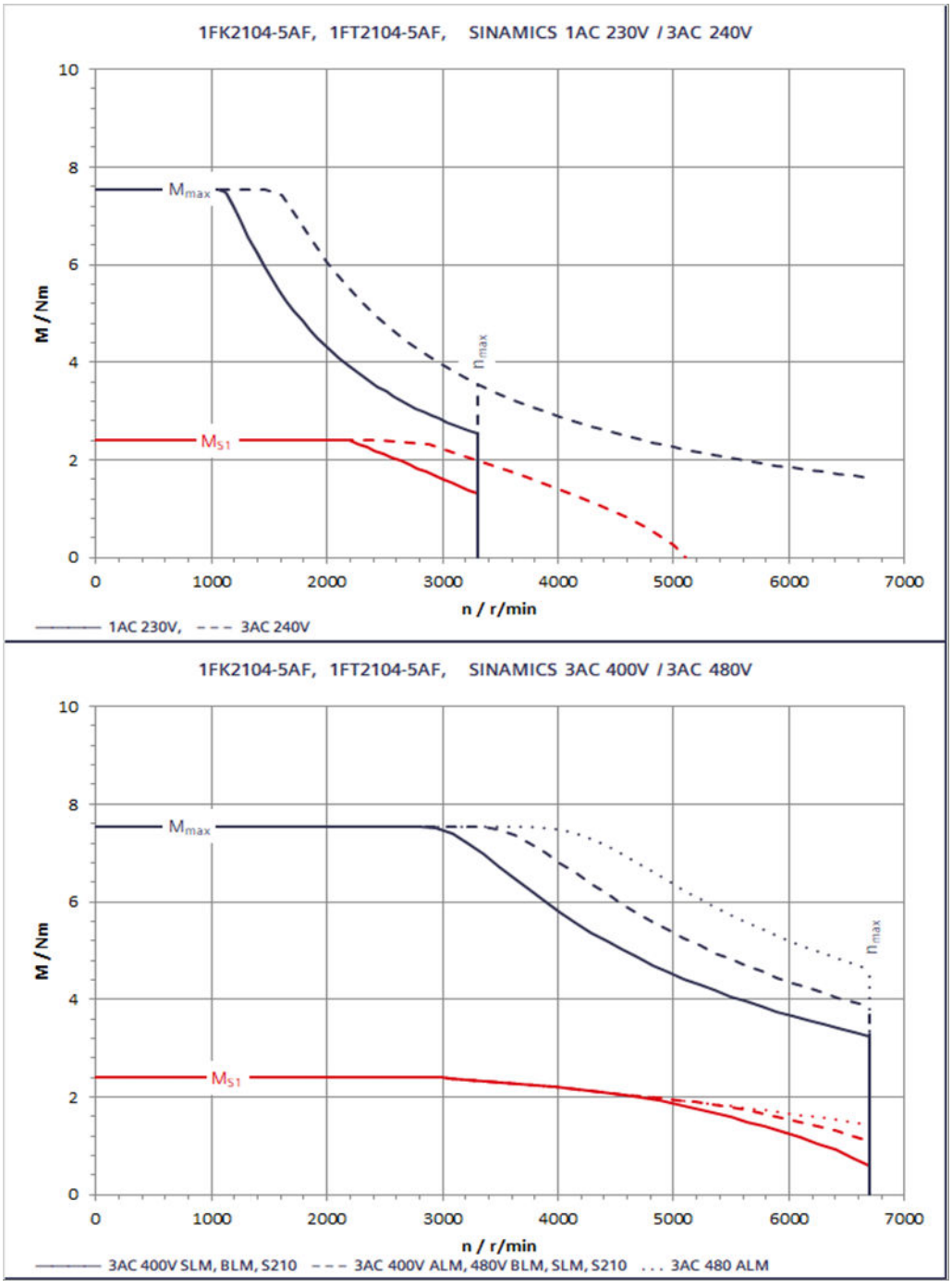
1FK2104-4AK, 1FT2104-4AK three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	2.4
Maximum torque	M_{max}	Nm	3.85
Maximum current	I_{max}	A	8.7
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	0.35
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.43
Weight	m_{Mot}	kg	2.05
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	2.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7500
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	1.27
Rated current	I_{rated}	A	2.4
Rated power	P_{rated}	kW	0.4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	6000
Rated torque	M_{rated}	Nm	0.95
Rated current	I_{rated}	A	1.88
Rated power	P_{rated}	kW	0.6
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2104-4AK, 1FT2104-4AK, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FK2104-4AK, 1FT2104-4AK, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

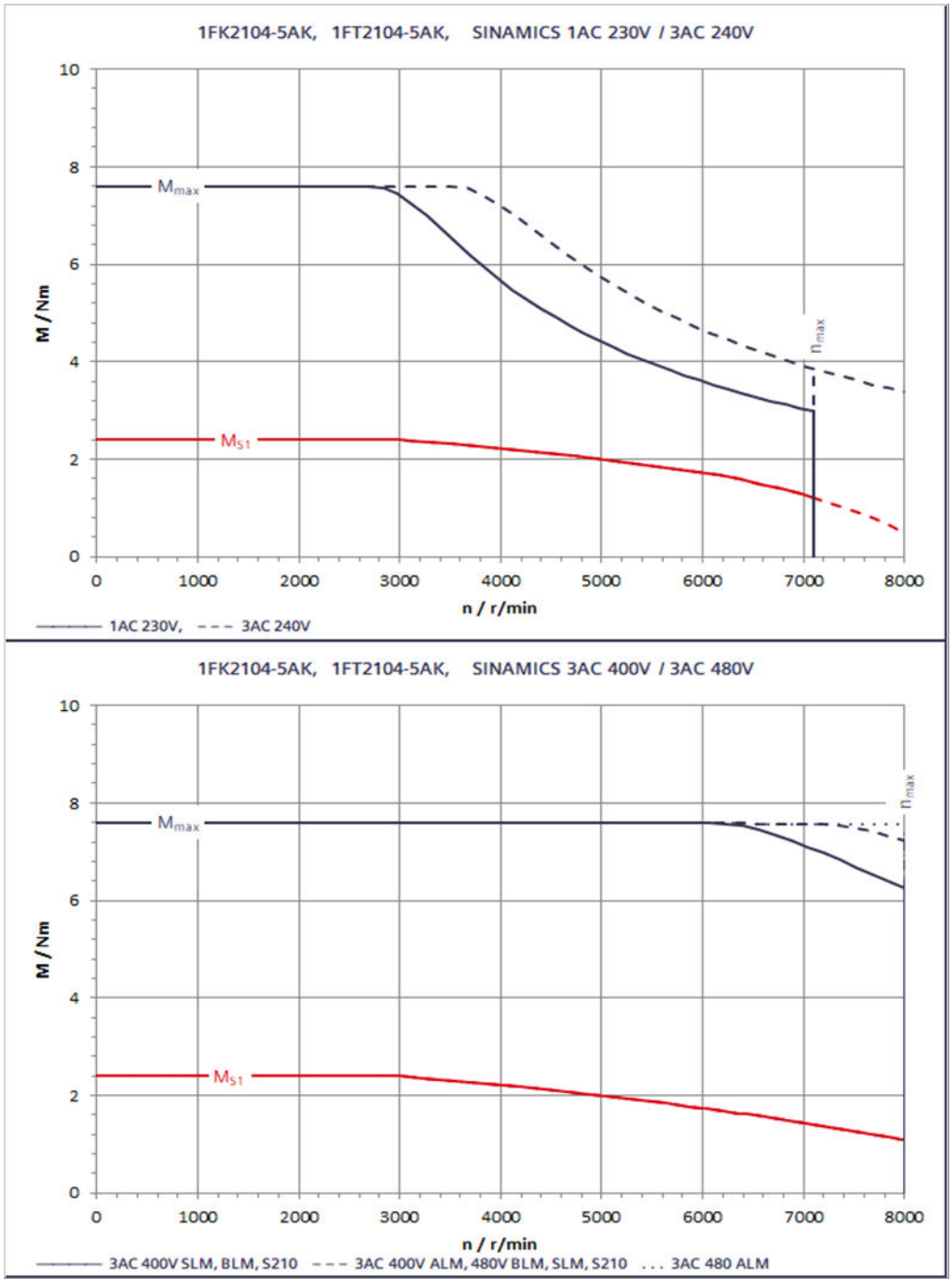
6.3.1.9 1FK2104-5AF, 1FT2104-5AF

1FK2104-5AF, 1FT2104-5AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	2.4
Stall current	I_0	A	2.1
Maximum torque	M_{max}	Nm	7.5
Maximum current	I_{max}	A	7.6
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	0.56
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.65
Weight	m_{Mot}	kg	2.85
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	3.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	2.1
Rated power	P_{rated}	kW	0.375
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6700
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	2.1
Rated power	P_{rated}	kW	0.75
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2104-5AF, 1FT2104-5AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2104-5AF, 1FT2104-5AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

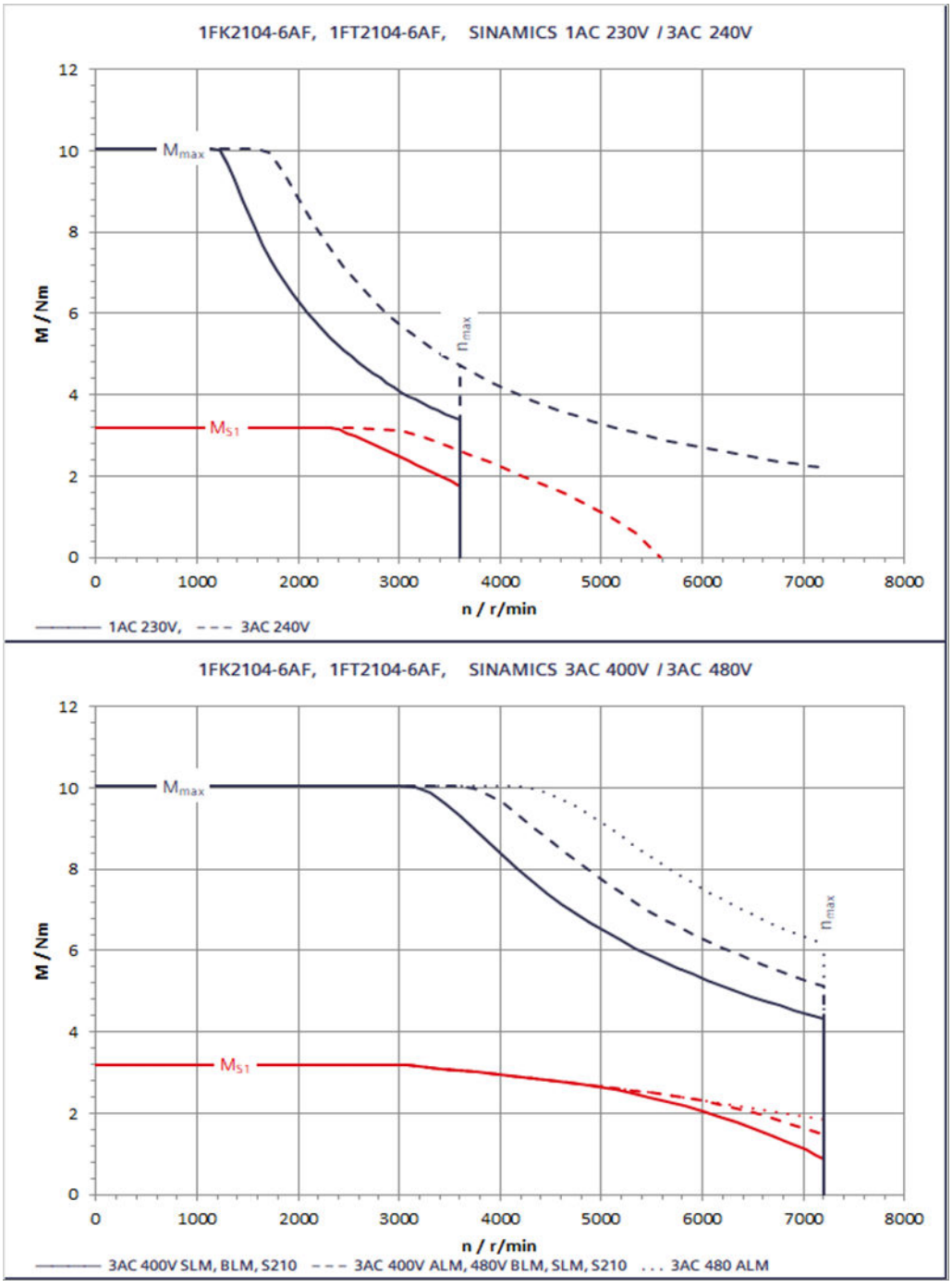
6.3.1.10 1FK2104-5AK, 1FT2104-5AK

1FK2104-5AK, 1FT2104-5AK three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	2.4
Stall current	I_0	A	4.4
Maximum torque	M_{max}	Nm	7.6
Maximum current	I_{max}	A	16
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	0.56
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.65
Weight	m_{Mot}	kg	2.85
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	3.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7100
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	4.4
Rated power	P_{rated}	kW	0.75
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	6000
Rated torque	M_{rated}	Nm	1.7
Rated current	I_{rated}	A	3.2
Rated power	P_{rated}	kW	1.07
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2104-5AK, 1FT2104-5AK, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2104-5AK, 1FT2104-5AK, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

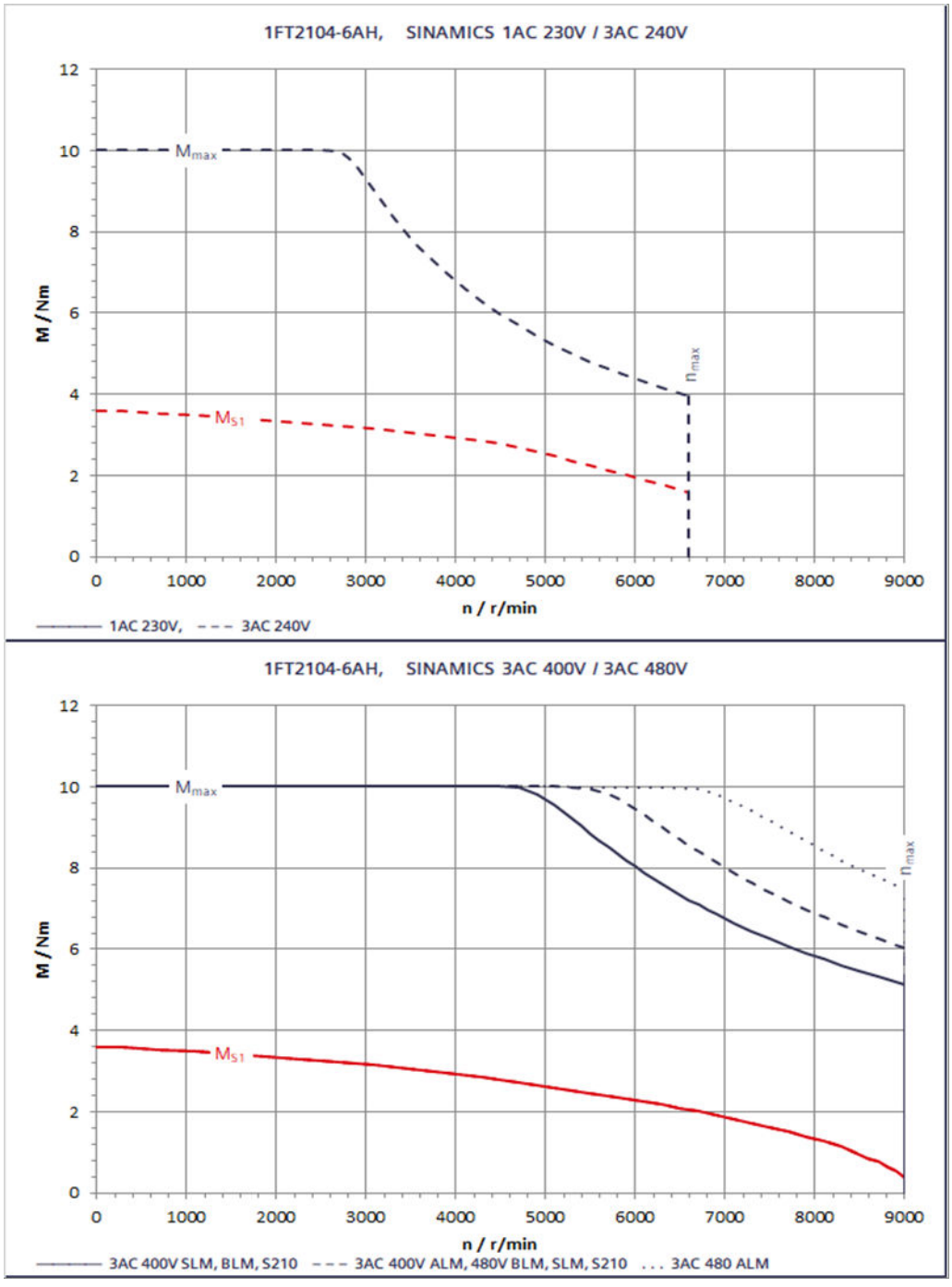
6.3.1.11 1FK2104-6AF, 1FT2104-6AF

Three-phase servomotor 1FT2104-6AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.2
Stall current	I_0	A	3
Maximum torque	M_{max}	Nm	10
Maximum current	I_{max}	A	10.9
Thermal time constant	T_{th}	min	38
Moment of inertia	J_{Mot}	kg cm²	0.76
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.84
Weight	m_{Mot}	kg	3.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.25
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3600
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	3.2
Rated current	I_{rated}	A	3
Rated power	P_{rated}	kW	0.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7200
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	3.2
Rated current	I_{rated}	A	3
Rated power	P_{rated}	kW	1
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2104-6AF, 1FT2104-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2104-6AF, 1FT2104-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

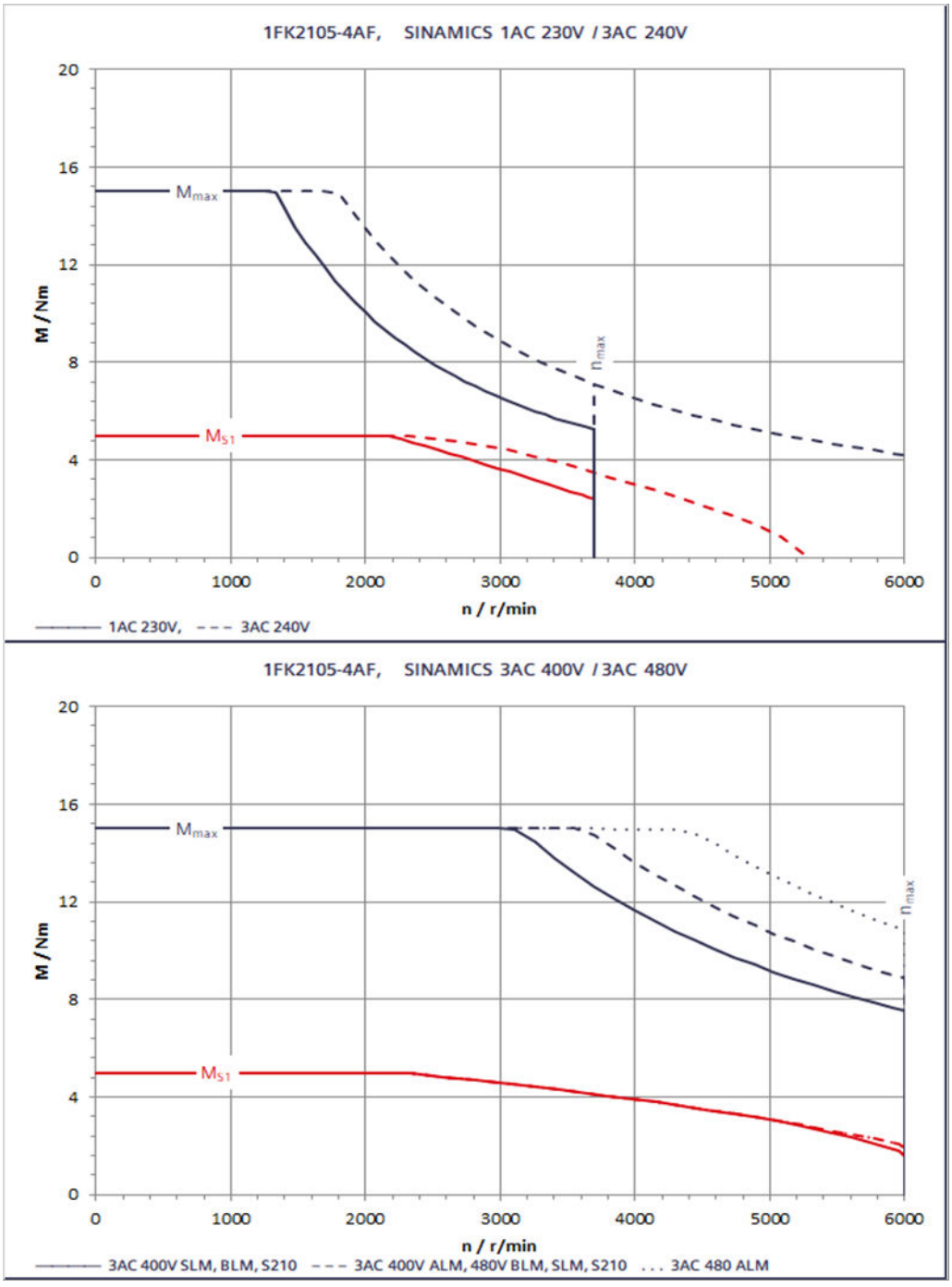
6.3.1.12 1FT2104-6AH

Three-phase servomotor 1FT2104-6AH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.6
Stall current	I_0	A	4.95
Maximum torque	M_{max}	Nm	10
Maximum current	I_{max}	A	16.3
Thermal time constant	T_{th}	min	38
Moment of inertia	J_{Mot}	kg cm²	0.76
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.84
Weight	m_{Mot}	kg	3.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.25
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6600
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	3.25
Rated current	I_{rated}	A	4.6
Rated power	P_{rated}	kW	0.86
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	2.8
Rated current	I_{rated}	A	4
Rated power	P_{rated}	kW	1.32
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2104-6AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2104-6AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

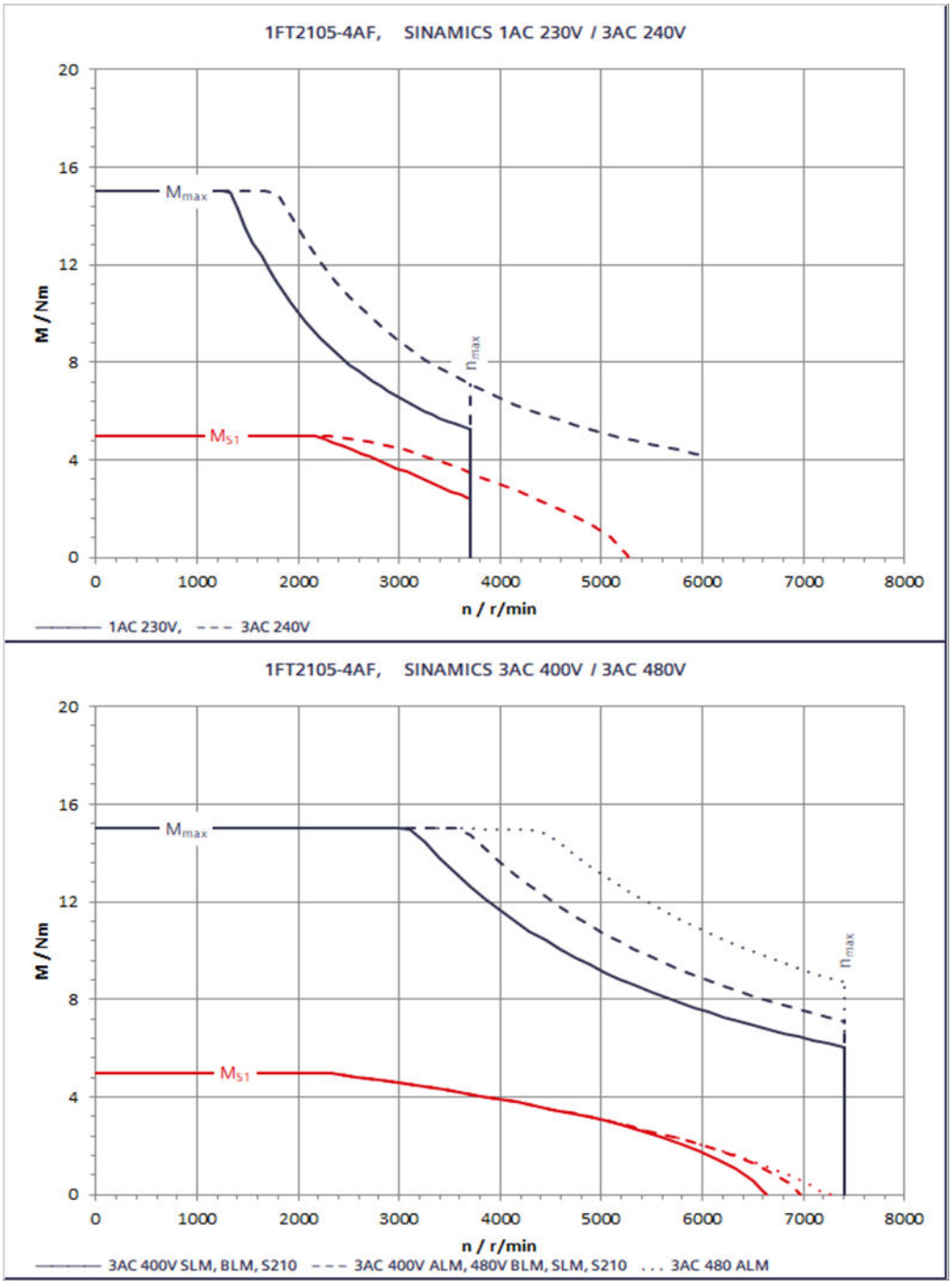
6.3.1.13 1FK2105-4AF

1FK2105-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	5
Stall current	I_0	A	4.65
Maximum torque	M_{max}	Nm	15
Maximum current	I_{max}	A	18
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	1.71
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	2.55
Weight	m_{Mot}	kg	5.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	6.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3700
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	5
Rated current	I_{rated}	A	4.65
Rated power	P_{rated}	kW	0.79
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	4.6
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	1.45
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2105-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2105-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

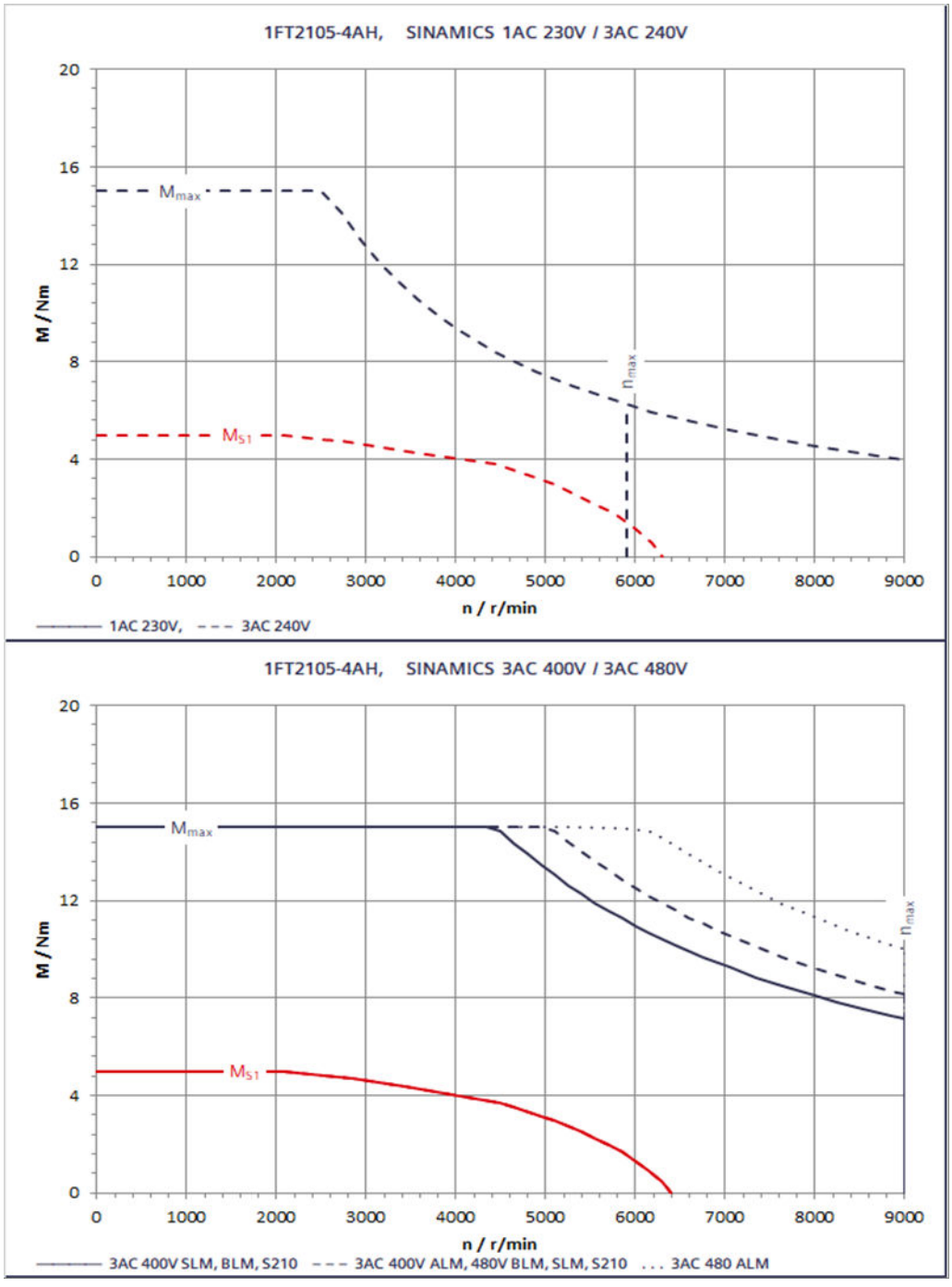
6.3.1.14 1FT2105-4AF

Three-phase servomotor 1FT2105-4AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	5
Stall current	I_0	A	4.65
Maximum torque	M_{max}	Nm	15
Maximum current	I_{max}	A	18
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	1.71
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	2.55
Weight	m_{Mot}	kg	5.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	6.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3700
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	5
Rated current	I_{rated}	A	4.65
Rated power	P_{rated}	kW	0.79
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7400
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	4.6
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	1.45
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2105-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2105-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

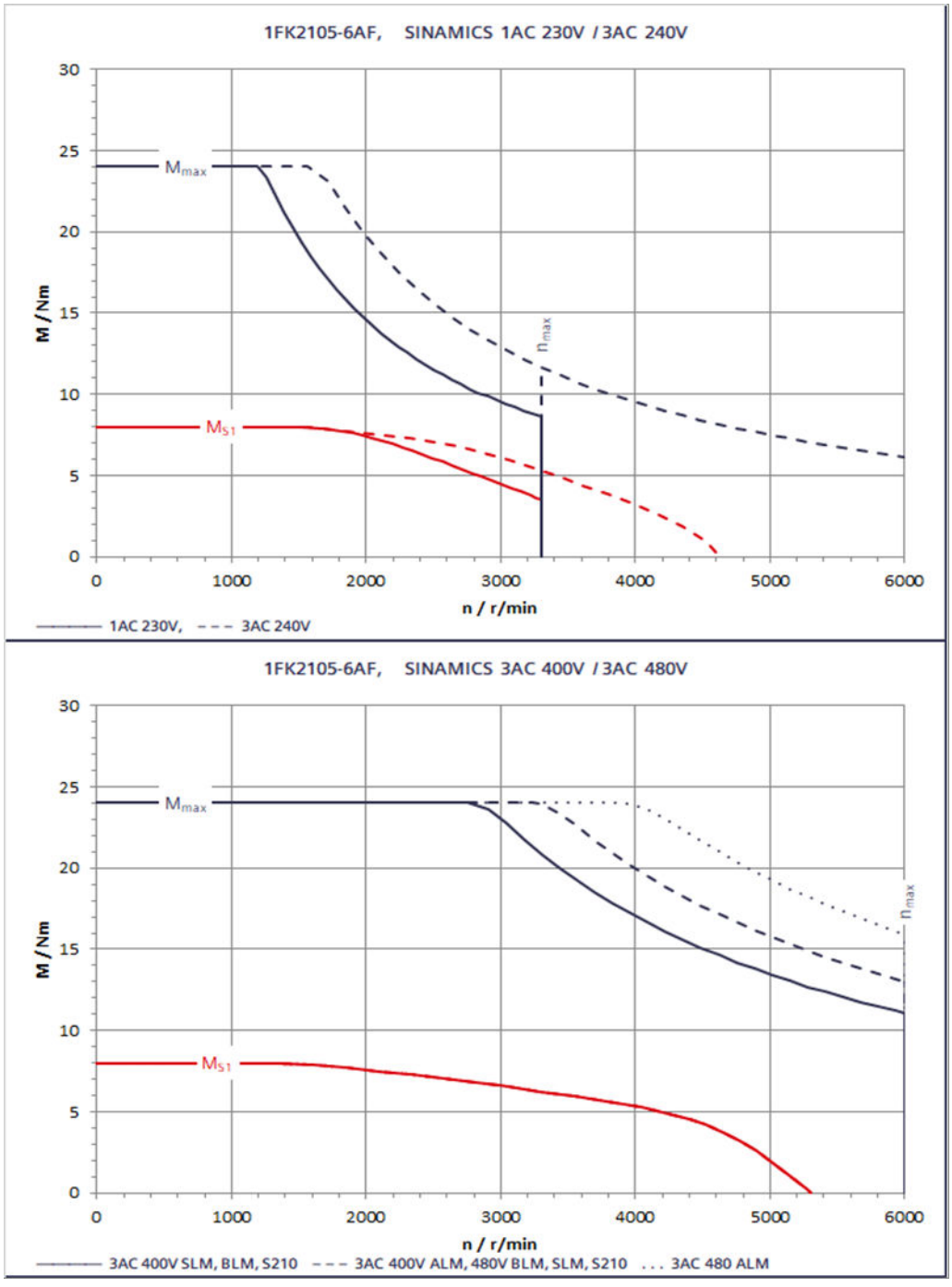
6.3.1.15 1FT2105-4AH

Three-phase servomotor 1FT2105-4AH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	5
Stall current	I_0	A	6.9
Maximum torque	M_{max}	Nm	15
Maximum current	I_{max}	A	27
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	1.71
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	2.55
Weight	m_{Mot}	kg	5.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	6.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5900
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	4.85
Rated current	I_{rated}	A	6.9
Rated power	P_{rated}	kW	1.27
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	9000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	3.7
Rated current	I_{rated}	A	5.4
Rated power	P_{rated}	kW	1.74
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2105-4AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2105-4AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

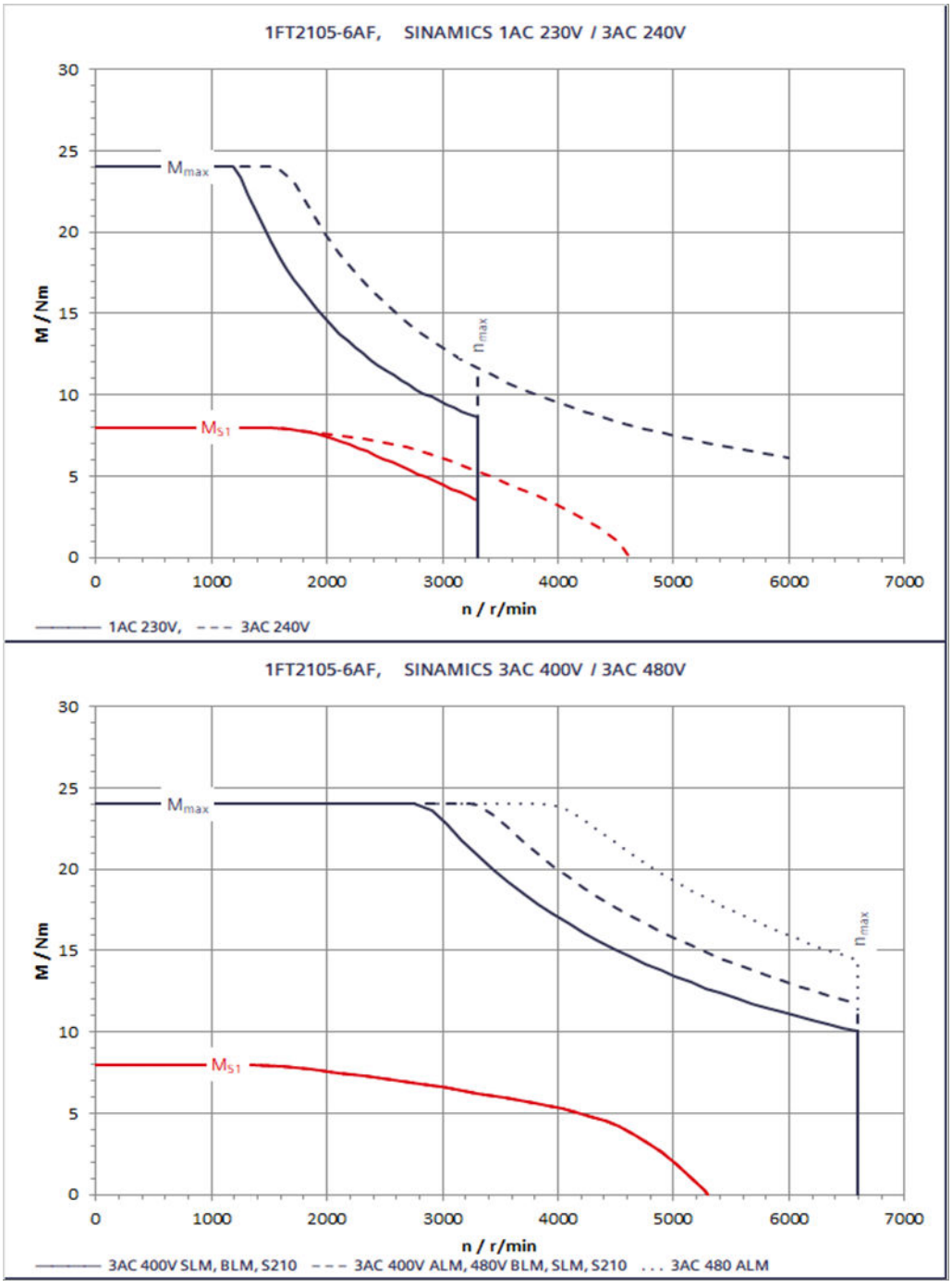
6.3.1.16 1FK2105-6AF

1FK2105-6AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	8
Stall current	I_0	A	6.7
Maximum torque	M_{max}	Nm	24
Maximum current	I_{max}	A	24
Thermal time constant	T_{th}	min	40
Moment of inertia	J_{Mot}	kg cm²	2.65
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	3.5
Weight	m_{Mot}	kg	7.7
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	8.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8
Rated current	I_{rated}	A	6.7
Rated power	P_{rated}	kW	1.26
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	6.6
Rated current	I_{rated}	A	5.6
Rated power	P_{rated}	kW	2.1
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2105-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2105-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

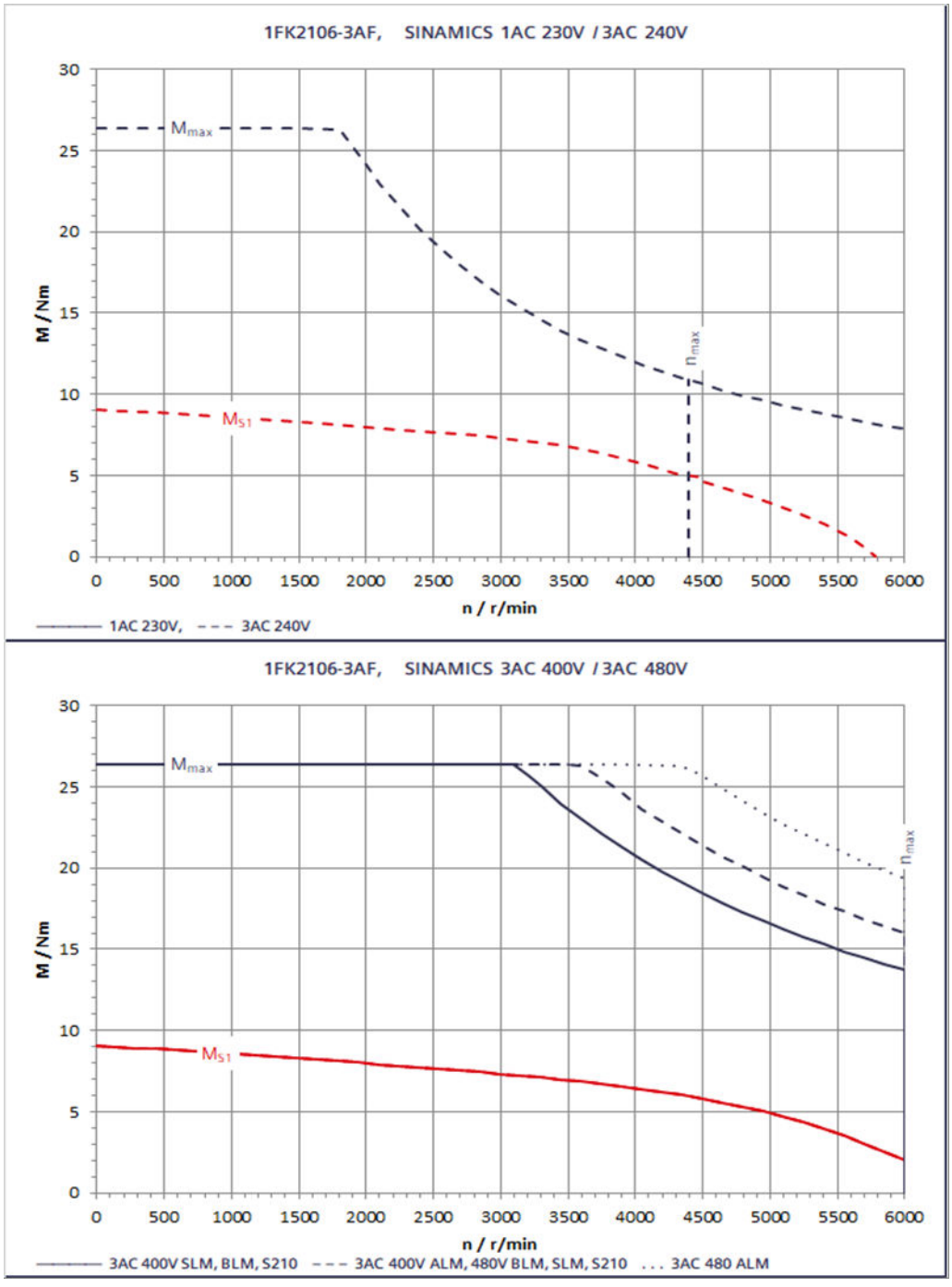
6.3.1.17 1FT2105-6AF

Three-phase servomotor 1FT2105-6AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	8
Stall current	I_0	A	6.7
Maximum torque	M_{max}	Nm	24
Maximum current	I_{max}	A	24
Thermal time constant	T_{th}	min	40
Moment of inertia	J_{Mot}	kg cm²	2.65
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	3.5
Weight	m_{Mot}	kg	7.7
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	8.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8
Rated current	I_{rated}	A	6.7
Rated power	P_{rated}	kW	1.26
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6600
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	6.6
Rated current	I_{rated}	A	5.6
Rated power	P_{rated}	kW	2.1
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2105-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2105-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

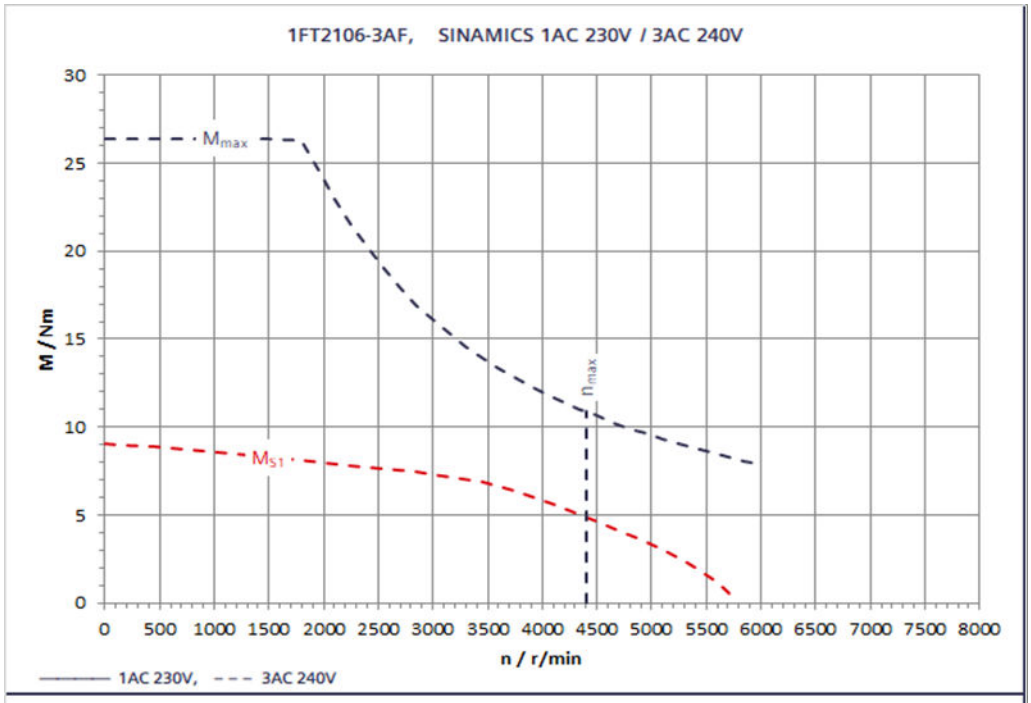
6.3.1.18 1FK2106-3AF

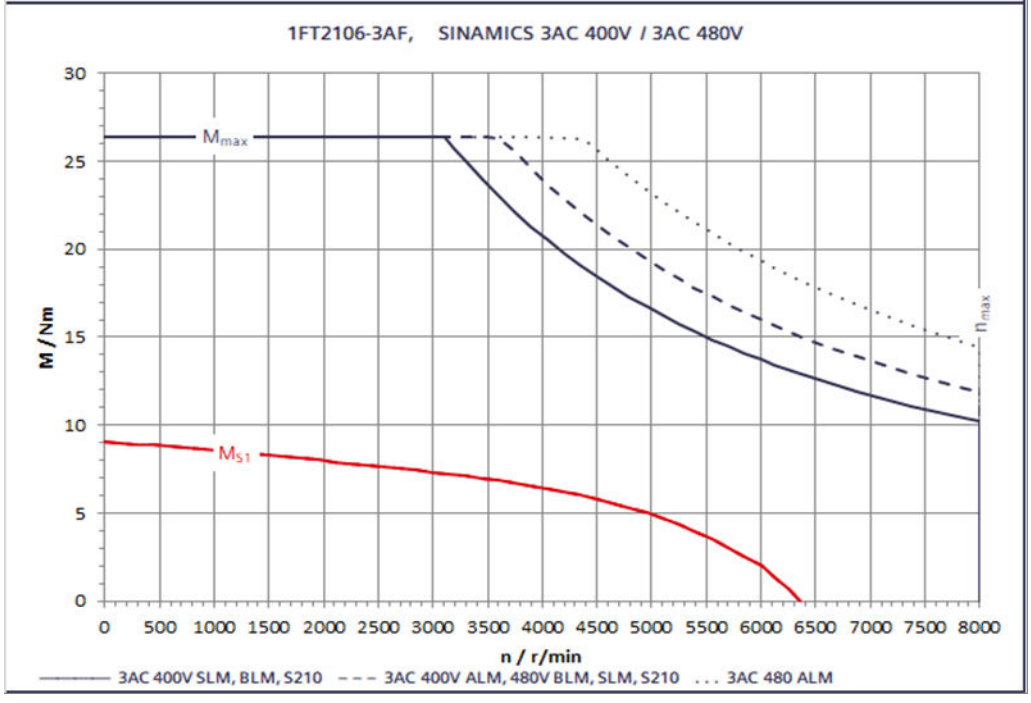
1FK2106-3AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	9
Stall current	I_0	A	9.2
Maximum torque	M_{max}	Nm	26
Maximum current	I_{max}	A	43
Thermal time constant	T_{th}	min	30
Moment of inertia	J_{Mot}	kg cm²	4.6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	6.3
Weight	m_{Mot}	kg	7.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4400
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8.3
Rated current	I_{rated}	A	8.7
Rated power	P_{rated}	kW	1.3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	7.3
Rated current	I_{rated}	A	7.9
Rated power	P_{rated}	kW	2.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2106-3AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2106-3AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.19 1FT2106-3AF

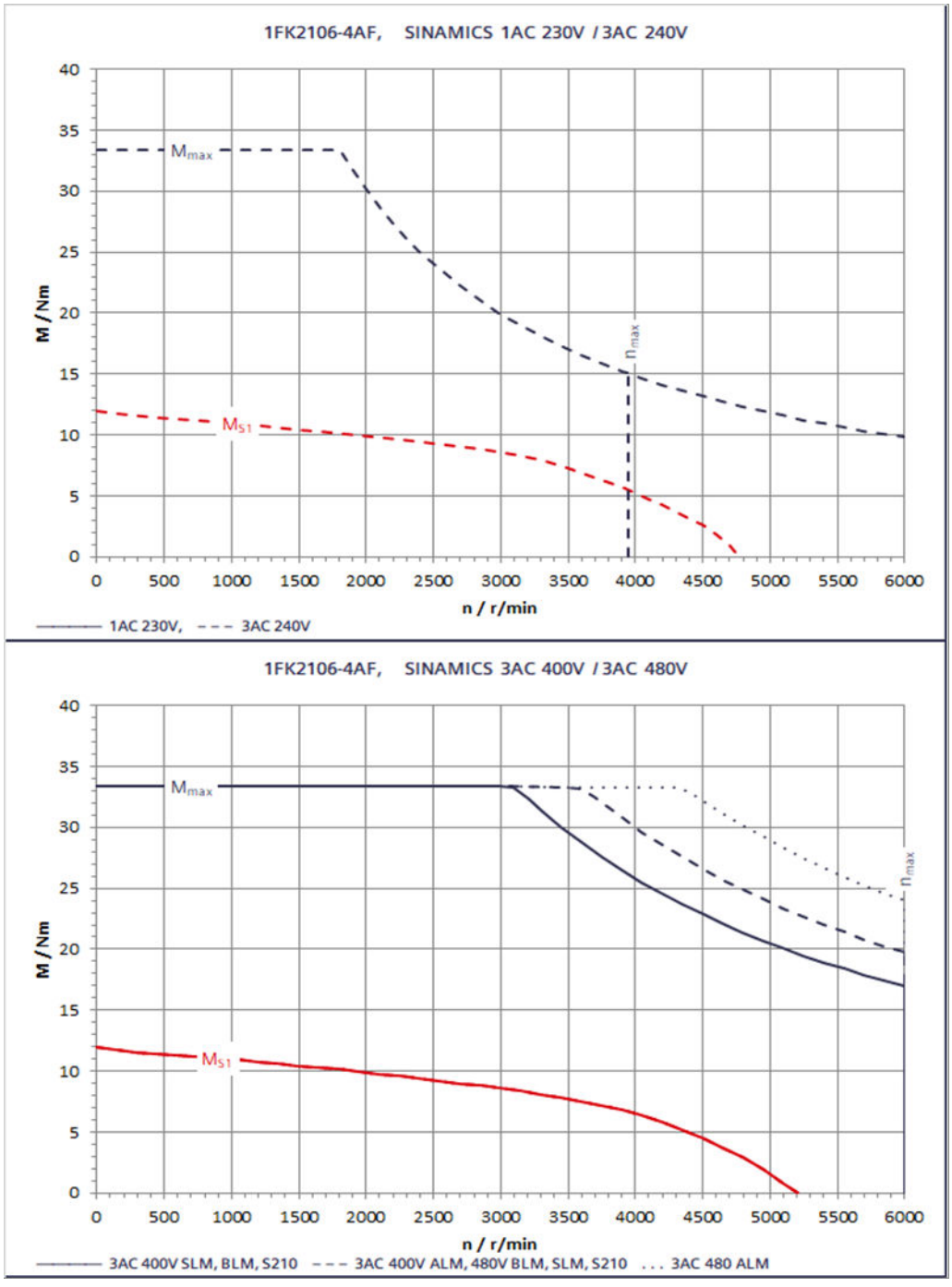
Three-phase servomotor 1FT2106-3AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	9
Stall current	I_0	A	9.2
Maximum torque	M_{max}	Nm	26
Maximum current	I_{max}	A	43
Thermal time constant	T_{th}	min	30
Moment of inertia	J_{Mot}	kg cm²	4.6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	6.3
Weight	m_{Mot}	kg	7.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4400
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8.3
Rated current	I_{rated}	A	8.7
Rated power	P_{rated}	kW	1.3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	7.3
Rated current	I_{rated}	A	7.9
Rated power	P_{rated}	kW	2.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2106-3AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2106-3AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

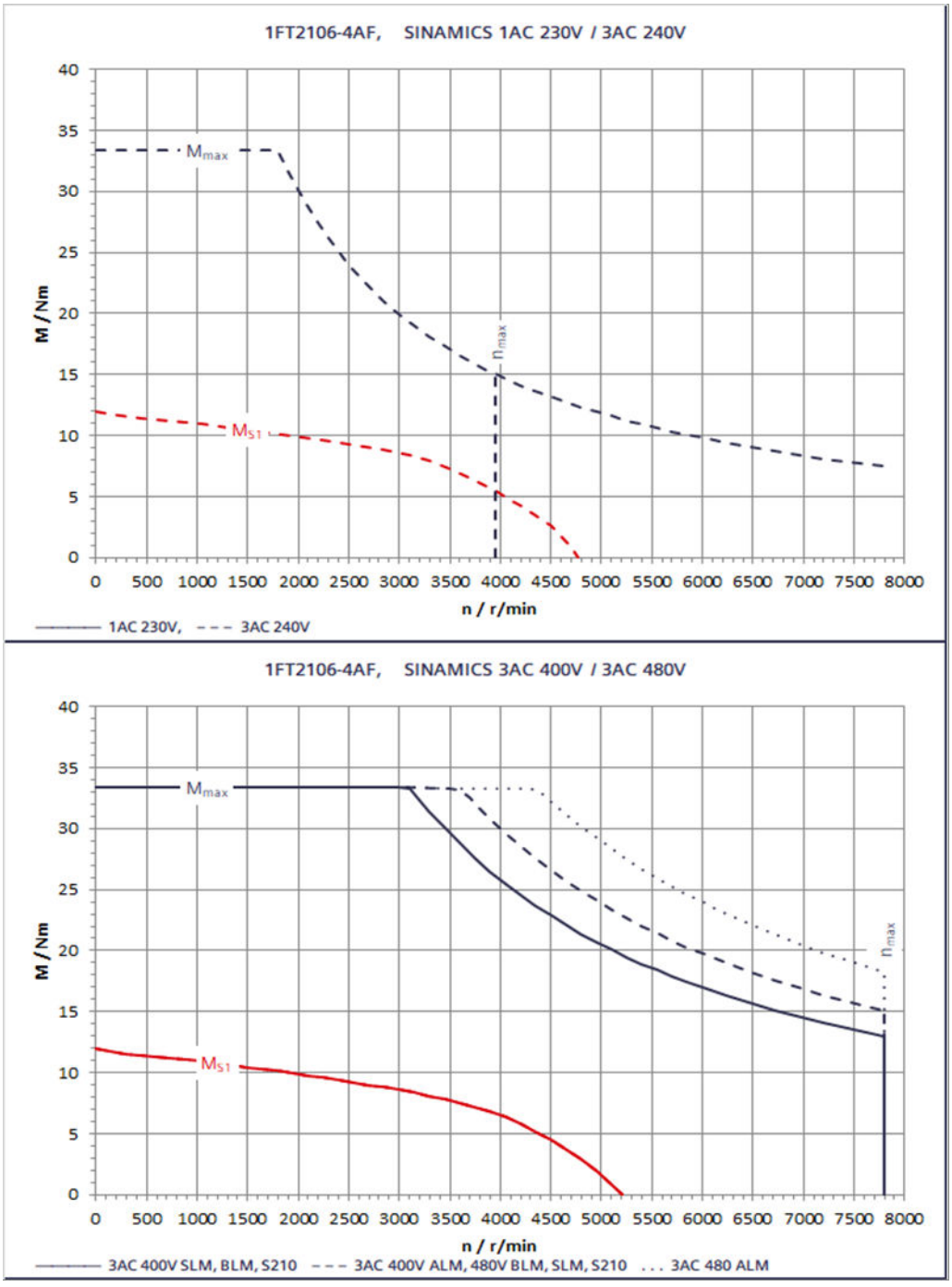
6.3.1.20 1FK2106-4AF

1FK2106-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	10.7
Maximum torque	M_{max}	Nm	33
Maximum current	I_{max}	A	42
Thermal time constant	T_{th}	min	34
Moment of inertia	J_{Mot}	kg cm²	6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	7.6
Weight	m_{Mot}	kg	9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	10.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3950
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	10.5
Rated current	I_{rated}	A	9.6
Rated power	P_{rated}	kW	1.64
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	8.6
Rated current	I_{rated}	A	8.1
Rated power	P_{rated}	kW	2.7
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		


1FK2106-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2106-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

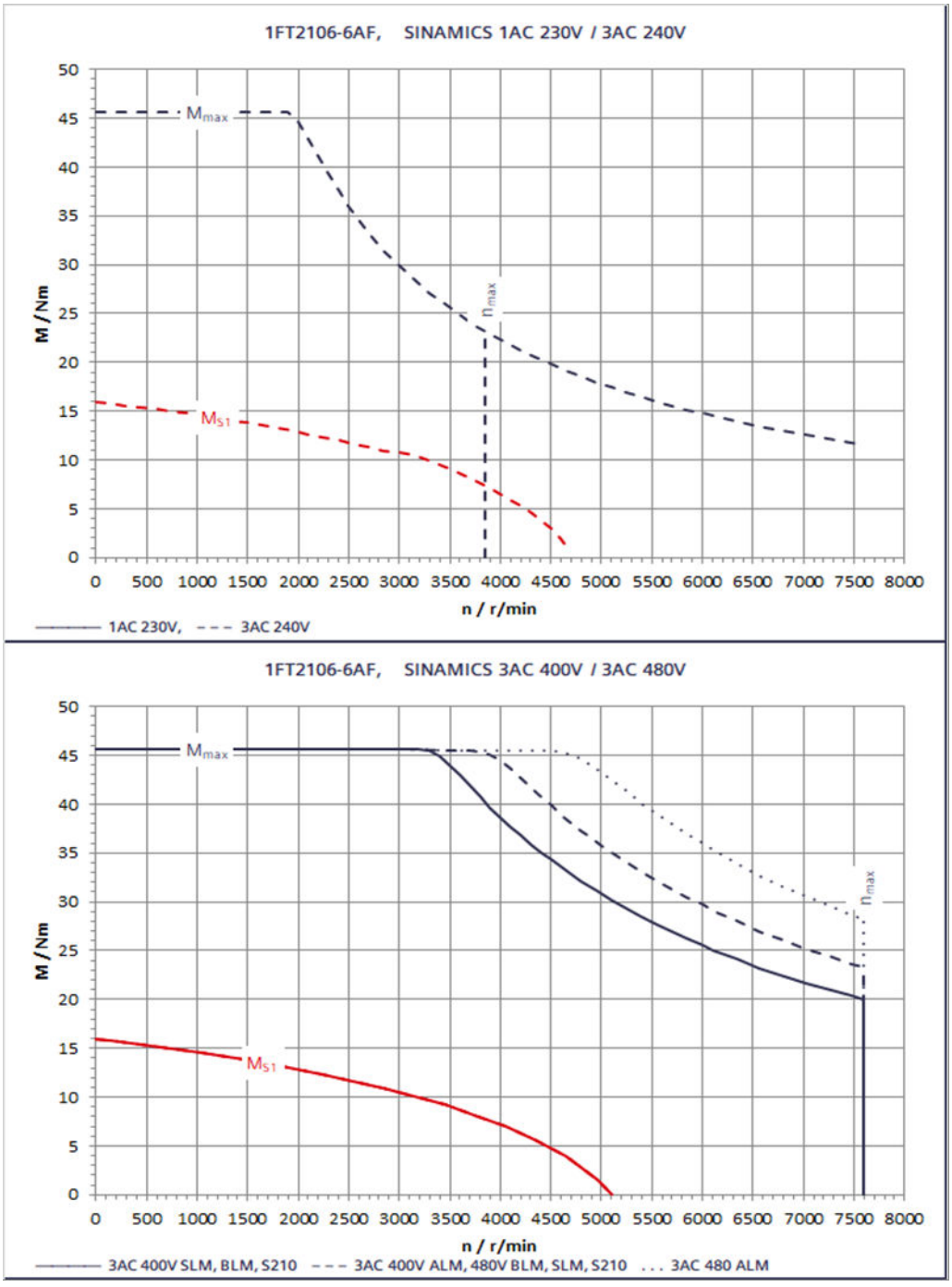
6.3.1.21 1FT2106-4AF

Three-phase servomotor 1FT2106-4AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	10.7
Maximum torque	M_{max}	Nm	33
Maximum current	I_{max}	A	42
Thermal time constant	T_{th}	min	34
Moment of inertia	J_{Mot}	kg cm²	6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	7.6
Weight	m_{Mot}	kg	9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	10.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3950
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	10.5
Rated current	I_{rated}	A	9.6
Rated power	P_{rated}	kW	1.64
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7800
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	8.6
Rated current	I_{rated}	A	8.1
Rated power	P_{rated}	kW	2.7
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		


1FT2106-4AF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-4AF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

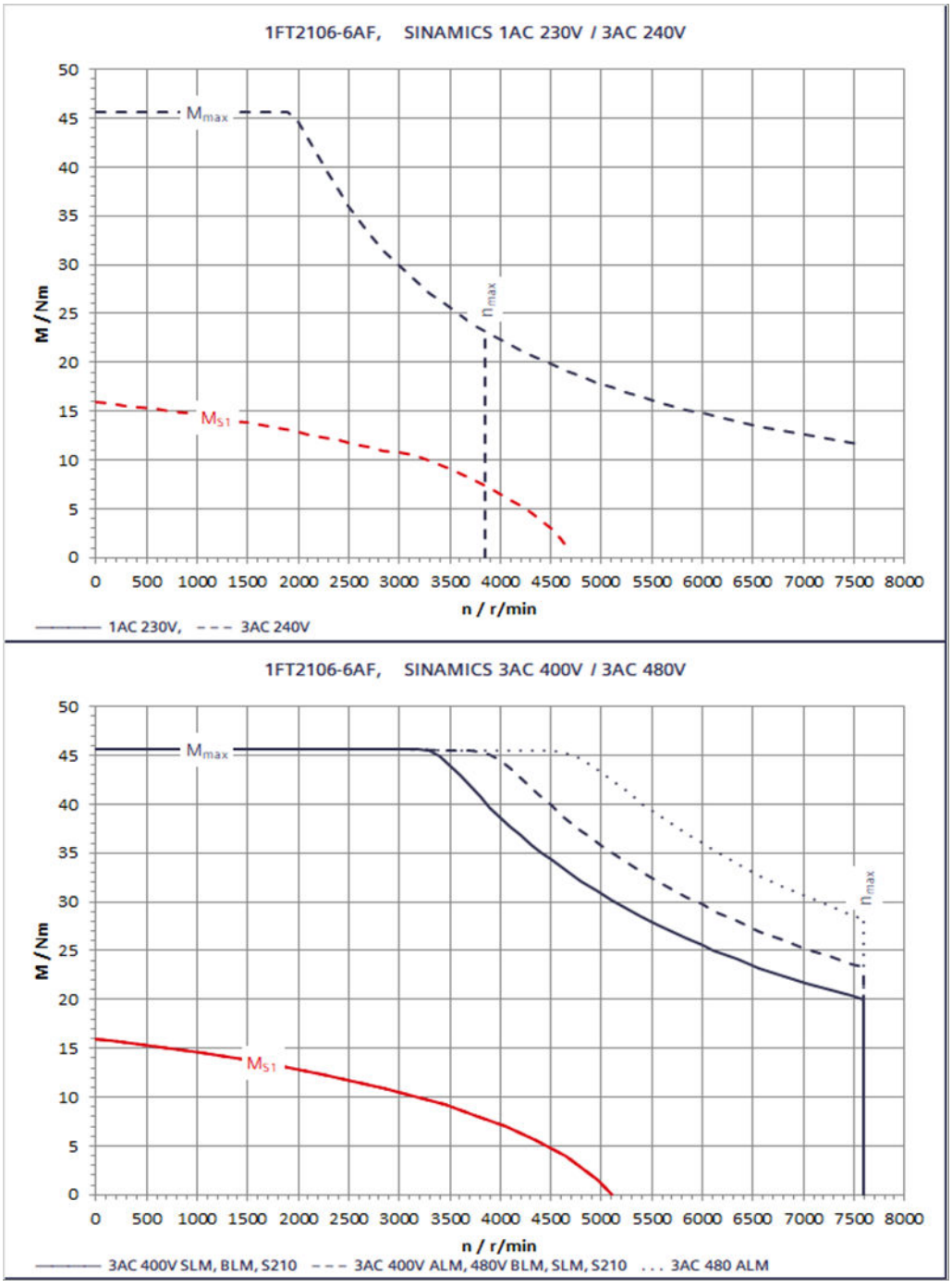
6.3.1.22 1FK2106-6AF

Three-phase servomotor 1FT2106-6AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	16
Stall current	I_0	A	14.3
Maximum torque	M_{max}	Nm	45.5
Maximum current	I_{max}	A	49
Thermal time constant	T_{th}	min	50
Moment of inertia	J_{Mot}	kg cm²	8.7
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	10.4
Weight	m_{Mot}	kg	11.8
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	13.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	13.8
Rated current	I_{rated}	A	12.5
Rated power	P_{rated}	kW	2.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	10.6
Rated current	I_{rated}	A	9.7
Rated power	P_{rated}	kW	3.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2106-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

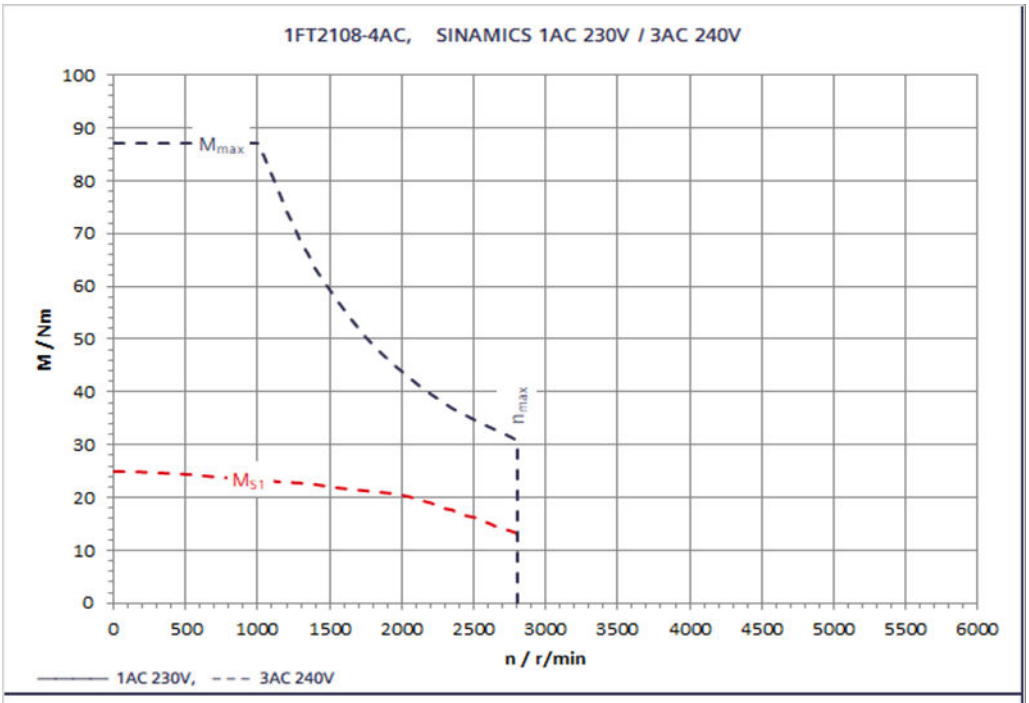
6.3.1.23 1FT2106-6AF

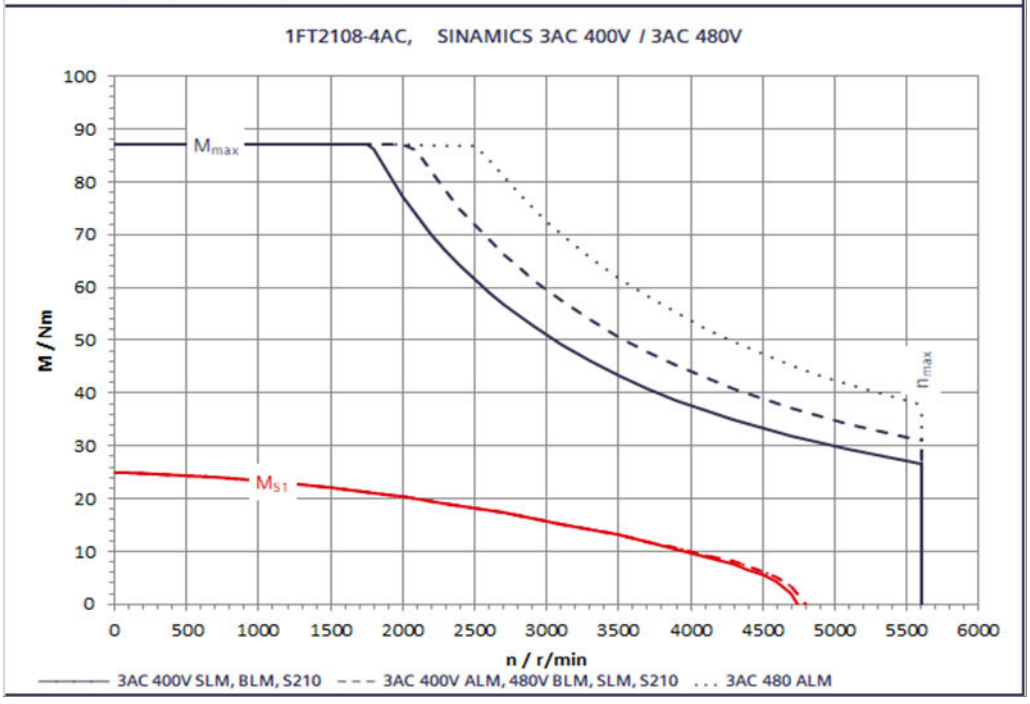
Three-phase servomotor 1FT2106-6AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	16
Stall current	I_0	A	14.3
Maximum torque	M_{max}	Nm	45.5
Maximum current	I_{max}	A	49
Thermal time constant	T_{th}	min	50
Moment of inertia	J_{Mot}	kg cm²	8.7
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	10.4
Weight	m_{Mot}	kg	11.8
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	13.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	13.8
Rated current	I_{rated}	A	12.5
Rated power	P_{rated}	kW	2.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7600
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	10.6
Rated current	I_{rated}	A	9.7
Rated power	P_{rated}	kW	3.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2106-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.24 1FT2108-4AC

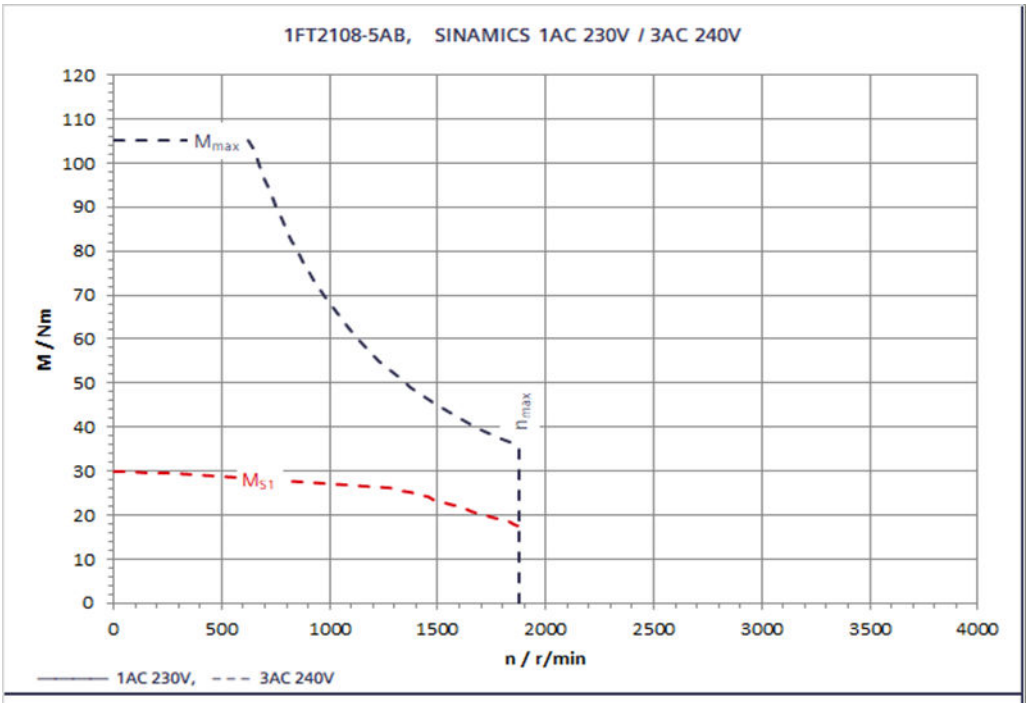
Three-phase servomotor 1FT2108-4AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	25
Stall current	I_0	A	14.8
Maximum torque	M_{max}	Nm	87
Maximum current	I_{max}	A	77
Thermal time constant	T_{th}	min	49
Moment of inertia	J_{Mot}	kg cm²	18.3
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	22.3
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	23.9
Weight	m_{Mot}	kg	17
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	19.7
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	19.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2800
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	23.5
Rated current	I_{rated}	A	14.2
Rated power	P_{rated}	kW	2.45
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5600
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	20.5
Rated current	I_{rated}	A	12.8
Rated power	P_{rated}	kW	4.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		

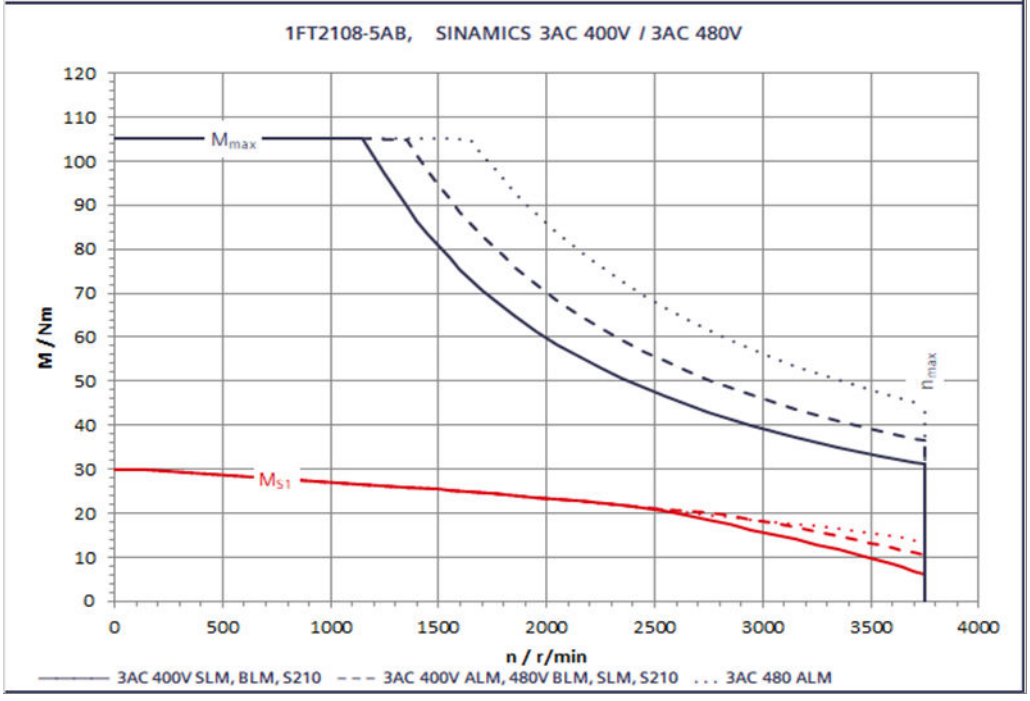

1FT2108-4AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V


1FT2108-4AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.25 1FT2108-5AB

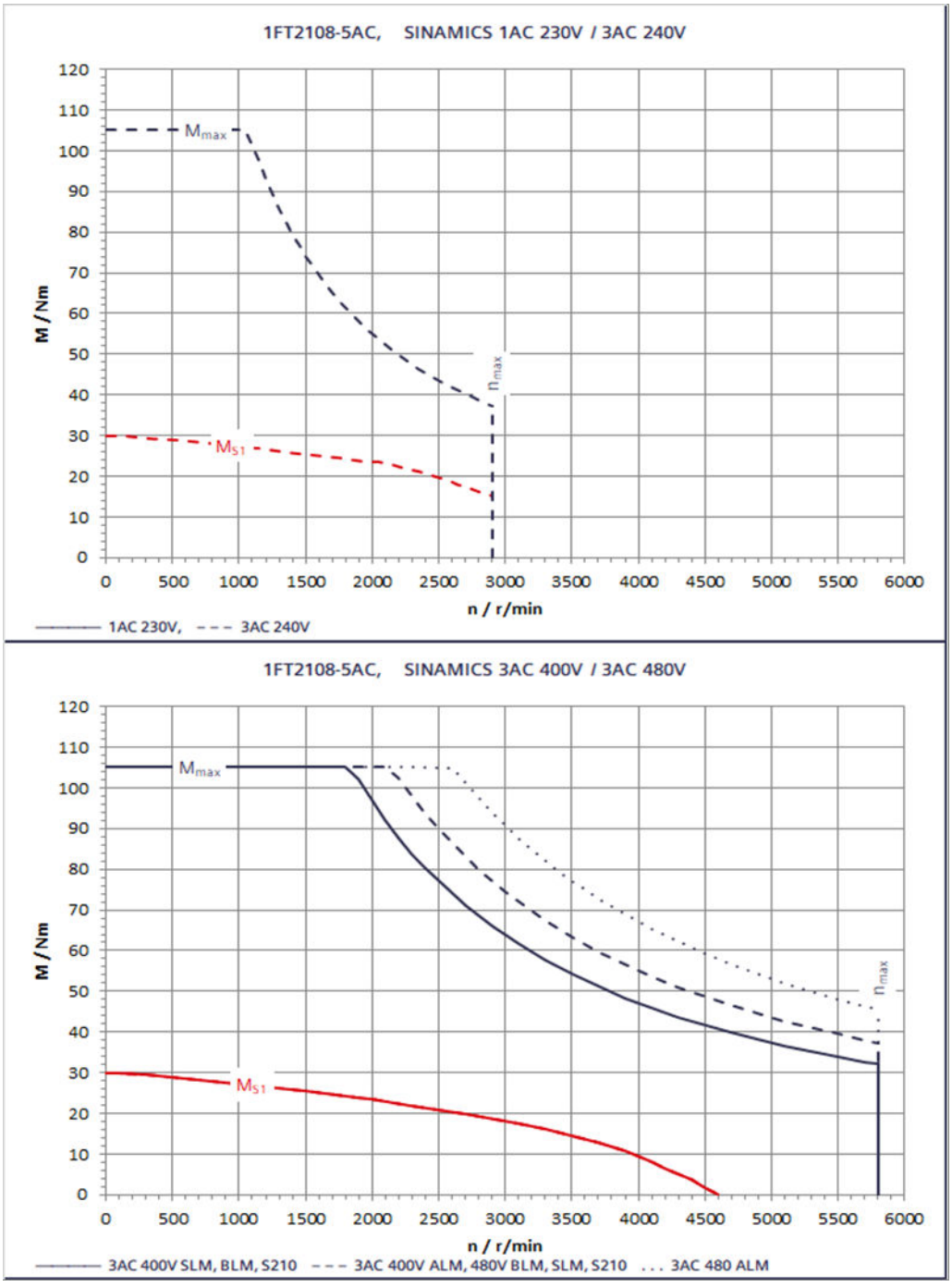
Three-phase servomotor 1FT2108-5AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	30
Stall current	I_0	A	11.8
Maximum torque	M_{max}	Nm	105
Maximum current	I_{max}	A	61
Thermal time constant	T_{th}	min	50
Moment of inertia	J_{Mot}	kg cm²	21.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	25.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	27.2
Weight	m_{Mot}	kg	19.7
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	22.4
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	22.5
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1880
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	28
Rated current	I_{rated}	A	11.1
Rated power	P_{rated}	kW	2.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3750
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	25.5
Rated current	I_{rated}	A	10.3
Rated power	P_{rated}	kW	4
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2108-5AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2108-5AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

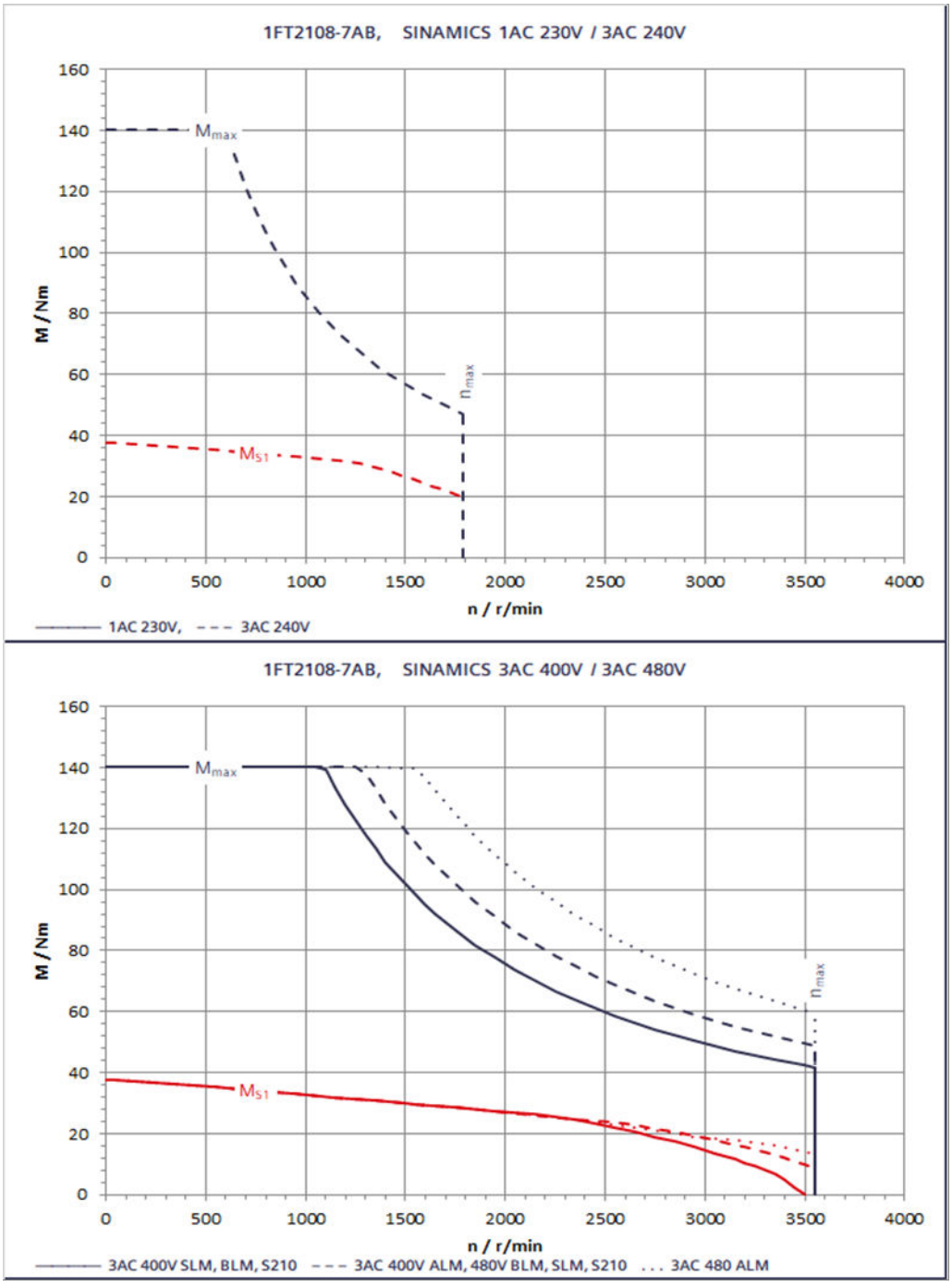
6.3.1.26 1FT2108-5AC

Three-phase servomotor 1FT2108-5AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	30
Stall current	I_0	A	18.4
Maximum torque	M_{max}	Nm	105
Maximum current	I_{max}	A	96
Thermal time constant	T_{th}	min	55
Moment of inertia	J_{Mot}	kg cm²	21.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	25.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	27.2
Weight	m_{Mot}	kg	20
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	22.7
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	22.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2900
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	27.5
Rated current	I_{rated}	A	17.2
Rated power	P_{rated}	kW	2.85
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5800
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	23.5
Rated current	I_{rated}	A	15.2
Rated power	P_{rated}	kW	4.9
Connections			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section for power cable	4 x 2.5 mm²		


1FT2108-5AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2108-5AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

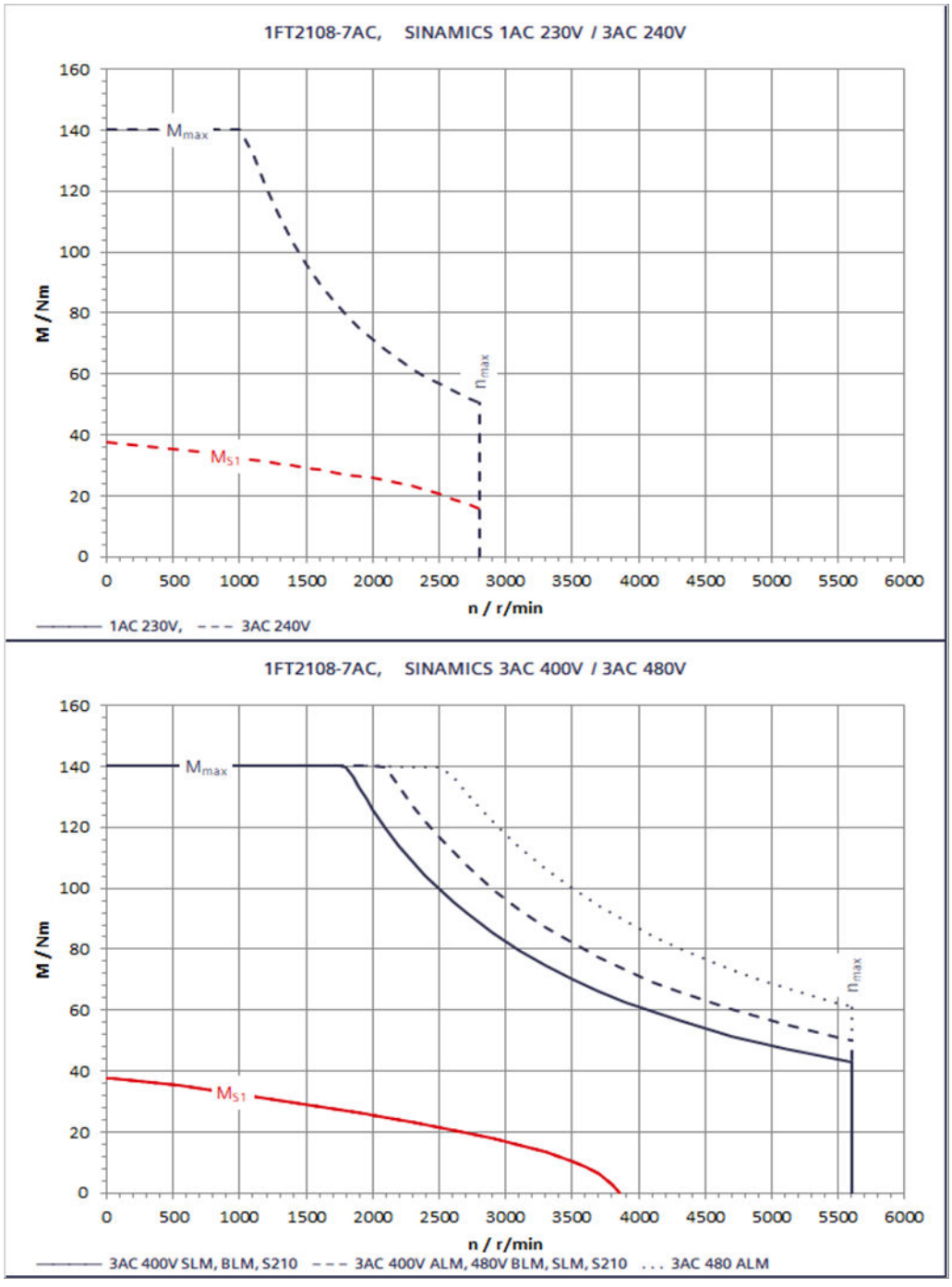
6.3.1.27 1FT2108-7AB

Three-phase servomotor 1FT2108-7AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	37.5
Stall current	I_0	A	14
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	78
Thermal time constant	T_{th}	min	60
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	24.5
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	27.2
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	27.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1790
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	33
Rated current	I_{rated}	A	13
Rated power	P_{rated}	kW	2.6
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3550
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	30
Rated current	I_{rated}	A	11.5
Rated power	P_{rated}	kW	4.7
Connections			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section for power cable	4 x 1.5 mm²		


1FT2108-7AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2108-7AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

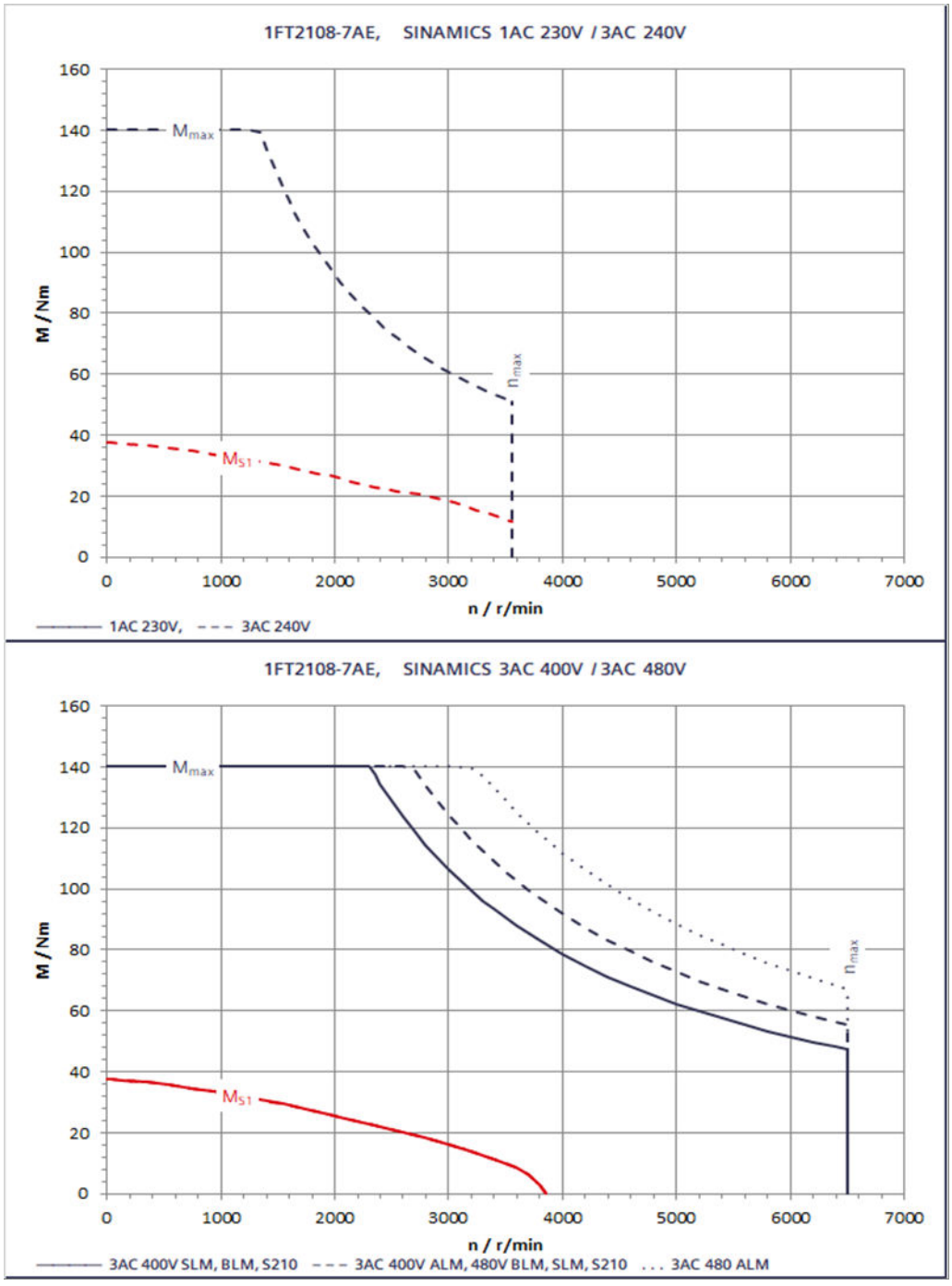
6.3.1.28 1FT2108-7AC

Three-phase servomotor 1FT2108-7AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	37.5
Stall current	I_0	A	22
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	123
Thermal time constant	T_{th}	min	60
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	25
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	27.7
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	27.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2800
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	32.5
Rated current	I_{rated}	A	19.7
Rated power	P_{rated}	kW	3.4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5600
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	26
Rated current	I_{rated}	A	16
Rated power	P_{rated}	kW	5.4
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		


1FT2108-7AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2108-7AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.1.29 1FT2108-7AE

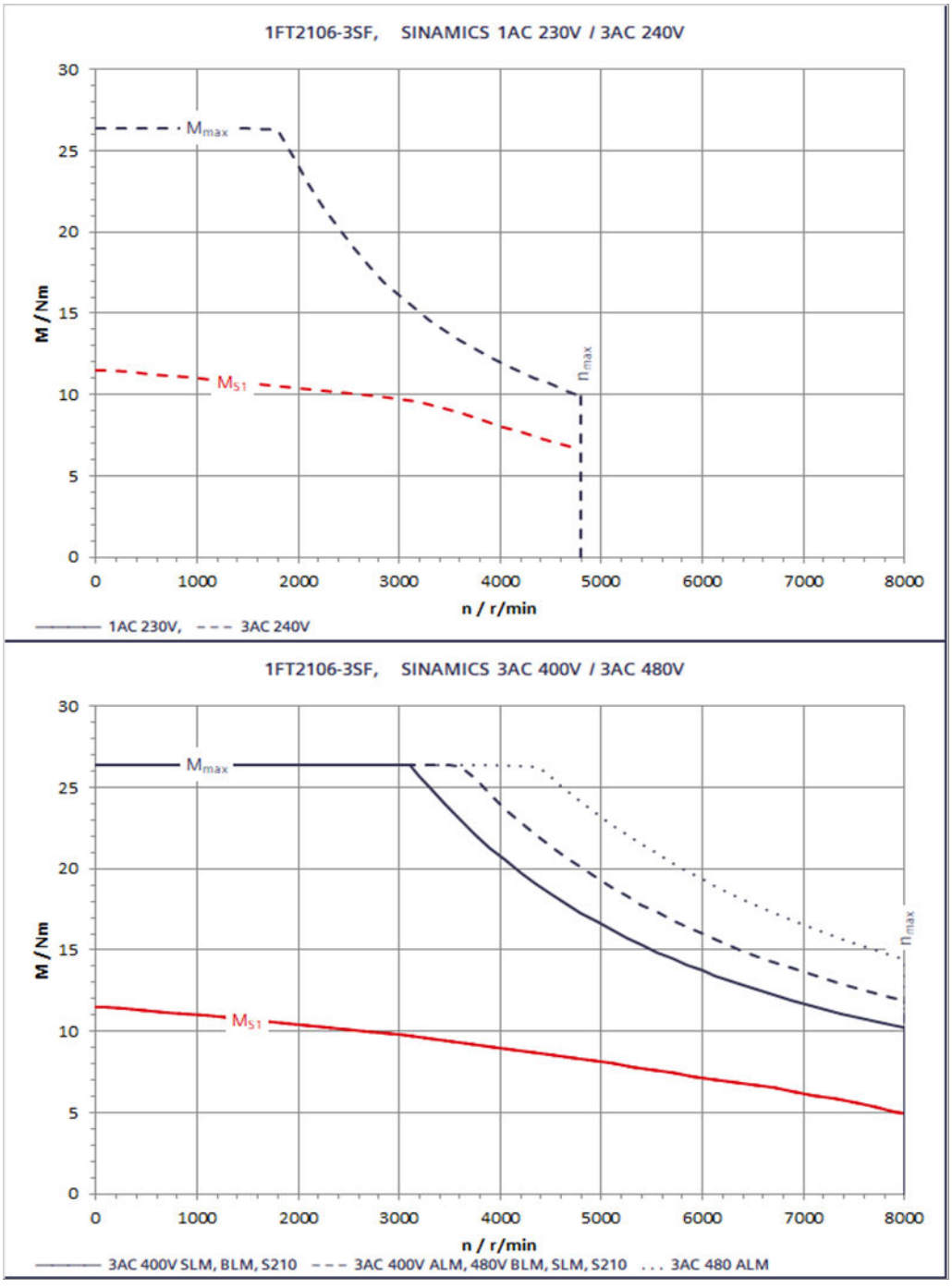
Three-phase servomotor 1FT2108-7AE			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	37.5
Stall current	I_0	A	28
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	155
Thermal time constant	T_{th}	min	65
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	25.2
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	27.9
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	28
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3550
Rated speed	n_{rated}	r/min	1250
Rated torque	M_{rated}	Nm	31.5
Rated current	I_{rated}	A	17
Rated power	P_{rated}	kW	4.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6500
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	21
Rated current	I_{rated}	A	17
Rated power	P_{rated}	kW	5.5
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		


1FT2108-7AE, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2108-7AE, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.2 High Dynamic, force-ventilated

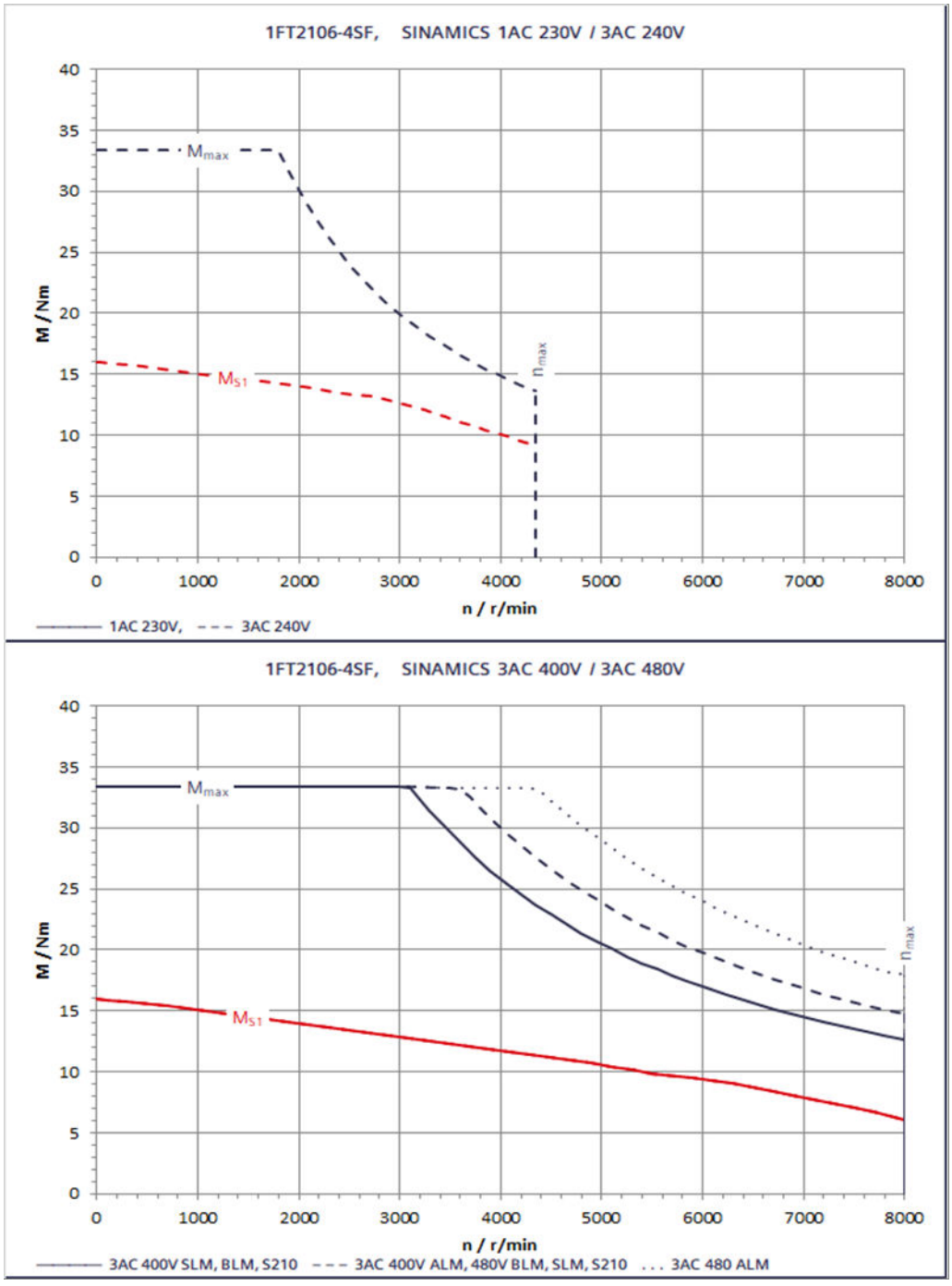
6.3.2.1 1FT2106-3SF

Three-phase servomotor 1FT2106-3SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	11.5
Stall current	I_0	A	11.6
Maximum torque	M_{max}	Nm	26
Maximum current	I_{max}	A	43
Thermal time constant	T_{th}	min	14
Moment of inertia	J_{Mot}	kg cm²	4.6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	6.3
Weight	m_{Mot}	kg	9.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	11.1
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4800
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	10.7
Rated current	I_{rated}	A	11
Rated power	P_{rated}	kW	1.68
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	9.8
Rated current	I_{rated}	A	10.3
Rated power	P_{rated}	kW	3.1
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2106-3SF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-3SF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.2.2 1FT2106-4SF

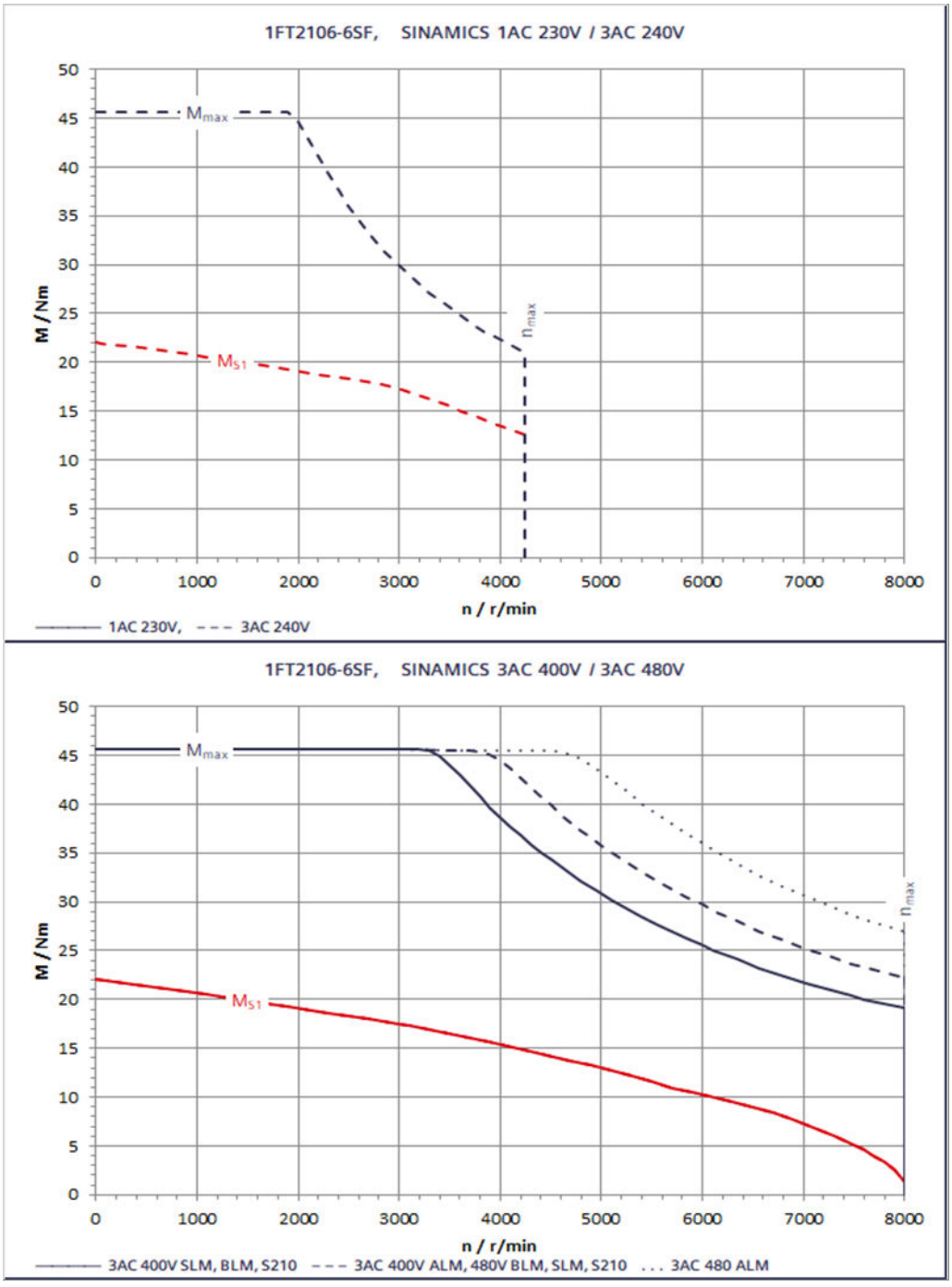
Three-phase servomotor 1FT2106-4SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	16
Stall current	I_0	A	14.6
Maximum torque	M_{max}	Nm	33
Maximum current	I_{max}	A	42
Thermal time constant	T_{th}	min	15
Moment of inertia	J_{Mot}	kg cm²	6
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	7.6
Weight	m_{Mot}	kg	11.1
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	12.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4350
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	14.5
Rated current	I_{rated}	A	13.6
Rated power	P_{rated}	kW	2.3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	12.9
Rated current	I_{rated}	A	12.4
Rated power	P_{rated}	kW	4.05
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2106-4SF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-4SF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.2.3 1FT2106-6SF

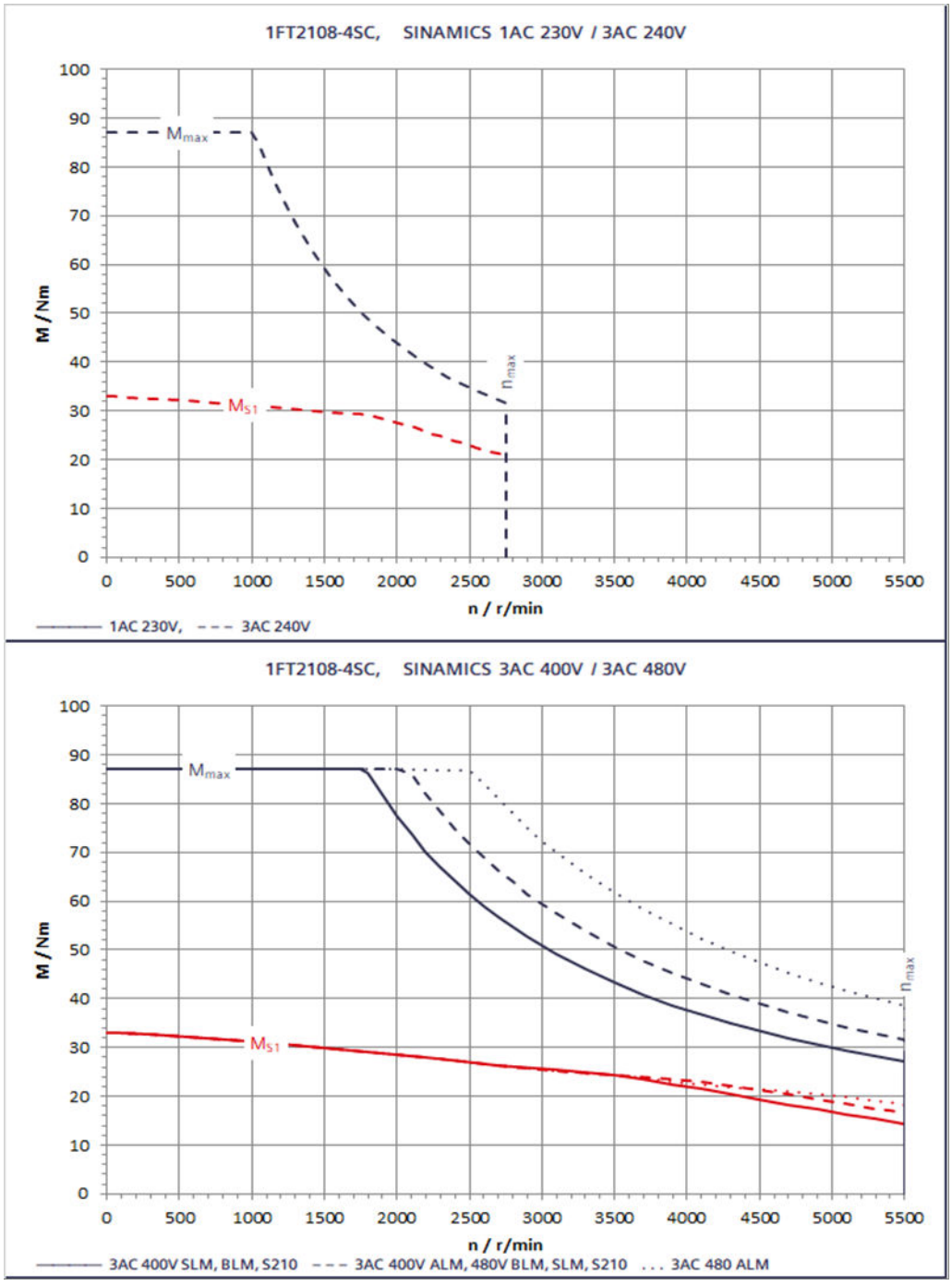
Three-phase servomotor 1FT2106-6SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	19.6
Maximum torque	M_{max}	Nm	45.5
Maximum current	I_{max}	A	49
Thermal time constant	T_{th}	min	15
Moment of inertia	J_{Mot}	kg cm²	8.7
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	10.4
Weight	m_{Mot}	kg	14
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	15.8
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4250
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	19.9
Rated current	I_{rated}	A	18.3
Rated power	P_{rated}	kW	3.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	17.5
Rated current	I_{rated}	A	16.6
Rated power	P_{rated}	kW	5.5
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable[1)]	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		

[1)] To comply with the specifications, a minimum cross-section of 4 x 4 mm² must be used.


1FT2106-6SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2106-6SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

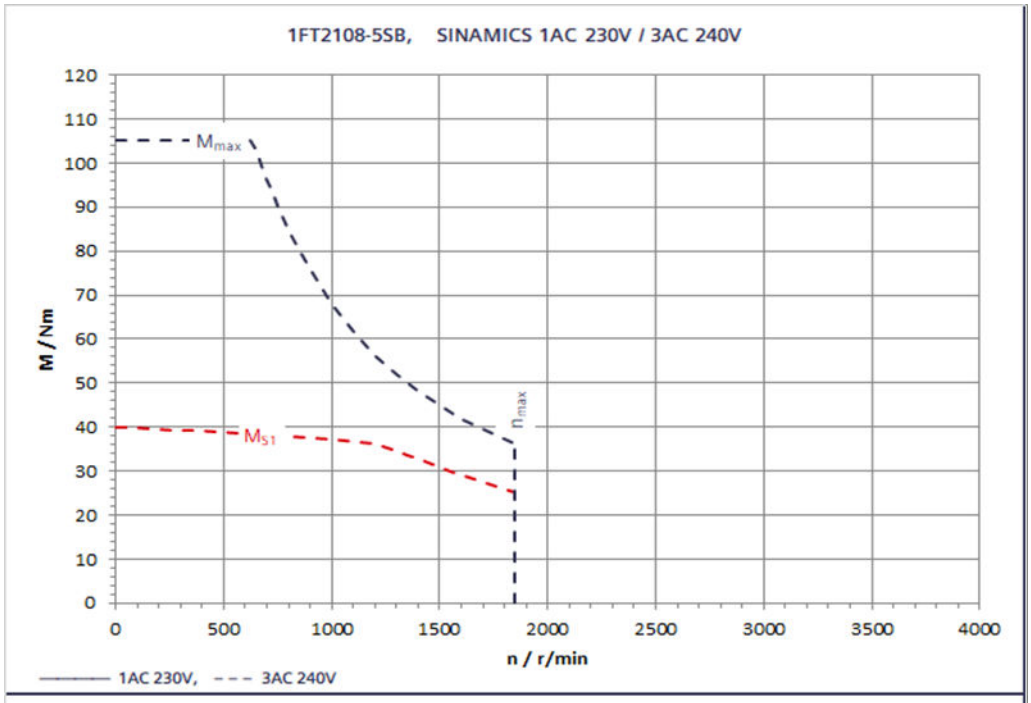
6.3.2.4 1FT2108-4SC

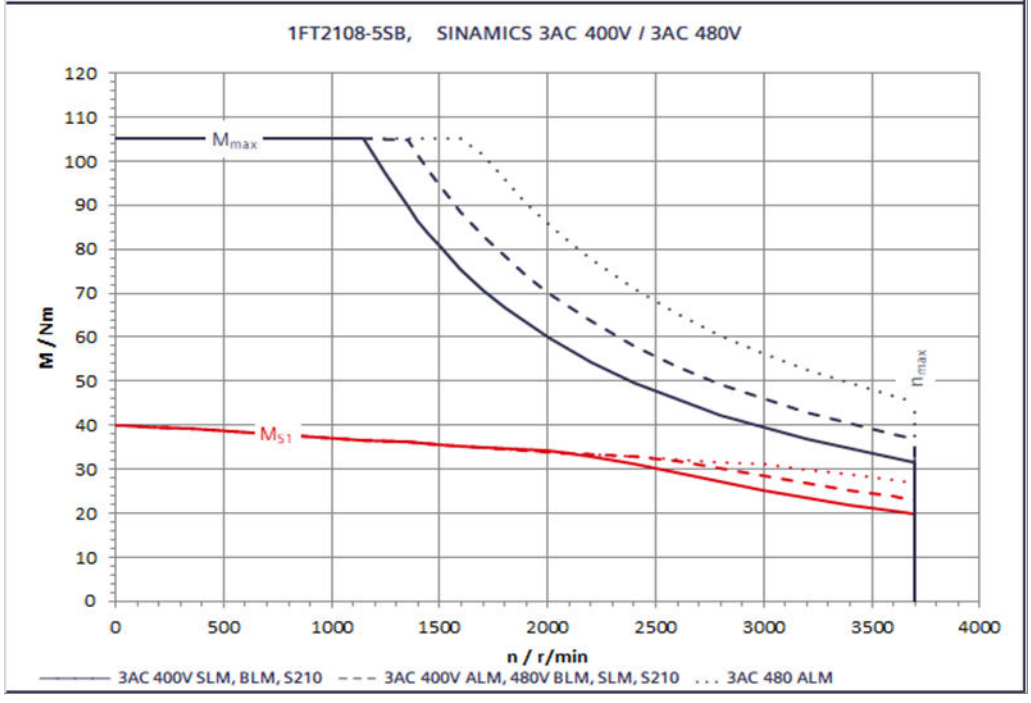
Three-phase servomotor 1FT2108-4SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	33
Stall current	I_0	A	19.2
Maximum torque	M_{max}	Nm	87
Maximum current	I_{max}	A	77
Thermal time constant	T_{th}	min	14.5
Moment of inertia	J_{Mot}	kg cm²	18.3
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	22.3
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	23.9
Weight	m_{Mot}	kg	19.8
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	22.5
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	22.7
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5500
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	28.5
Rated current	I_{rated}	A	17.4
Rated power	P_{rated}	kW	6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2750
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	31
Rated current	I_{rated}	A	18.6
Rated power	P_{rated}	kW	3.25
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2108-4SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2108-4SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.2.5 1FT2108-5SB

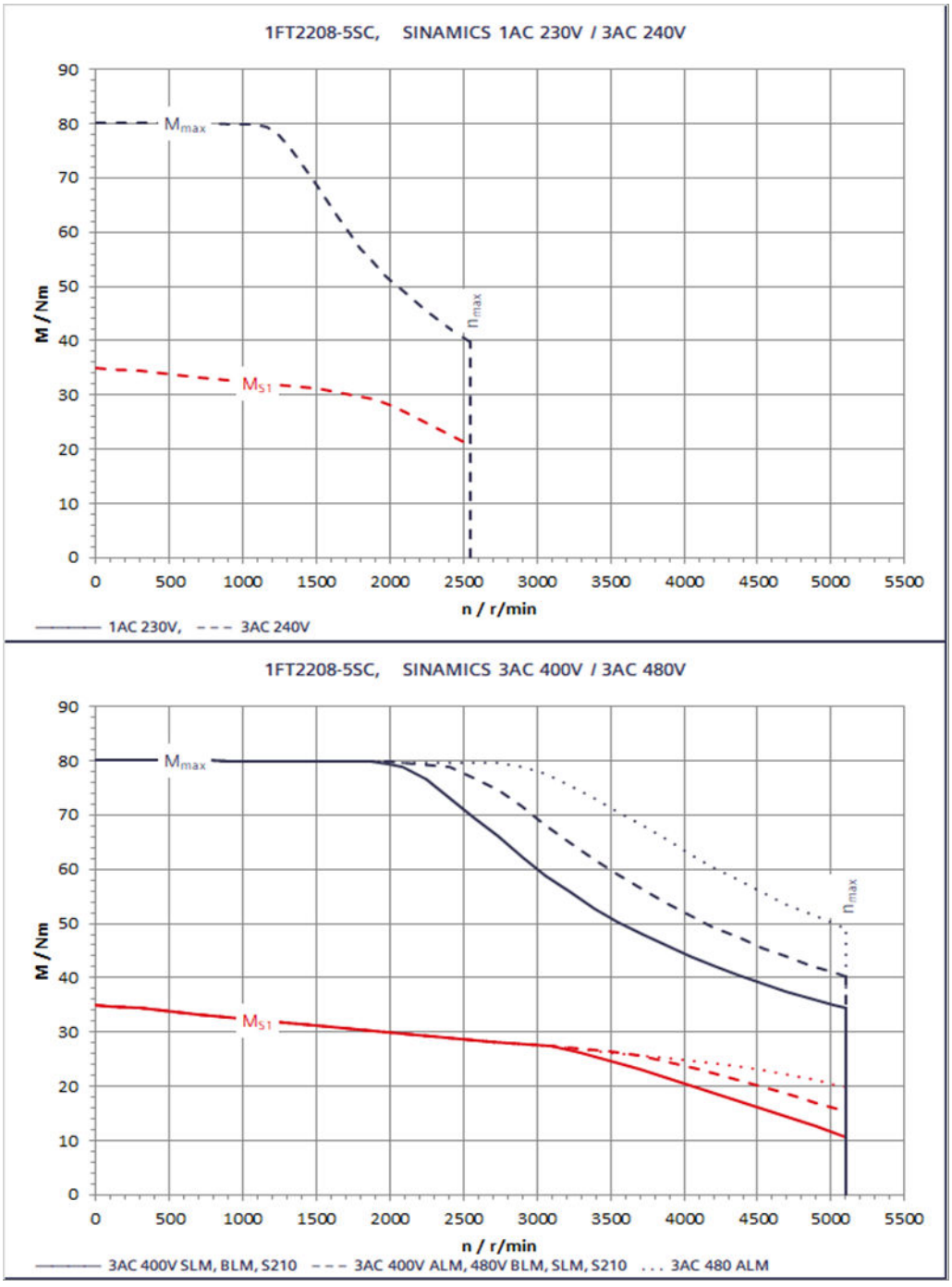
Three-phase servomotor 1FT2108-5SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	15.5
Maximum torque	M_{max}	Nm	105
Maximum current	I_{max}	A	61
Thermal time constant	T_{th}	min	16
Moment of inertia	J_{Mot}	kg cm²	21.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	25.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	27.2
Weight	m_{Mot}	kg	22.1
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	24.8
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	24.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1850
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	38
Rated current	I_{rated}	A	14.6
Rated power	P_{rated}	kW	3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3700
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	35.5
Rated current	I_{rated}	A	14.9
Rated power	P_{rated}	kW	5.6
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2108-5SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2108-5SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

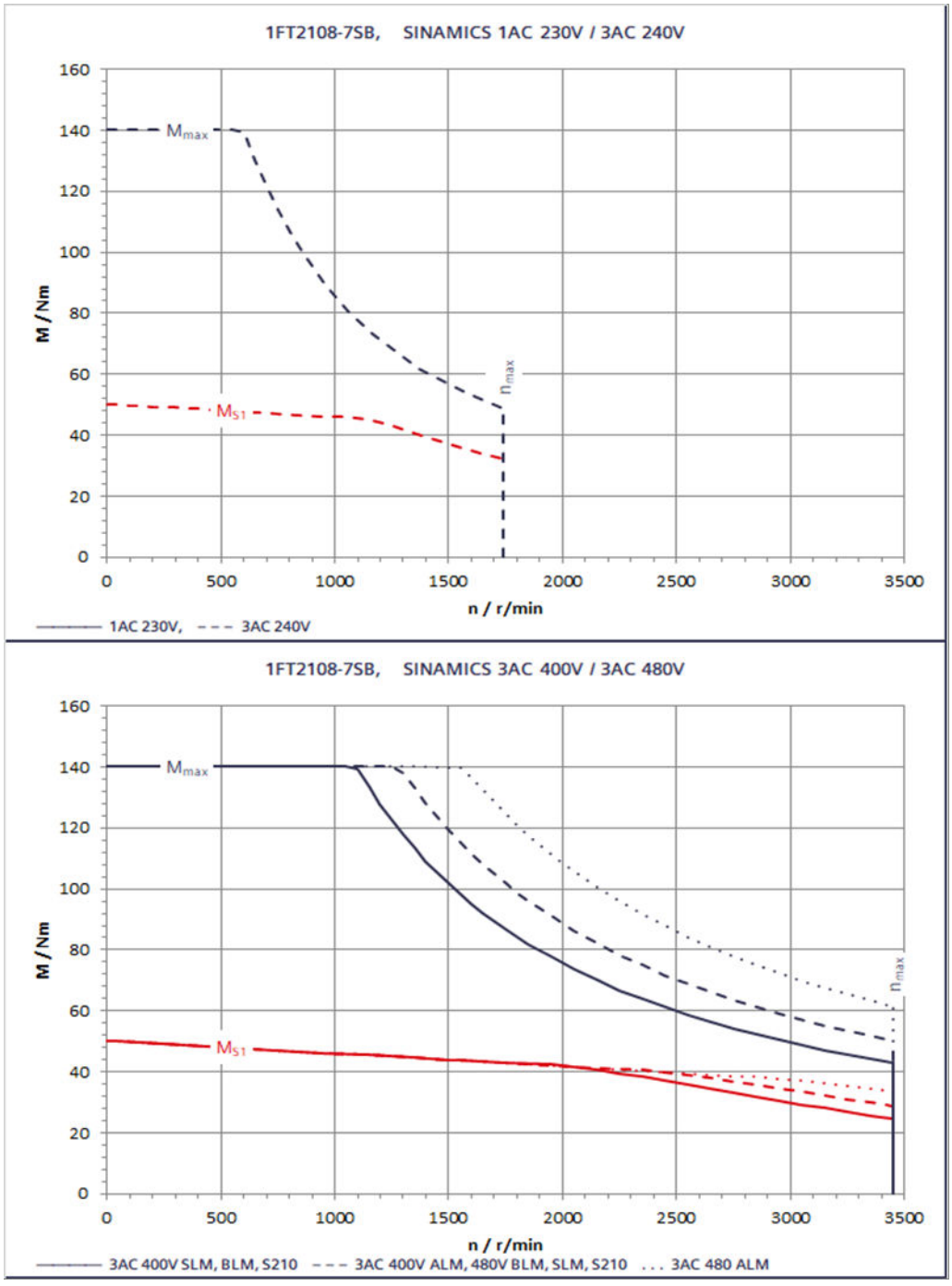
6.3.2.6 1FT2108-5SC

Three-phase servomotor 1FT2108-5SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	24
Maximum torque	M_{max}	Nm	105
Maximum current	I_{max}	A	96
Thermal time constant	T_{th}	min	17
Moment of inertia	J_{Mot}	kg cm²	21.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	25.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	27.2
Weight	m_{Mot}	kg	22.4
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	25.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	25.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2900
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	37.5
Rated current	I_{rated}	A	23
Rated power	P_{rated}	kW	3.9
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5800
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	34
Rated current	I_{rated}	A	21.5
Rated power	P_{rated}	kW	7.1
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		
Fan connection			
Fan connection	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-5SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-5SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

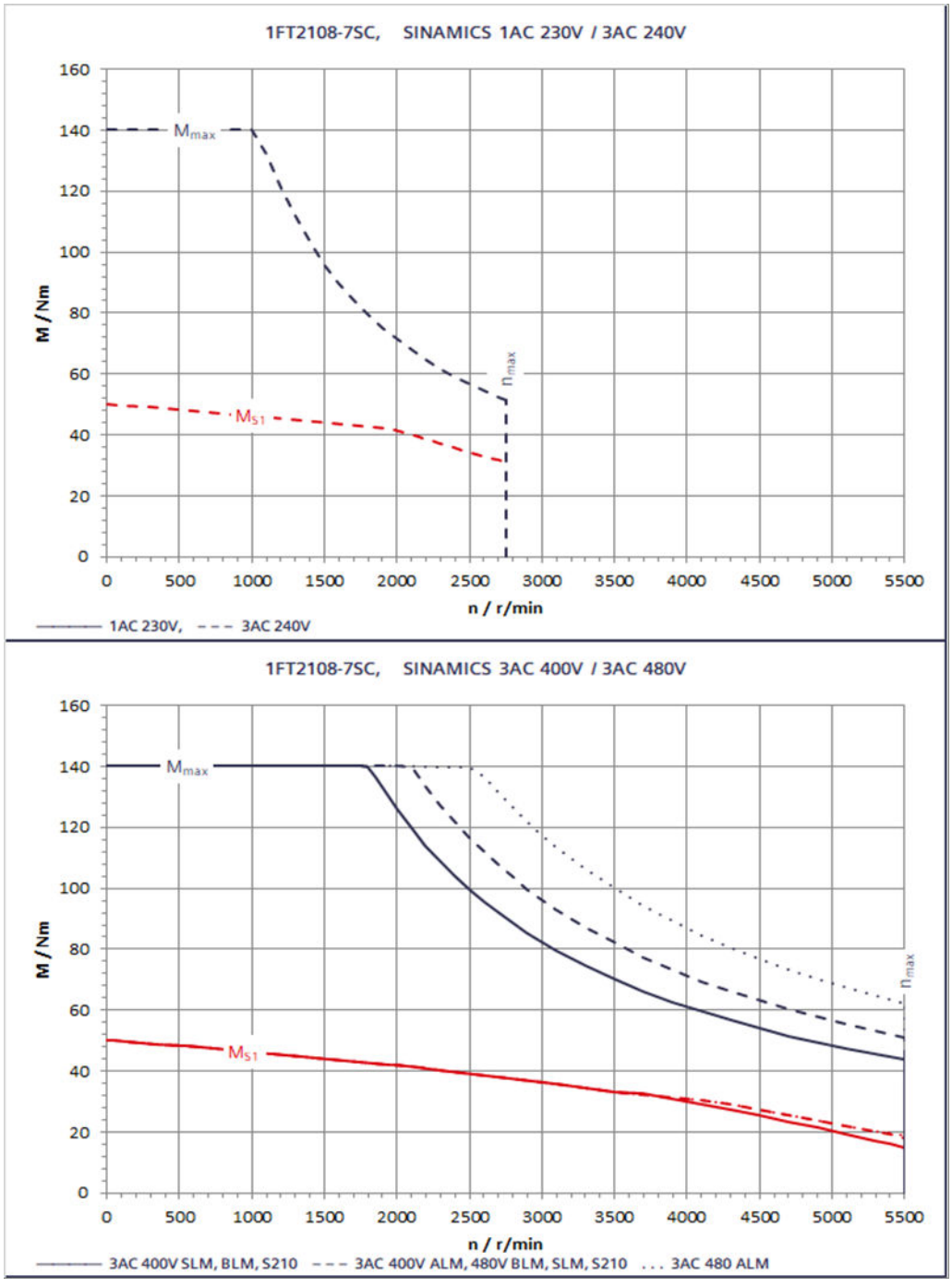
6.3.2.7 1FT2108-7SB

Three-phase servomotor 1FT2108-7SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	50
Stall current	I_0	A	18.2
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	78
Thermal time constant	T_{th}	min	18
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	27.3
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	30
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	30.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1740
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	47
Rated current	I_{rated}	A	17.6
Rated power	P_{rated}	kW	3.7
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3450
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	44
Rated current	I_{rated}	A	16.8
Rated power	P_{rated}	kW	6.9
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2108-7SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2108-7SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

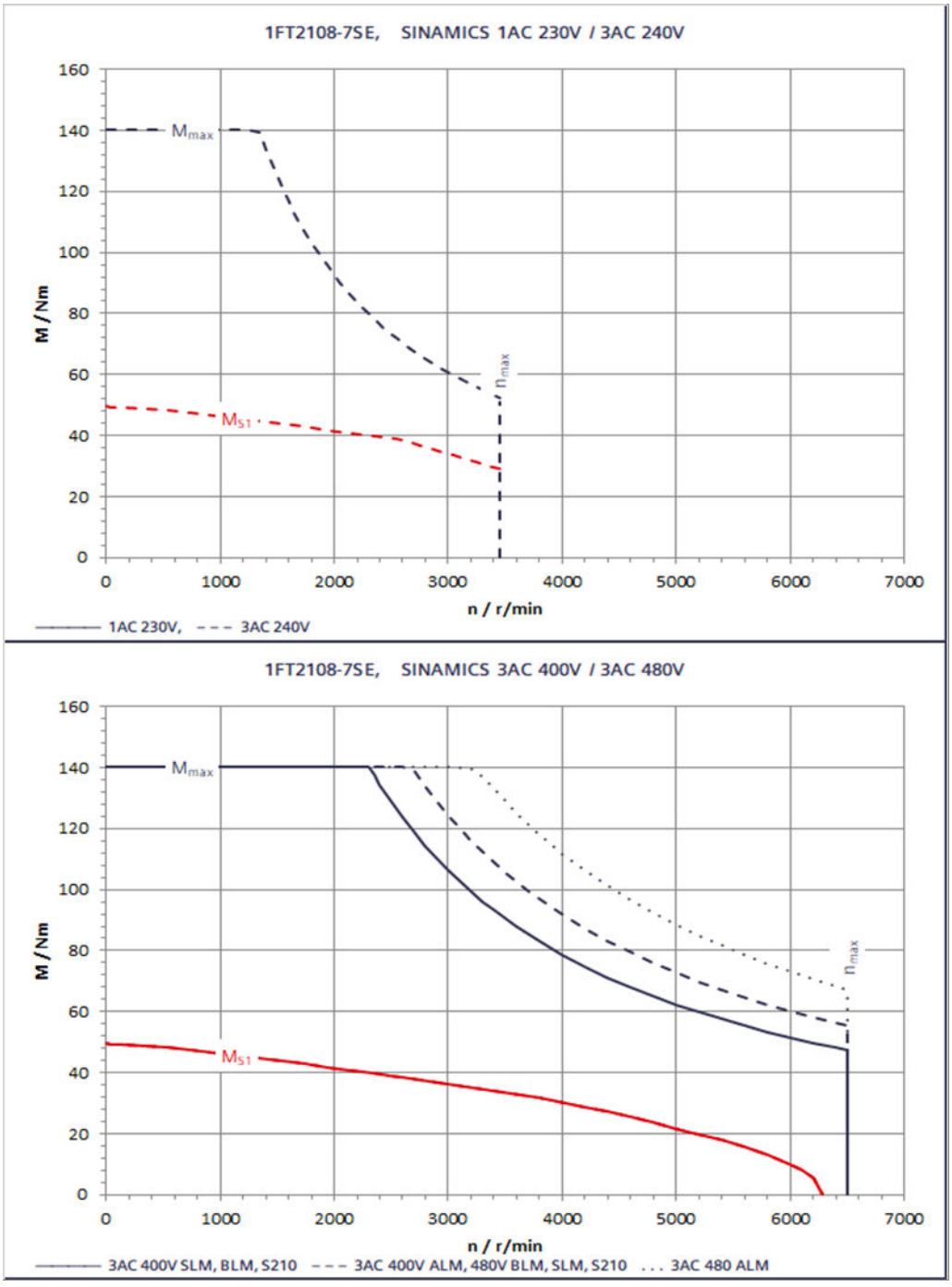
6.3.2.8 1FT2108-7SC

Three-phase servomotor 1FT2108-7SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	50
Stall current	I_0	A	29
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	123
Thermal time constant	T_{th}	min	18.5
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	27.4
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	30.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	30.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2750
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	46
Rated current	I_{rated}	A	27.5
Rated power	P_{rated}	kW	4.85
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5500
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	42
Rated current	I_{rated}	A	26
Rated power	P_{rated}	kW	8.8
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 6 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2108-7SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2108-7SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.2.9 1FT2108-7SE

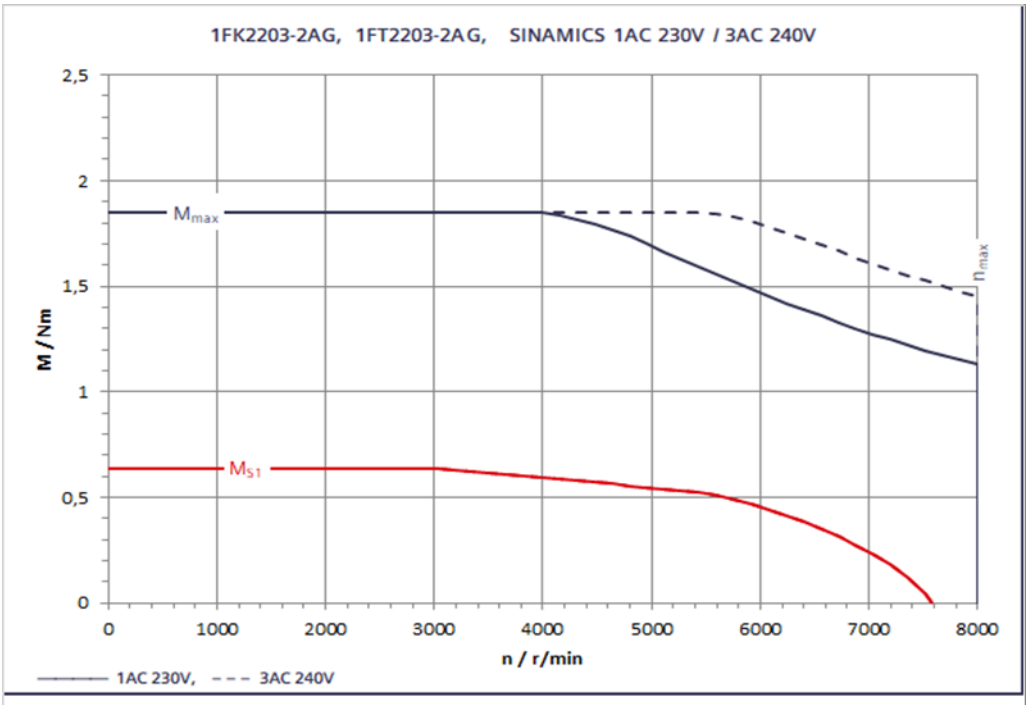
Three-phase servomotor 1FT2108-7SE			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	49.5
Stall current	I_0	A	36
Maximum torque	M_{max}	Nm	140
Maximum current	I_{max}	A	155
Thermal time constant	T_{th}	min	18
Moment of inertia	J_{Mot}	kg cm²	28.2
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.2
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	33.8
Weight	m_{Mot}	kg	27.6
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	30.3
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	30.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3450
Rated speed	n_{rated}	r/min	1250
Rated torque	M_{rated}	Nm	45
Rated current	I_{rated}	A	34.5
Rated power	P_{rated}	kW	5.9
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6500
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	39
Rated current	I_{rated}	A	31
Rated power	P_{rated}	kW	10.2
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 6 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2108-7SE, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2108-7SE, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3 Compact, naturally cooled

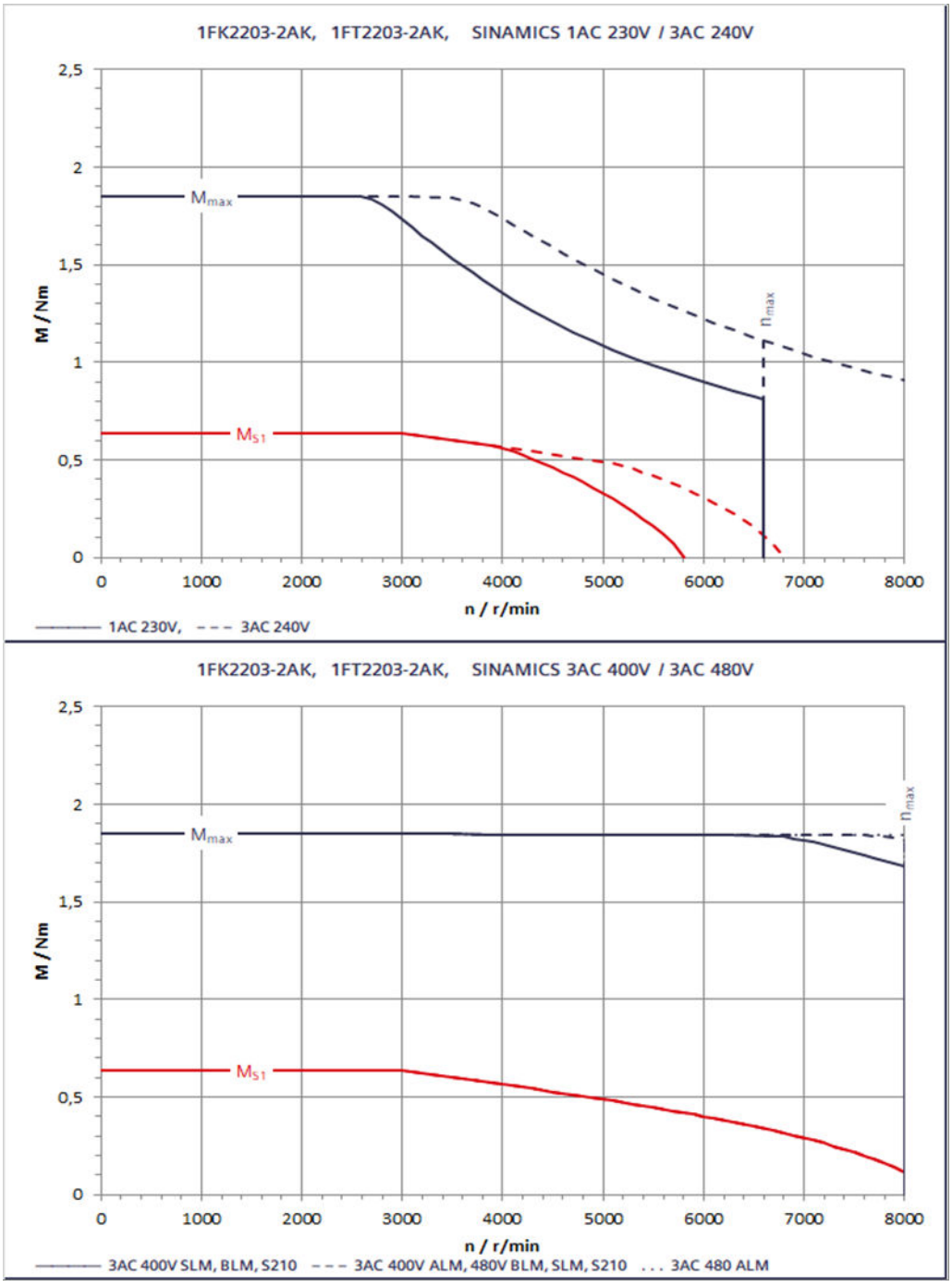
6.3.3.1 1FK2203-2AG, 1FT2203-2AG

1FK2203-2AG, 1FT2203-2AG three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.64
Stall current	I_0	A	1.38
Maximum torque	M_{max}	Nm	1.85
Maximum current	I_{max}	A	4.2
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	0.2
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.22
Weight	m_{Mot}	kg	1.15
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.52
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	0.64
Rated current	I_{rated}	A	1.38
Rated power	P_{rated}	kW	0.2
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2203-2AG, 1FT2203-2AG, SINAMICS 1AC 230V / 3AC 240V
2,5
2
1,5
1
0,5
0
M / Nm
M_max
M_S1
n_max
0
1000
2000
3000
4000
5000
6000
7000
8000
n / r/min
1AC 230V, 3AC 240V

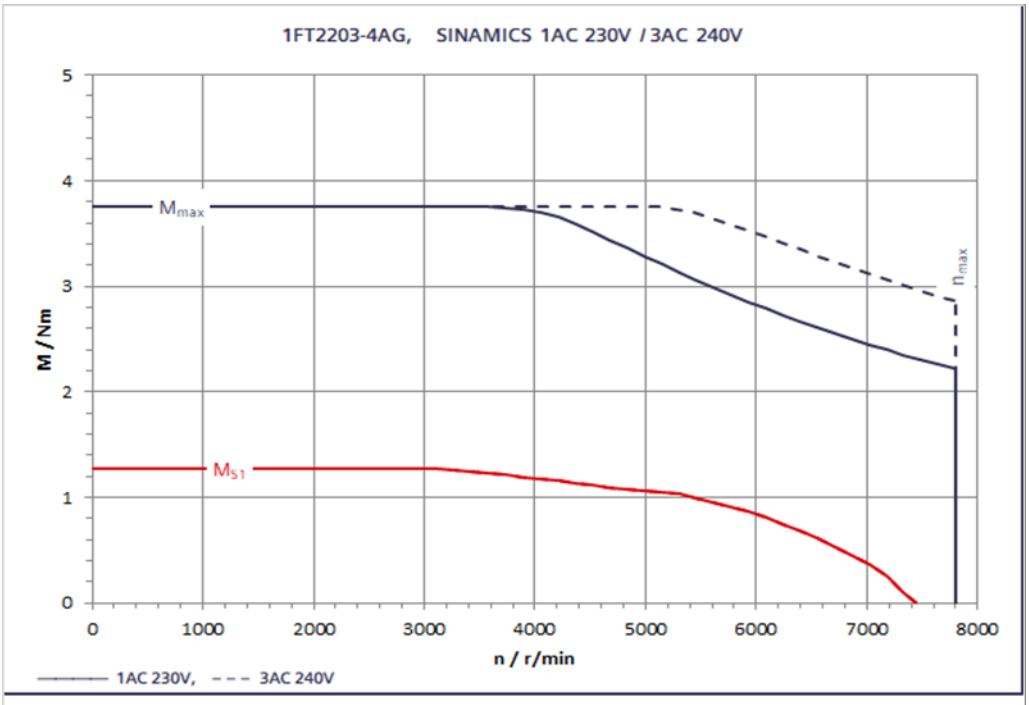
6.3.3.2 1FK2203-2AK, 1FT2203-2AK

1FK2203-2AK, 1FT2203-2AK three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	0.64
Stall current	I_0	A	1.05
Maximum torque	M_{max}	Nm	1.85
Maximum current	I_{max}	A	3.4
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	0.2
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.22
Weight	m_{Mot}	kg	1.16
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.53
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6600
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	0.64
Rated current	I_{rated}	A	1.12
Rated power	P_{rated}	kW	0.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	6000
Rated torque	M_{rated}	Nm	0.405
Rated current	I_{rated}	A	0.75
Rated power	P_{rated}	kW	0.255
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2203-2AK, 1FT2203-2AK, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2203-2AK, 1FT2203-2AK, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

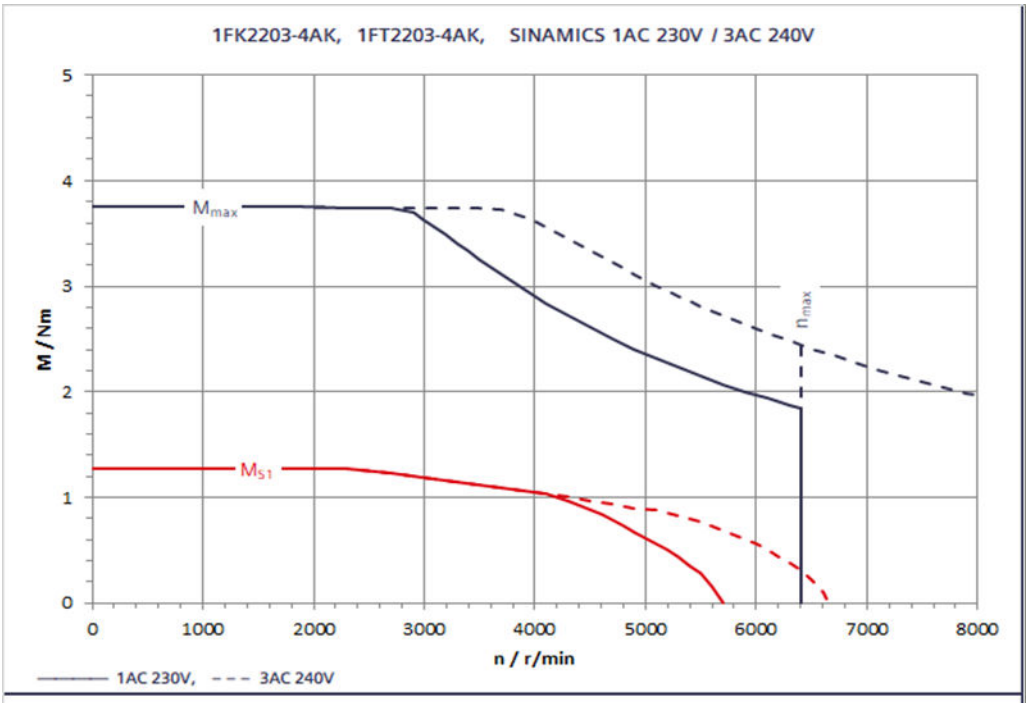
6.3.3.3 1FT2203-4AG

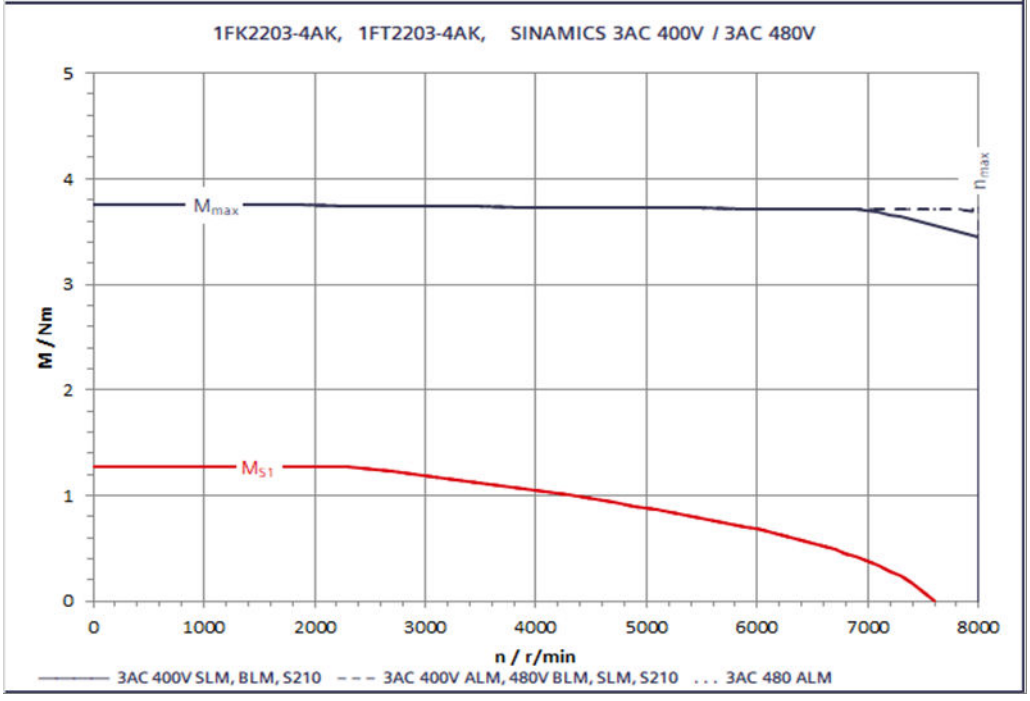
Three-phase servomotor 1FT2203-4AG			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	2.52
Maximum torque	M_{max}	Nm	3.75
Maximum current	I_{max}	A	7.8
Thermal time constant	T_{th}	min	28
Moment of inertia	J_{Mot}	kg cm²	0.35
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.37
Weight	m_{Mot}	kg	1.48
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.96
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7800
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	1.27
Rated current	I_{rated}	A	2.52
Rated power	P_{rated}	kW	0.4
Motor plugs			
One Cable Connection (OCC): Connector size	M12		
Two Cable Connection (2CC): Power connector size	-		
Two Cable Connection (2CC): Signal connector size	-		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2203-4AG, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
1
2
3
4
5
0
1000
2000
3000
4000
5000
6000
7000
8000
1AC 230V,
3AC 240V

6.3.3.4 1FK2203-4AK, 1FT2203-4AK

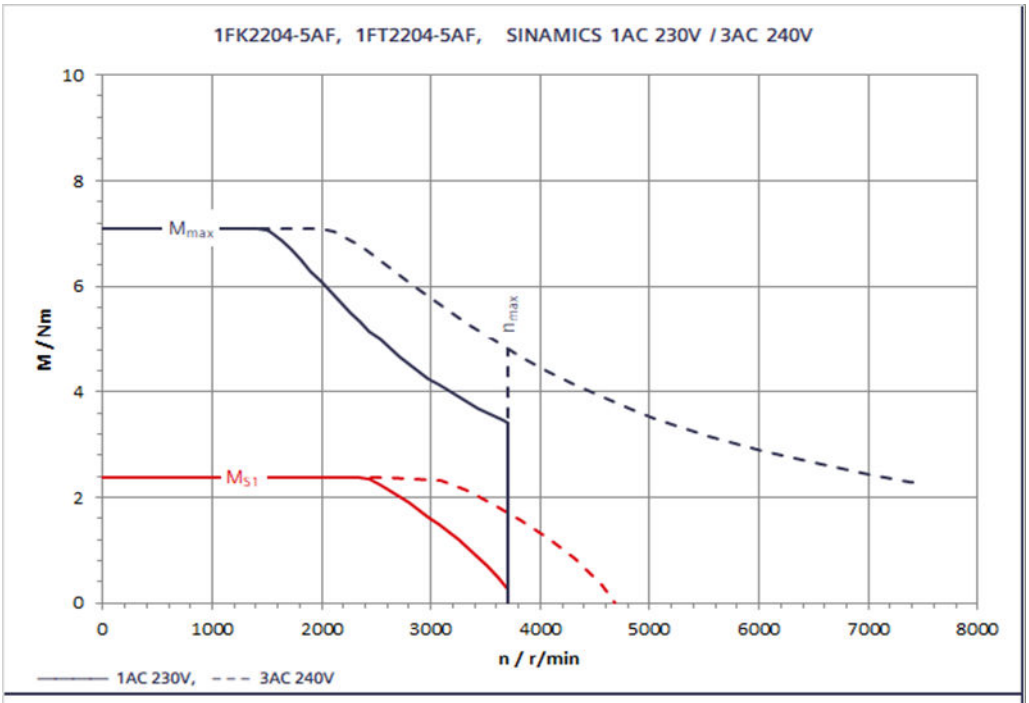
1FK2203-4AK, 1FT2203-4AK three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	1.27
Stall current	I_0	A	2.05
Maximum torque	M_{max}	Nm	3.75
Maximum current	I_{max}	A	6.7
Thermal time constant	T_{th}	min	28
Moment of inertia	J_{Mot}	kg cm²	0.35
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	0.37
Weight	m_{Mot}	kg	1.49
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	1.97
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6400
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	1.19
Rated current	I_{rated}	A	2
Rated power			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	6000
Rated torque	M_{rated}	Nm	0.68
Rated current	I_{rated}	A	1.24
Rated power	P_{rated}	kW	0.43
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		

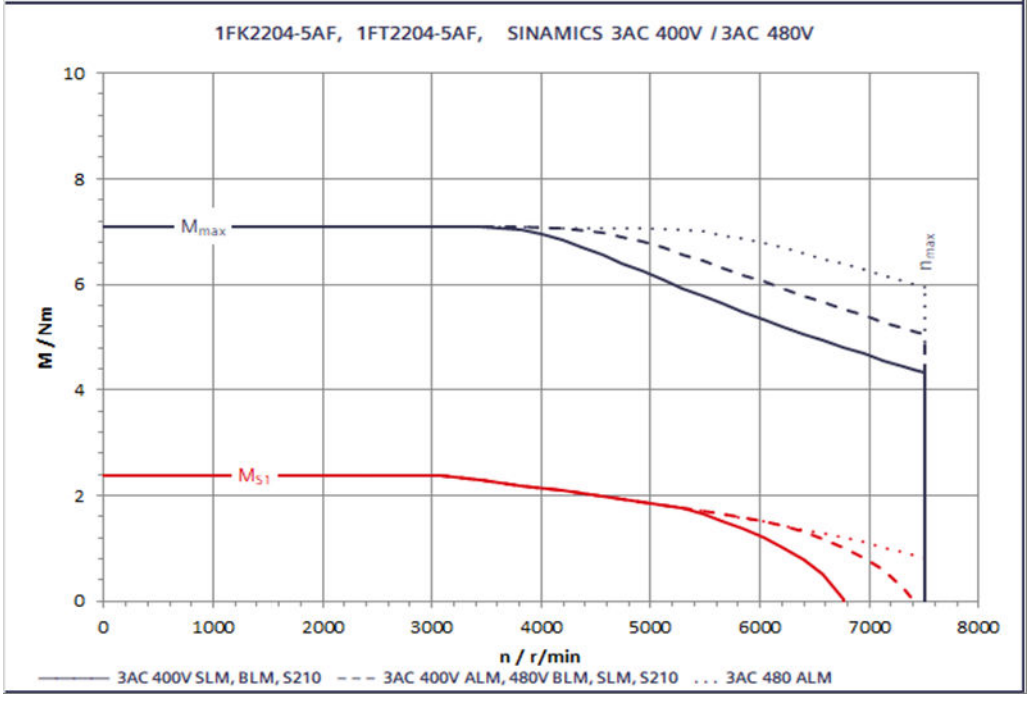

1FK2203-4AK, 1FT2203-4AK, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V


1FK2203-4AK, 1FT2203-4AK, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.5 1FK2204-5AF, 1FT2204-5AF

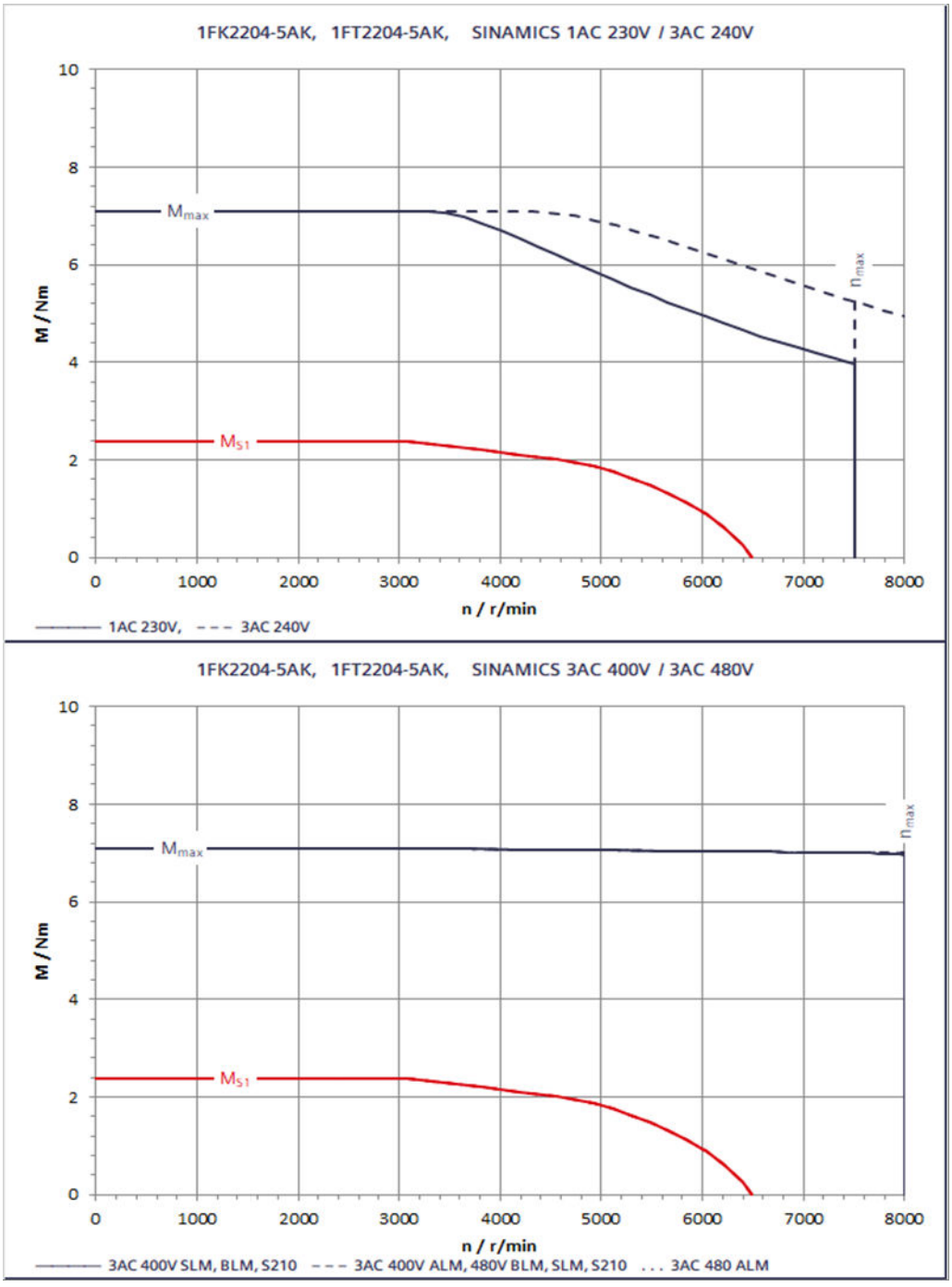
1FK2204-5AF, 1FT2204-5AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	2.4
Stall current	I_0	A	2.25
Maximum torque	M_{max}	Nm	7.1
Maximum current	I_{max}	A	7.1
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	1.23
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	1.31
Weight	m_{Mot}	kg	2.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	3.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3700
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	2.25
Rated power			
Max. permissible speed	$n_{max\ inv}$	r/min	7500
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	2.25
Rated power	P_{rated}	kW	0.75
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2204-5AF, 1FT2204-5AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FK2204-5AF, 1FT2204-5AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

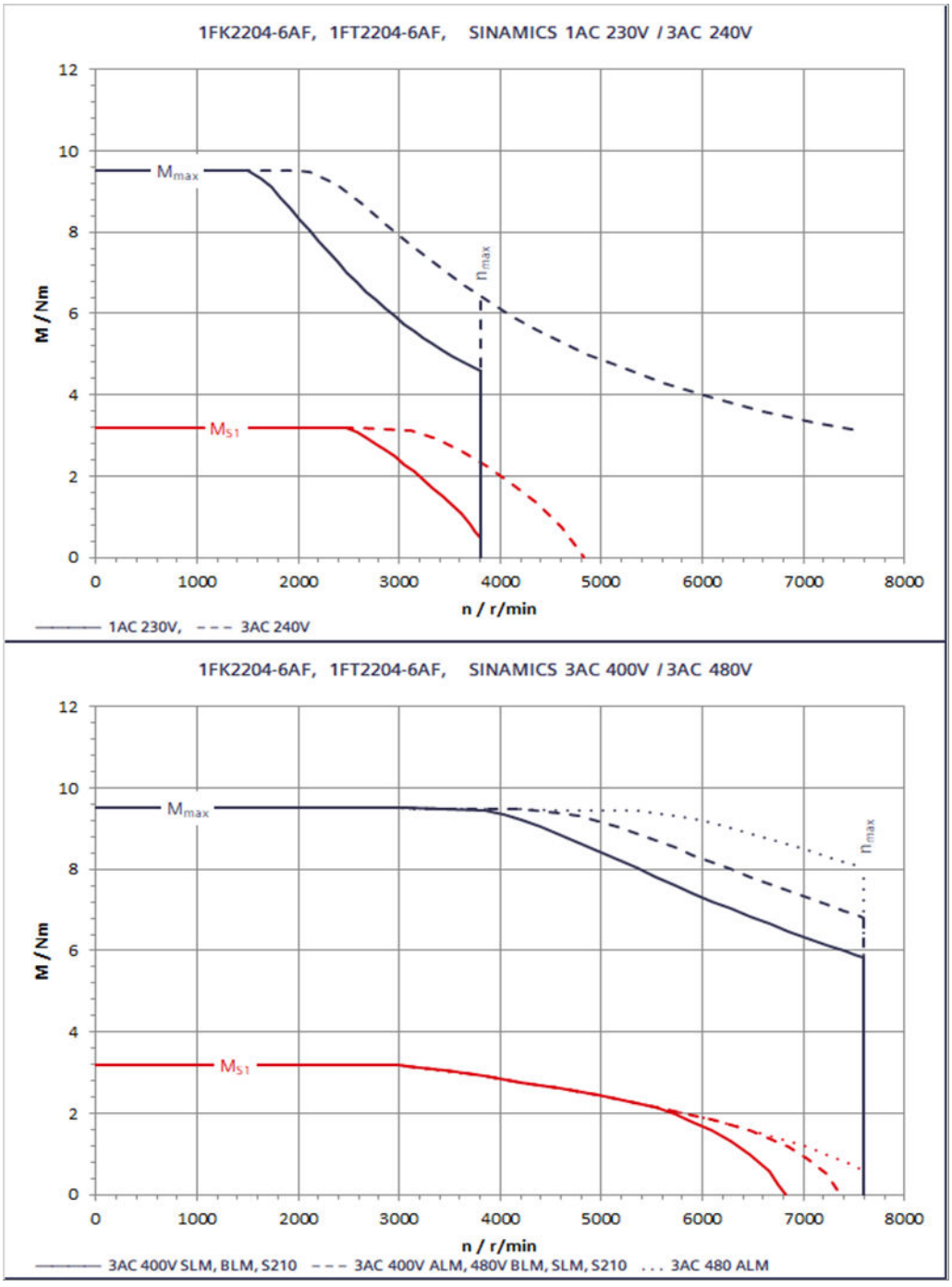
6.3.3.6 1FK2204-5AK, 1FT2204-5AK

1FK2204-5AK, 1FT2204-5AK three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	2.4
Stall current	I_0	A	4.4
Maximum torque	M_{max}	Nm	7.1
Maximum current	I_{max}	A	14.2
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	1.23
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	1.31
Weight	m_{Mot}	kg	2.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	3.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7500
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	2.4
Rated current	I_{rated}	A	4.4
Rated power	P_{rated}	kW	0.75
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	6000
Rated torque	M_{rated}	Nm	0.9
Rated current	I_{rated}	A	1.95
Rated power	P_{rated}	kW	0.57
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2204-5AK, 1FT2204-5AK, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_max
M_S1
n_max
1AC 230V, 3AC 240V
1FK2204-5AK, 1FT2204-5AK, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_max
M_S1
n_max
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

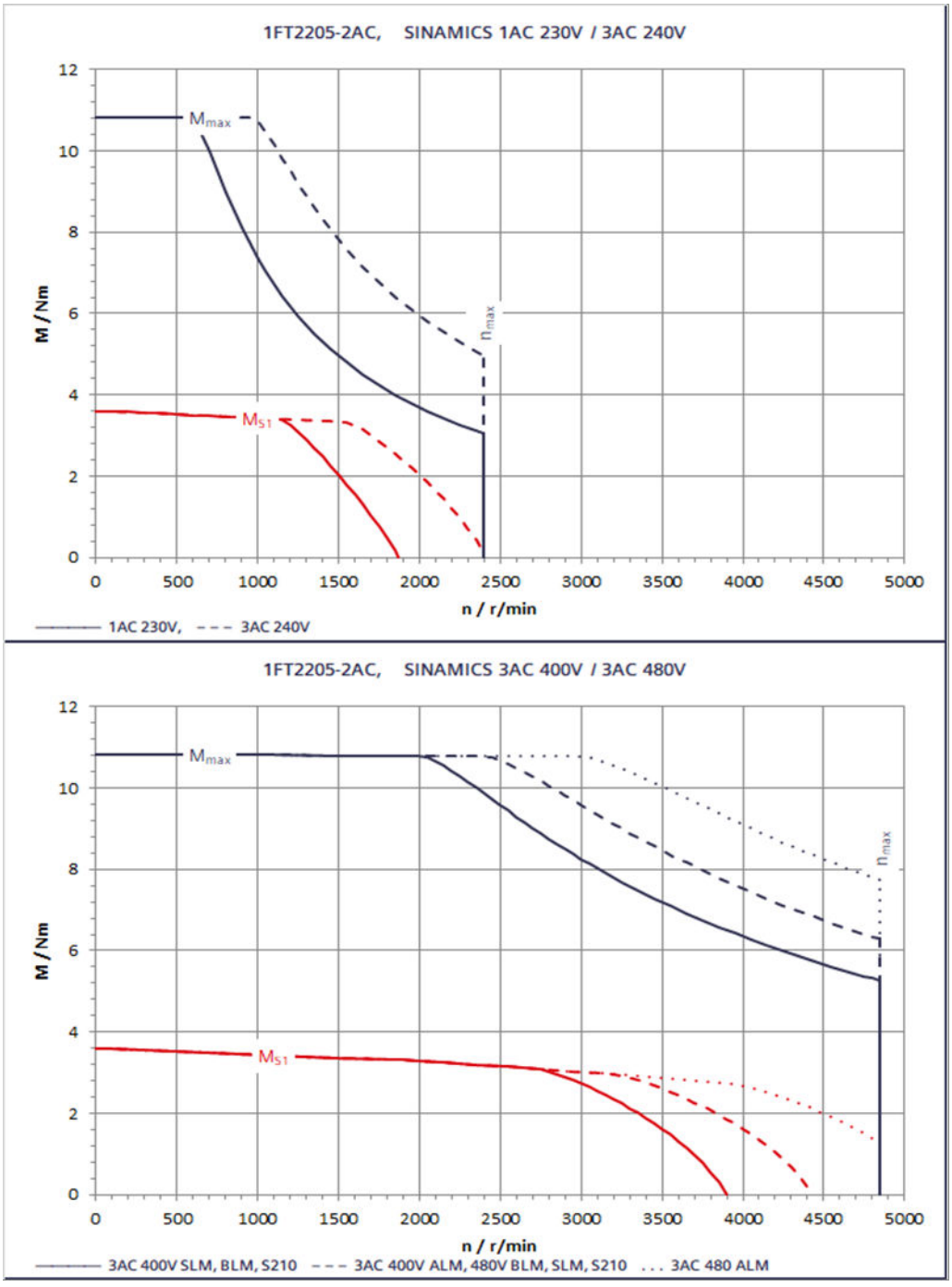
6.3.3.7 1FK2204-6AF, 1FT2204-6AF

1FK2204-6AF, 1FT2204-6AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.2
Stall current	I_0	A	3
Maximum torque	M_{max}	Nm	9.5
Maximum current	I_{max}	A	9.9
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	1.61
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	1.69
Weight	m_{Mot}	kg	3.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.35
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3800
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	3.2
Rated current	I_{rated}	A	3
Rated power	P_{rated}	kW	0.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	7600
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	3.2
Rated current	I_{rated}	A	3
Rated power	P_{rated}	kW	1
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2204-6AF, 1FT2204-6AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2204-6AF, 1FT2204-6AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

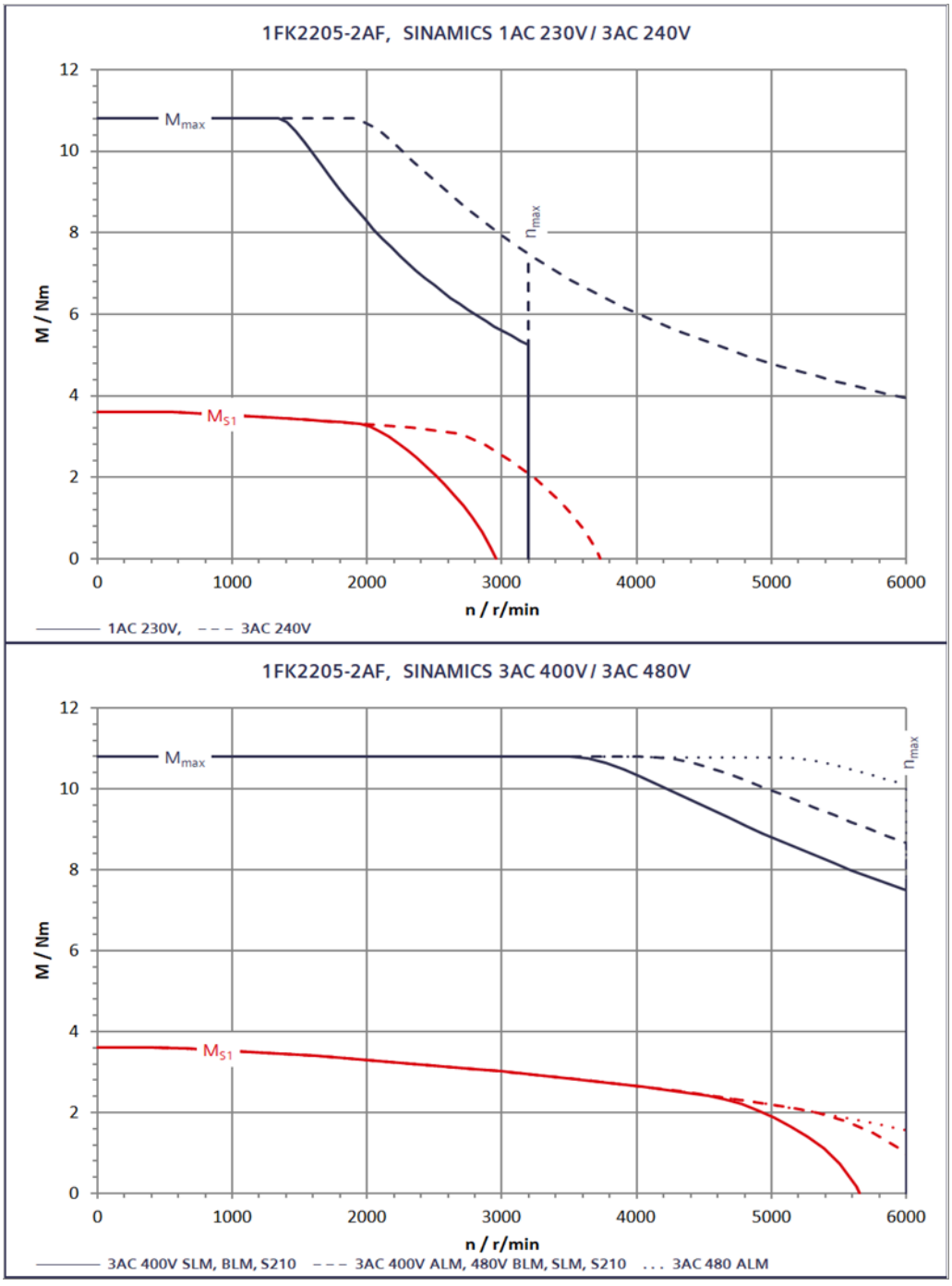
6.3.3.8 1FT2205-2AC

Three-phase servomotor 1FT2205-2AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.6
Stall current	I_0	A	1.84
Maximum torque	M_{max}	Nm	10.8
Maximum current	I_{max}	A	6
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	3.15
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	4.05
Weight	m_{Mot}	kg	3.75
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2400
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	3.45
Rated current	I_{rated}	A	1.79
Rated power	P_{rated}	kW	0.36
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4850
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	3.3
Rated current	I_{rated}	A	1.74
Rated power	P_{rated}	kW	0.69
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2205-2AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2205-2AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

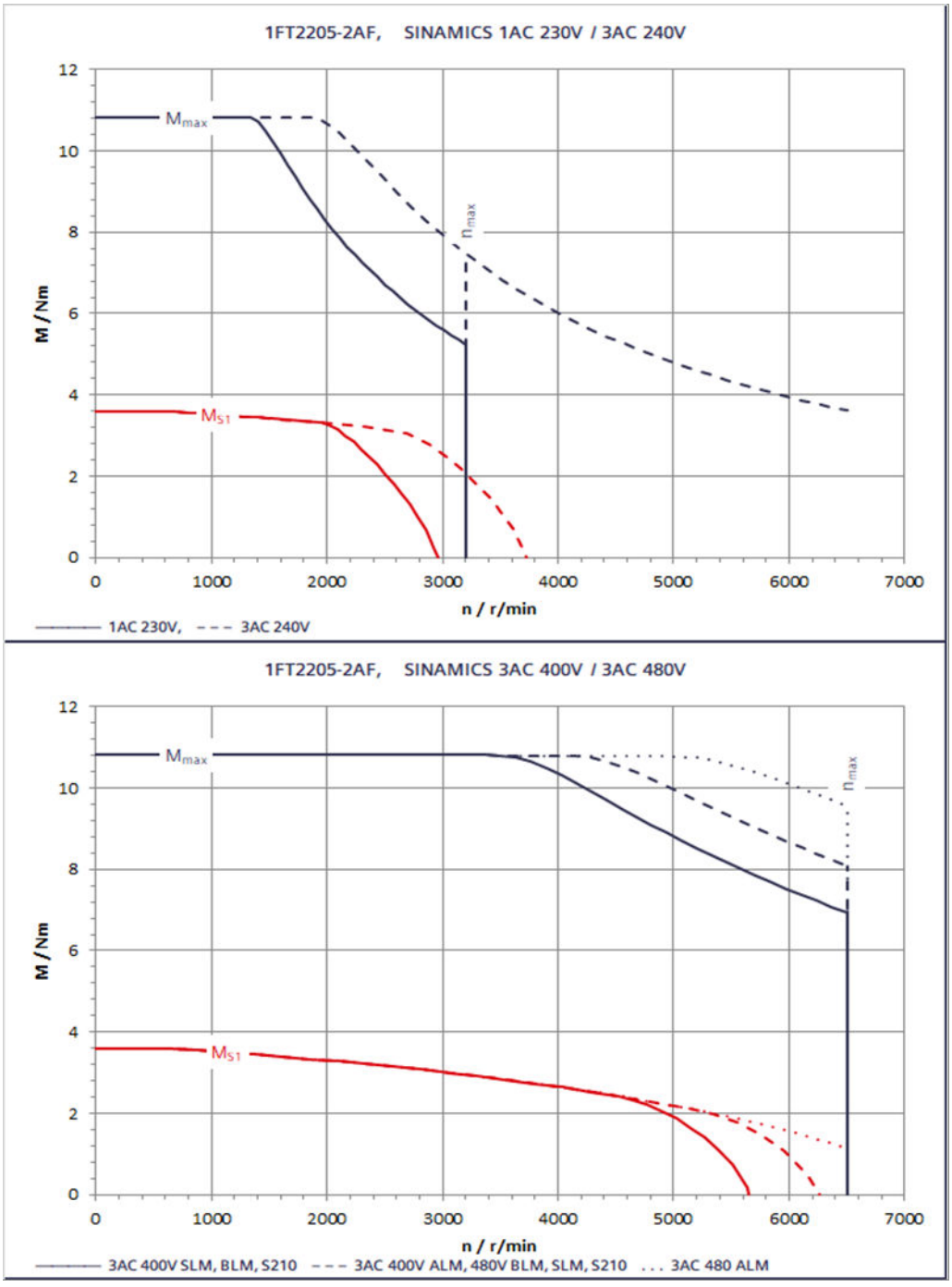
6.3.3.9 1FK2205-2AF

1FK2205-2AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.6
Stall current	I_0	A	2.9
Maximum torque	M_{max}	Nm	10.8
Maximum current	I_{max}	A	9.5
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	3.15
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	4.05
Weight	m_{Mot}	kg	3.75
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3200
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	3.4
Rated current	I_{rated}	A	2.8
Rated power	P_{rated}	kW	0.53
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	3
Rated current	I_{rated}	A	2.5
Rated power	P_{rated}	kW	0.94
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2205-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_max
M_S1
n_max
1AC 230V, 3AC 240V
1FK2205-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_max
M_S1
n_max
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

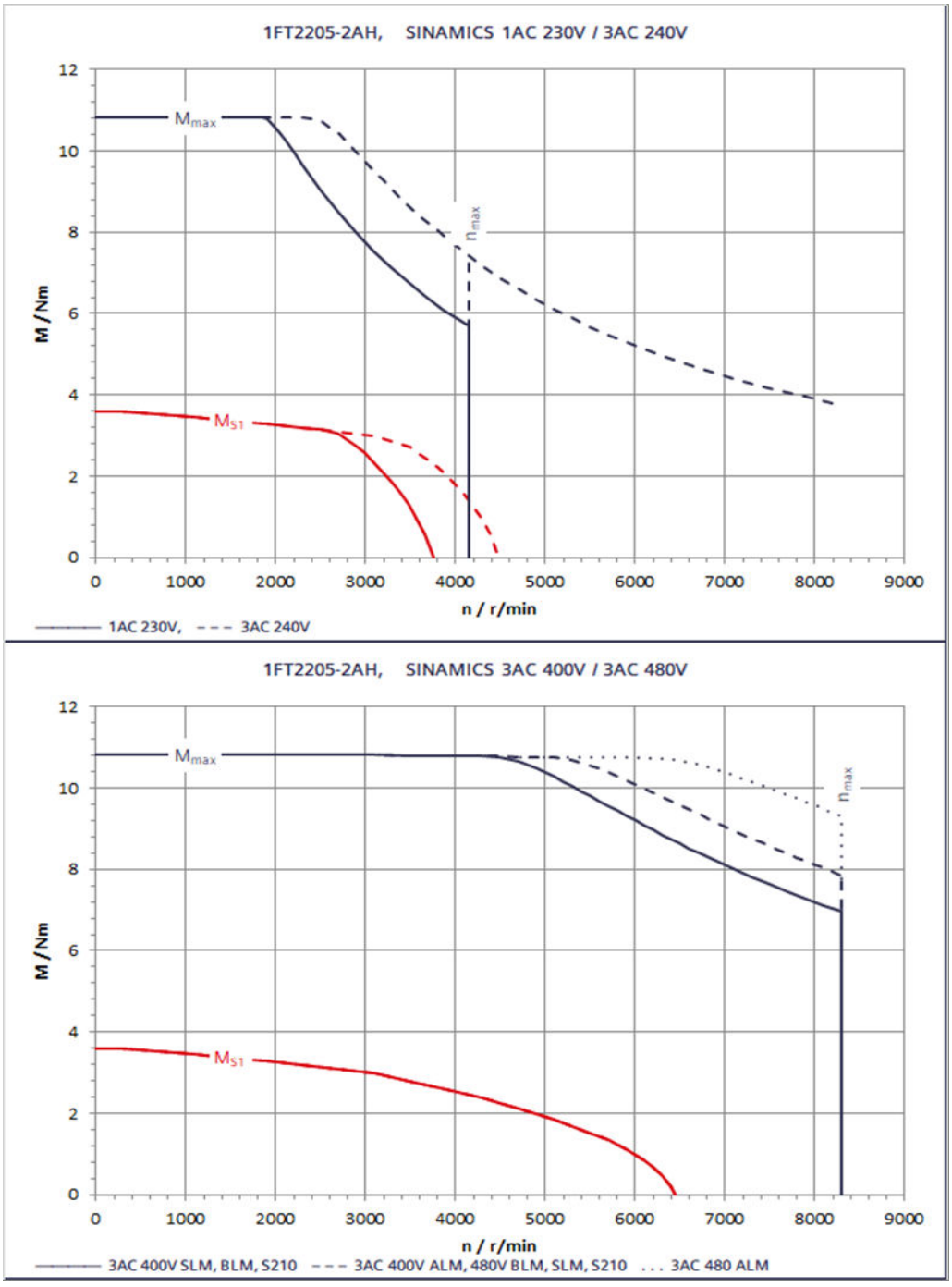
6.3.3.10 1FT2205-2AF

Three-phase servomotor 1FT2205-2AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.6
Stall current	I_0	A	2.9
Maximum torque	M_{max}	Nm	10.8
Maximum current	I_{max}	A	9.5
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	3.15
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	4.05
Weight	m_{Mot}	kg	3.75
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3200
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	3.4
Rated current	I_{rated}	A	2.8
Rated power	P_{rated}	kW	0.53
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6500
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	3
Rated current	I_{rated}	A	2.5
Rated power	P_{rated}	kW	0.94
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2205-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2205-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

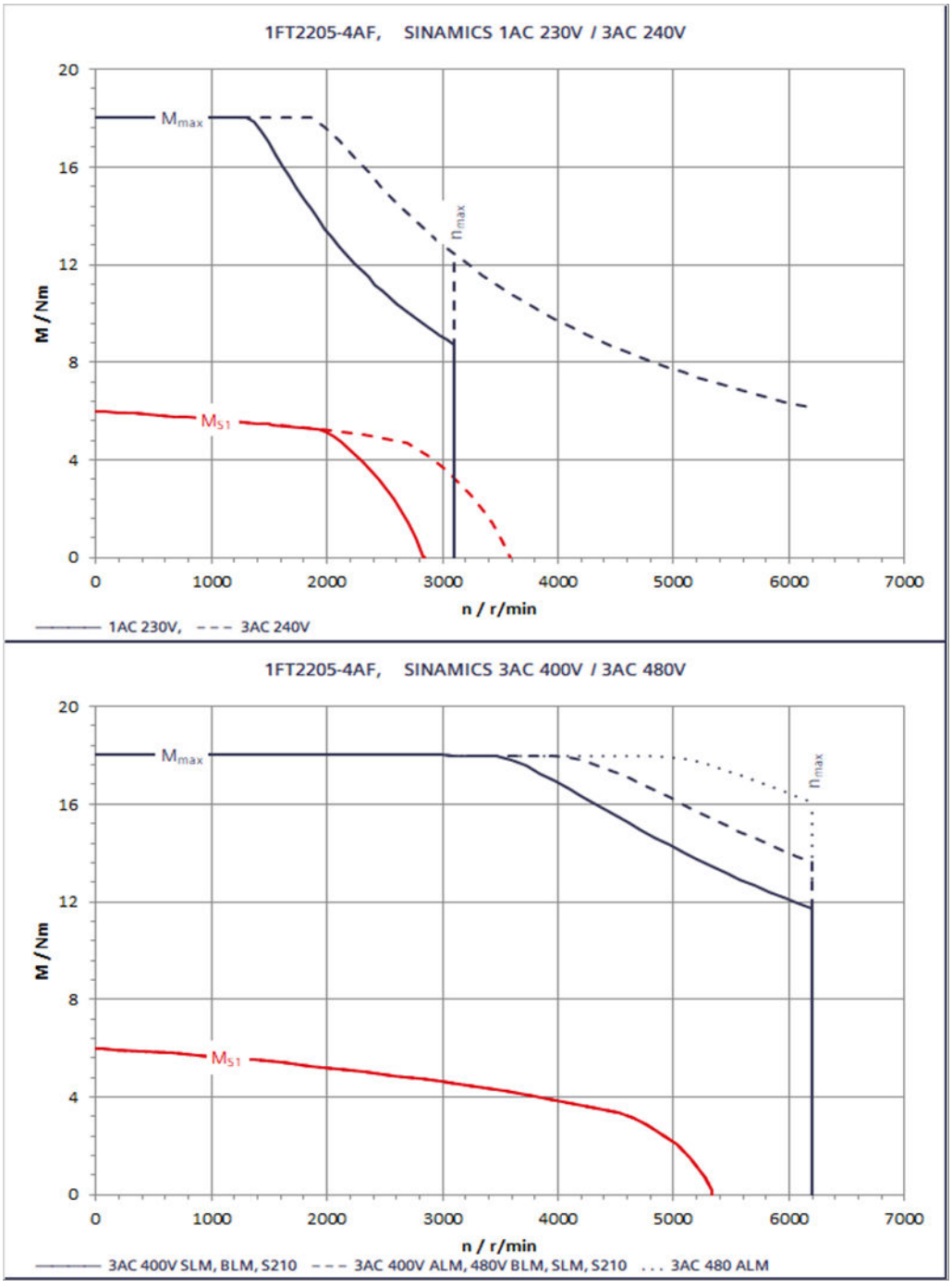
6.3.3.11 1FT2205-2AH

Three-phase servomotor 1FT2205-2AH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	3.6
Stall current	I_0	A	3.8
Maximum torque	M_{max}	Nm	10.8
Maximum current	I_{max}	A	12.1
Thermal time constant	T_{th}	min	29
Moment of inertia	J_{Mot}	kg cm²	3.15
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	4.05
Weight	m_{Mot}	kg	3.75
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	4.75
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4150
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	3.15
Rated current	I_{rated}	A	3.45
Rated power	P_{rated}	kW	0.82
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8300
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	2.25
Rated current	I_{rated}	A	2.55
Rated power	P_{rated}	kW	1.06
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2205-2AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2205-2AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

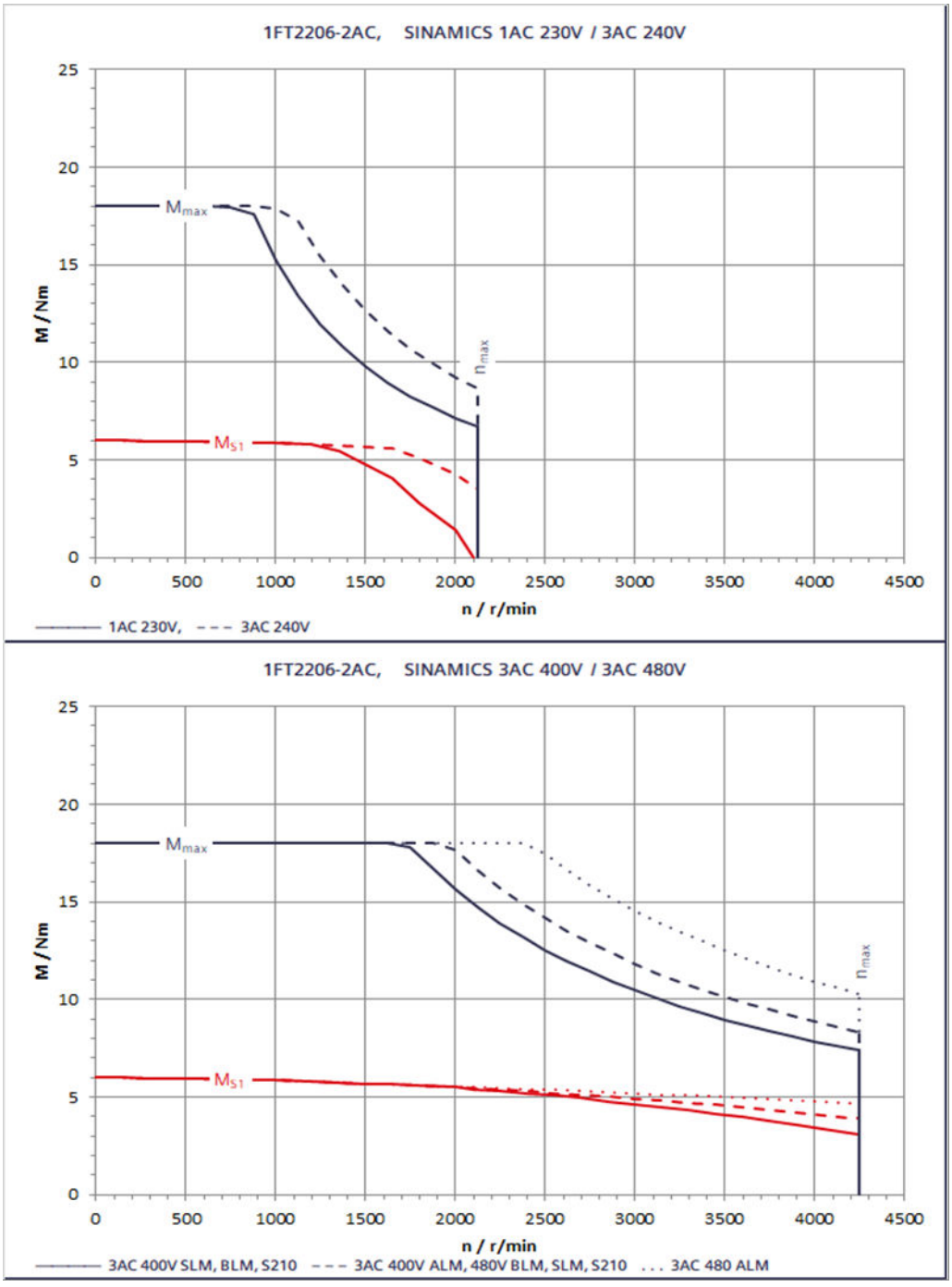
6.3.3.12 1FT2205-4AF

1FT2205-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6
Stall current	I_0	A	4.7
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	15.1
Thermal time constant	T_{th}	min	31
Moment of inertia	J_{Mot}	kg cm²	5.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	6
Weight	m_{Mot}	kg	5.2
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	6.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3100
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	5.5
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	0.86
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	4.6
Rated current	I_{rated}	A	3.75
Rated power	P_{rated}	kW	1.45
Motor plugs			
One Cable Connection (OCC): Connector size	M17		
Two Cable Connection (2CC): Power connector size	M17		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2205-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2205-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

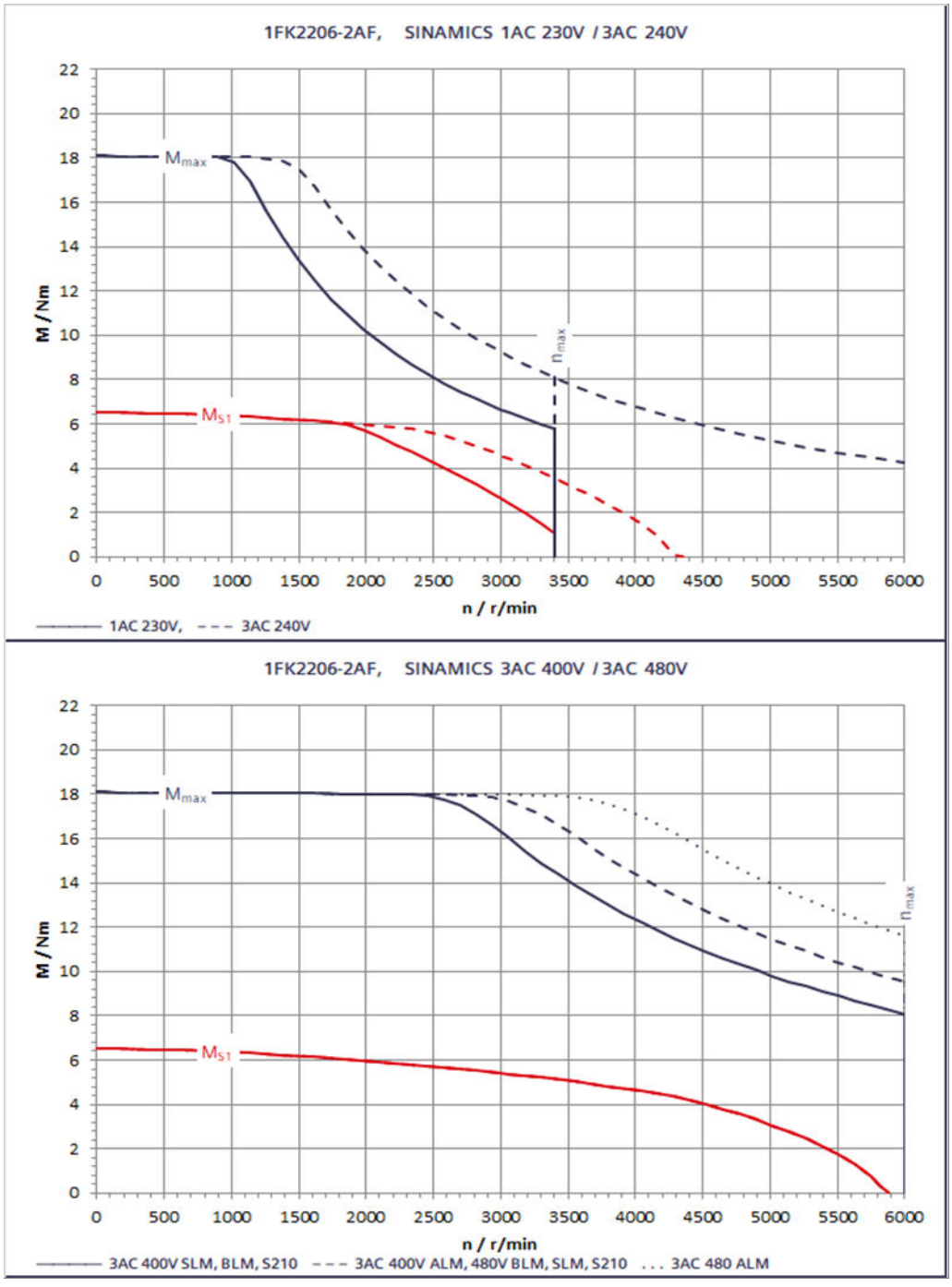
6.3.3.13 1FT2206-2AC

Three-phase servomotor 1FT2206-2AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6
Stall current	I_0	A	2.8
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	10.3
Thermal time constant	T_{th}	min	24
Moment of inertia	J_{Mot}	kg cm²	7.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	9.4
Weight	m_{Mot}	kg	6.3
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	7.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2125
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	5.85
Rated current	I_{rated}	A	2.8
Rated power	P_{rated}	kW	0.61
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4250
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	5.5
Rated current	I_{rated}	A	2.8
Rated power	P_{rated}	kW	1.15
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-2AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2206-2AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

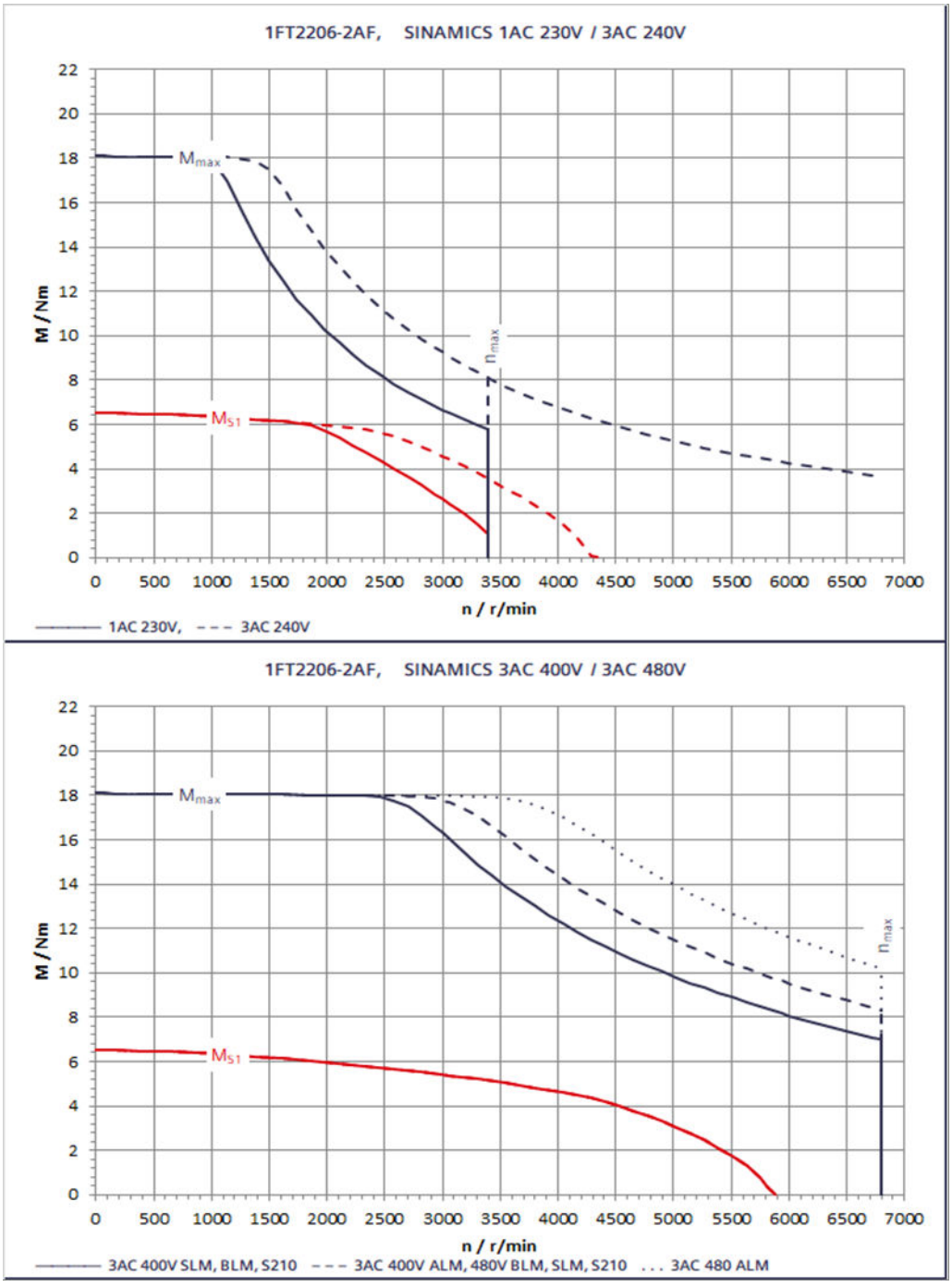
6.3.3.14 1FK2206-2AF

1KT2206-2AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6.5
Stall current	I_0	A	5
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	17.8
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	7.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	9.4
Weight	m_{Mot}	kg	6.3
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	7.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3400
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	6.1
Rated current	I_{rated}	A	4.8
Rated power	P_{rated}	kW	0.97
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	5.4
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	1.71
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2206-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FK2206-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

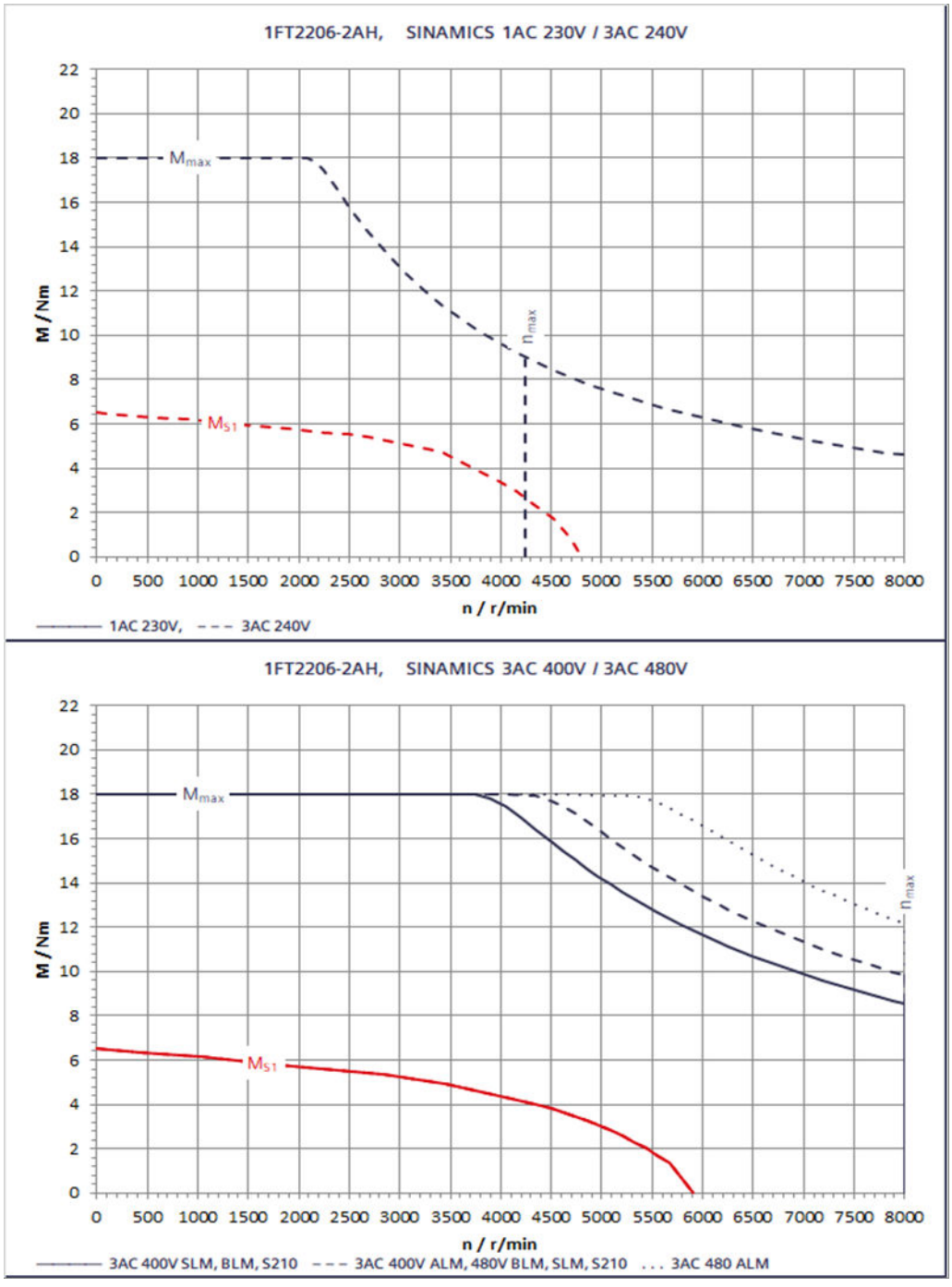
6.3.3.15 1FT2206-2AF

1FT2206-2AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6.5
Stall current	I_0	A	5
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	17.8
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	7.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	9.4
Weight	m_{Mot}	kg	6.3
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	7.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3400
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	6.1
Rated current	I_{rated}	A	4.8
Rated power	P_{rated}	kW	0.97
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6800
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	5.4
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	1.71
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

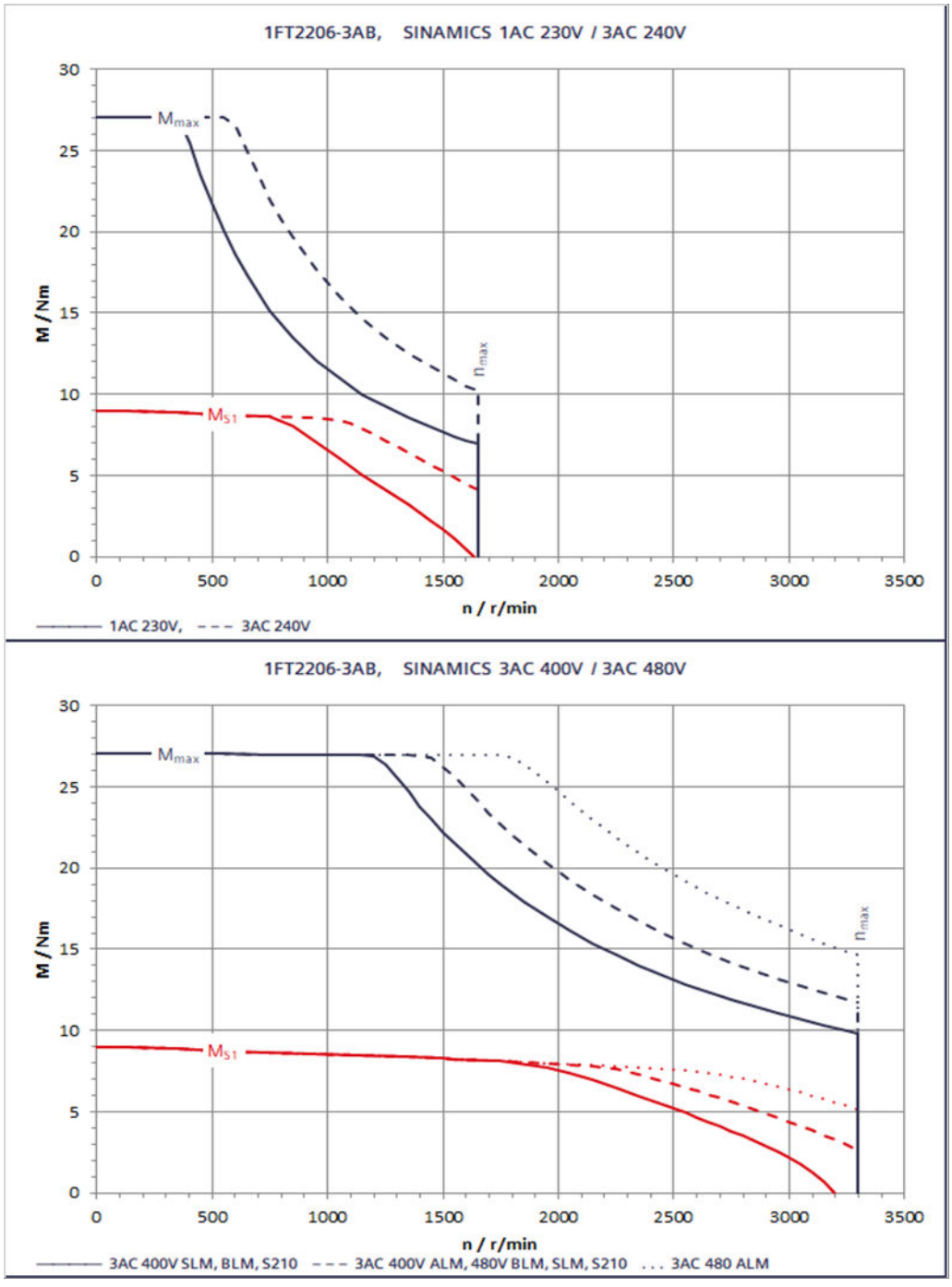
6.3.3.16 1FT2206-2AH

1FT2206-2AH three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6.5
Stall current	I_0	A	6.5
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	22.5
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	7.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	9.4
Weight	m_{Mot}	kg	6.3
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	7.9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4250
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	5.5
Rated current	I_{rated}	A	5.7
Rated power	P_{rated}	kW	1.45
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	3.85
Rated current	I_{rated}	A	4.1
Rated power	P_{rated}	kW	1.8
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-2AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-2AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

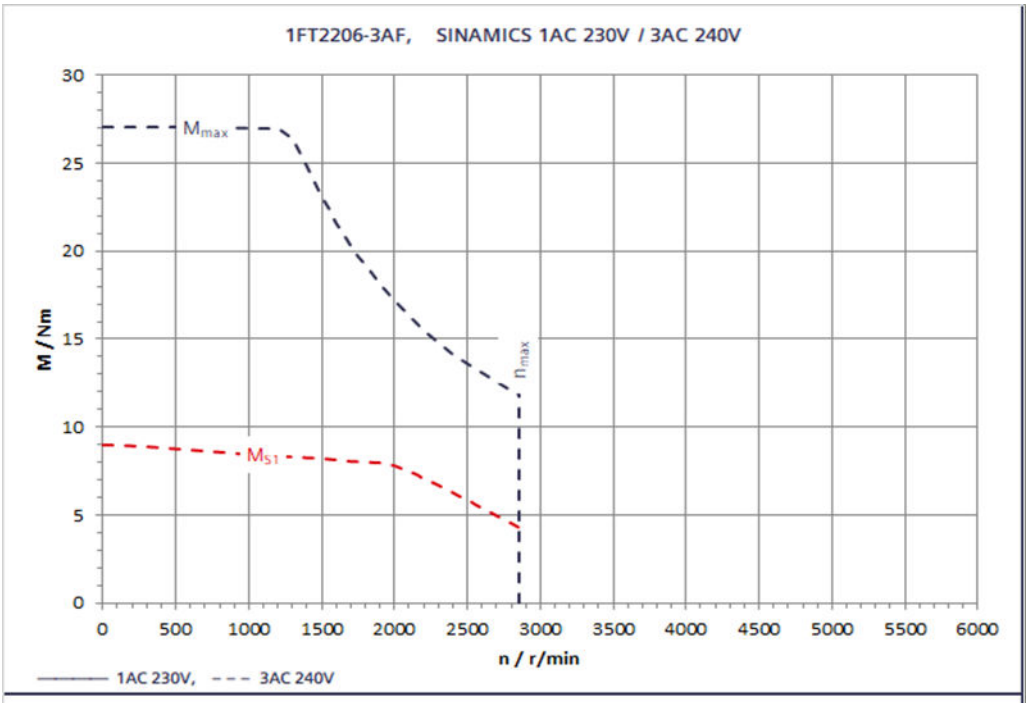
6.3.3.17 1FT2206-3AB

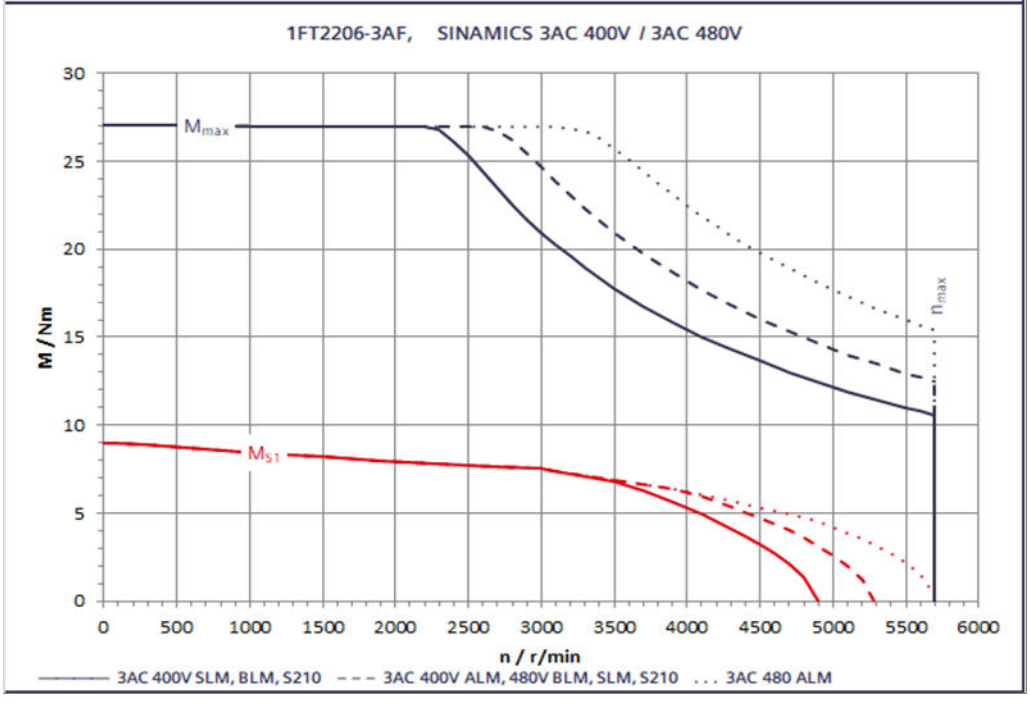
Three-phase servomotor 1FT2206-3AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	9
Stall current	I_0	A	3.15
Maximum torque	M_{max}	Nm	27
Maximum current	I_{max}	A	11.4
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	11.5
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	13.1
Weight	m_{Mot}	kg	7.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1650
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	8.7
Rated current	I_{rated}	A	3.05
Rated power	P_{rated}	kW	0.68
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8.3
Rated current	I_{rated}	A	2.9
Rated power	P_{rated}	kW	1.3
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-3AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-3AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.18 1FT2206-3AF

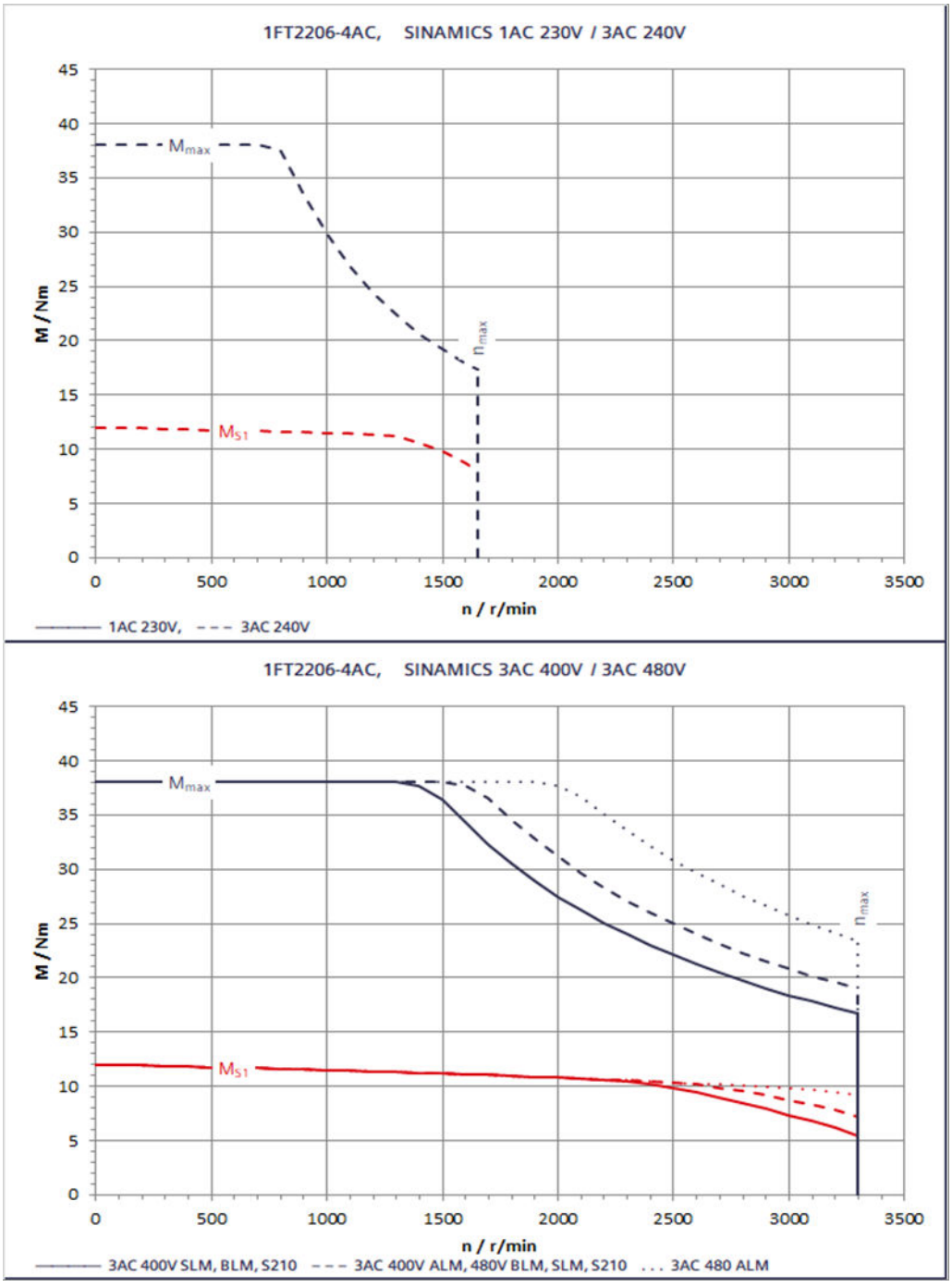
Three-phase servomotor 1FT2206-3AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	9
Stall current	I_0	A	5.4
Maximum torque	M_{max}	Nm	27
Maximum current	I_{max}	A	19.7
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	11.5
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	13.1
Weight	m_{Mot}	kg	7.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	8.2
Rated current	I_{rated}	A	5
Rated power	P_{rated}	kW	1.29
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5700
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	7.5
Rated current	I_{rated}	A	4.65
Rated power	P_{rated}	kW	2.35
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-3AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2206-3AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

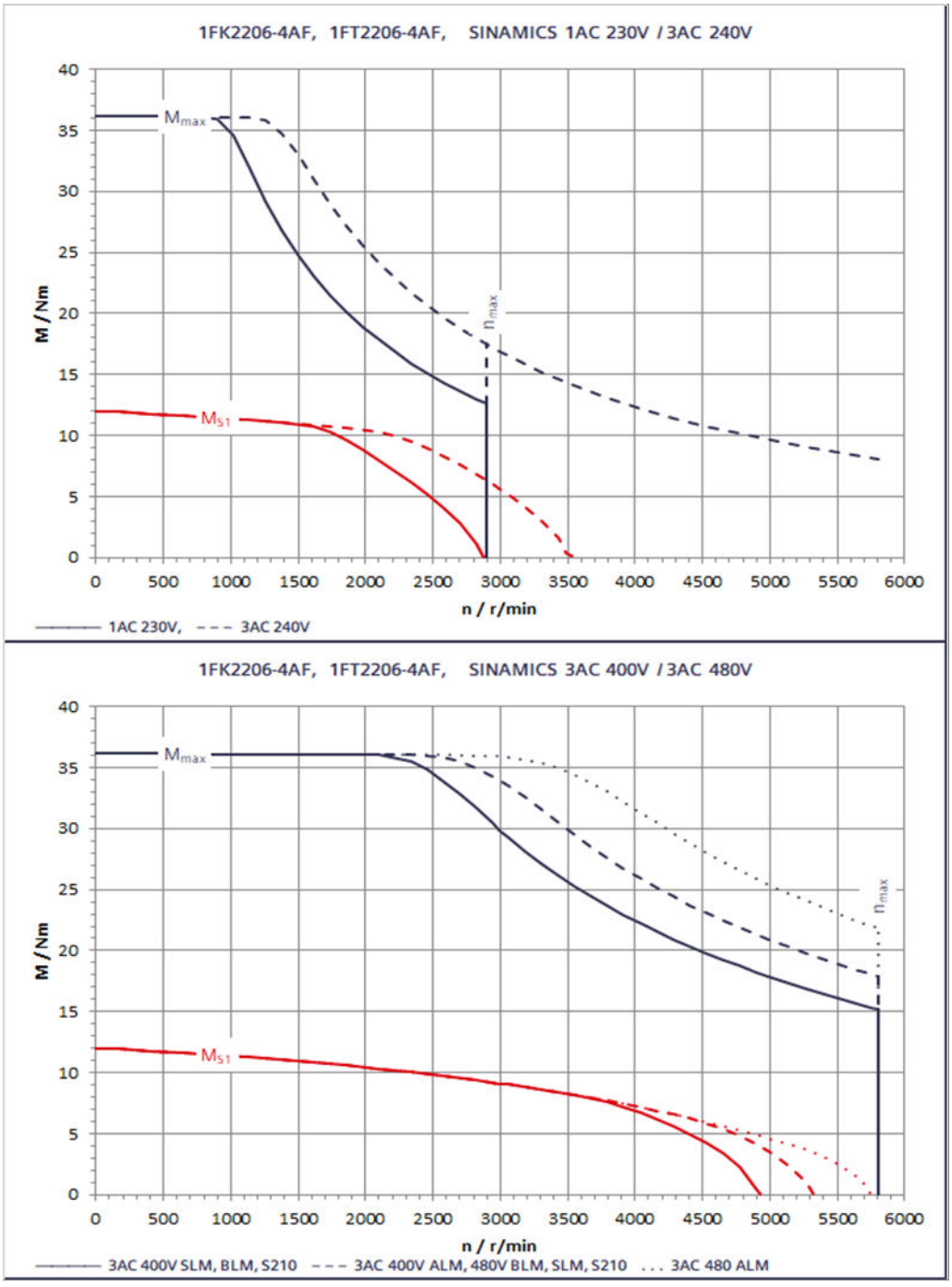
6.3.3.19 1FT2206-4AC

Three-phase servomotor 1FT2206-4AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	4.5
Maximum torque	M_{max}	Nm	38
Maximum current	I_{max}	A	17
Thermal time constant	T_{th}	min	32
Moment of inertia	J_{Mot}	kg cm²	15.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	16.8
Weight	m_{Mot}	kg	8.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	10.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1650
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	11.5
Rated current	I_{rated}	A	4.37
Rated power	P_{rated}	kW	1.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	10.5
Rated current	I_{rated}	A	4.1
Rated power	P_{rated}	kW	2.2
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2206-4AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-4AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

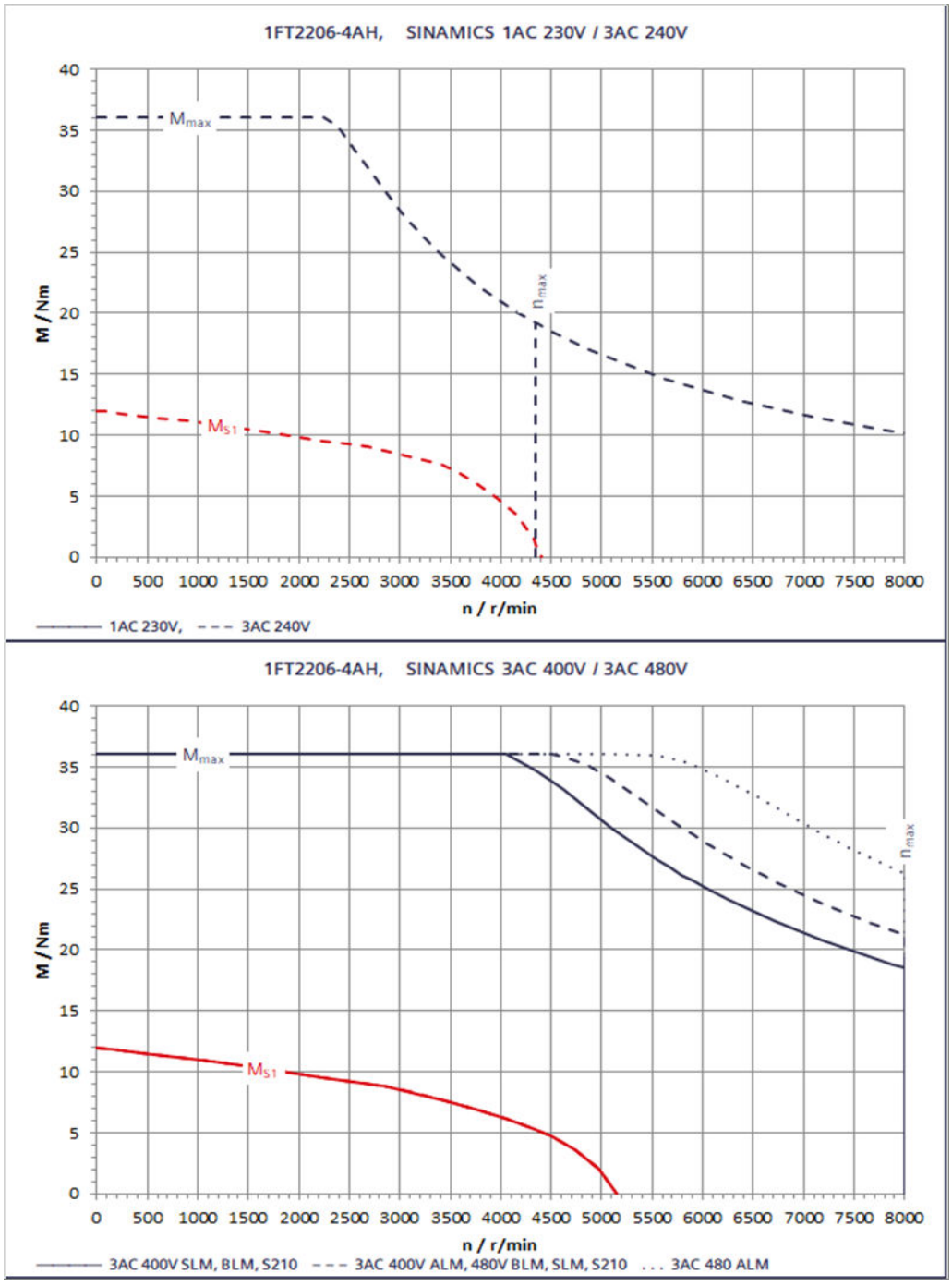
6.3.3.20 1FK2206-4AF, 1FT2206-4AF

1FK2206-4AF, 1FT2206-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	7.9
Maximum torque	M_{max}	Nm	36
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	24
Moment of inertia	J_{Mot}	kg cm²	15.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	16.8
Weight	m_{Mot}	kg	8.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	10.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2900
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	10.9
Rated current	I_{rated}	A	7.3
Rated power	P_{rated}	kW	1.72
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5800
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	9.1
Rated current	I_{rated}	A	6.2
Rated power	P_{rated}	kW	2.85
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2206-4AF, 1FT2206-4AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2206-4AF, 1FT2206-4AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

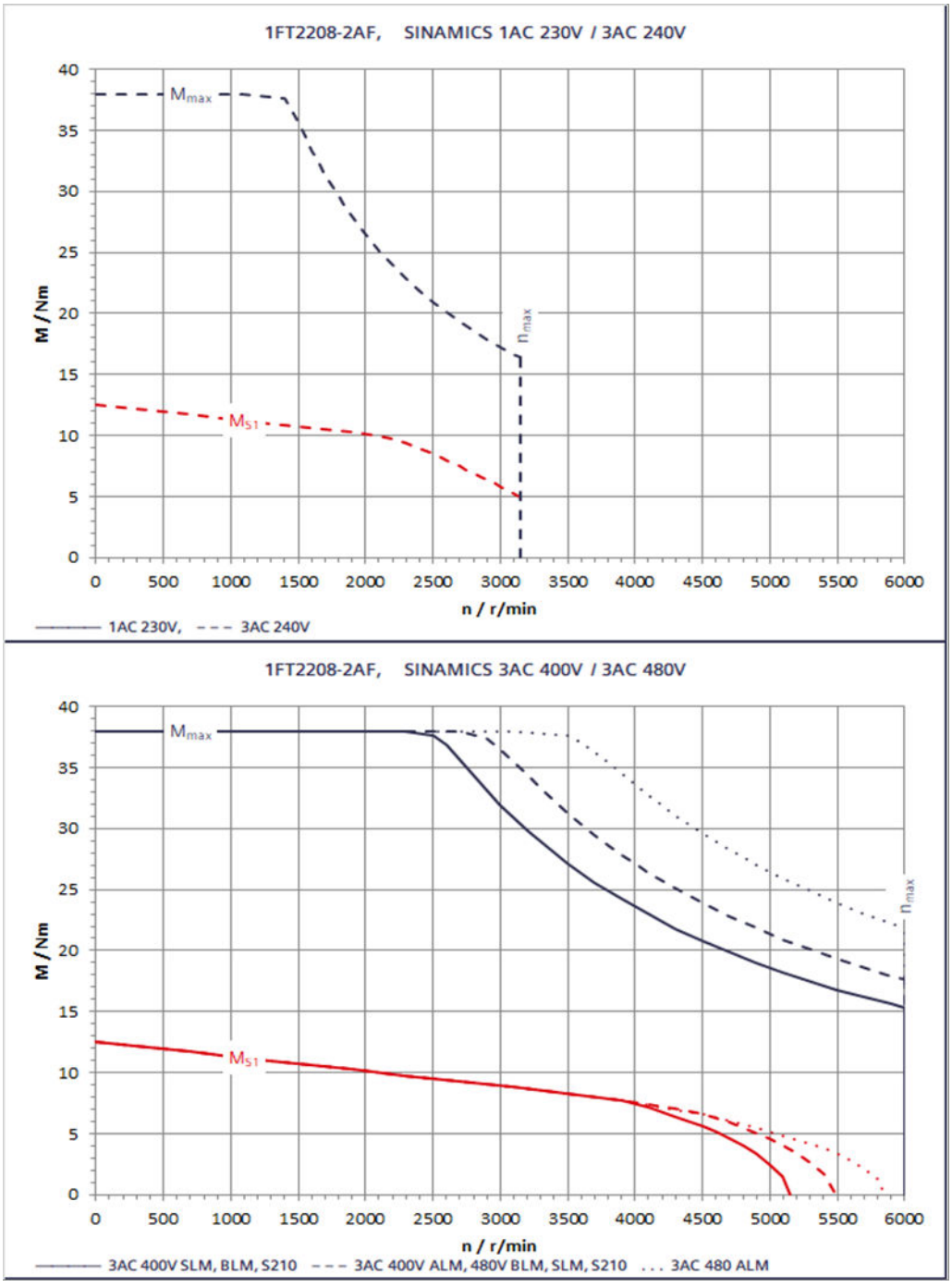
6.3.3.21 1FT2206-4AH

1FT2206-4AH three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	12
Maximum torque	M_{max}	Nm	36
Maximum current	I_{max}	A	44
Thermal time constant	T_{th}	min	24
Moment of inertia	J_{Mot}	kg cm²	15.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	16.8
Weight	m_{Mot}	kg	8.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	10.6
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4350
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	9.3
Rated current	I_{rated}	A	9.8
Rated power	P_{rated}	kW	2.4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	4.7
Rated current	I_{rated}	A	5.2
Rated power	P_{rated}	kW	2.2
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2206-4AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-4AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

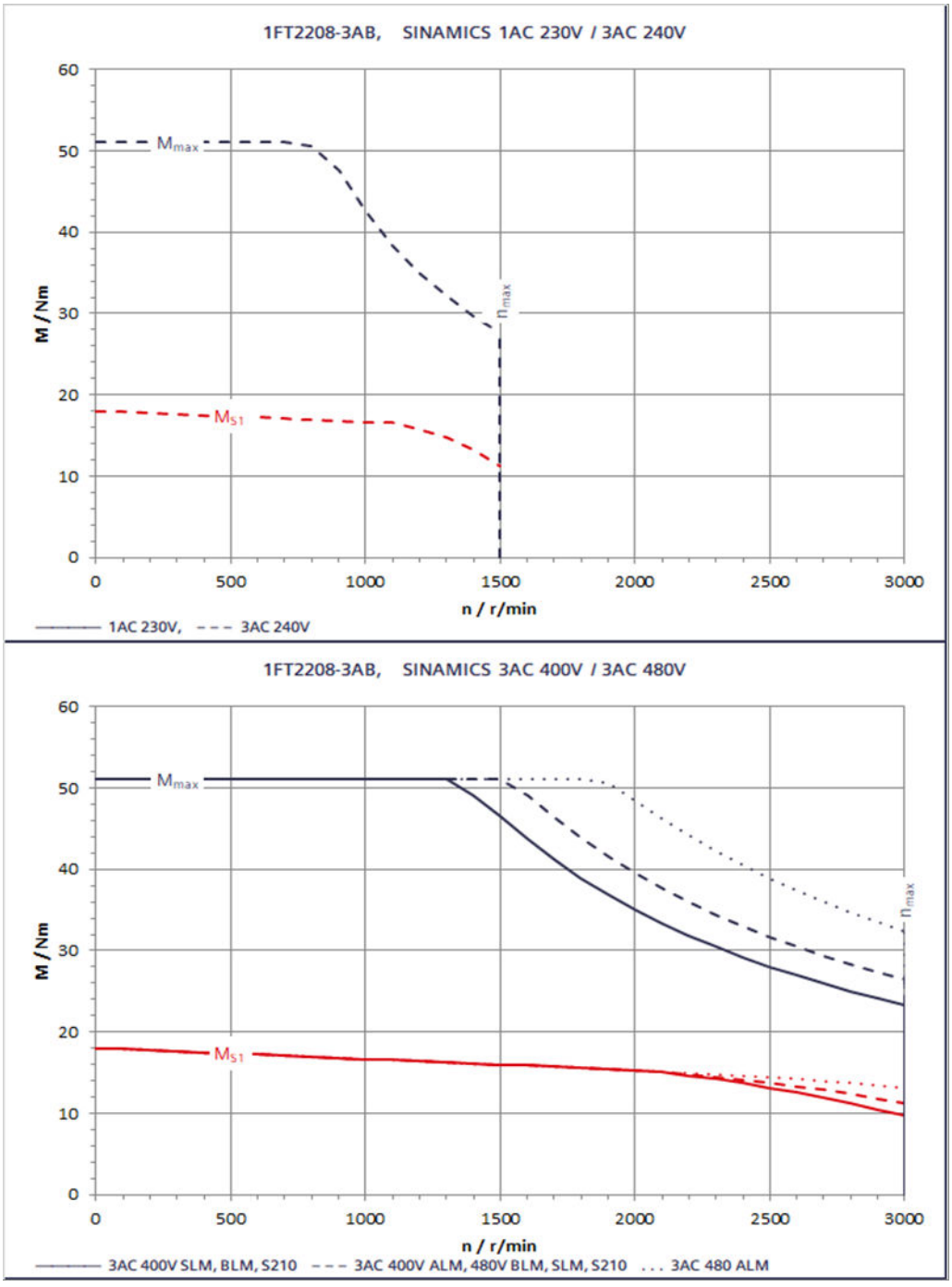
6.3.3.22 1FT2208-2AF

Three-phase servomotor 1FT2208-2AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12.5
Stall current	I_0	A	8.3
Maximum torque	M_{max}	Nm	38
Maximum current	I_{max}	A	31
Thermal time constant	T_{th}	min	30
Moment of inertia	J_{Mot}	kg cm²	22.5
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	25.5
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	28
Weight	m_{Mot}	kg	10.4
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	12.6
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	13.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3150
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	10.7
Rated current	I_{rated}	A	7.5
Rated power	P_{rated}	kW	1.68
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	9
Rated current	I_{rated}	A	6.5
Rated power	P_{rated}	kW	2.85
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2208-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2208-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

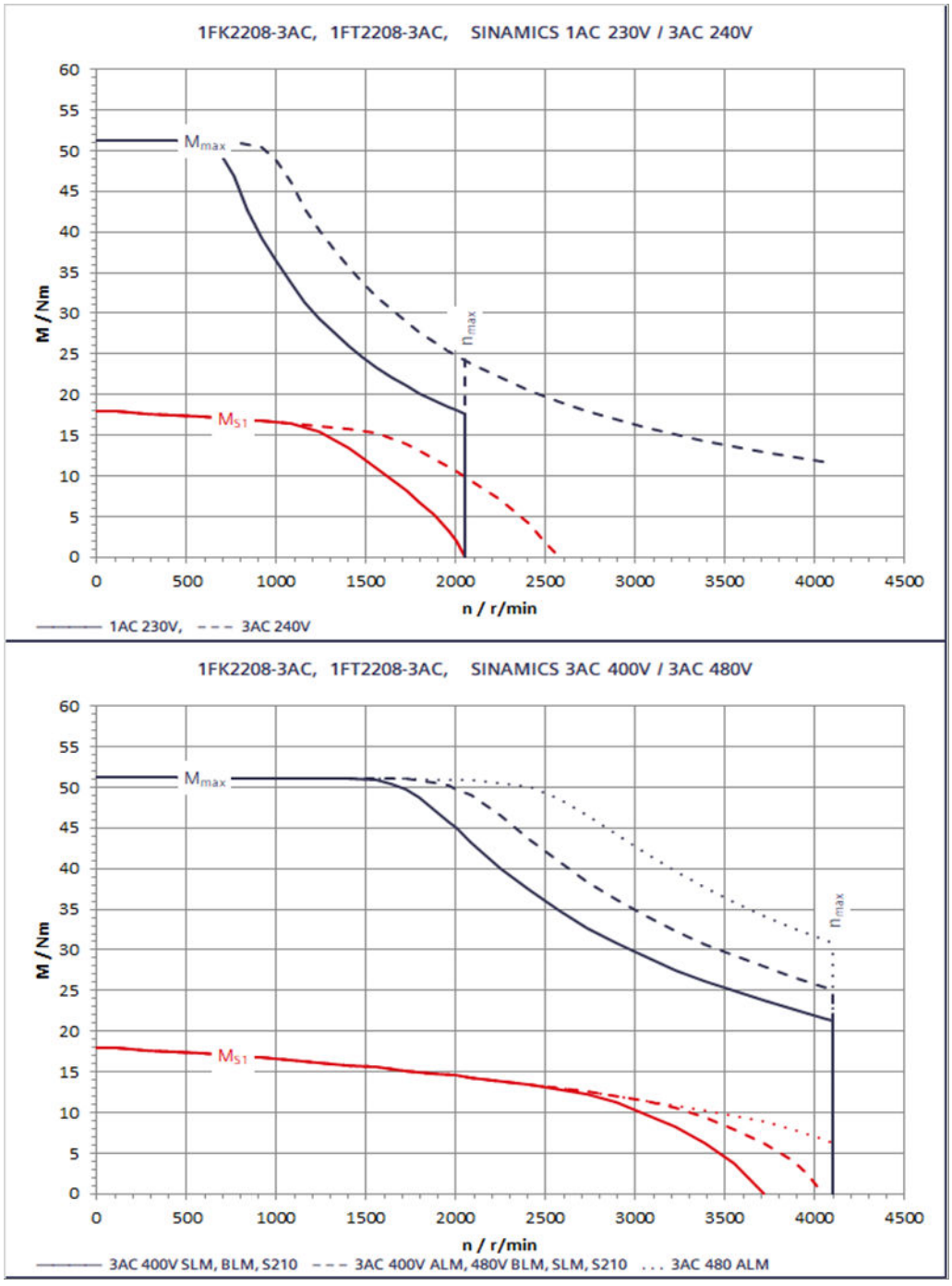
6.3.3.23 1FT2208-3AB

Three-phase servomotor 1FT2208-3AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	18
Stall current	I_0	A	6.2
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	20.5
Thermal time constant	T_{th}	min	36
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	12.6
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	14.6
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	15.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1500
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	17
Rated current	I_{rated}	A	5.95
Rated power	P_{rated}	kW	1.34
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	16
Rated current	I_{rated}	A	5.7
Rated power	P_{rated}	kW	2.5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2208-3AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2208-3AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

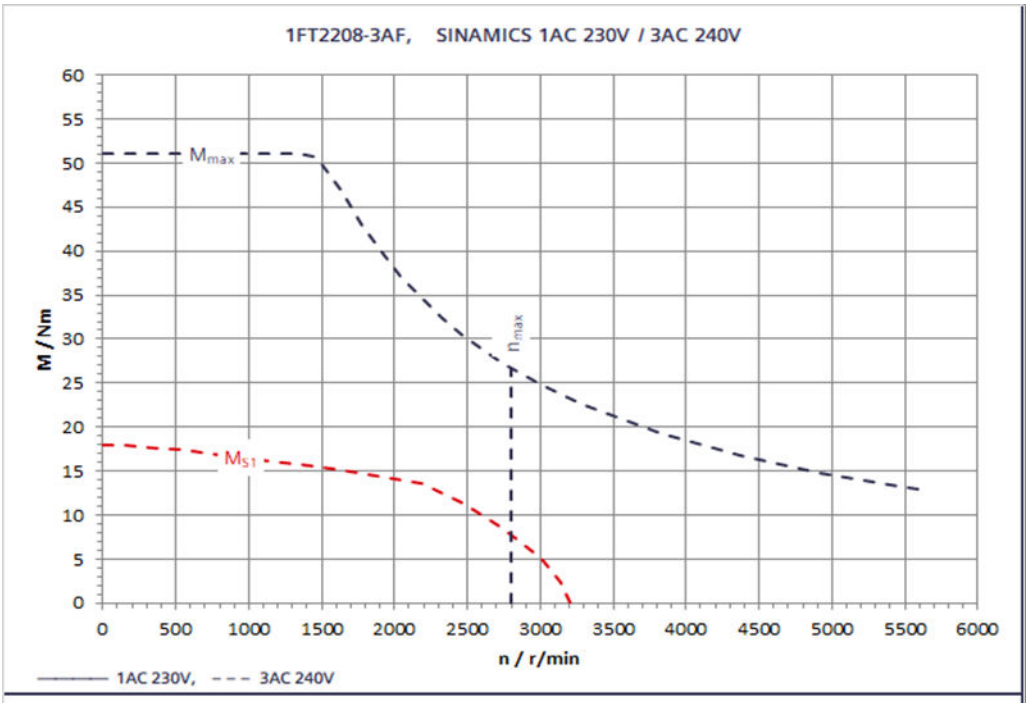
6.3.3.24 1FK2208-3AC, 1FT2208-3AC

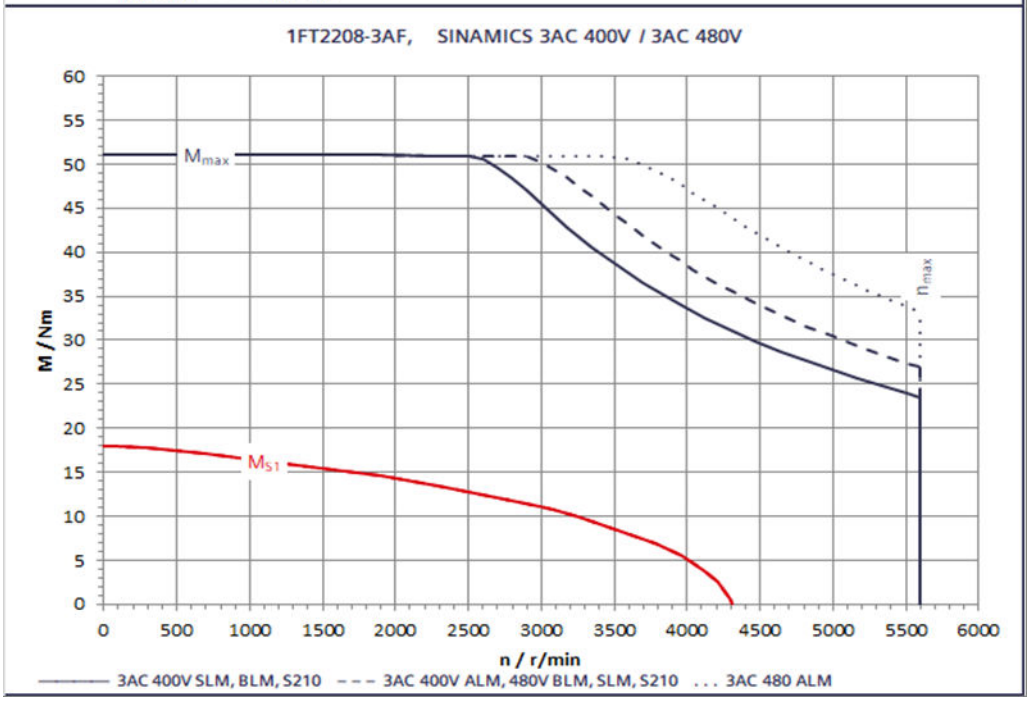
1FK2208-3AC, 1FT2208-3AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	18
Stall current	I_0	A	8.4
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	26
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	12.6
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	14.6
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	15.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2050
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	16.6
Rated current	I_{rated}	A	7.9
Rated power	P_{rated}	kW	1.74
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4100
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	14.5
Rated current	I_{rated}	A	7
Rated power	P_{rated}	kW	3.05
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2208-3AC, 1FT2208-3AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2208-3AC, 1FT2208-3AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.25 1FT2208-3AF

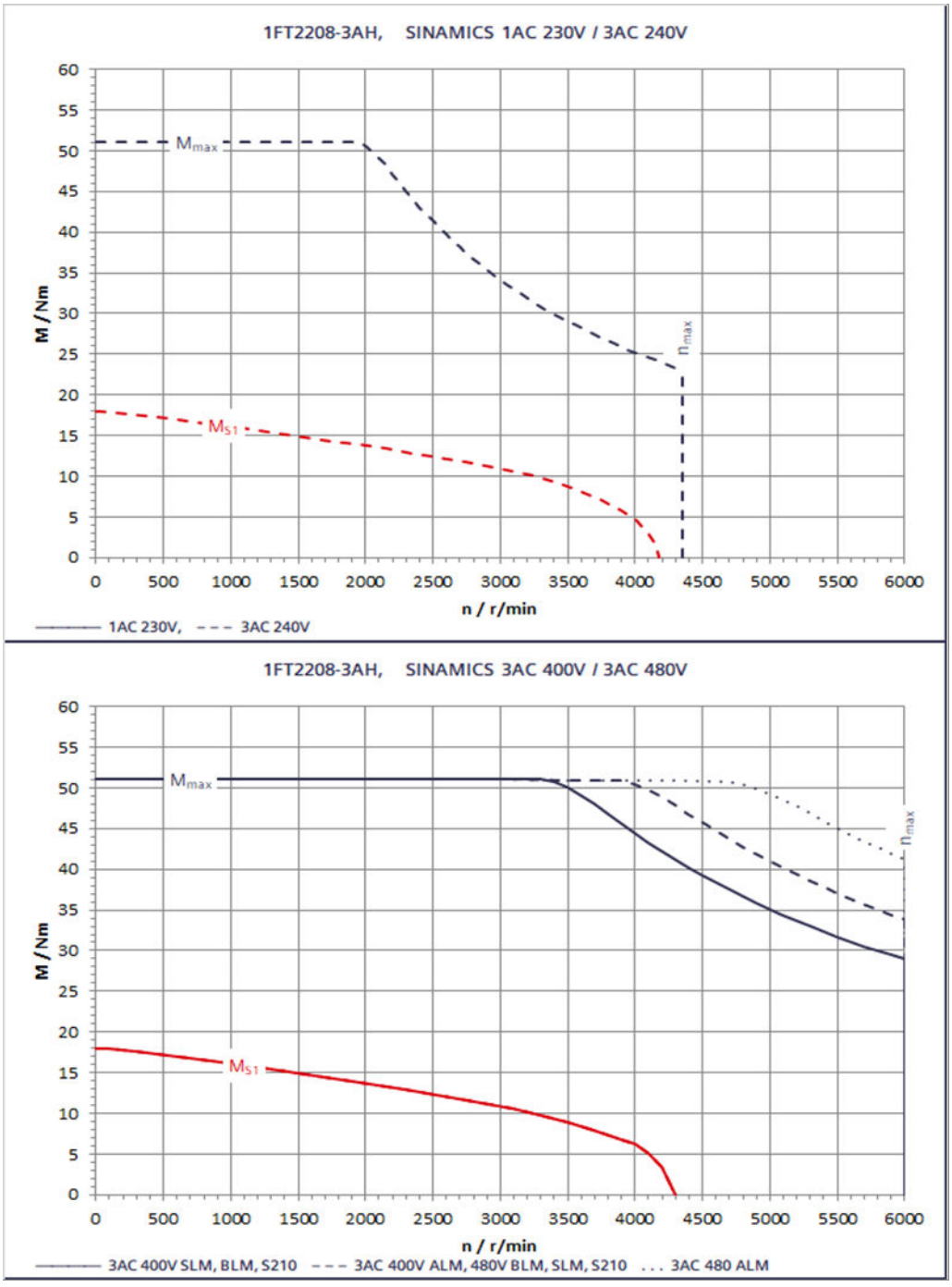
1FT2208-3AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	18
Stall current	I_0	A	11.9
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	40
Thermal time constant	T_{th}	min	26
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	12.6
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	14.6
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	15.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2800
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	15.4
Rated current	I_{rated}	A	10.4
Rated power	P_{rated}	kW	2.4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5600
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	11.1
Rated current	I_{rated}	A	7.7
Rated power	P_{rated}	kW	3.5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2208-3AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V


1FT2208-3AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

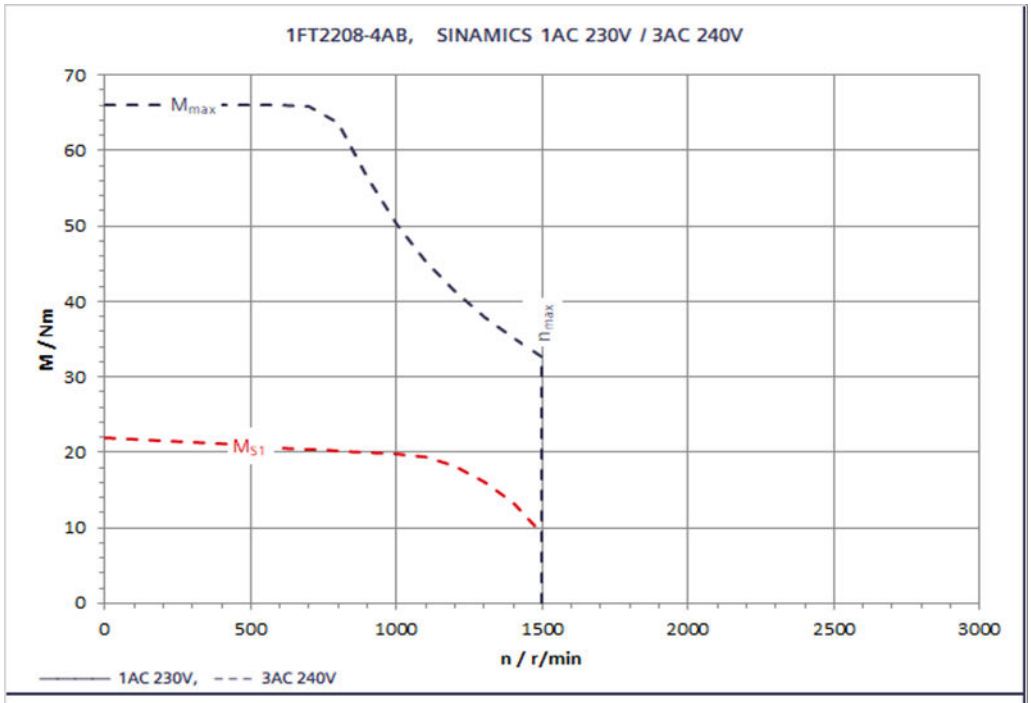
6.3.3.26 1FT2208-3AH

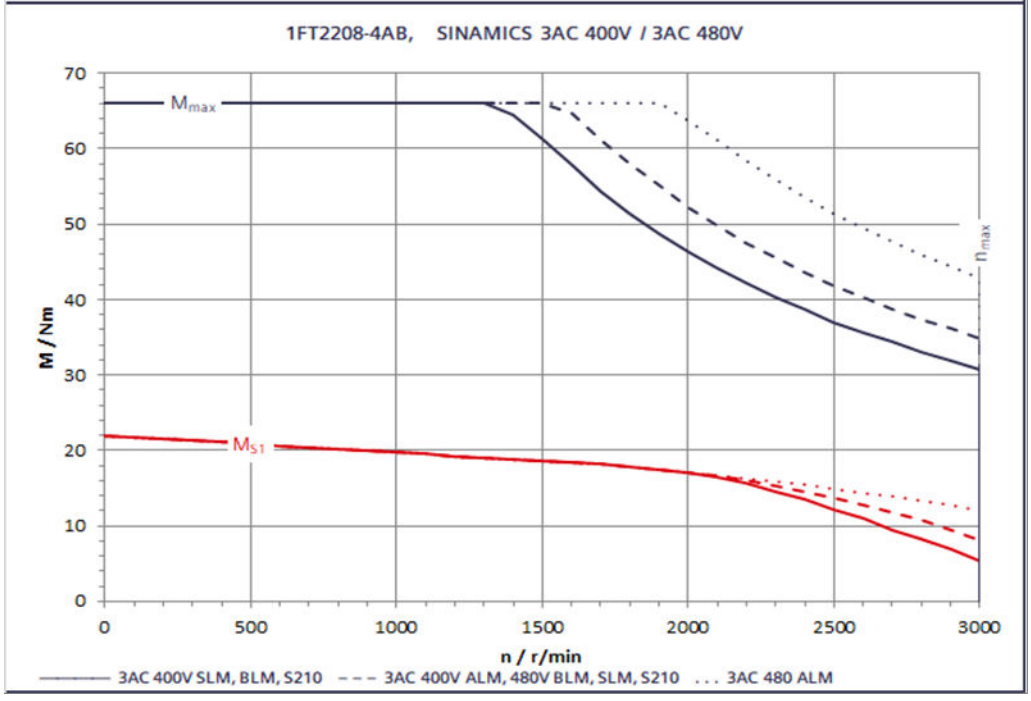
Three-phase servomotor 1FT2208-3AH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	18
Stall current	I_0	A	16.5
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	57
Thermal time constant	T_{th}	min	26
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	12.6
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	14.6
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	15.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4350
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	12.4
Rated current	I_{rated}	A	12.2
Rated power	P_{rated}	kW	3.25
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	4000
Rated torque	M_{rated}	Nm	6.2
Rated current	I_{rated}	A	6.4
Rated power	P_{rated}	kW	2.6
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		


1FT2208-3AH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-3AH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.27 1FT2208-4AB

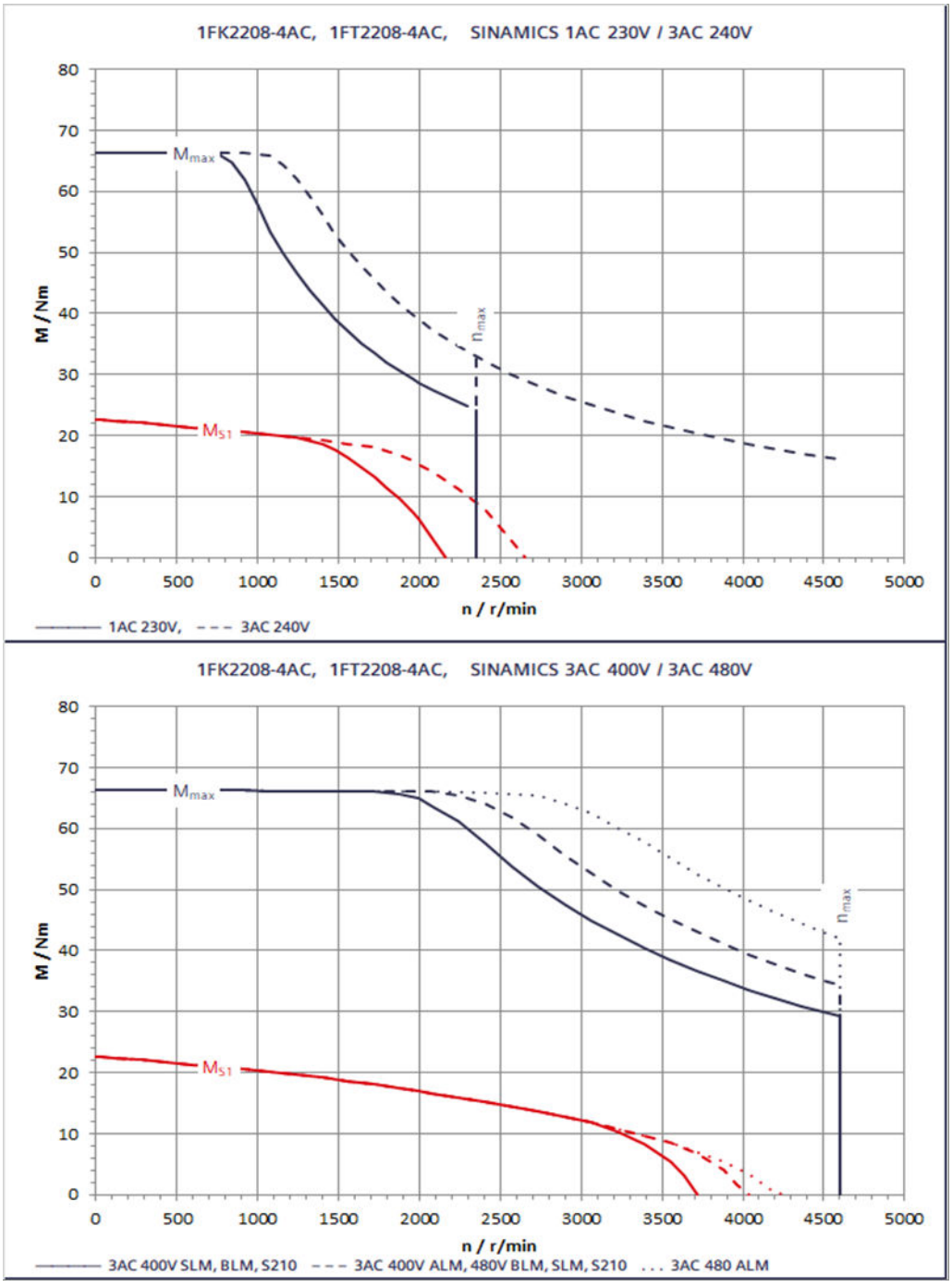
Three-phase servomotor 1FT2208-4AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	7.1
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	25
Thermal time constant	T_{th}	min	42
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	14.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	17.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1500
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	20.3
Rated current	I_{rated}	A	6.75
Rated power	P_{rated}	kW	1.59
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	18.6
Rated current	I_{rated}	A	6.4
Rated power	P_{rated}	kW	2.9
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2208-4AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V


1FT2208-4AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

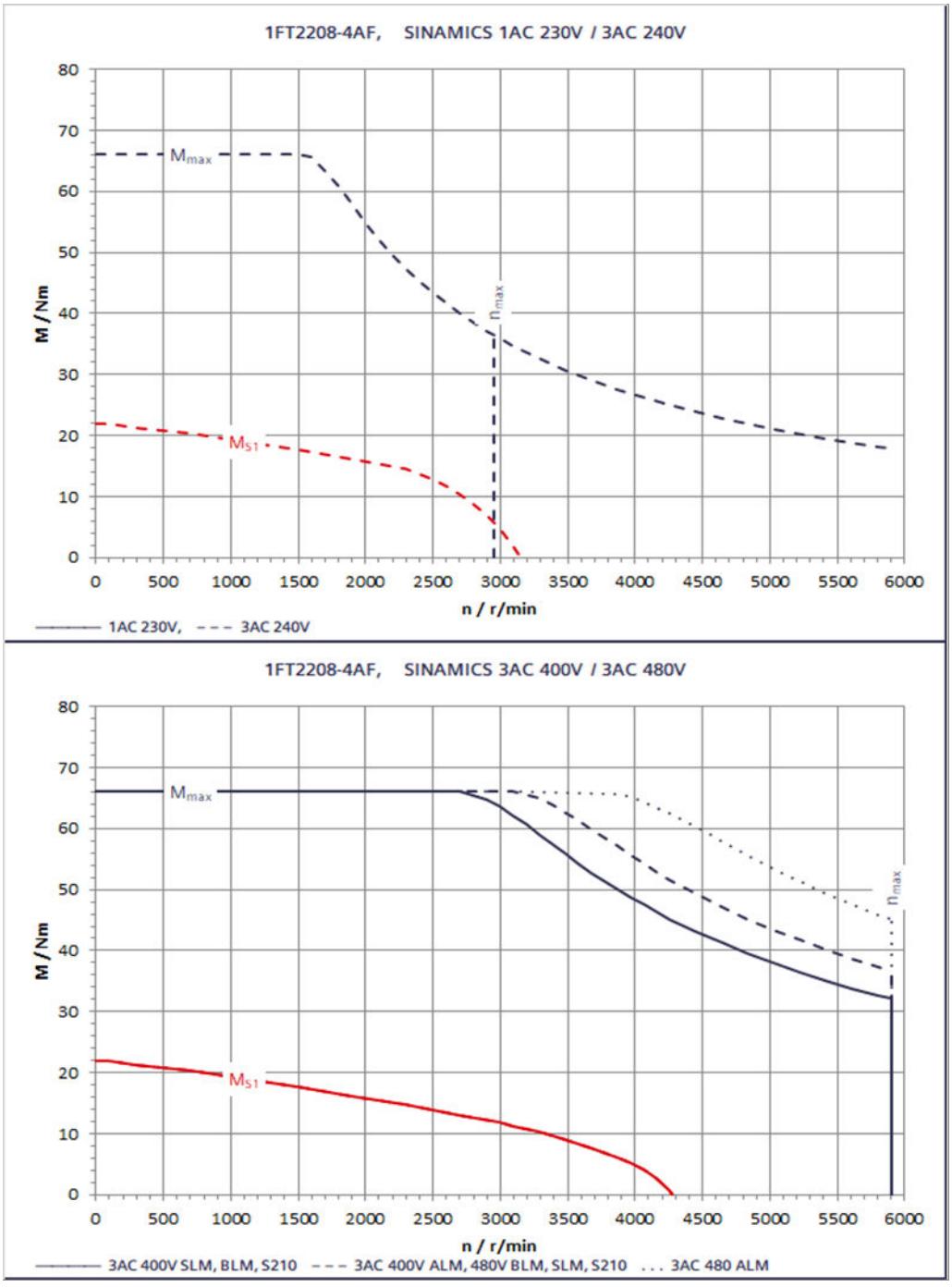
6.3.3.28 1FK2208-4AC, 1FT2208-4AC

1FK2208-4AC, 1FT2208-4AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	11.7
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	43.5
Thermal time constant	T_{th}	min	28
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	14.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	17.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2350
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	20
Rated current	I_{rated}	A	10.9
Rated power	P_{rated}	kW	2.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4600
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	17
Rated current	I_{rated}	A	9.3
Rated power	P_{rated}	kW	3.55
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		


1FK2208-4AC, 1FT2208-4AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2208-4AC, 1FT2208-4AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

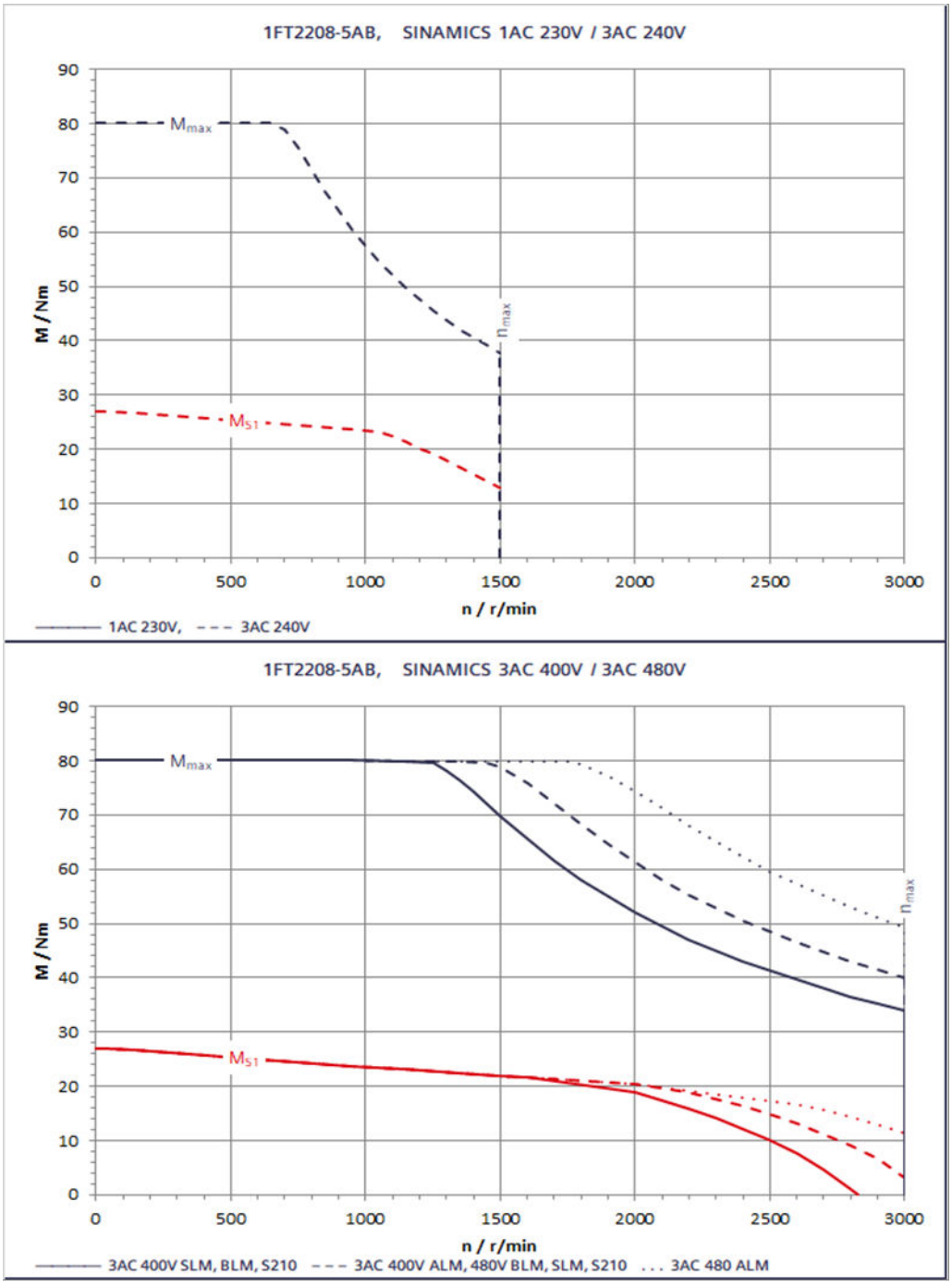
6.3.3.29 1FT2208-4AF

1FT2208-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	15
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	28
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	14.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	17.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2950
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	17.6
Rated current	I_{rated}	A	12.4
Rated power	P_{rated}	kW	2.75
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5900
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	11.8
Rated current	I_{rated}	A	8.5
Rated power	P_{rated}	kW	3.7
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2208-4AF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-4AF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

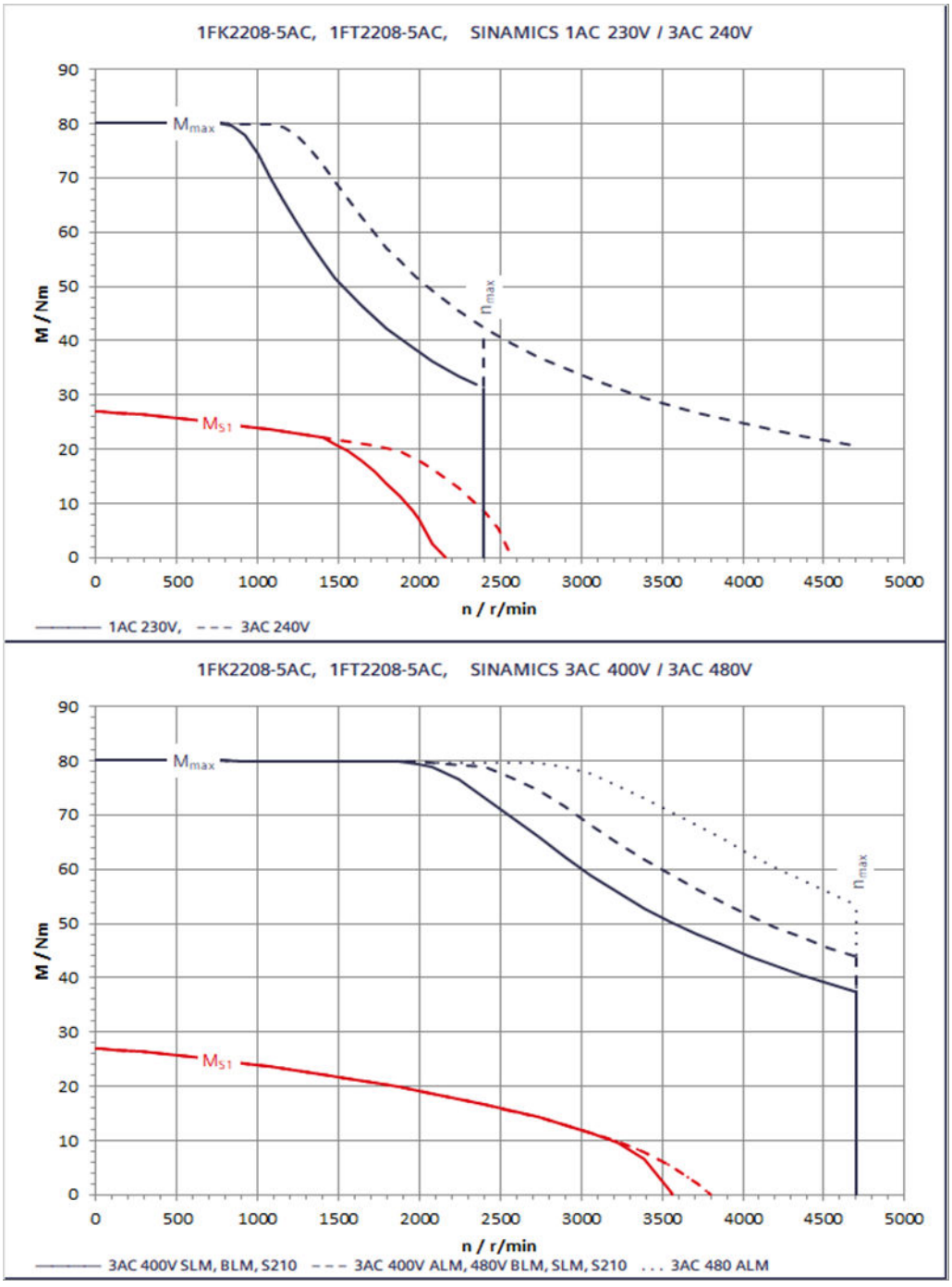
6.3.3.30 1FT2208-5AB

Three-phase servomotor 1FT2208-5AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	27
Stall current	I_0	A	8.6
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	30
Moment of inertia	J_{Mot}	kg cm²	48.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	53.6
Weight	m_{Mot}	kg	16.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	19.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1500
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	24.5
Rated current	I_{rated}	A	7.9
Rated power	P_{rated}	kW	1.92
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	22
Rated current	I_{rated}	A	7.2
Rated power	P_{rated}	kW	3.45
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2208-5AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2208-5AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

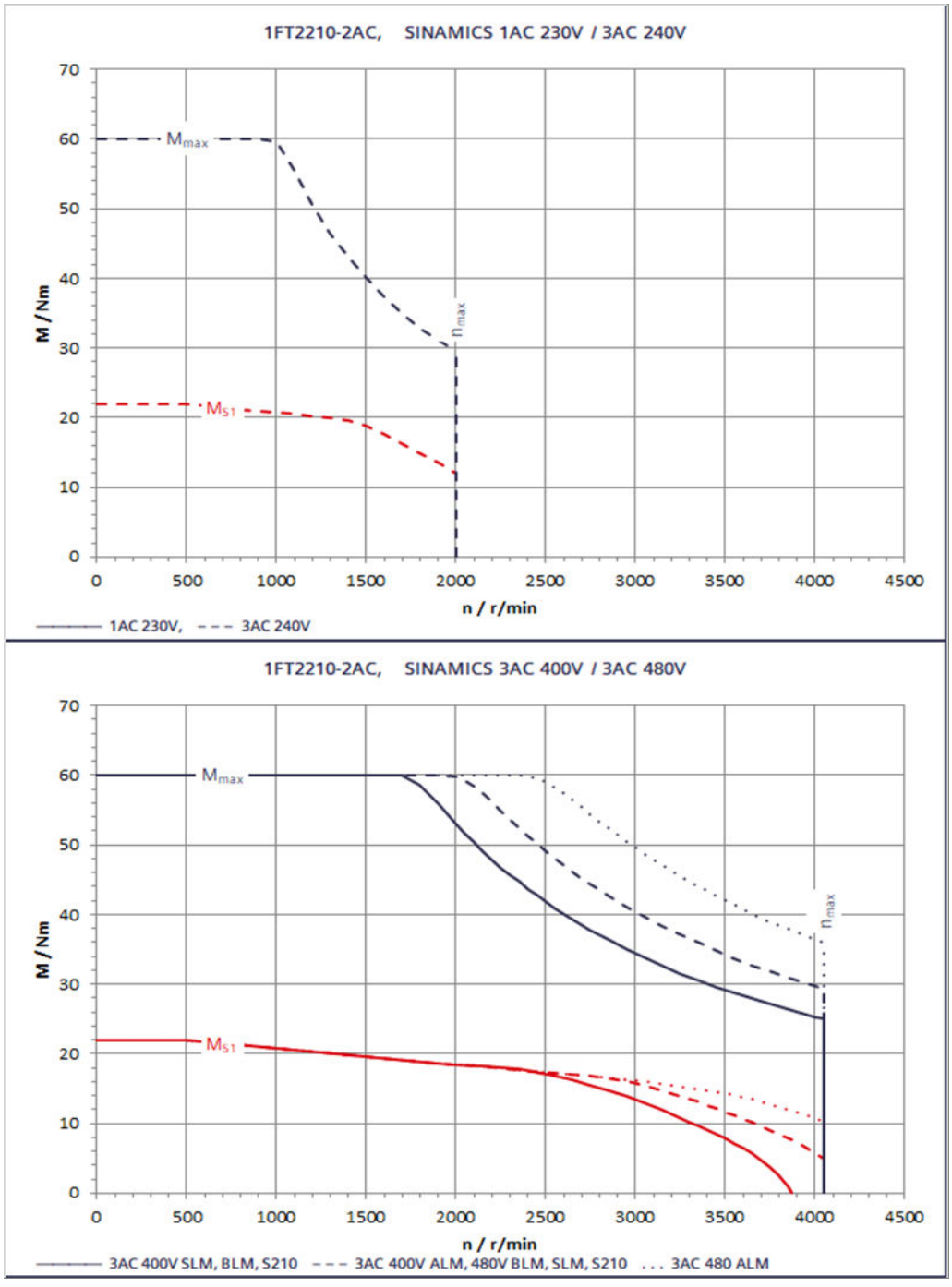
6.3.3.31 1FK2208-5AC, 1FT2208-5AC

1FK2208-5AC, 1FT2208-5AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	27
Stall current	I_0	A	14.6
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	51.5
Thermal time constant	T_{th}	min	30
Moment of inertia	J_{Mot}	kg cm²	48.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	53.6
Weight	m_{Mot}	kg	16.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	19.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2400
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	23.5
Rated current	I_{rated}	A	13.2
Rated power	P_{rated}	kW	2.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4700
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	19.1
Rated current	I_{rated}	A	10.8
Rated power	P_{rated}	kW	4
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FK2208-5AC, 1FT2208-5AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2208-5AC, 1FT2208-5AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

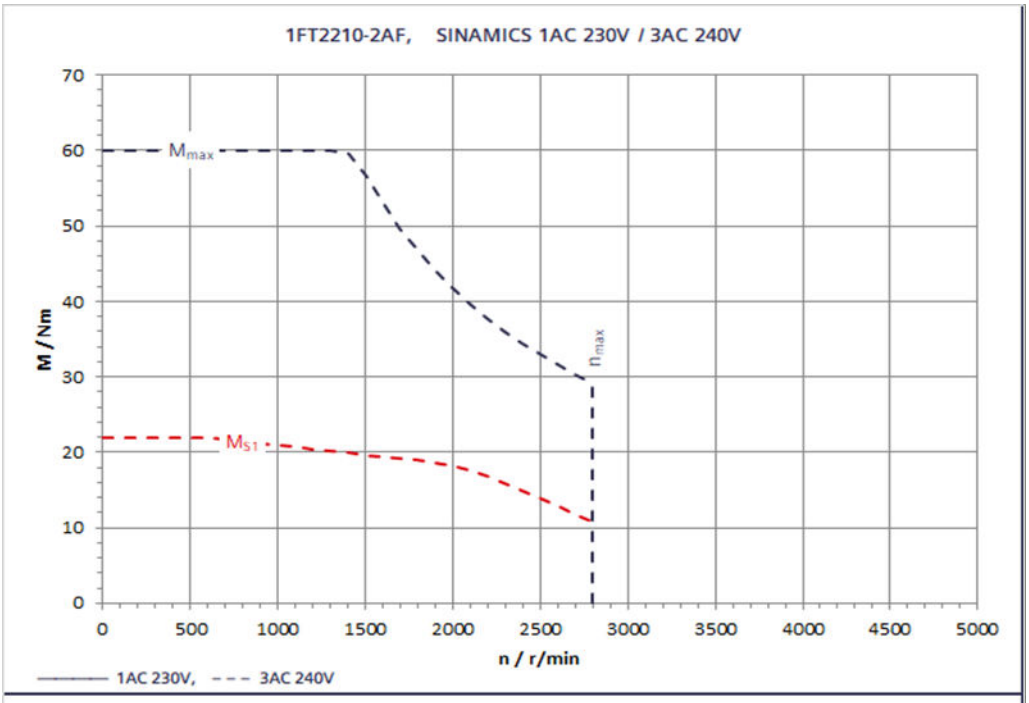
6.3.3.32 1FT2210-2AC

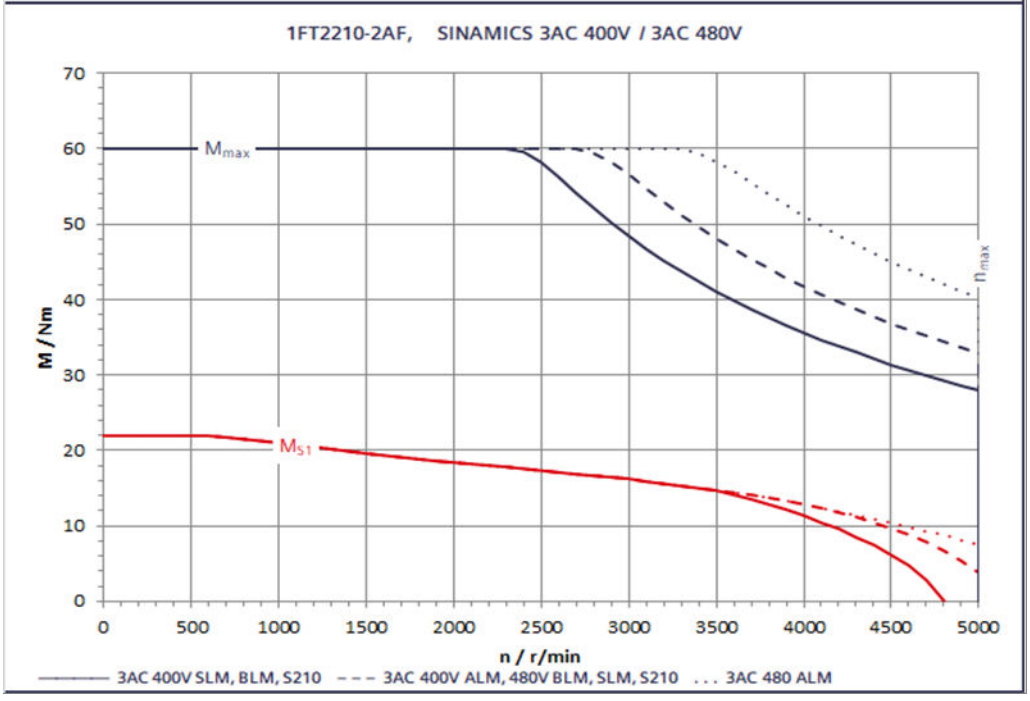
Three-phase servomotor 1FT2210-2AC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	9.3
Maximum torque	M_{max}	Nm	60
Maximum current	I_{max}	A	32
Thermal time constant	T_{th}	min	39
Moment of inertia	J_{Mot}	kg cm²	61.7
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	67.7
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	77.3
Weight	m_{Mot}	kg	16.7
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	20.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	21.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2000
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	20.5
Rated current	I_{rated}	A	9
Rated power	P_{rated}	kW	2.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4050
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	18.4
Rated current	I_{rated}	A	8.1
Rated power	P_{rated}	kW	3.85
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FT2210-2AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-2AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.33 1FT2210-2AF

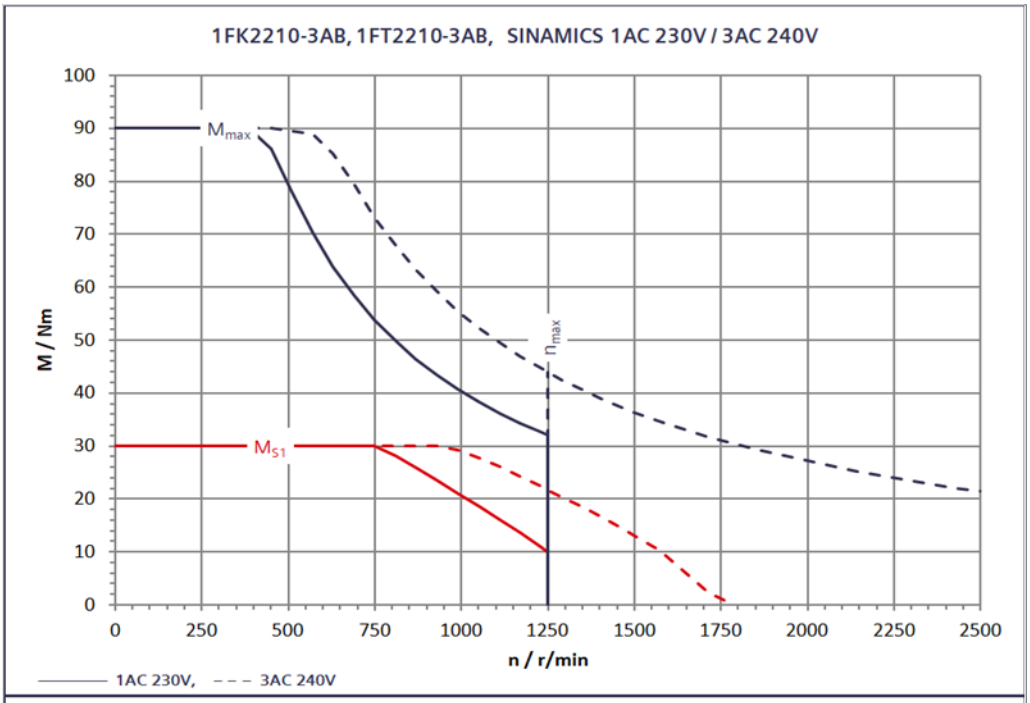
Three-phase servomotor 1FT2210-2AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	12.9
Maximum torque	M_{max}	Nm	60
Maximum current	I_{max}	A	44.5
Thermal time constant	T_{th}	min	39
Moment of inertia	J_{Mot}	kg cm²	61.7
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	67.7
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	77.3
Weight	m_{Mot}	kg	16.7
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	20.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	21.4
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2800
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	19.6
Rated current	I_{rated}	A	11.9
Rated power	P_{rated}	kW	3.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	16.2
Rated current	I_{rated}	A	10.1
Rated power	P_{rated}	kW	5.1
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		

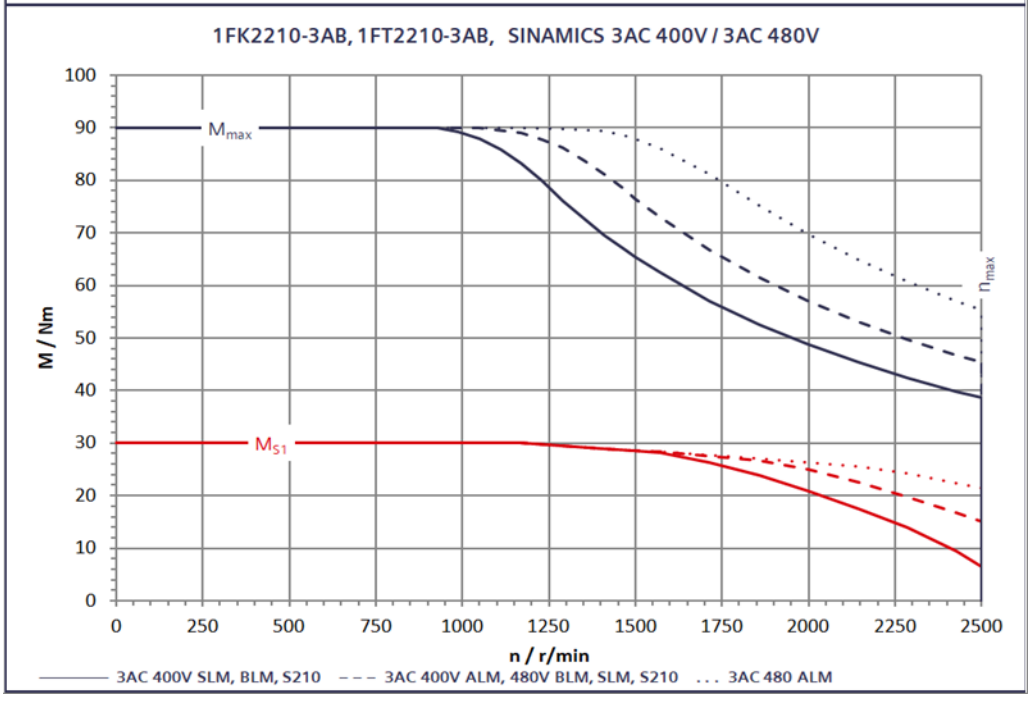

1FT2210-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_max
M_S1
n_max
1AC 230V, 3AC 240V


1FT2210-2AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_max
M_S1
n_max
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.34 1FK2210-3AB, 1FT2210-3AB

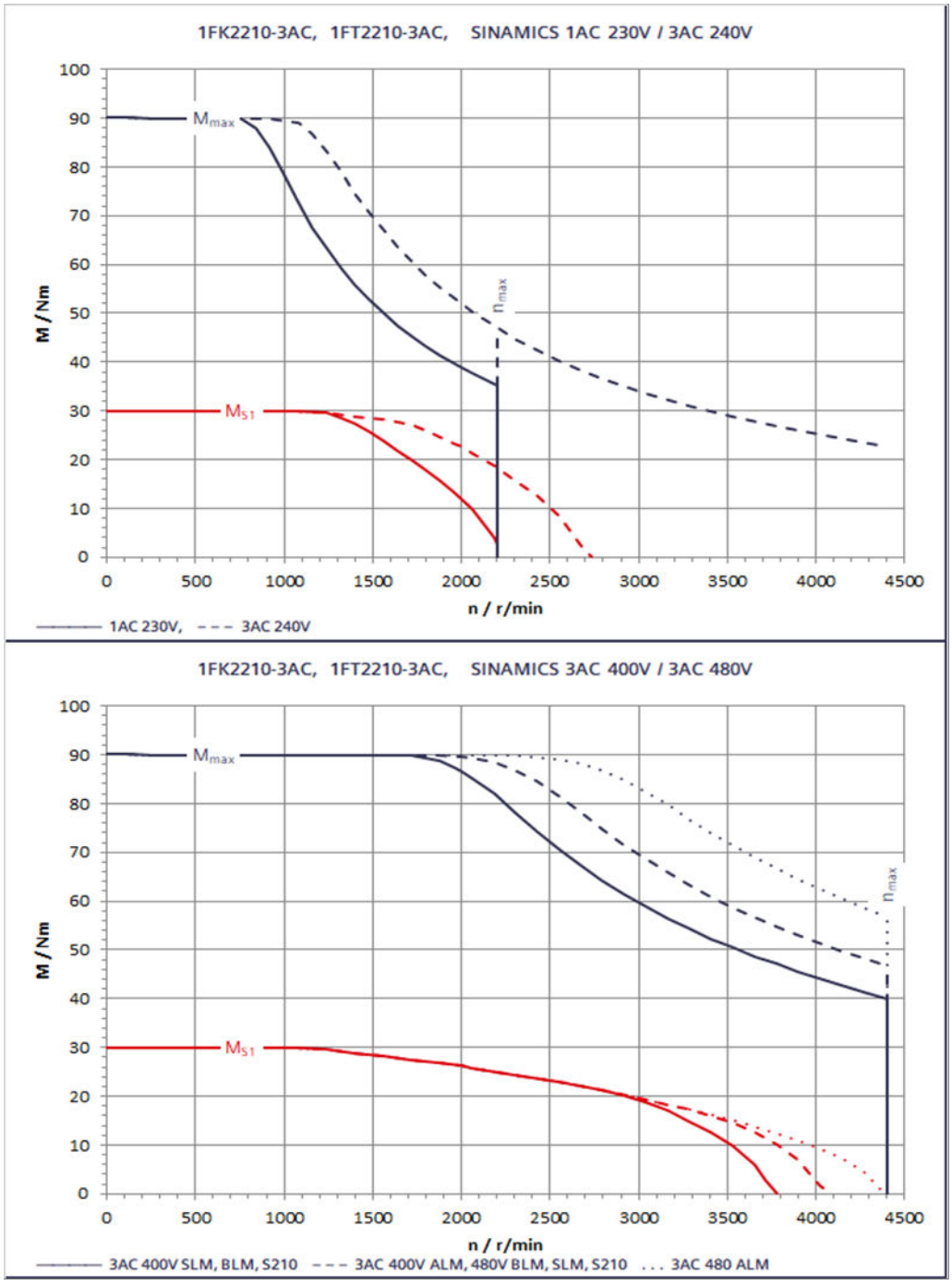
1FK2210-3AB, 1FT2210-3AB three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	30
Stall current	I_0	A	8.5
Maximum torque	M_{max}	Nm	90
Maximum current	I_{max}	A	31.5
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	88.8
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	94.8
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	104
Weight	m_{Mot}	kg	22
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	25
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	26.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1250
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	30
Rated current	I_{rated}	A	8.6
Rated power	P_{rated}	kW	2.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2500
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	28.5
Rated current	I_{rated}	A	8.3
Rated power	P_{rated}	kW	4.5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2210-3AB, 1FT2210-3AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, – – – 3AC 240V


1FK2210-3AB, 1FT2210-3AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210 – – – 3AC 400V ALM, 480V BLM, SLM, S210 . . . 3AC 480 ALM

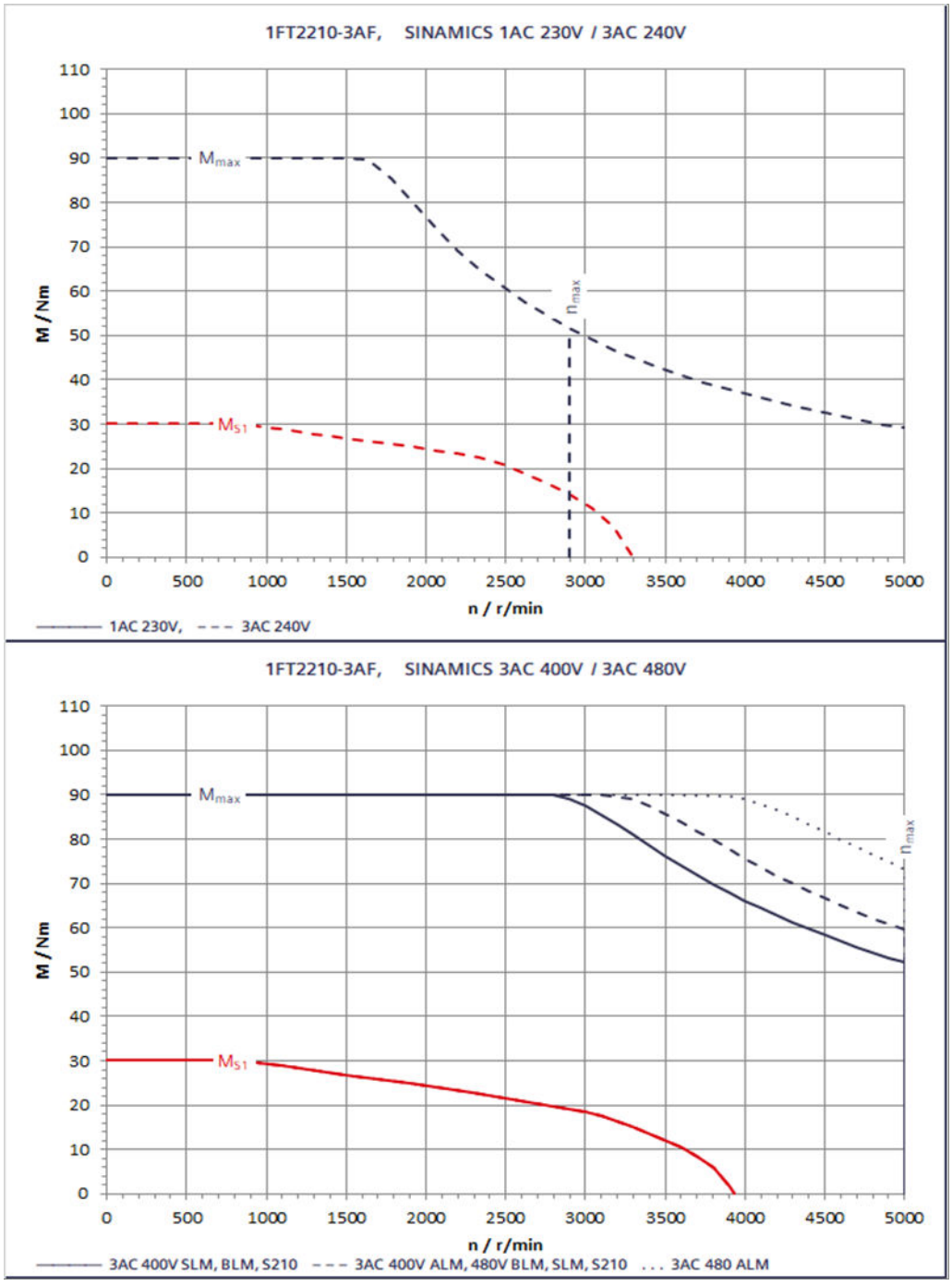
6.3.3.35 1FK2210-3AC, 1FT2210-3AC

1FK2210-3AC, 1FT2210-3AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	30
Stall current	I_0	A	15
Maximum torque	M_{max}	Nm	90
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	88.8
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	94.8
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	104
Weight	m_{Mot}	kg	22
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	25
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	26.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2200
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	30
Rated current	I_{rated}	A	15.5
Rated power	P_{rated}	kW	3.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4400
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	26
Rated current	I_{rated}	A	13.5
Rated power	P_{rated}	kW	5.5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FK2210-3AC, 1FT2210-3AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2210-3AC, 1FT2210-3AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

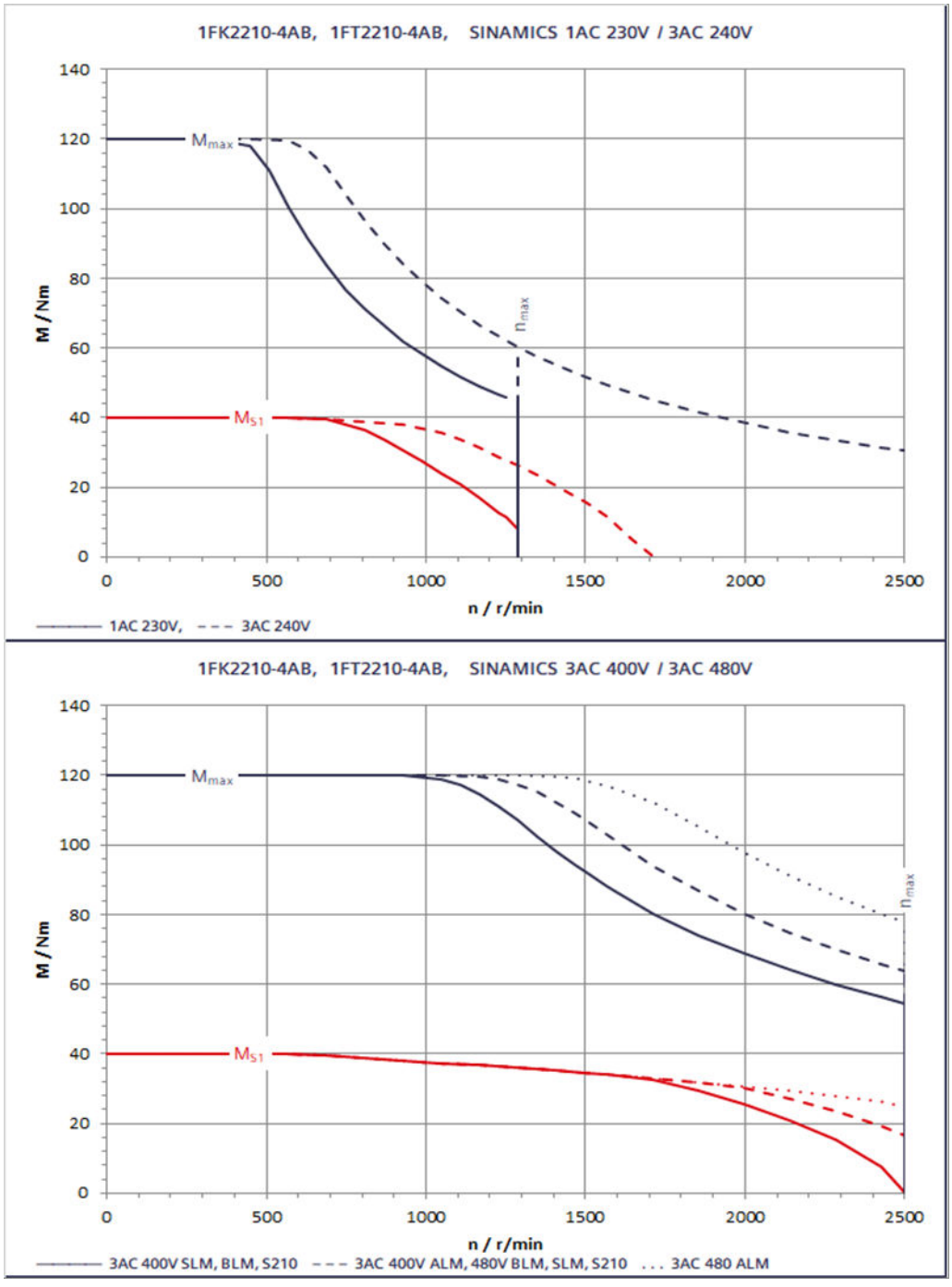
6.3.3.36 1FT2210-3AF

1FT2210-3AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	30
Stall current	I_0	A	19.8
Maximum torque	M_{max}	Nm	90
Maximum current	I_{max}	A	74
Thermal time constant	T_{th}	min	33
Moment of inertia	J_{Mot}	kg cm²	88.8
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	94.8
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	104
Weight	m_{Mot}	kg	22
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	25
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	26.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2900
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	27
Rated current	I_{rated}	A	19.1
Rated power	P_{rated}	kW	4.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	18.5
Rated current	I_{rated}	A	13.6
Rated power	P_{rated}	kW	5.8
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		


1FT2210-3AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-3AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

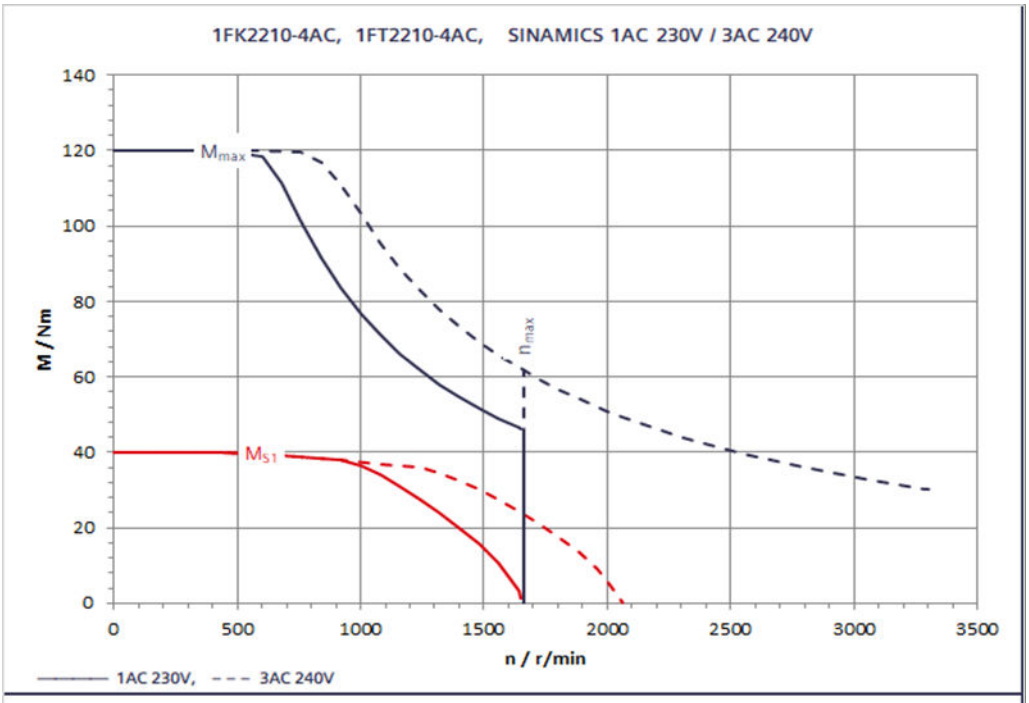
6.3.3.37 1FK2210-4AB, 1FT2210-4AB

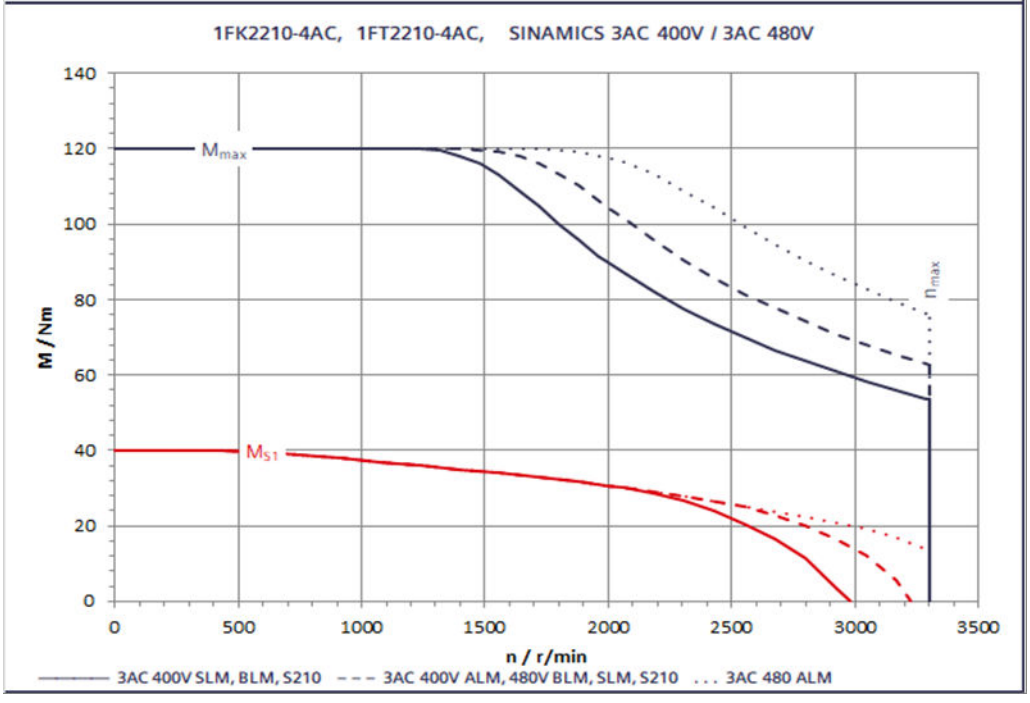
1FK2210-4AB, 1FT2210-4AB three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	11.8
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	43.5
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	27
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	31
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1290
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	39
Rated current	I_{rated}	A	11.6
Rated power	P_{rated}	kW	3.05
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2500
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	34.5
Rated current	I_{rated}	A	10.4
Rated power	P_{rated}	kW	5.4
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FK2210-4AB, 1FT2210-4AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2210-4AB, 1FT2210-4AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.38 1FK2210-4AC, 1FT2210-4AC

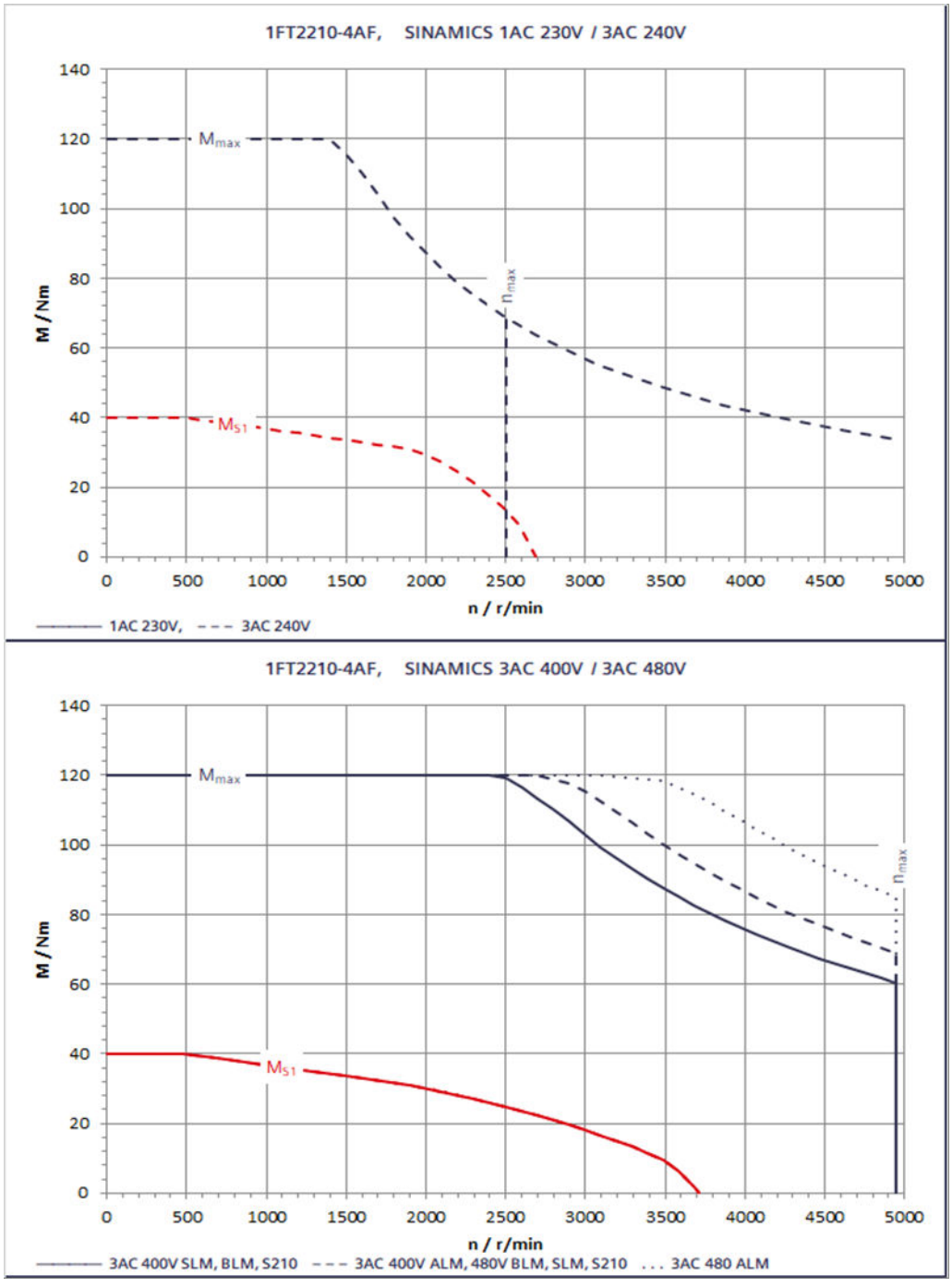
1FK2210-4AC, 1FT2210-4AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	15
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	27
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	31
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1660
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	37
Rated current	I_{rated}	A	14.3
Rated power	P_{rated}	kW	3.9
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	30.5
Rated current	I_{rated}	A	11.8
Rated power	P_{rated}	kW	6.4
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FK2210-4AC, 1FT2210-4AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FK2210-4AC, 1FT2210-4AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

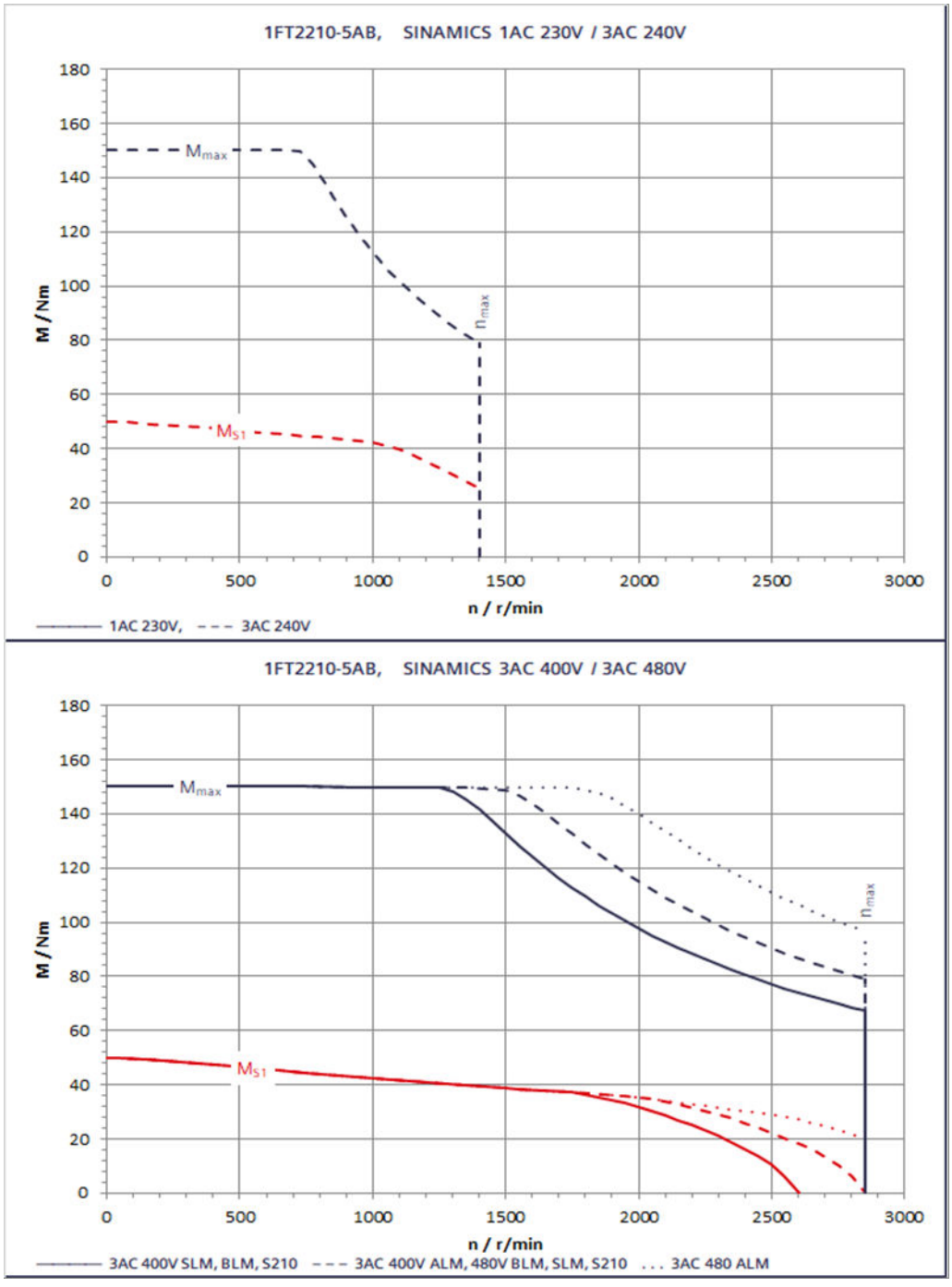
6.3.3.39 1FT2210-4AF

1FT2210-4AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	22.5
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	84
Thermal time constant	T_{th}	min	35
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	27
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	31
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2500
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	33.5
Rated current	I_{rated}	A	19.8
Rated power	P_{rated}	kW	5.3
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4950
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	18
Rated current	I_{rated}	A	11.1
Rated power	P_{rated}	kW	5.7
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		


1FT2210-4AF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-4AF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

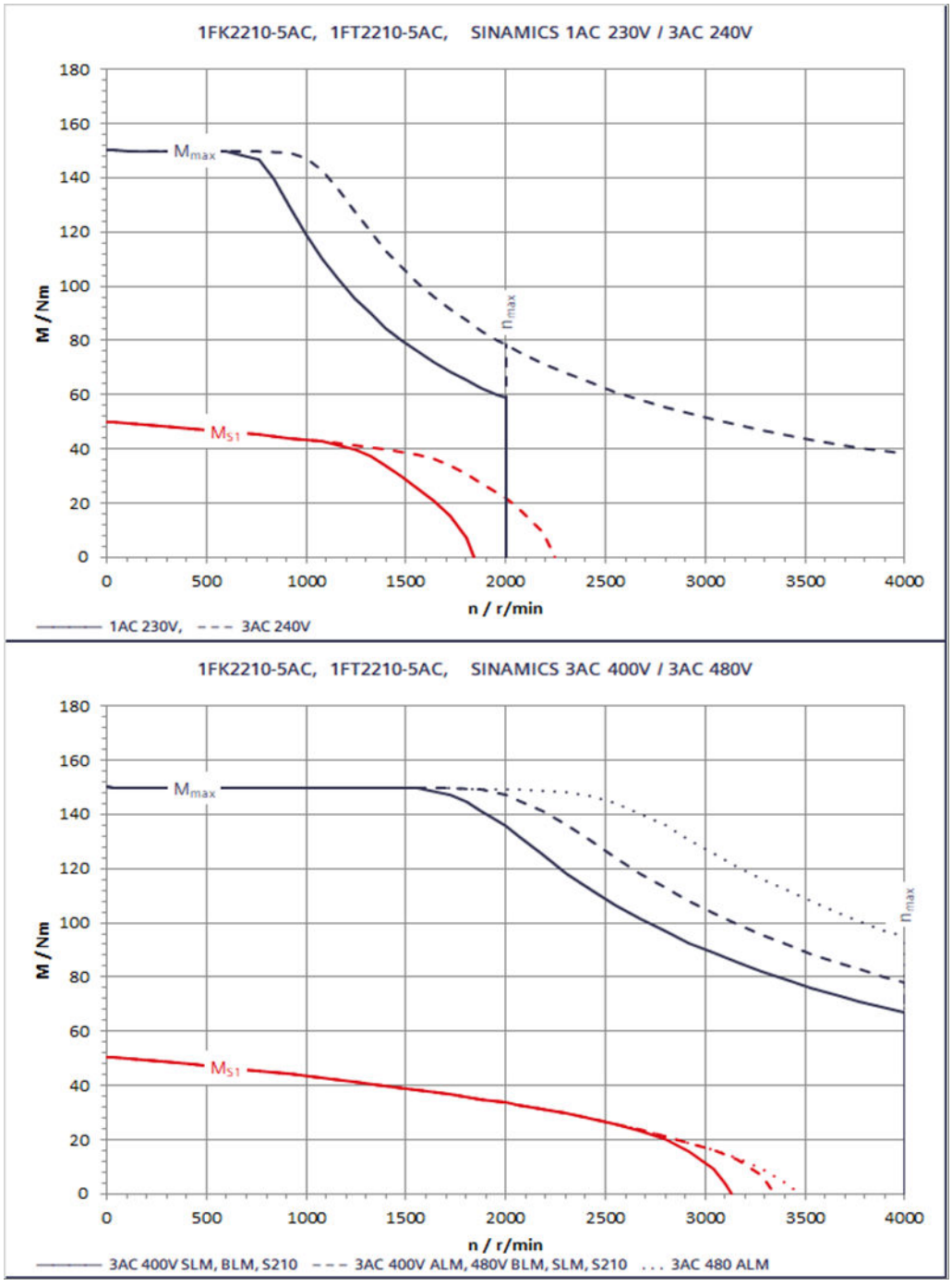
6.3.3.40 1FT2210-5AB

Three-phase servomotor 1FT2210-5AB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	50
Stall current	I_0	A	15
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	32
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	36
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1400
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	44.5
Rated current	I_{rated}	A	13.6
Rated power	P_{rated}	kW	3.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	39
Rated current	I_{rated}	A	12.1
Rated power	P_{rated}	kW	6.1
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		


1FT2210-5AB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-5AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

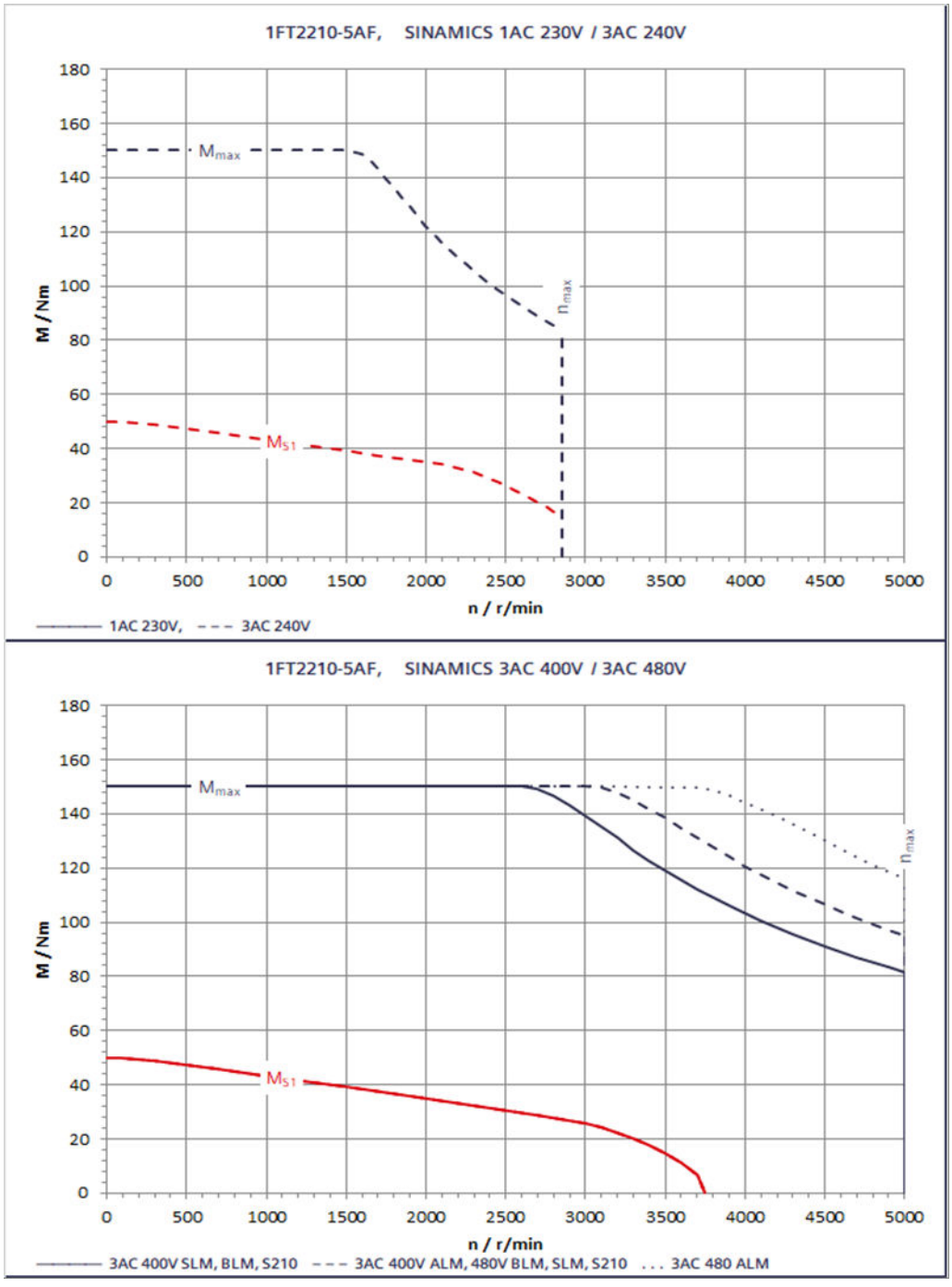
6.3.3.41 1FK2210-5AC, 1FT2210-5AC

1FK2210-5AC, 1FT2210-5AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	50
Stall current	I_0	A	22.5
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	83
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	32
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	36
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2000
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	43
Rated current	I_{rated}	A	19.9
Rated power	P_{rated}	kW	4.55
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4000
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	33.5
Rated current	I_{rated}	A	15.8
Rated power	P_{rated}	kW	7.1
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		


1FK2210-5AC, 1FT2210-5AC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FK2210-5AC, 1FT2210-5AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.3.42 1FT2210-5AF

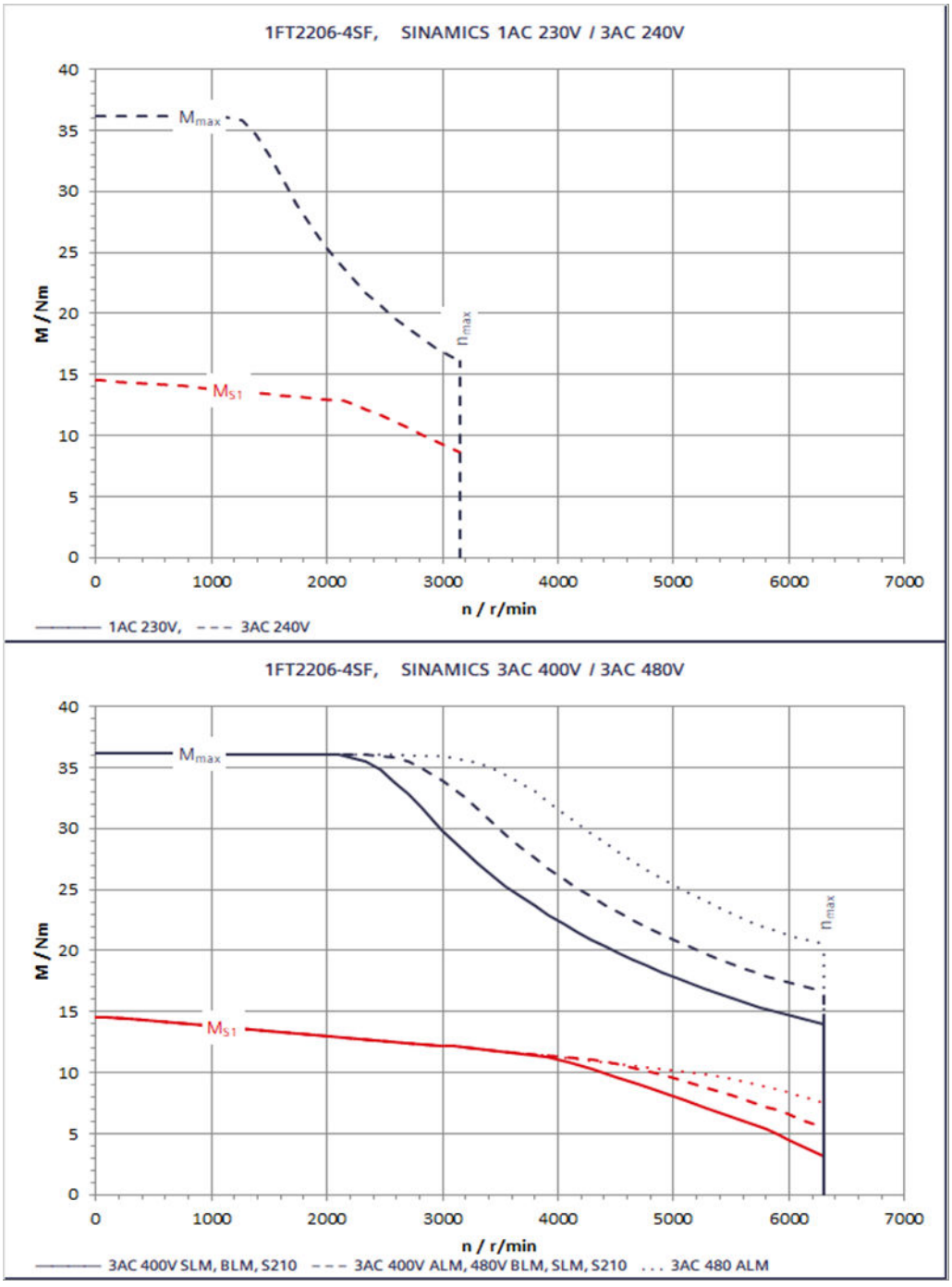
Three-phase servomotor 1FT2210-5AF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	50
Stall current	I_0	A	30
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	111
Thermal time constant	T_{th}	min	37
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	32
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	36
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	39
Rated current	I_{rated}	A	24
Rated power	P_{rated}	kW	6.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	26
Rated current	I_{rated}	A	16.7
Rated power	P_{rated}	kW	8.2
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 6 mm²		


1FT2210-5AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-5AF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.4 Compact, force-ventilated

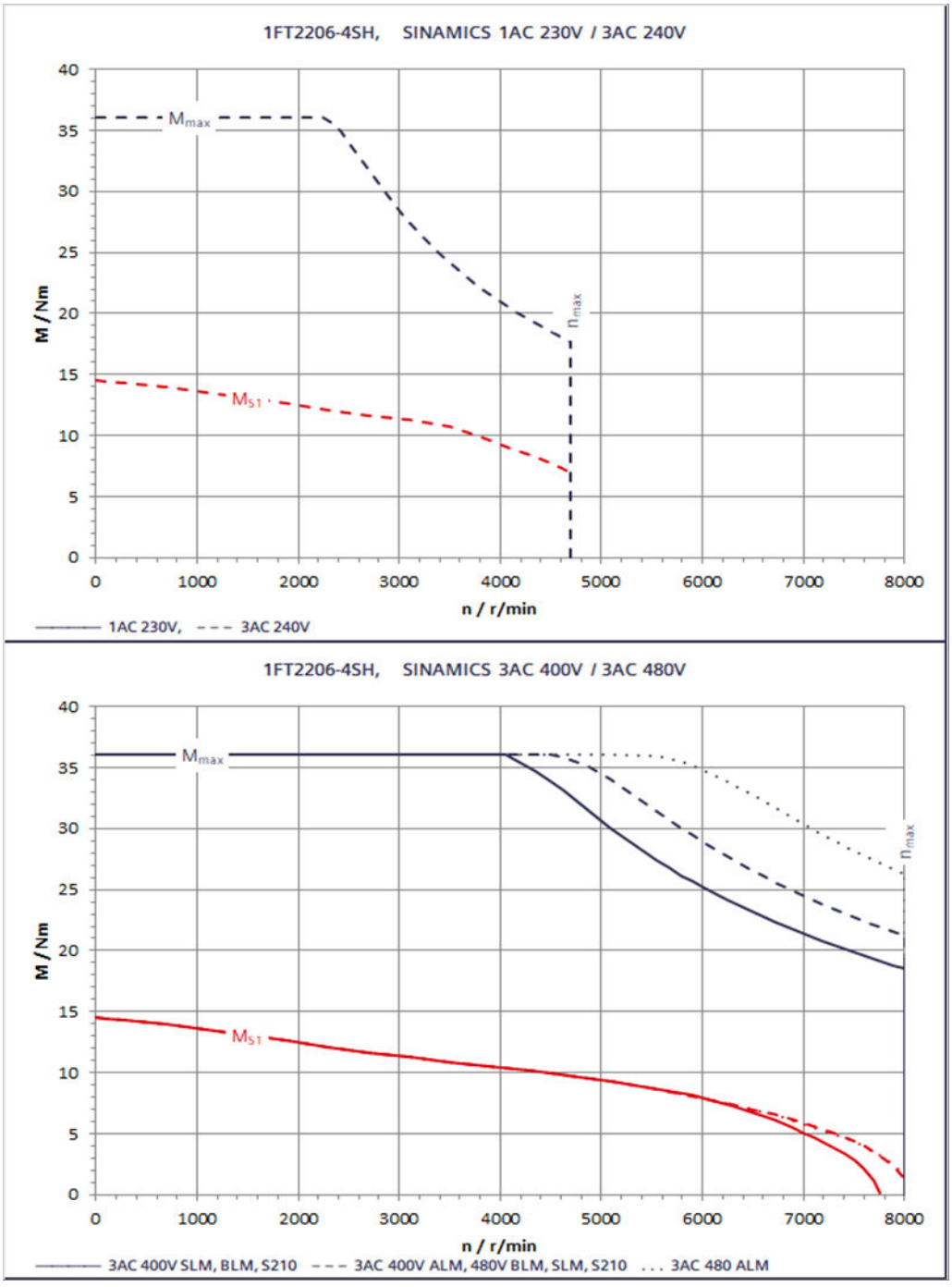
6.3.4.1 1FK2206-4SF

1FT2206-4SF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	14.5
Stall current	I_0	A	9.6
Maximum torque	M_{max}	Nm	36
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	14
Moment of inertia	J_{Mot}	kg cm²	15.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	16.8
Weight	m_{Mot}	kg	11
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	12.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3150
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	13.4
Rated current	I_{rated}	A	9.1
Rated power	P_{rated}	kW	2.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6300
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	12.2
Rated current	I_{rated}	A	8.6
Rated power	P_{rated}	kW	3.85
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2206-4SF, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
Mmax
MS1
nmax
1AC 230V, 3AC 240V
1FT2206-4SF, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
Mmax
MS1
nmax
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

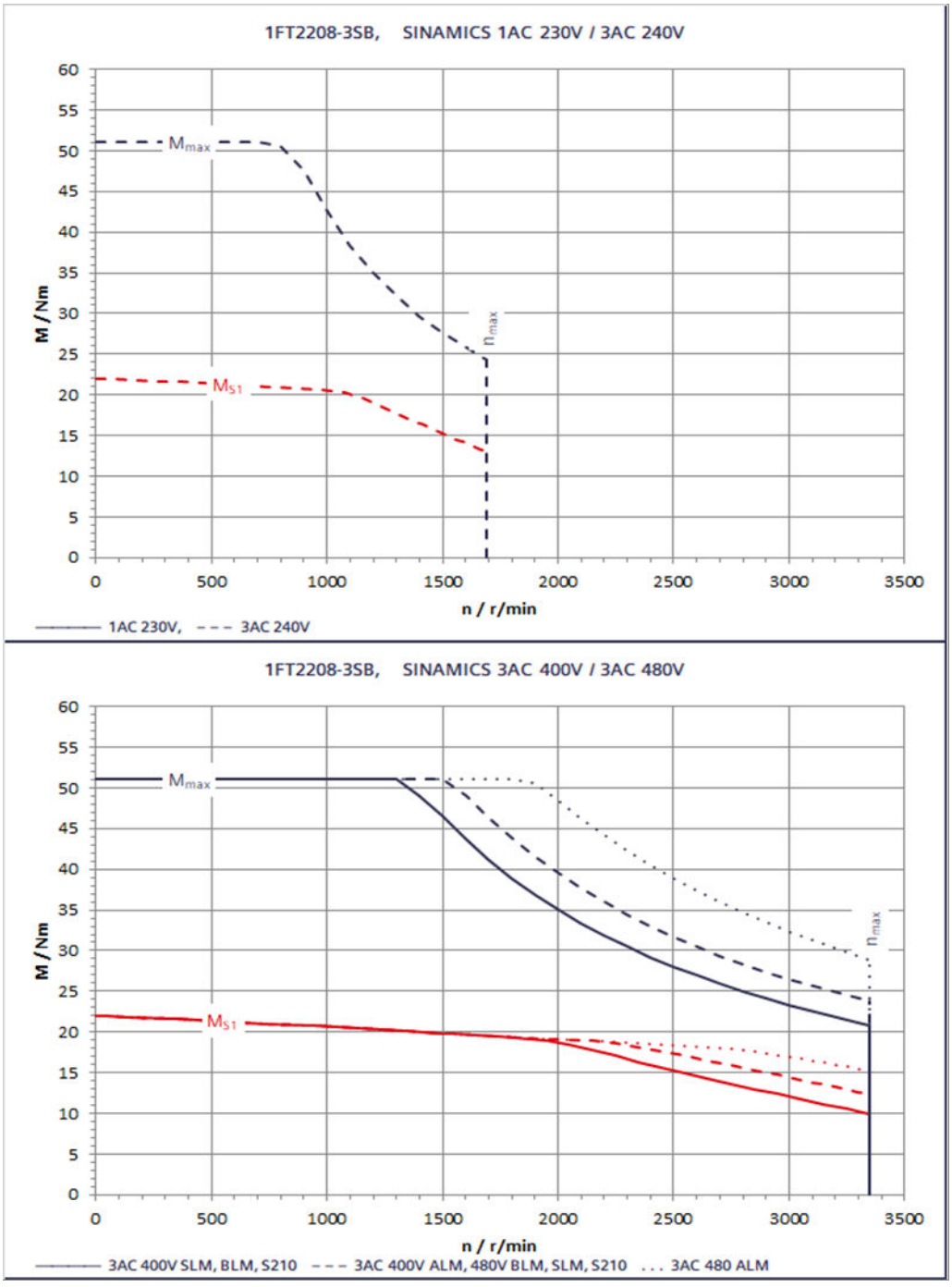
6.3.4.2 1FT2206-4SH

Three-phase servomotor 1FT2206-4SH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	14.5
Stall current	I_0	A	14.3
Maximum torque	M_{max}	Nm	36
Maximum current	I_{max}	A	44
Thermal time constant	T_{th}	min	14
Moment of inertia	J_{Mot}	kg cm²	15.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	16.8
Weight	m_{Mot}	kg	11
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	12.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4700
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	11.9
Rated current	I_{rated}	A	12.3
Rated power	P_{rated}	kW	3.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	8000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	10
Rated current	I_{rated}	A	10.6
Rated power	P_{rated}	kW	4.7
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2206-4SH, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2206-4SH, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

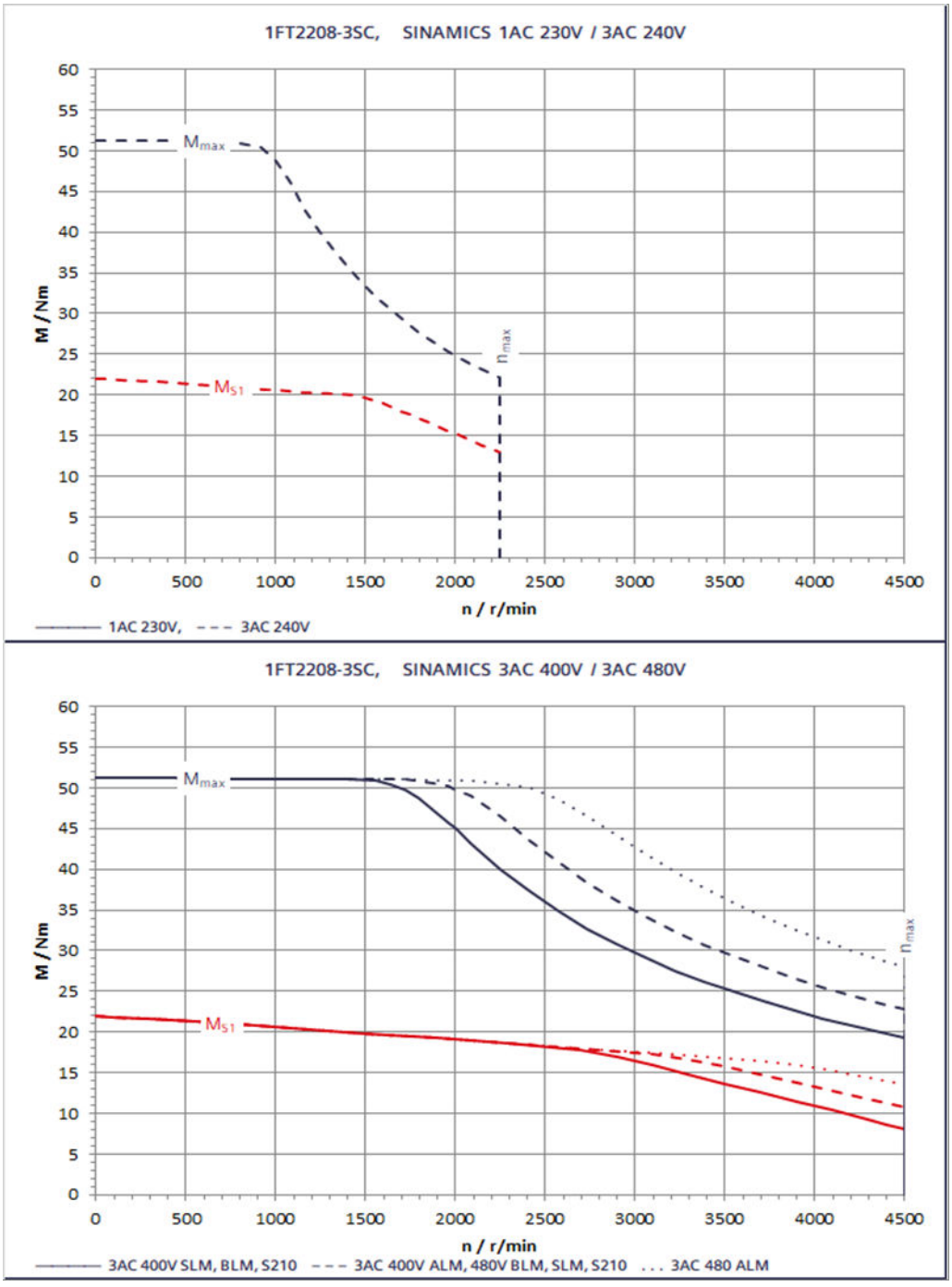
6.3.4.3 1FT2208-3SB

Three-phase servomotor 1FT2208-3SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	7.8
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	20.5
Thermal time constant	T_{th}	min	12
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	14.9
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	17.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	17.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1690
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	20.5
Rated current	I_{rated}	A	7.6
Rated power	P_{rated}	kW	1.62
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3350
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	19.9
Rated current	I_{rated}	A	7.3
Rated power	P_{rated}	kW	3.1
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-3SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-3SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

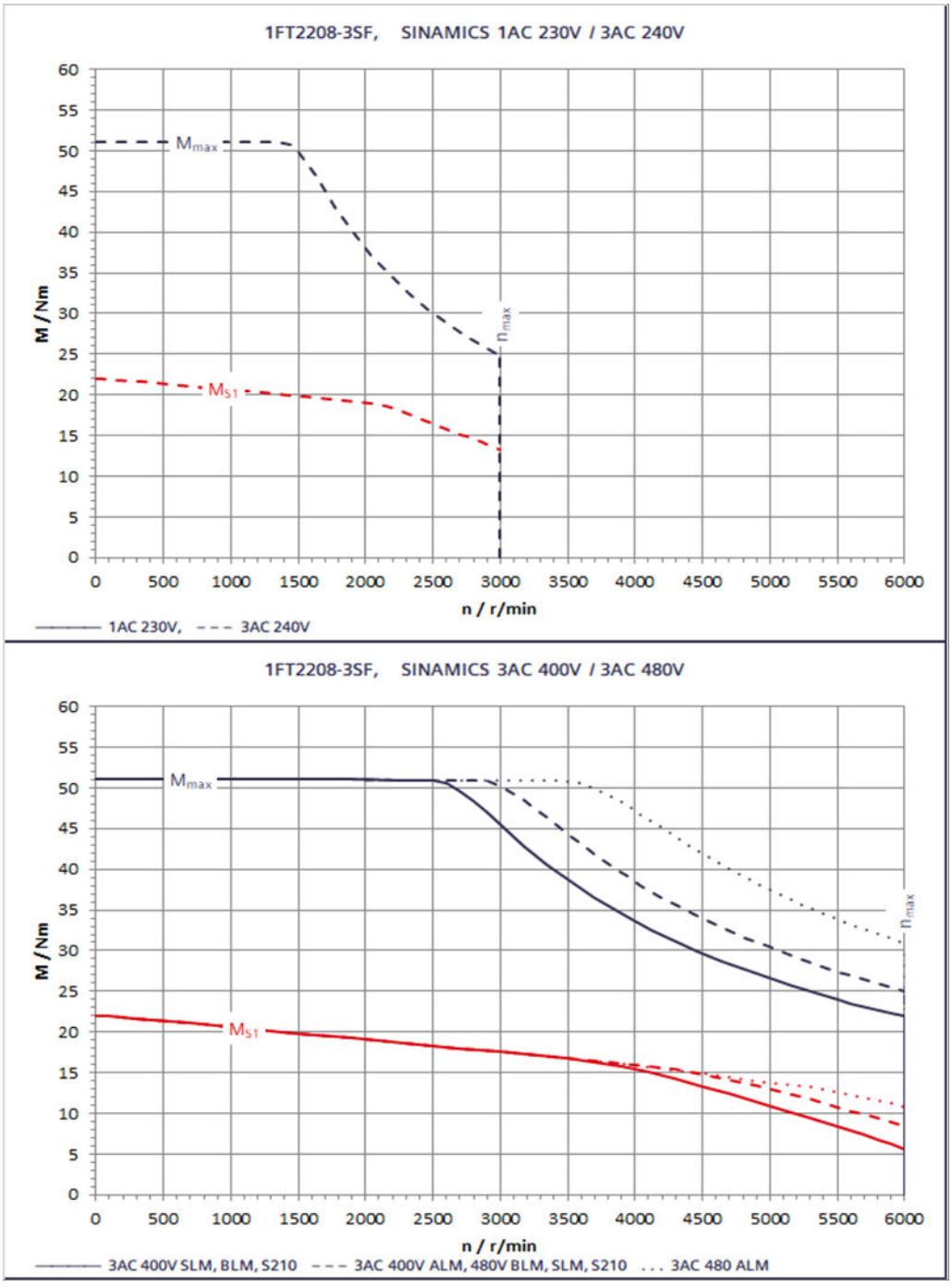
6.3.4.4 1FT2208-3SC

Three-phase servomotor 1FT2208-3SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	10.4
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	12
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	14.9
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	17.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	17.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2250
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	20.5
Rated current	I_{rated}	A	9.9
Rated power	P_{rated}	kW	2.15
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4500
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	19.1
Rated current	I_{rated}	A	9.5
Rated power	P_{rated}	kW	4
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-3SC, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-3SC, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

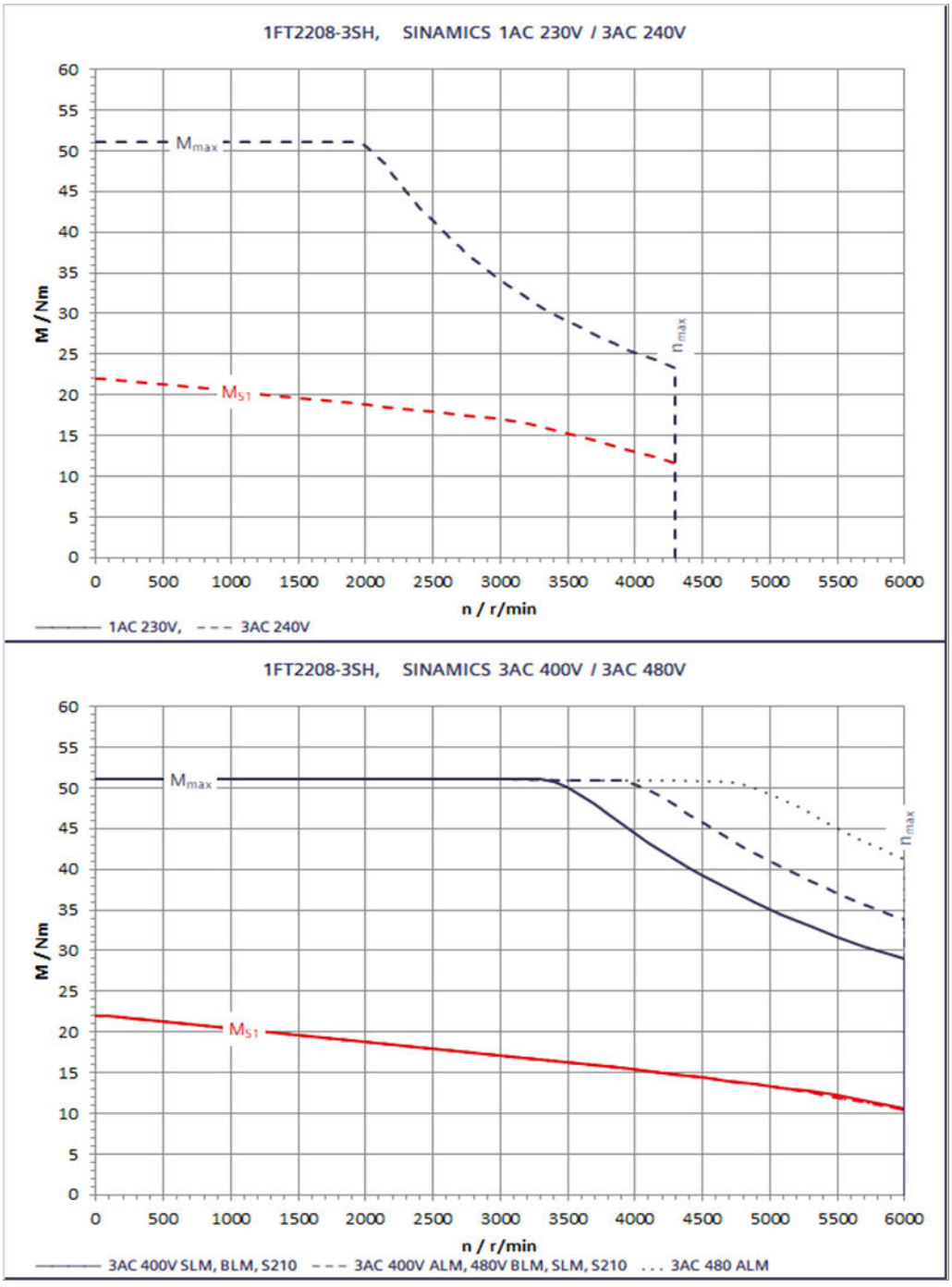
6.3.4.5 1FT2208-3SF

Three-phase servomotor 1FT2208-3SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	14.1
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	40
Thermal time constant	T_{th}	min	12
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	14.9
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	17.1
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	17.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	19.9
Rated current	I_{rated}	A	13.2
Rated power	P_{rated}	kW	3.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	17.6
Rated current	I_{rated}	A	12.2
Rated power	P_{rated}	kW	5.5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-3SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-3SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

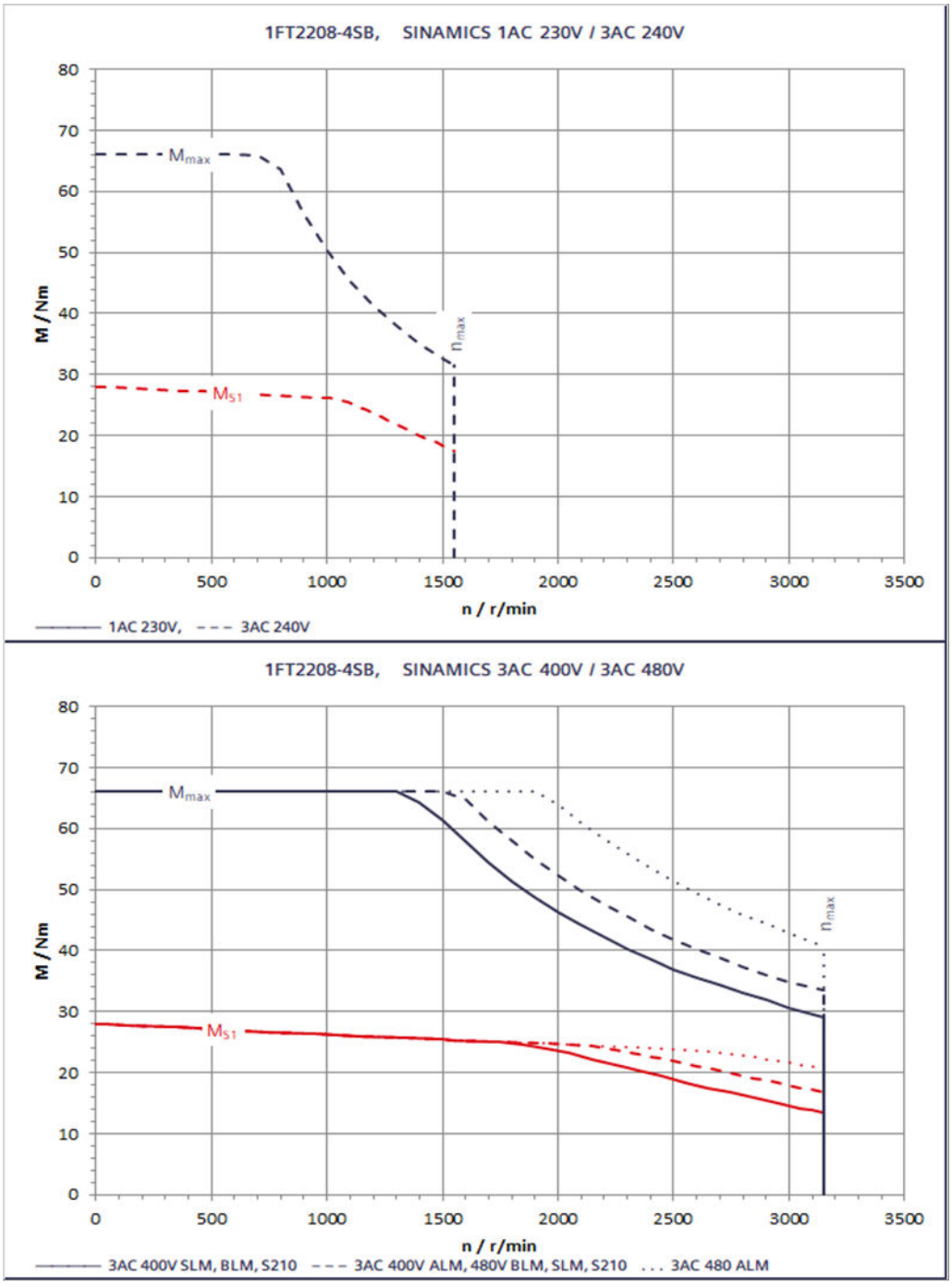
6.3.4.6 1FT2208-3SH

Three-phase servomotor 1FT2208-3SH			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	19.8
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	57
Thermal time constant	T_{th}	min	12
Moment of inertia	J_{Mot}	kg cm²	29.6
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	32.6
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	35.1
Weight	m_{Mot}	kg	15.3
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	17.5
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	18.1
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3900
Rated speed	n_{rated}	r/min	2500
Rated torque	M_{rated}	Nm	17.9
Rated current	I_{rated}	A	17.3
Rated power	P_{rated}	kW	4.7
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	4500
Rated torque	M_{rated}	Nm	14.4
Rated current	I_{rated}	A	14.2
Rated power	P_{rated}	kW	6.8
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-3SH, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-3SH, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

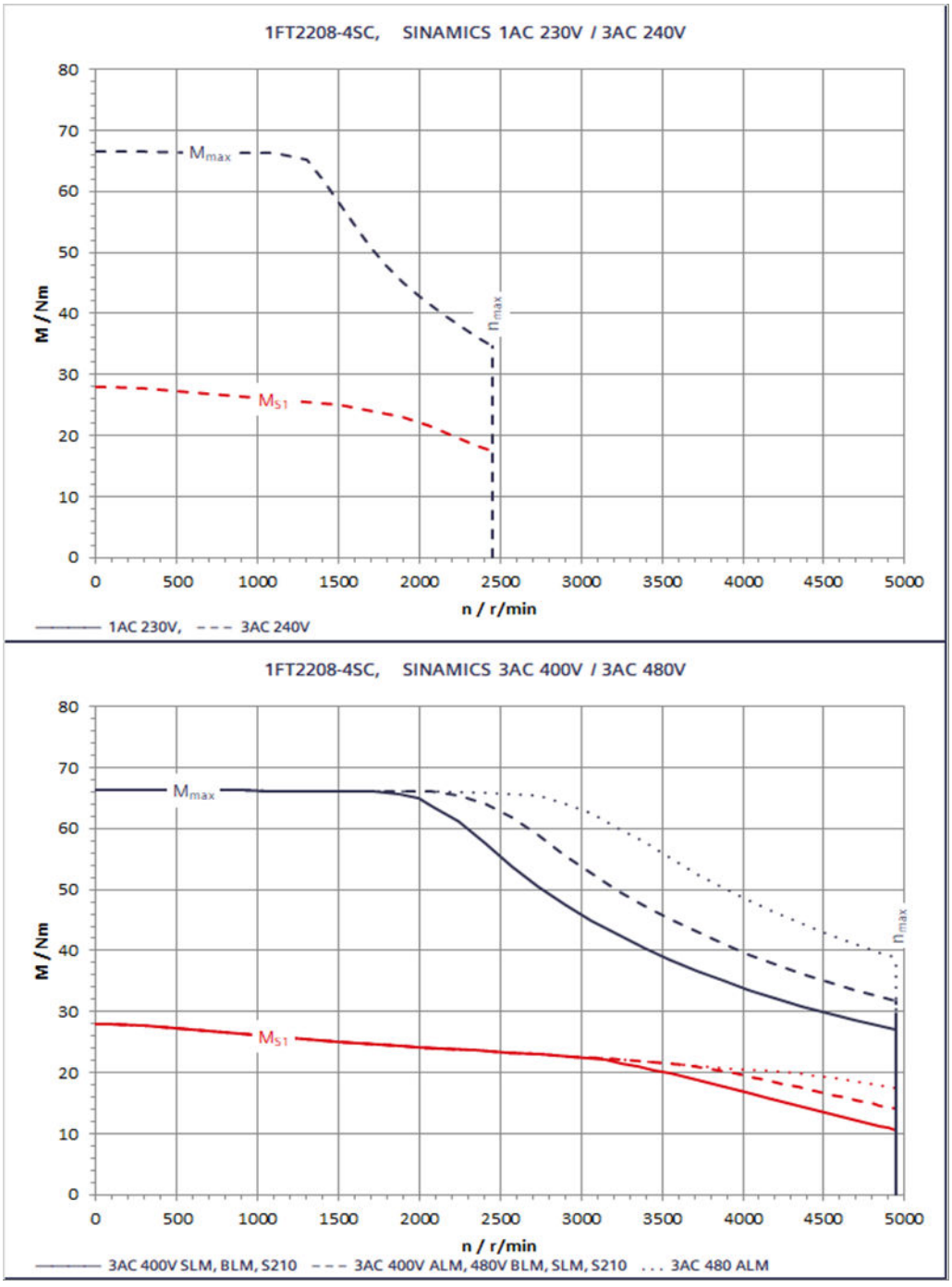
6.3.4.7 1FT2208-4SB

Three-phase servomotor 1FT2208-4SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	28
Stall current	I_0	A	9.3
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	25
Thermal time constant	T_{th}	min	13
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	17.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	20.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1550
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	26.5
Rated current	I_{rated}	A	9
Rated power	P_{rated}	kW	2.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3150
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	25.5
Rated current	I_{rated}	A	8.8
Rated power	P_{rated}	kW	4
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-4SB, SINAMICS 1AC 230V / 3AC 240V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-4SB, SINAMICS 3AC 400V / 3AC 480V
M /Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

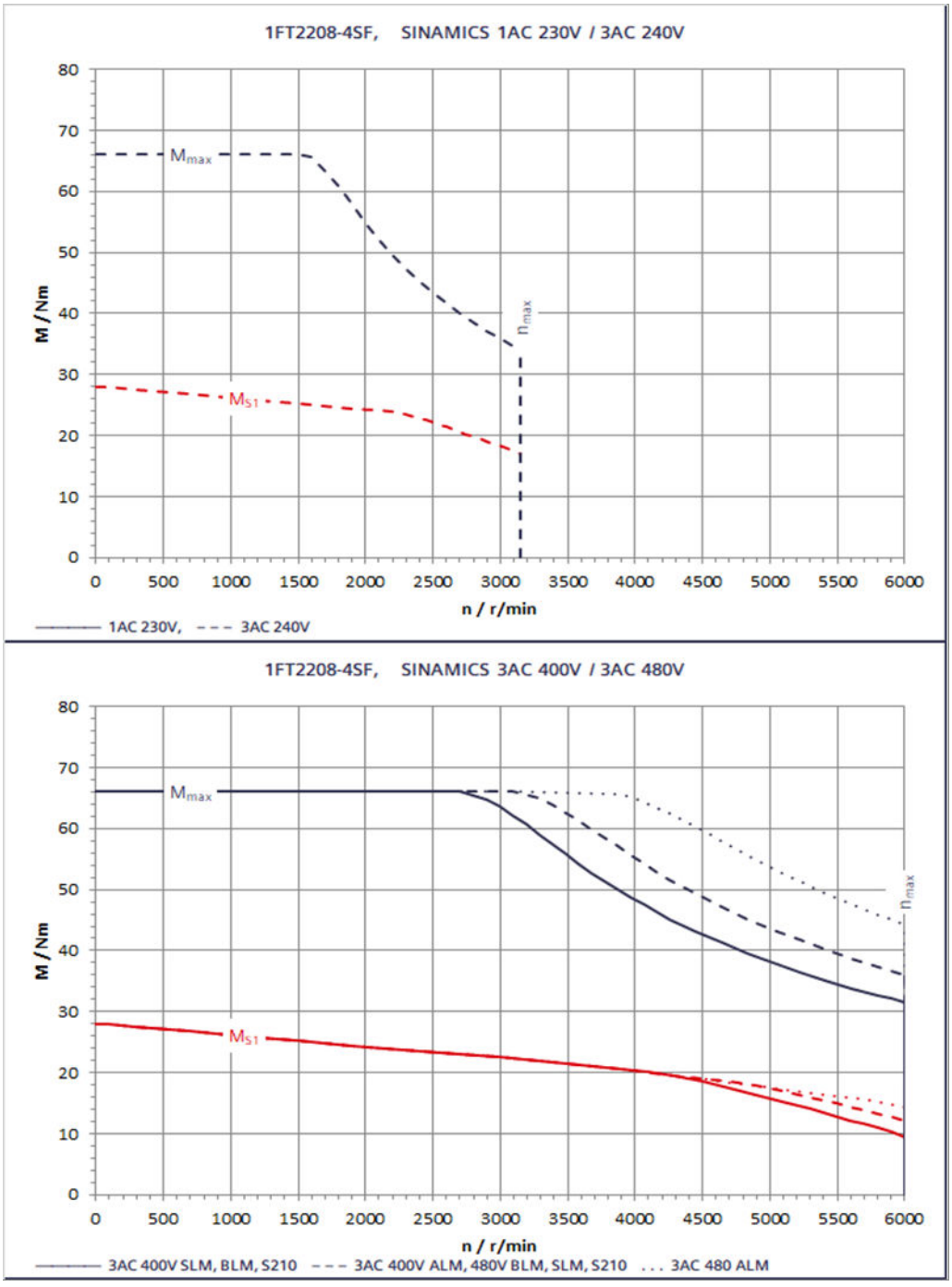
6.3.4.8 1FT2208-4SC

Three-phase servomotor 1FT2208-4SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	28
Stall current	I_0	A	14.6
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	43.5
Thermal time constant	T_{th}	min	13
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	17.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	20.3
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2450
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	26
Rated current	I_{rated}	A	14
Rated power	P_{rated}	kW	2.75
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4950
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	24
Rated current	I_{rated}	A	13.3
Rated power	P_{rated}	kW	5.1
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-4SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-4SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

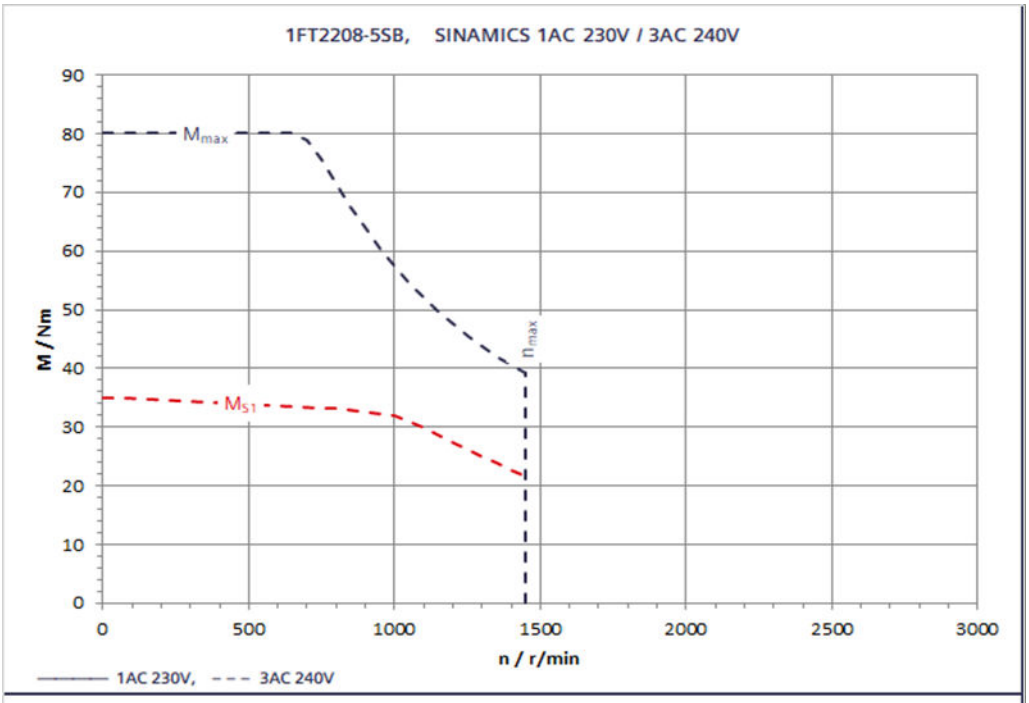
6.3.4.9 1FT2208-4SF

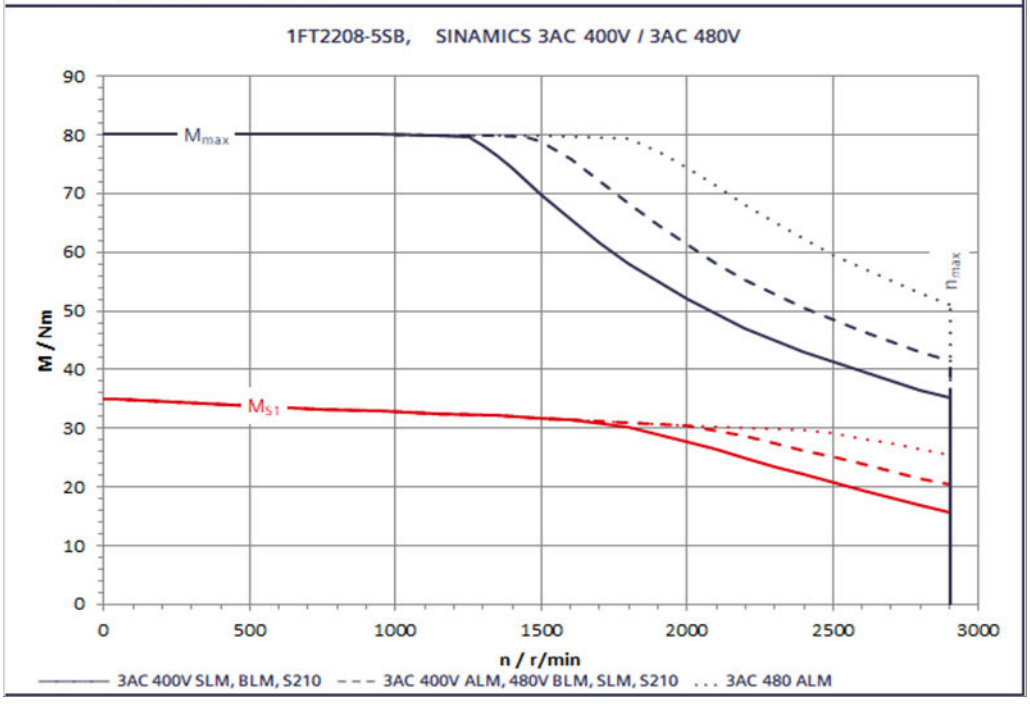
Three-phase servomotor 1FT2208-4SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	28
Stall current	I_0	A	18.7
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	13
Moment of inertia	J_{Mot}	kg cm²	38.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	44.4
Weight	m_{Mot}	kg	17.9
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	20.7
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3150
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	25
Rated current	I_{rated}	A	17.5
Rated power	P_{rated}	kW	3.95
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	22.5
Rated current	I_{rated}	A	16.3
Rated power	P_{rated}	kW	7.1
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-4SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-4SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.4.10 1FT2208-5SB

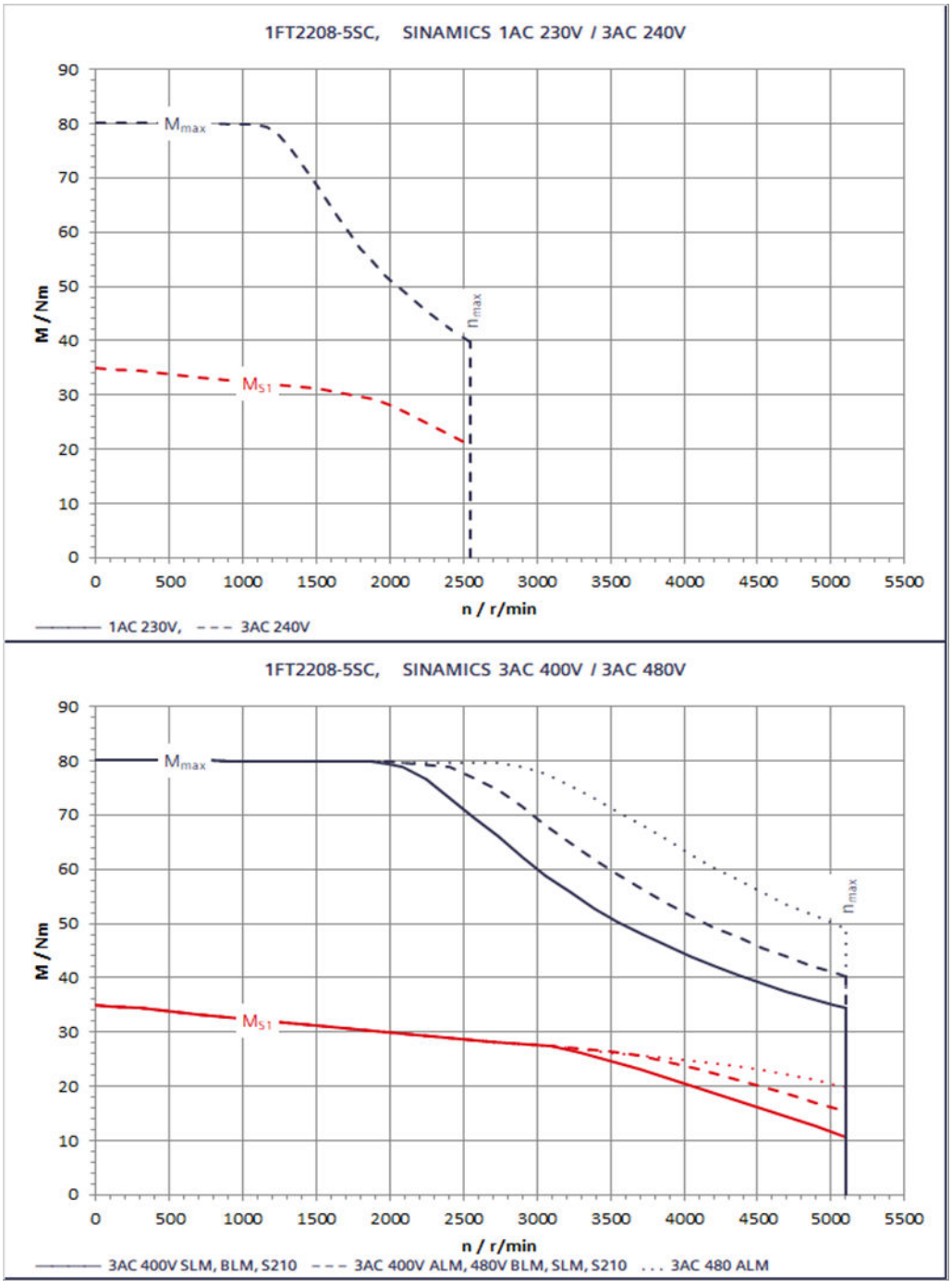
Three-phase servomotor 1FT2208-5SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	35
Stall current	I_0	A	10.7
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	29.5
Thermal time constant	T_{th}	min	13
Moment of inertia	J_{Mot}	kg cm²	48.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	53.6
Weight	m_{Mot}	kg	20
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	22.8
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1450
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	33.5
Rated current	I_{rated}	A	10.5
Rated power	P_{rated}	kW	2.6
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2900
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	32
Rated current	I_{rated}	A	10.2
Rated power	P_{rated}	kW	5
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 1 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-5SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2208-5SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

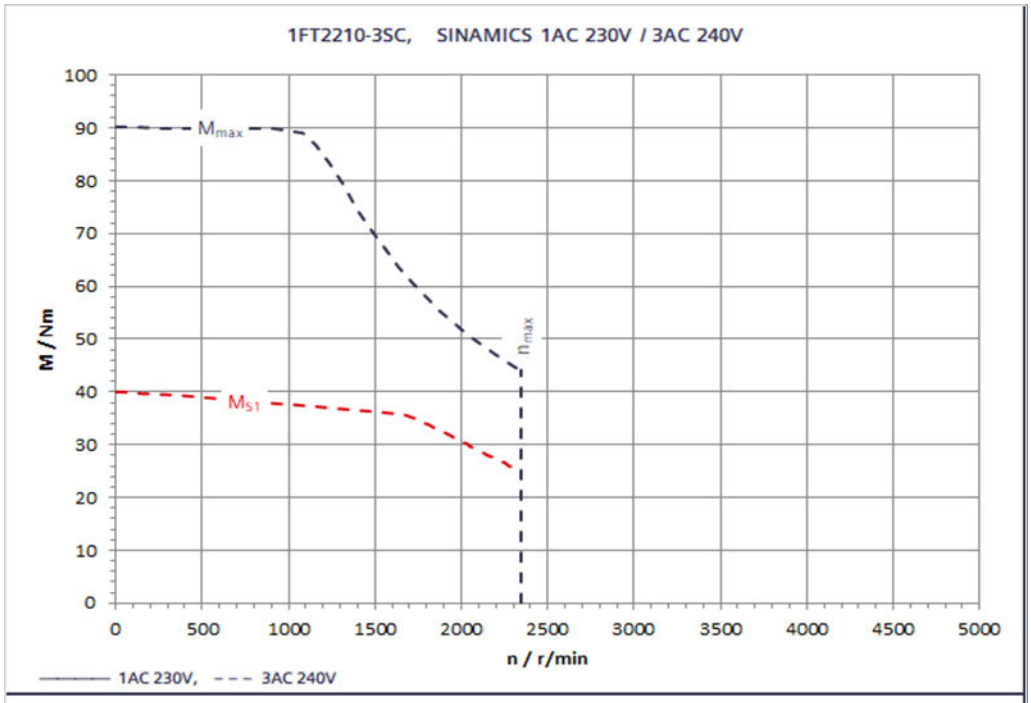
6.3.4.11 1FT2208-5SC

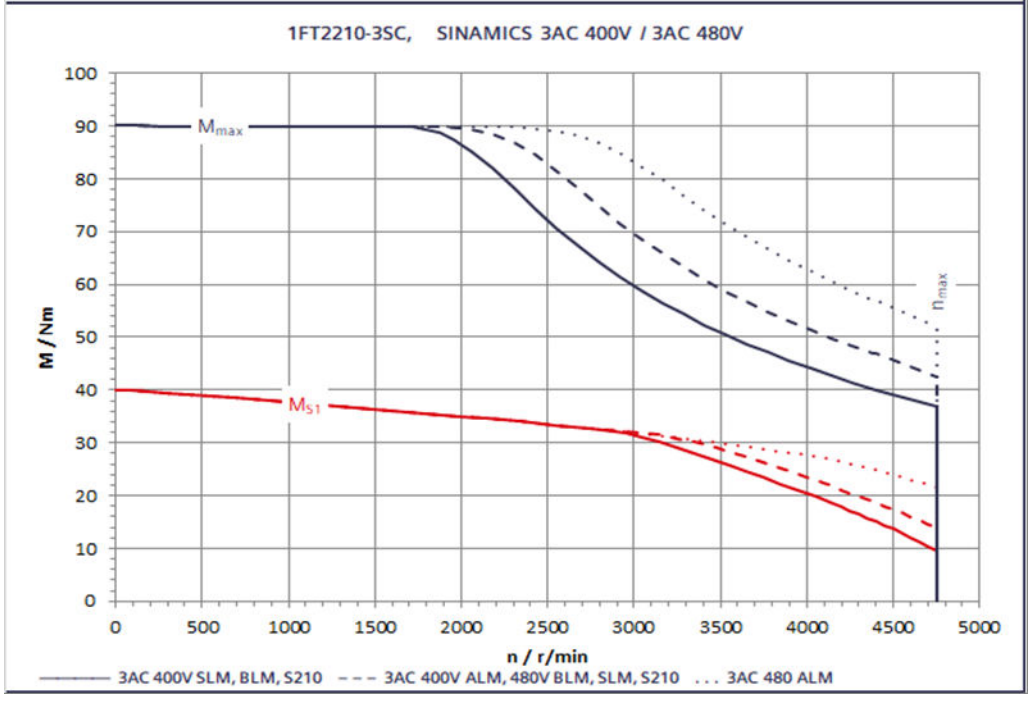
Three-phase servomotor 1FT2208-5SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	35
Stall current	I_0	A	18.8
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	51.5
Thermal time constant	T_{th}	min	13
Moment of inertia	J_{Mot}	kg cm²	48.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	53.6
Weight	m_{Mot}	kg	20.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	23.2
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2550
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	32.5
Rated current	I_{rated}	A	17.9
Rated power	P_{rated}	kW	3.4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5100
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	30
Rated current	I_{rated}	A	17.1
Rated power	P_{rated}	kW	6.3
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2208-5SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2208-5SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.4.12 1FT2210-3SC

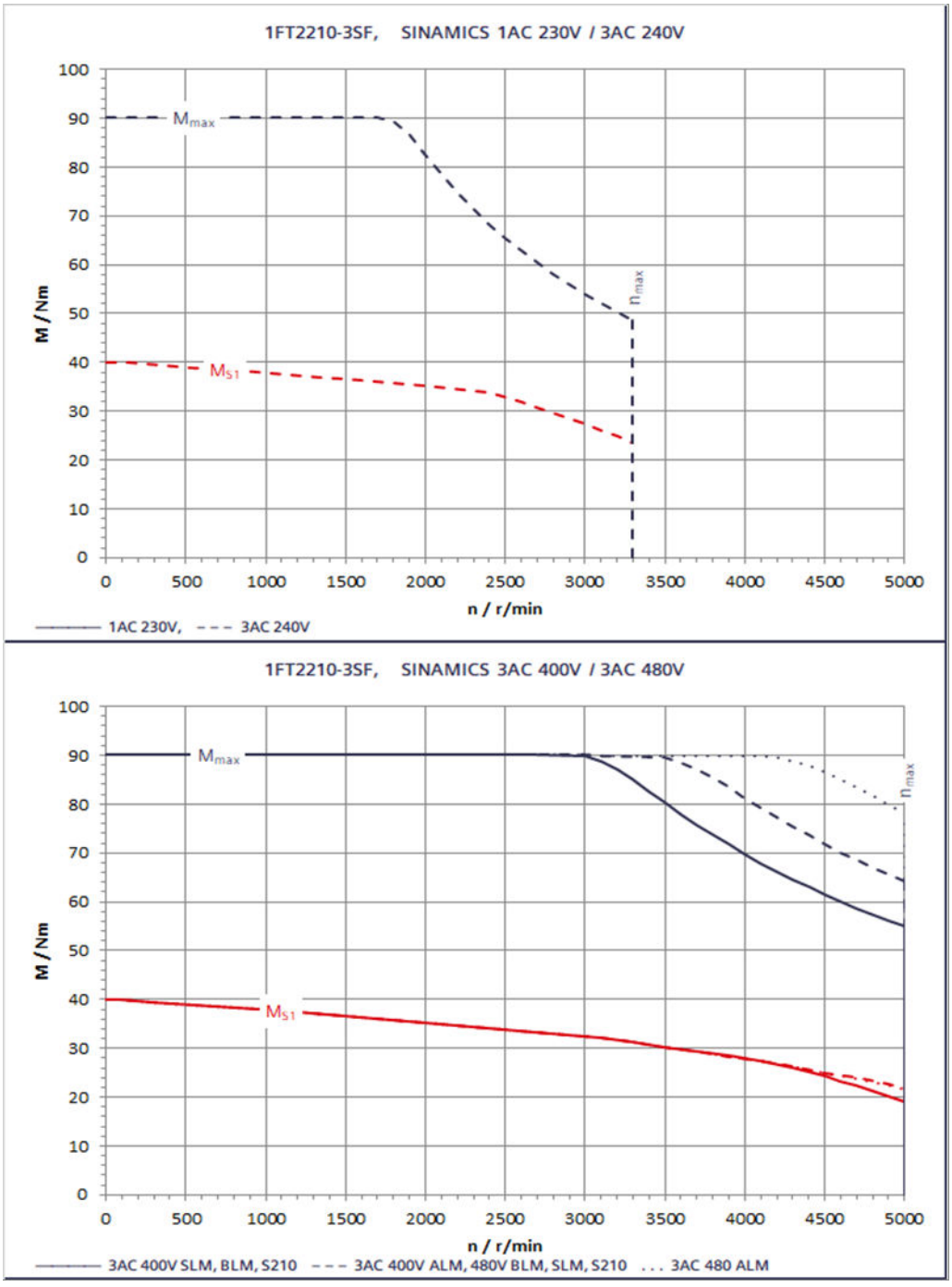
Three-phase servomotor 1FT2210-3SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	19.9
Maximum torque	M_{max}	Nm	90
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	14
Moment of inertia	J_{Mot}	kg cm²	88.8
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	94.8
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	104
Weight	m_{Mot}	kg	25
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	28.5
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	29.5
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2350
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	37.5
Rated current	I_{rated}	A	19.1
Rated power	P_{rated}	kW	3.95
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4750
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	35
Rated current	I_{rated}	A	18.1
Rated power	P_{rated}	kW	7.3
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-3SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V


1FT2210-3SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

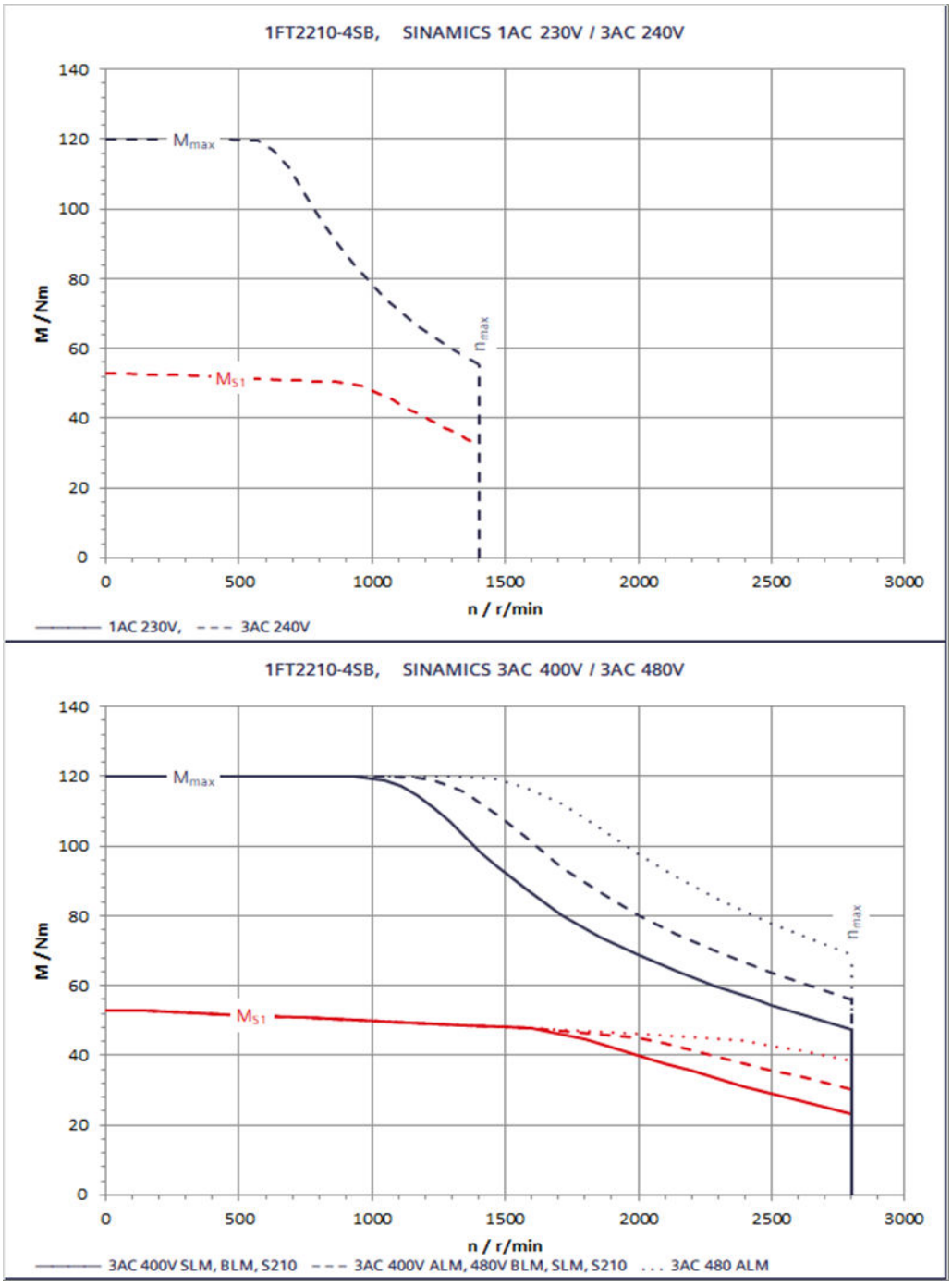
6.3.4.13 1FT2210-3SF

Three-phase servomotor 1FT2210-3SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	40
Stall current	I_0	A	27.5
Maximum torque	M_{max}	Nm	90
Maximum current	I_{max}	A	78
Thermal time constant	T_{th}	min	15
Moment of inertia	J_{Mot}	kg cm²	88.8
Moment of inertia (with brake 1)	$J_{Mot\ with\ Br}$	kg cm²	94.8
Moment of inertia (with brake 2)	$J_{Mot\ with\ Br}$	kg cm²	104
Weight	m_{Mot}	kg	25
Weight (with brake 1)	$m_{Mot\ with\ Br}$	kg	28.5
Weight (with brake 2)	$m_{Mot\ with\ Br}$	kg	29.5
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	36.5
Rated current	I_{rated}	A	26
Rated power	P_{rated}	kW	5.7
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	32
Rated current	I_{rated}	A	24
Rated power	P_{rated}	kW	10.1
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 4 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-3SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-3SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

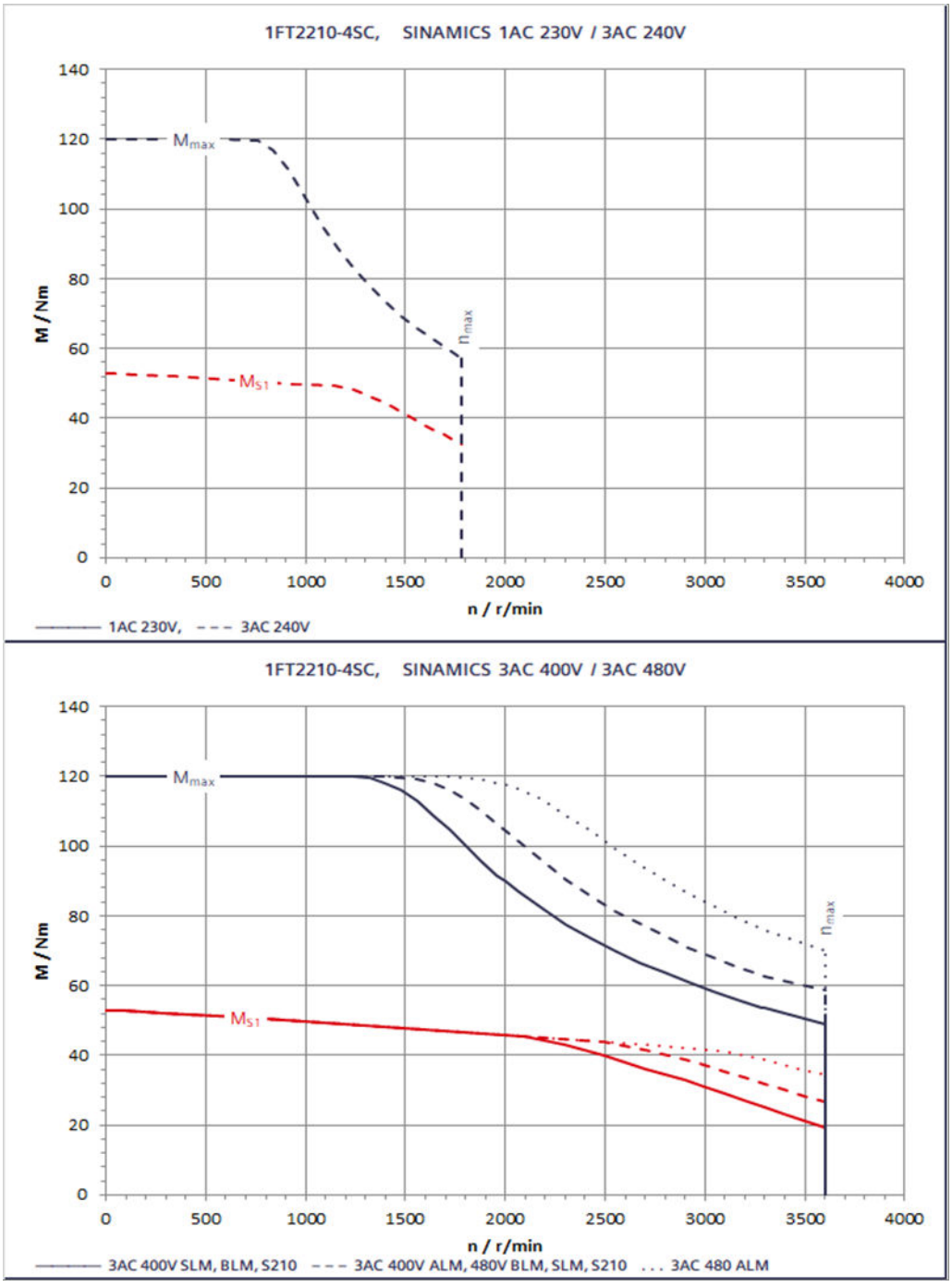
6.3.4.14 1FT2210-4SB

Three-phase servomotor 1FT2210-4SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	53
Stall current	I_0	A	15.5
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	43.5
Thermal time constant	T_{th}	min	16.5
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	29
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	34
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1390
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	51
Rated current	I_{rated}	A	15
Rated power	P_{rated}	kW	4
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2800
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	48
Rated current	I_{rated}	A	14.5
Rated power	P_{rated}	kW	7.6
Motor plugs			
One Cable Connection (OCC): Connector size	M23		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-4SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-4SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

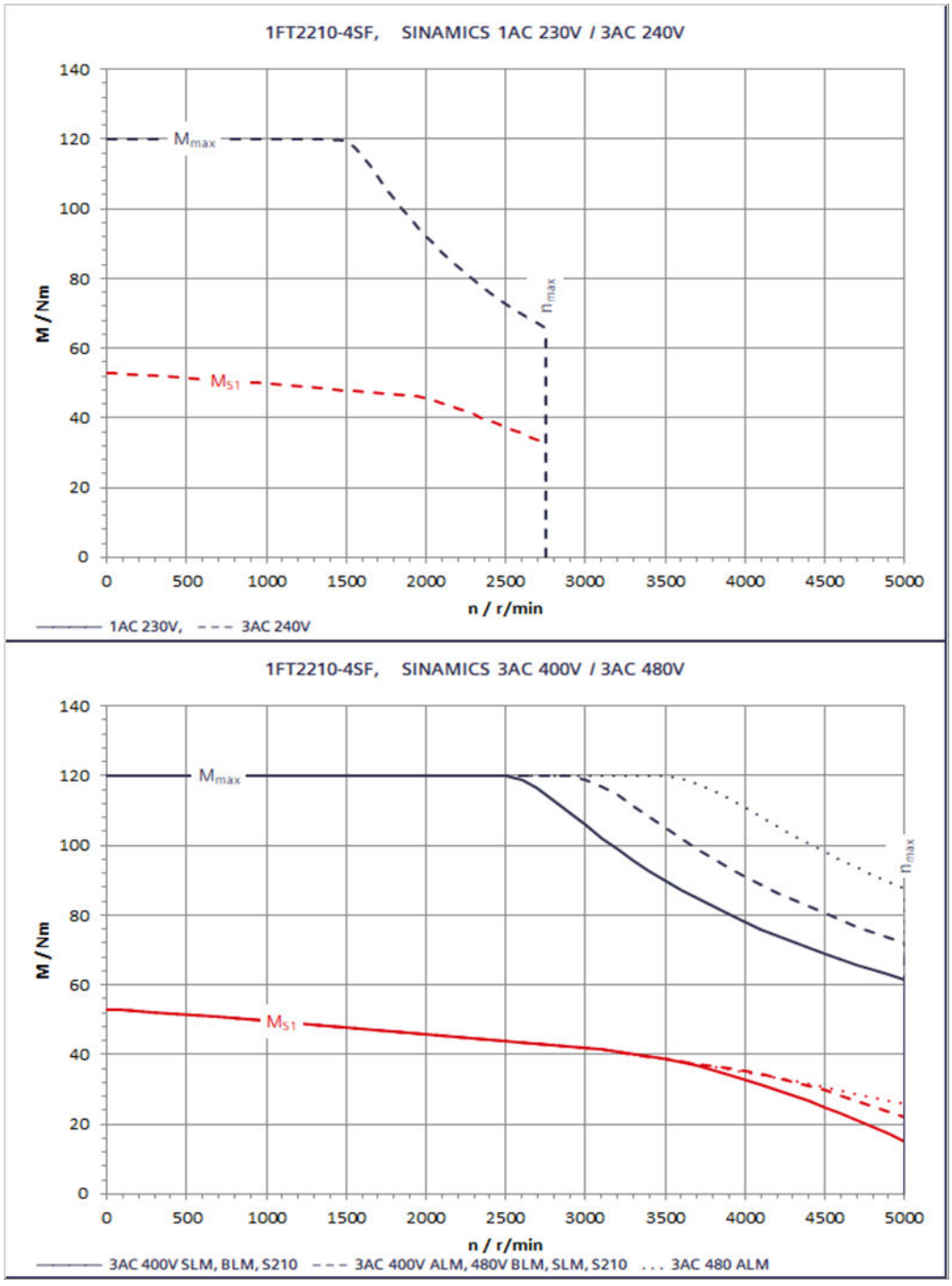
6.3.4.15 1FT2210-4SC

Three-phase servomotor 1FT2210-4SC			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	53
Stall current	I_0	A	19.8
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	16.5
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	29.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	34.5
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1780
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	49.5
Rated current	I_{rated}	A	18.9
Rated power	P_{rated}	kW	5.2
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3600
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	46
Rated current	I_{rated}	A	17.8
Rated power	P_{rated}	kW	9.6
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-4SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-4SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

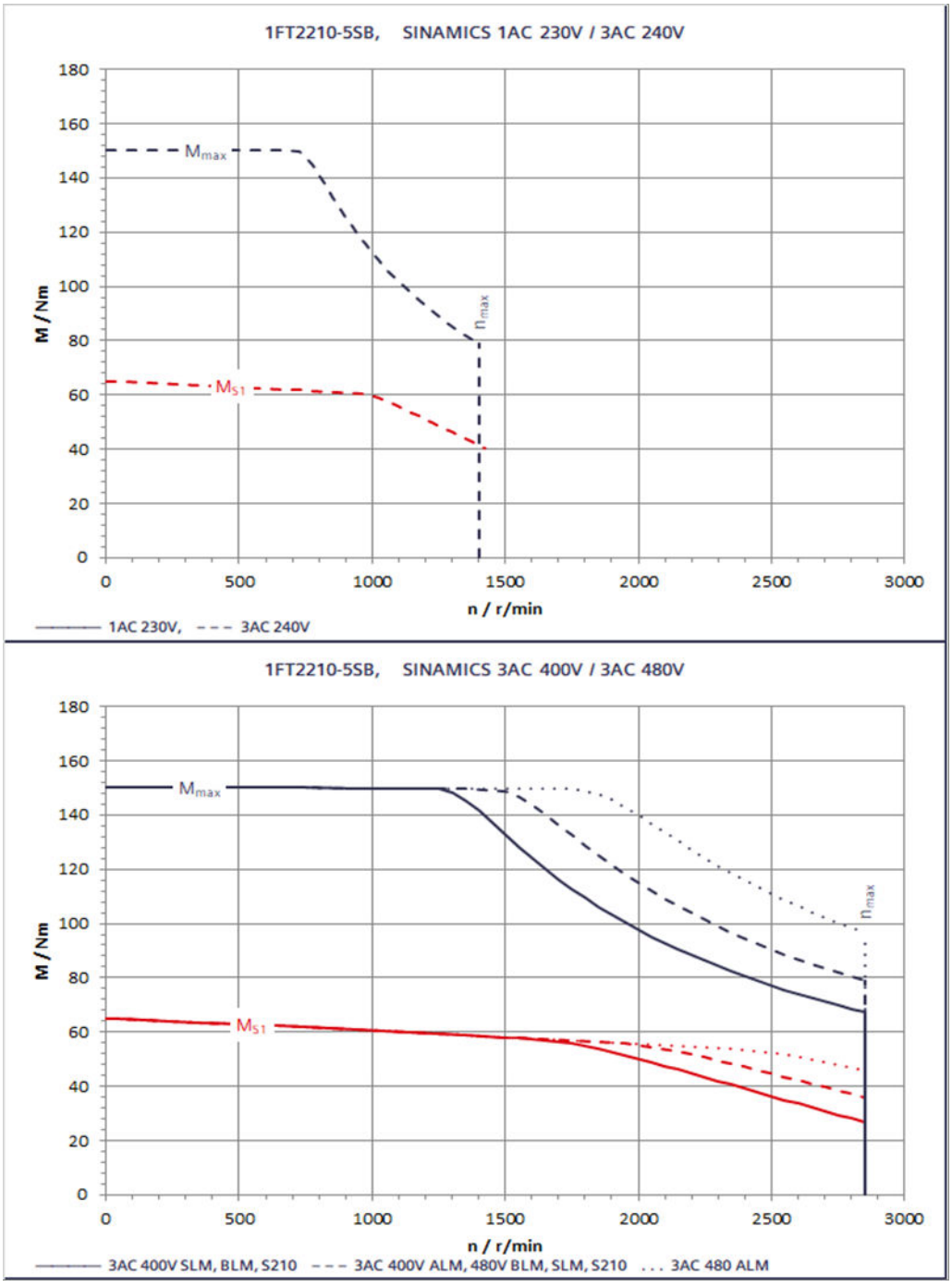
6.3.4.16 1FT2210-4SF

Three-phase servomotor 1FT2210-4SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	53
Stall current	I_0	A	31
Maximum torque	M_{max}	Nm	120
Maximum current	I_{max}	A	88
Thermal time constant	T_{th}	min	17
Moment of inertia	J_{Mot}	kg cm²	117
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	133
Weight	m_{Mot}	kg	29.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	34.5
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2750
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	48
Rated current	I_{rated}	A	29
Rated power	P_{rated}	kW	7.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	42
Rated current	I_{rated}	A	26
Rated power	P_{rated}	kW	13.2
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 6 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-4SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-4SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

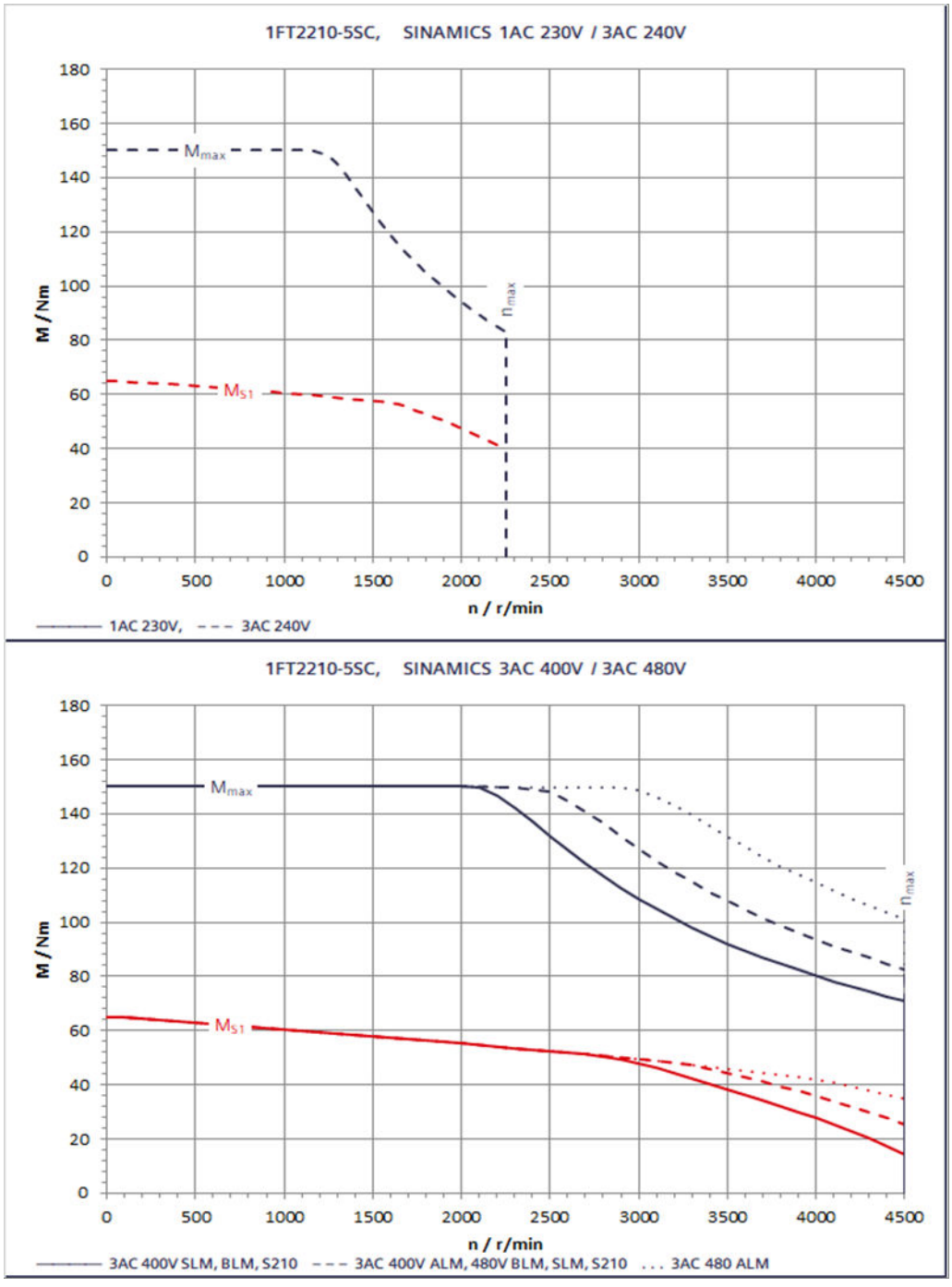
6.3.4.17 1FT2210-5SB

Three-phase servomotor 1FT2210-5SB			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	65
Stall current	I_0	A	19.3
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	55
Thermal time constant	T_{th}	min	19
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	34
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	39
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	1420
Rated speed	n_{rated}	r/min	750
Rated torque	M_{rated}	Nm	62
Rated current	I_{rated}	A	18.7
Rated power	P_{rated}	kW	4.85
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	58
Rated current	I_{rated}	A	18
Rated power	P_{rated}	kW	9.1
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 2.5 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-5SB, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-5SB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.4.18 1FT2210-5SC

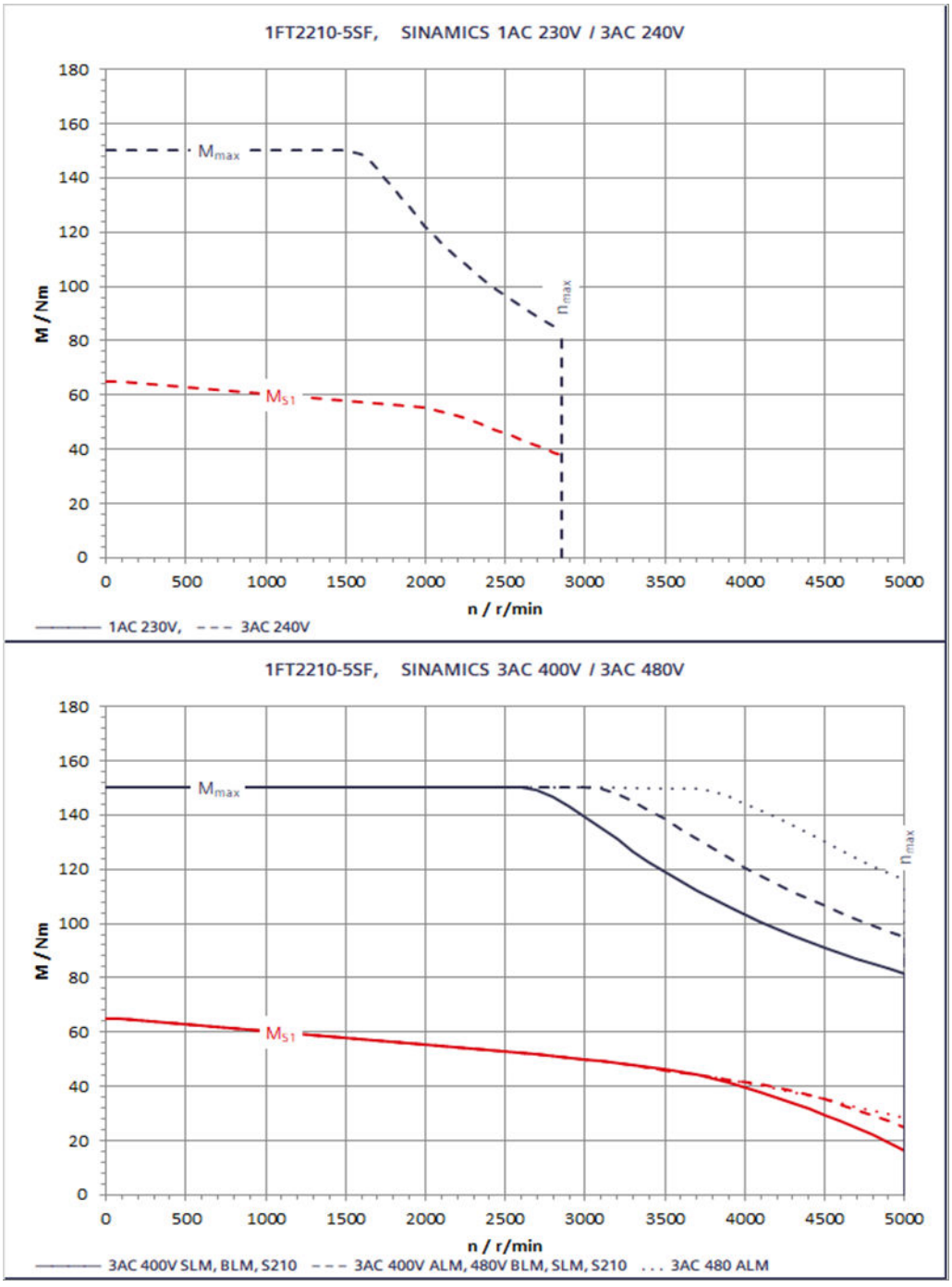
1FT2210-5SC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	65
Stall current	I_0	A	30.5
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	88
Thermal time constant	T_{th}	min	19
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	34
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	39
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2250
Rated speed	n_{rated}	r/min	1000
Rated torque	M_{rated}	Nm	60
Rated current	I_{rated}	A	295
Rated power	P_{rated}	kW	63
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4500
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	55
Rated current	I_{rated}	A	27.5
Rated power	P_{rated}	kW	11.5
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 6 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		


1FT2210-5SC, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-5SC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.4.19 1FT2210-5SF

Three-phase servomotor 1FT2210-5SF			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	65
Stall current	I_0	A	38.5
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	111
Thermal time constant	T_{th}	min	19
Moment of inertia	J_{Mot}	kg cm²	145
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	161
Weight	m_{Mot}	kg	34
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	39
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	2850
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	58
Rated current	I_{rated}	A	35.5
Rated power	P_{rated}	kW	9.1
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	5000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	50
Rated current	I_{rated}	A	31.5
Rated power	P_{rated}	kW	15.7
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M40		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable[1]	4 x 10 mm²		
Fan connection			
Fan connector	M12, 5-pole, A-coded according to IEC 61076-2-101		
Fan power supply	24 V. max. 2 A		

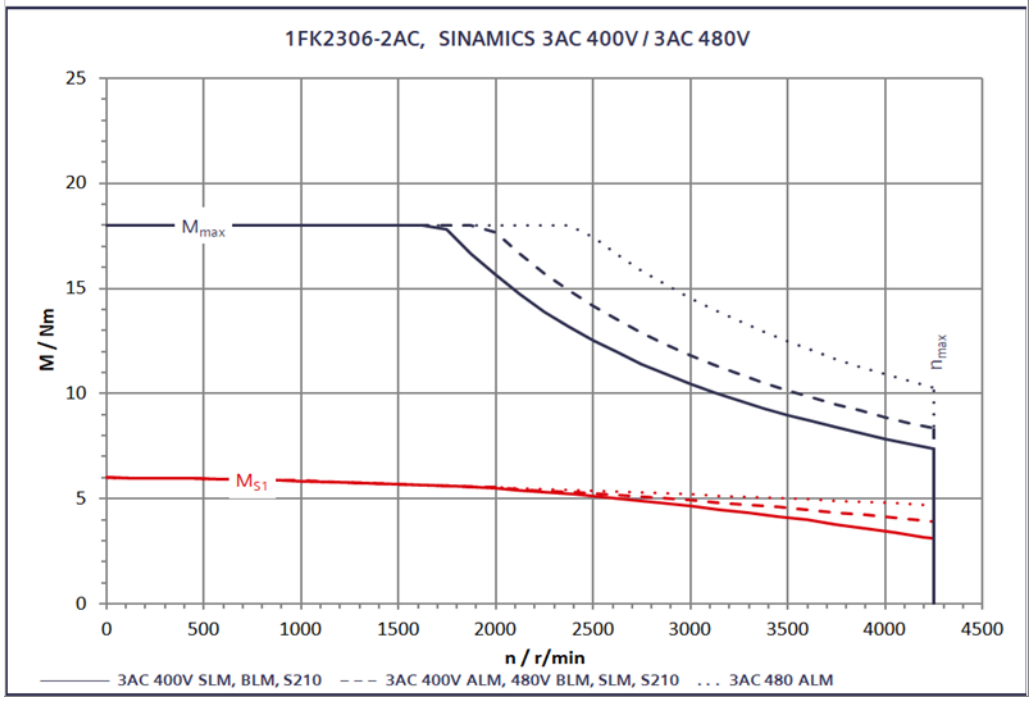
[1] To comply with the specifications acc. to CSA, a minimum cross-section of 4 x 16 mm² must be used.


1FT2210-5SF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, 3AC 240V
1FT2210-5SF, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.5 High Inertia, naturally cooled

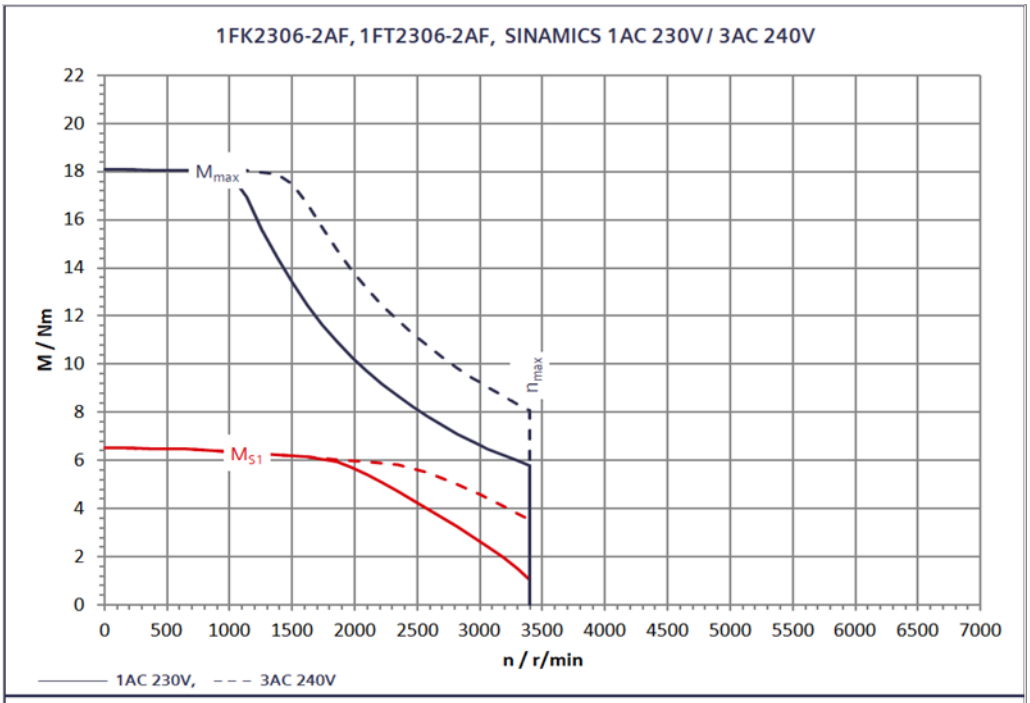
6.3.5.1 1FK2306-2AC

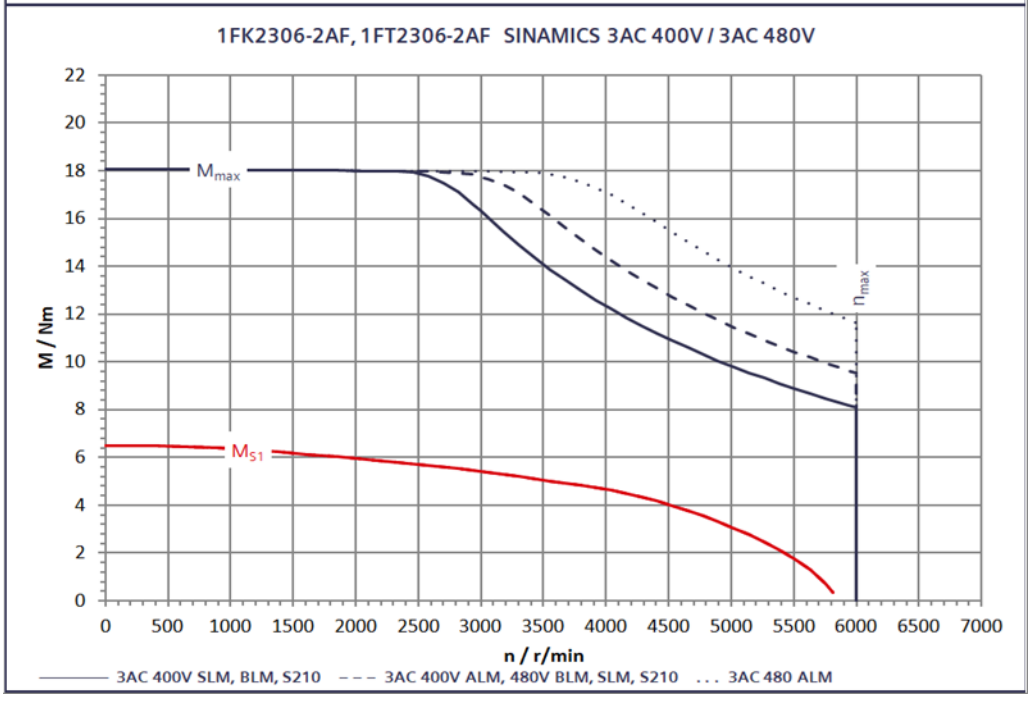
1FK2306-2AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6
Stall current	I_0	A	2.8
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	10.3
Thermal time constant	T_{th}	min	24
Moment of inertia	J_{Mot}	kg cm²	12.3
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	13.4
Weight	m_{Mot}	kg	7.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	4250
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	5.5
Rated current	I_{rated}	A	2.8
Rated power	P_{rated}	kW	1.15
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2306-2AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
5
10
15
20
25
0
500
1000
1500
2000
2500
3000
3500
4000
4500
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.5.2 1FK2306-2AF

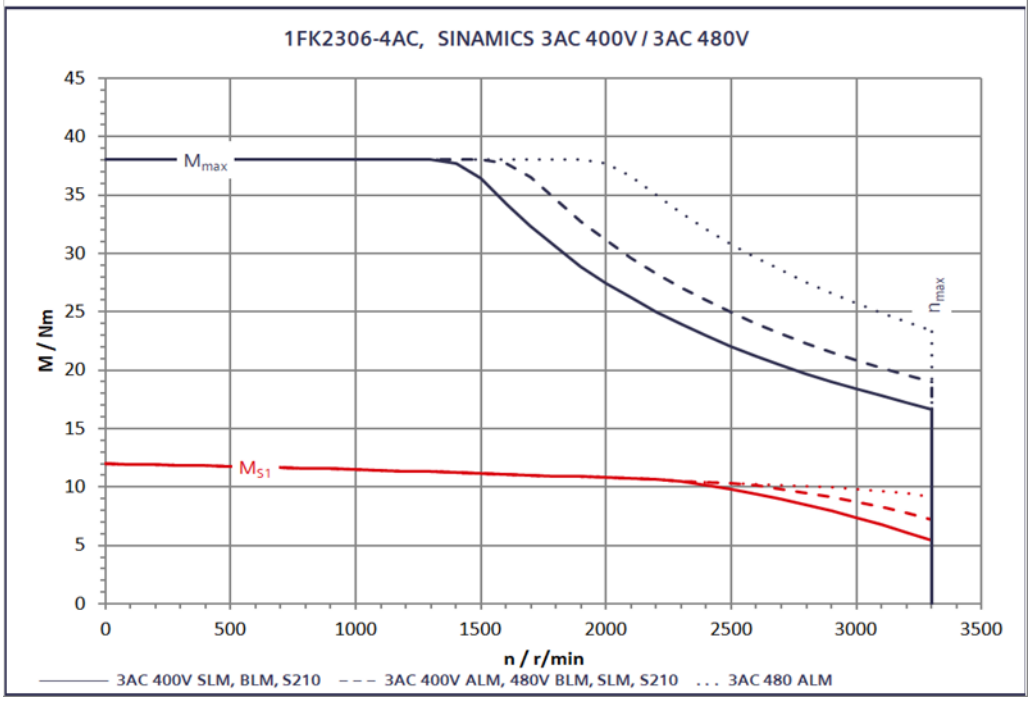
1FK2306-2AF three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	6.5
Stall current	I_0	A	5
Maximum torque	M_{max}	Nm	18
Maximum current	I_{max}	A	17.8
Thermal time constant	T_{th}	min	21
Moment of inertia	J_{Mot}	kg cm²	12.3
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	13.4
Weight	m_{Mot}	kg	7.6
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	9
Rated data with SINAMICS 200 ... 240 V 1 AC / 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3400
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	6.1
Rated current	I_{rated}	A	4.8
Rated power	P_{rated}	kW	0.96
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	6000
Rated speed	n_{rated}	r/min	3000
Rated torque	M_{rated}	Nm	5.4
Rated current	I_{rated}	A	4.35
Rated power	P_{rated}	kW	1.71
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2306-2AF, 1FT2306-2AF, SINAMICS 1AC 230V / 3AC 240V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
1AC 230V, – – – 3AC 240V


1FK2306-2AF, 1FT2306-2AF SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
3AC 400V SLM, BLM, S210 – – – 3AC 400V ALM, 480V BLM, SLM, S210 . . . 3AC 480 ALM

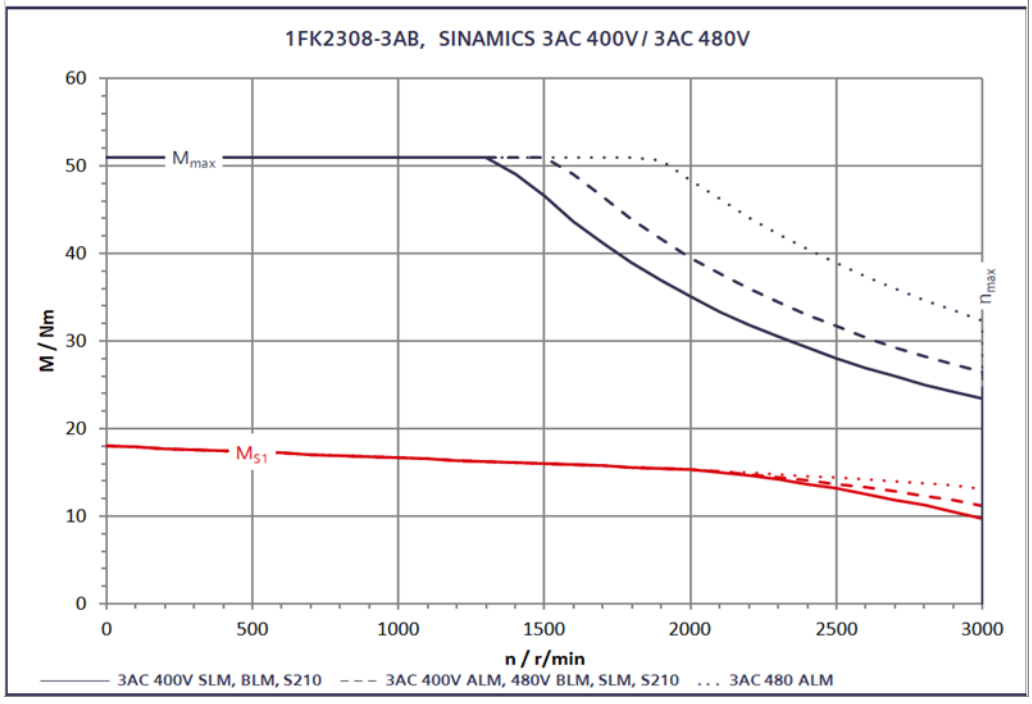
6.3.5.3 1FK2306-4AC

1FK2306-4AC three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	12
Stall current	I_0	A	4.5
Maximum torque	M_{max}	Nm	38
Maximum current	I_{max}	A	17
Thermal time constant	T_{th}	min	32
Moment of inertia	J_{Mot}	kg cm²	29.8
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	30.8
Weight	m_{Mot}	kg	11.4
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	12.8
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3300
Rated speed	n_{rated}	r/min	2000
Rated torque	M_{rated}	Nm	10.5
Rated current	I_{rated}	A	4.1
Rated power	P_{rated}	kW	2.2
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2306-4AC, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
5
10
15
20
25
30
35
40
45
0
500
1000
1500
2000
2500
3000
3500
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

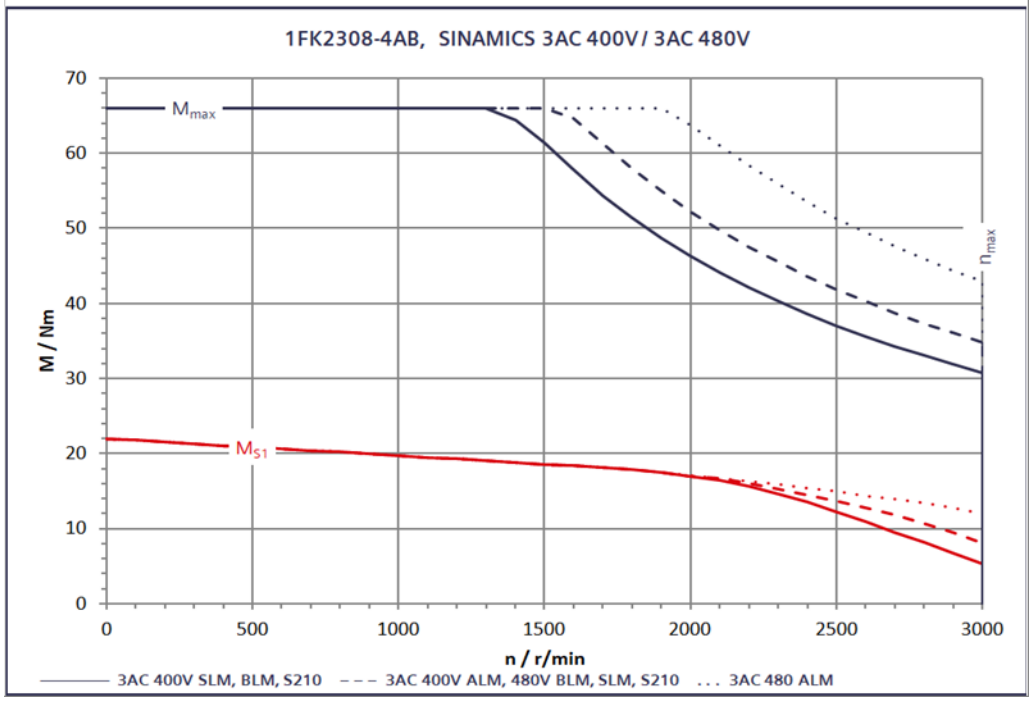
6.3.5.4 1FK2308-3AB

1FK2308-3AB three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	18
Stall current	I_0	A	6.2
Maximum torque	M_{max}	Nm	51
Maximum current	I_{max}	A	20.5
Thermal time constant	T_{th}	min	36
Moment of inertia	J_{Mot}	kg cm²	60.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	62.8
Weight	m_{Mot}	kg	16.2
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	18
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	16
Rated current	I_{rated}	A	5.7
Rated power	P_{rated}	kW	2.5
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2308-3AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
10
20
30
40
50
60
0
500
1000
1500
2000
2500
3000
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

6.3.5.5 1FK2308-4AB

1FK2308-4AB three-phase servomotor			
Technical specifications when used with SINAMICS	**Abbreviation**	**Unit**	**Value**
Static torque	M_0	Nm	22
Stall current	I_0	A	7.1
Maximum torque	M_{max}	Nm	66
Maximum current	I_{max}	A	25
Thermal time constant	T_{th}	min	42
Moment of inertia	J_{Mot}	kg cm²	69.1
Moment of inertia (with brake)	$J_{Mot\ with\ Br}$	kg cm²	74.4
Weight	m_{Mot}	kg	18.5
Weight (with brake)	$m_{Mot\ with\ Br}$	kg	20.5
Rated data with SINAMICS 380 ... 480 V 3 AC			
Max. permissible speed	$n_{max\ inv}$	r/min	3000
Rated speed	n_{rated}	r/min	1500
Rated torque	M_{rated}	Nm	18.6
Rated current	I_{rated}	A	6.4
Rated power	P_{rated}	kW	2.9
Motor plugs			
One Cable Connection (OCC): Connector size	-		
Two Cable Connection (2CC): Power connector size	M23		
Two Cable Connection (2CC): Signal connector size	M17		
Recommended minimum cross-section of the power cable	4 x 0.75 mm²		


1FK2308-4AB, SINAMICS 3AC 400V / 3AC 480V
M / Nm
n / r/min
M_{max}
M_{S1}
n_{max}
0
10
20
30
40
50
60
70
0
500
1000
1500
2000
2500
3000
3AC 400V SLM, BLM, S210
3AC 400V ALM, 480V BLM, SLM, S210
3AC 480 ALM

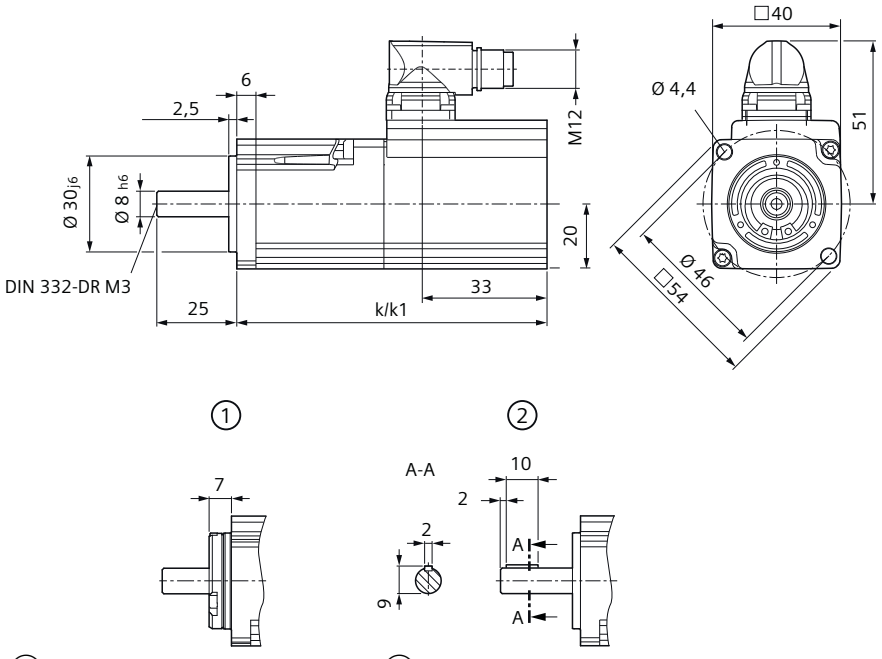
Dimension drawings

7

7.1 Motors with one connector

7.1.1 Dimension drawings 1Fx2x02

All dimensions in mm.

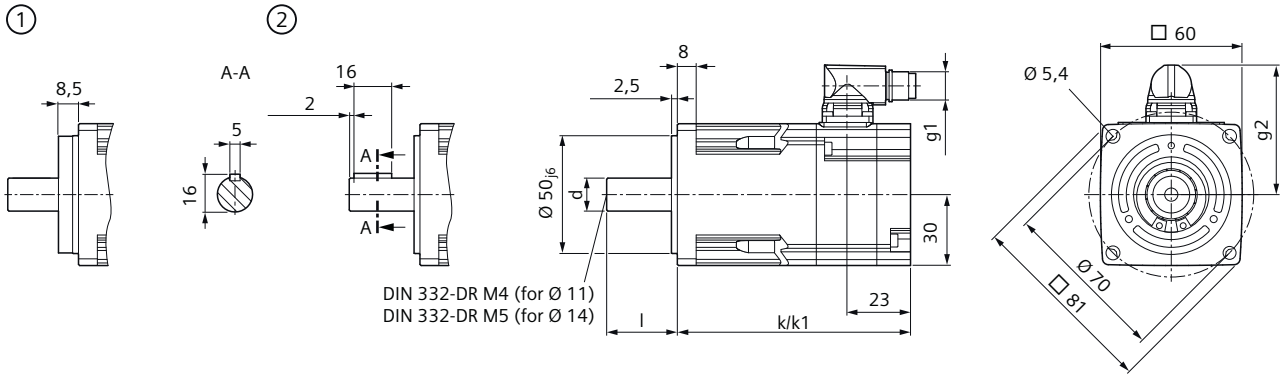


① With shaft sealing ring (IP65) ② With feather key

SIMOTICS S-1Fx2 Frame size 20	Dimensions	
	Without brake	With brake
	k	k1
1Fx2102-0Ax	90	121
1Fx2102-1Ax	106	137

7.1.2 Dimension drawings 1Fx2x03

All dimensions in mm.



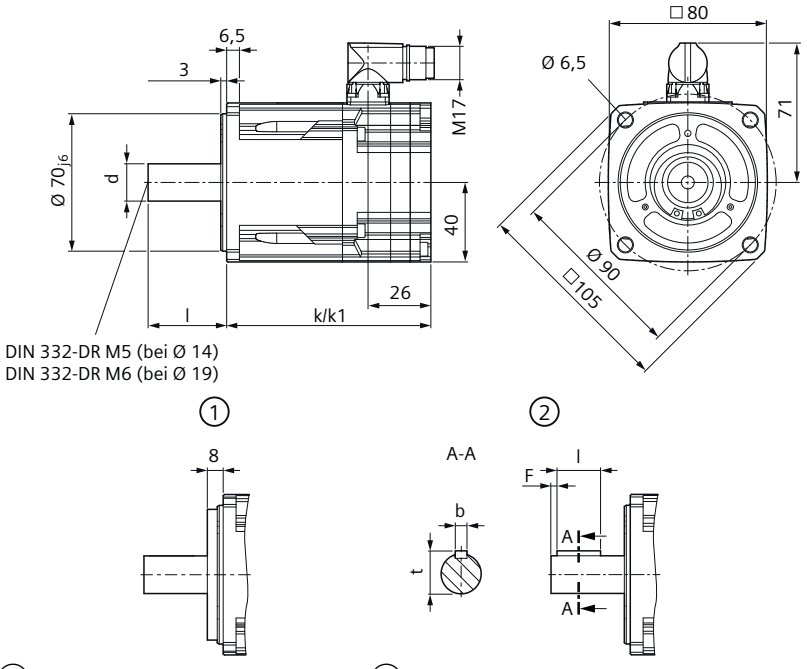
① With shaft sealing ring (IP65 and IP67)

② With feather key (only in combination with shaft geometry 1)

SIMOTICS S-1Fx2 Frame size 30	Dimensions							
			Without brake	With brake	Shaft diam. 14 x 30 mm		Shaft diam. 11 x 23 mm	
	g1	g2	k	k1	d	l	d	l
1Fx2x03-2AG	M12	55	99	131	14_{h6}	30	11_{k6}	23
1Fx2x03-4AG			123	155				
1Fx2103-2AH 1Fx2203-2AK	M17	60	99	131				
1Fx2103-4AH 1Fx2203-4AK			123	155				

7.1.3 Dimension drawings 1Fx2x04

All dimensions in mm



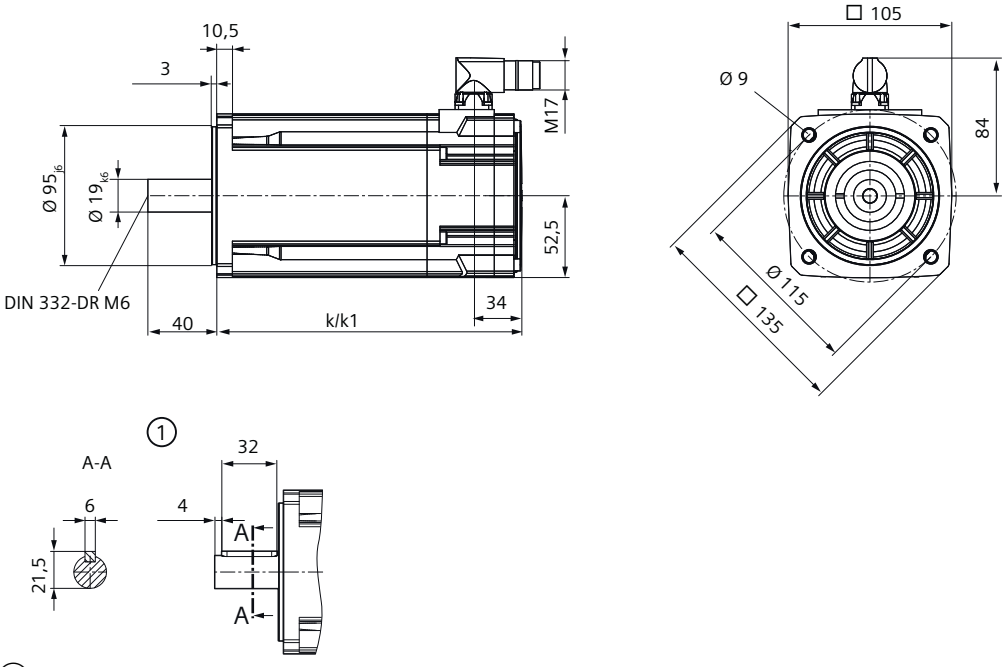
① With shaft sealing ring (IP65 and IP67) ② With feather key

SIMOTICS S-1Fx2 Frame size 40	Dimensions					
	Without brake	With brake	Shaft diam. 19 x 40 mm		Shaft diam. 14 x 30 mm	
	k	k1	d	l	d	l
1Fx2x04-4Ax	98	142	Ø 19 k6	40	Ø 14 k6	30
1Fx2x04-5Ax	126	170				
1Fx2x04-6Ax	144	188				

Motor frame size	Feather key dimensions							
	Shaft diam. 19 x 40 mm				Shaft diam. 14 x 30 mm			
	l	b	F	t	l	b	F	t
1Fx2x04	22	6	3	21.5	16	5	2	16

7.1.4 Dimension drawings 1Fx2105

All dimensions in mm.

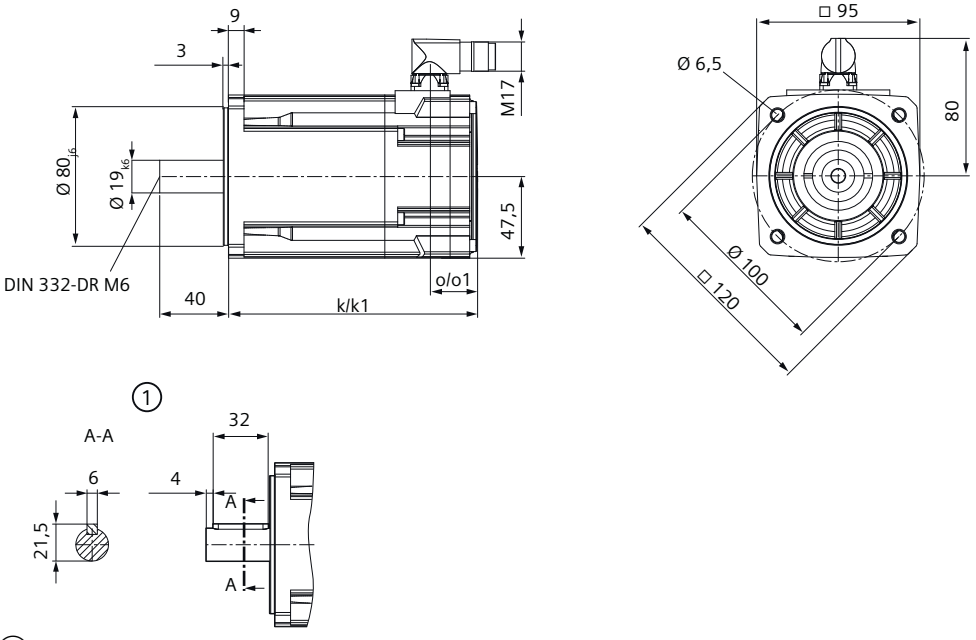


① With feather key

SIMOTICS S-1Fx2 Frame size 52	Dimensions	
	Without brake	With brake
	k	k1
1Fx2105-4Ax	173	200
1Fx2105-6Ax	215	242

7.1.5 Dimension drawings 1Fx2205

All dimensions in mm.

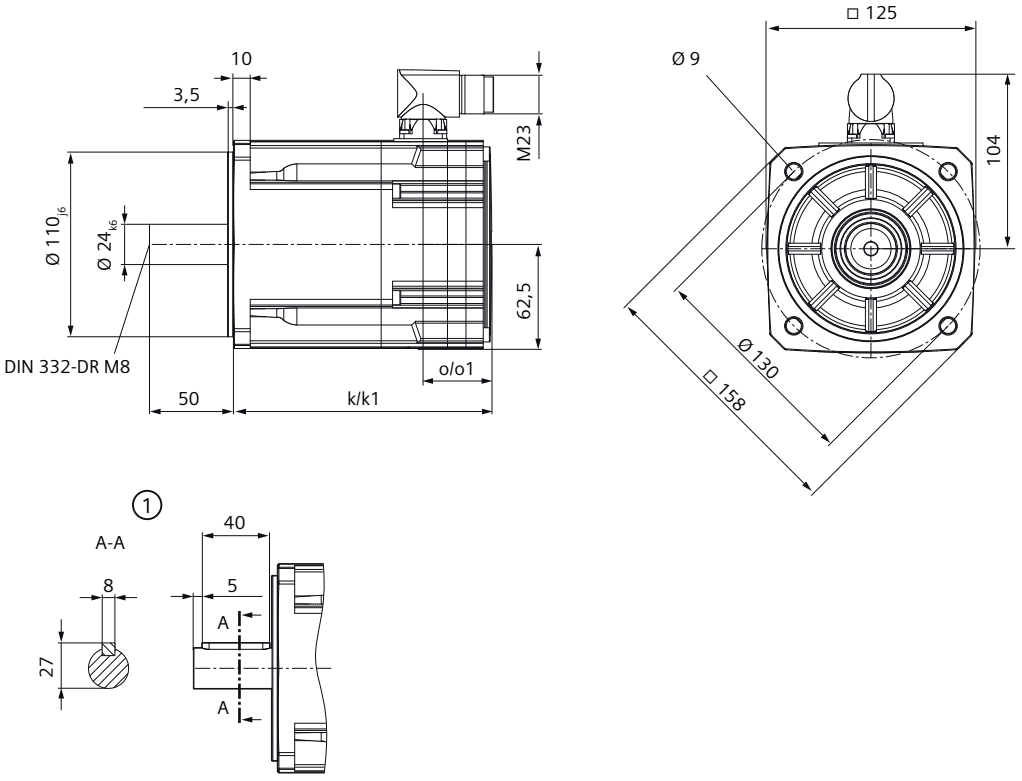


① With feather key

SIMOTICS S-1Fx2 Frame size 48	Dimensions			
	Without brake		With brake	
	k	o	k1	o1
1Fx2205-2Ax	145	28	188	34
1Fx2205-4Ax	177		220	

7.1.6 Dimension drawings 1Fx2x06

All dimensions in mm.

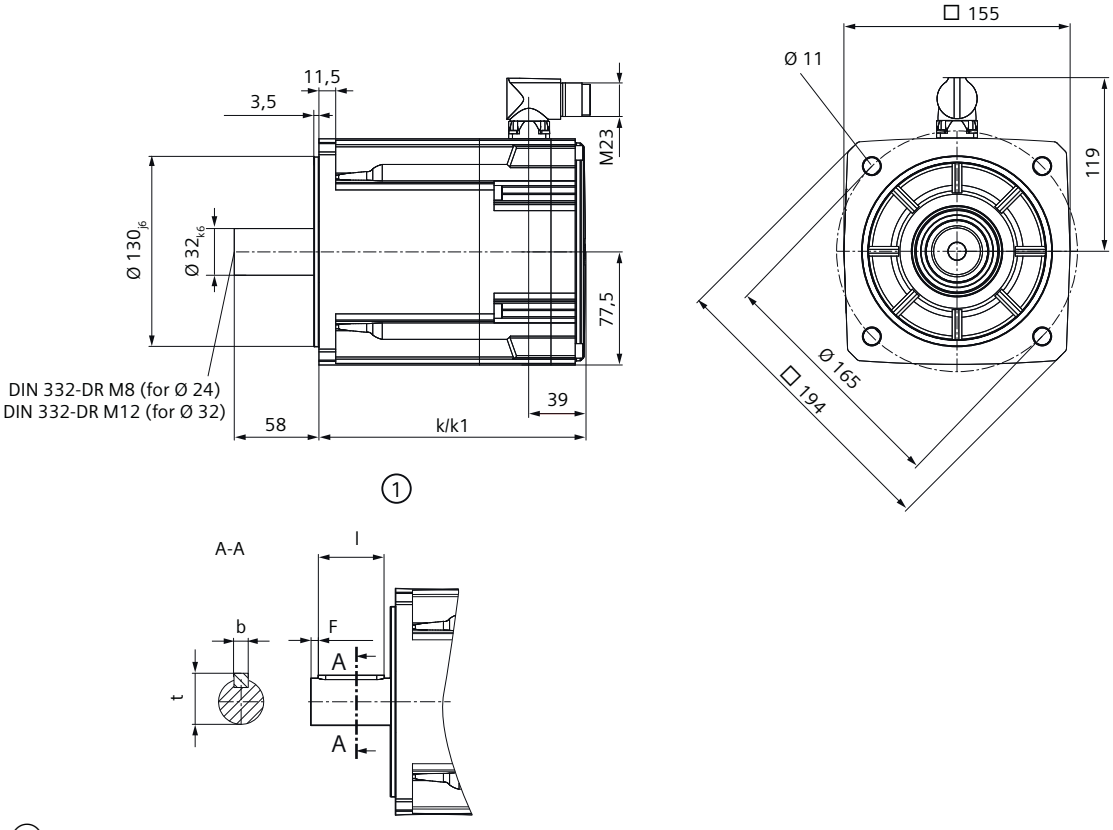


① With feather key

SIMOTICS S-1Fx2 Frame size 63	Dimensions			
	Without brake		With brake	
	k	o	k1	o1
1Fx2206-2Ax	154	41	205	53
1Fx2106-3Ax	174		225	
1Fx2206-3Ax	174		225	
1Fx2106-4Ax	193		244	
1Fx2206-4Ax	193		244	
1Fx2106-6Ax	232		283	

7.1.7 Dimension drawings 1Fx2x08

All dimensions in mm



① With feather key

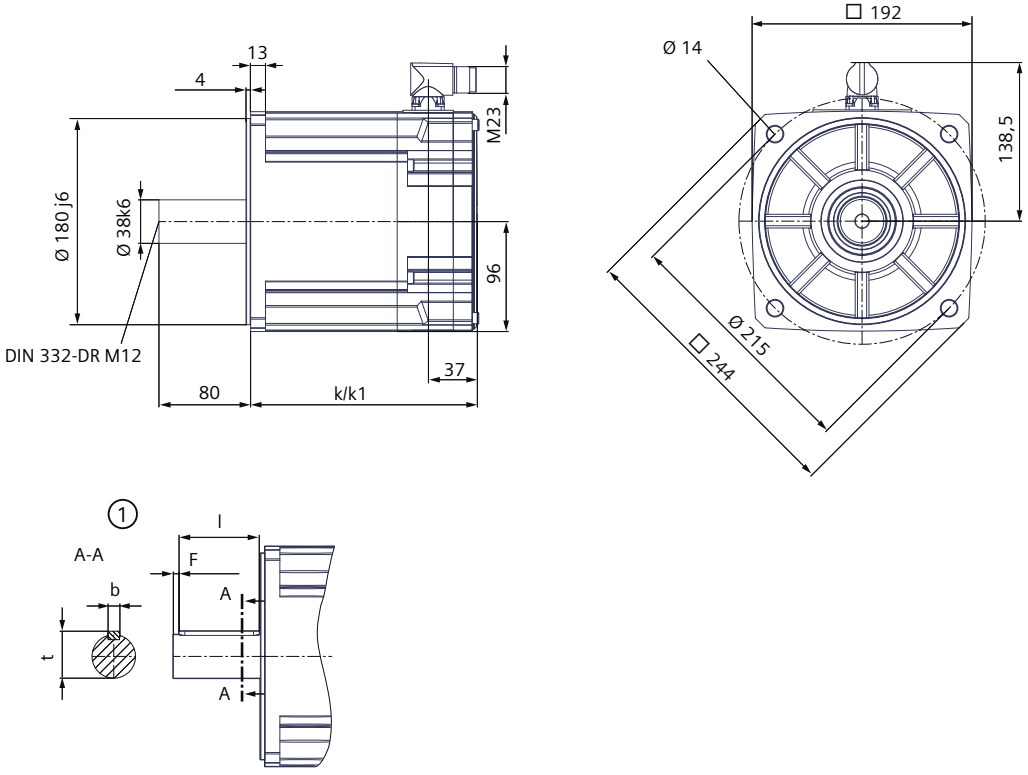
SIMOTICS S-1Fx2 Frame size 80	Dimensions	
	Without brake	With brake
	k	k1
1FT2108-4Ax	227	280
1FT2108-5Ax	247	300
1FT2108-7Ax	287	340
1Fx2208-2Ax	168	221
1Fx2208-3Ax	183	236
1Fx2208-4Ax	203	256
1Fx2208-5Ax	223	276

Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 32 x 58 mm		Shaft diam. 24 x 50 mm	
	d	l	d	l
1Fx2x08	32 (k6)	58	24 (k6)	50

Motor frame size	Feather key dimensions							
	Shaft diam. 32 x 58 mm				Shaft diam. 24 x 50 mm			
	l	b	F	t	l	b	F	t
1Fx2x08	45	10	5	35	40	8	5	27

7.1.8 Dimension drawings 1Fx2x10

All dimensions in mm.



① With feather key

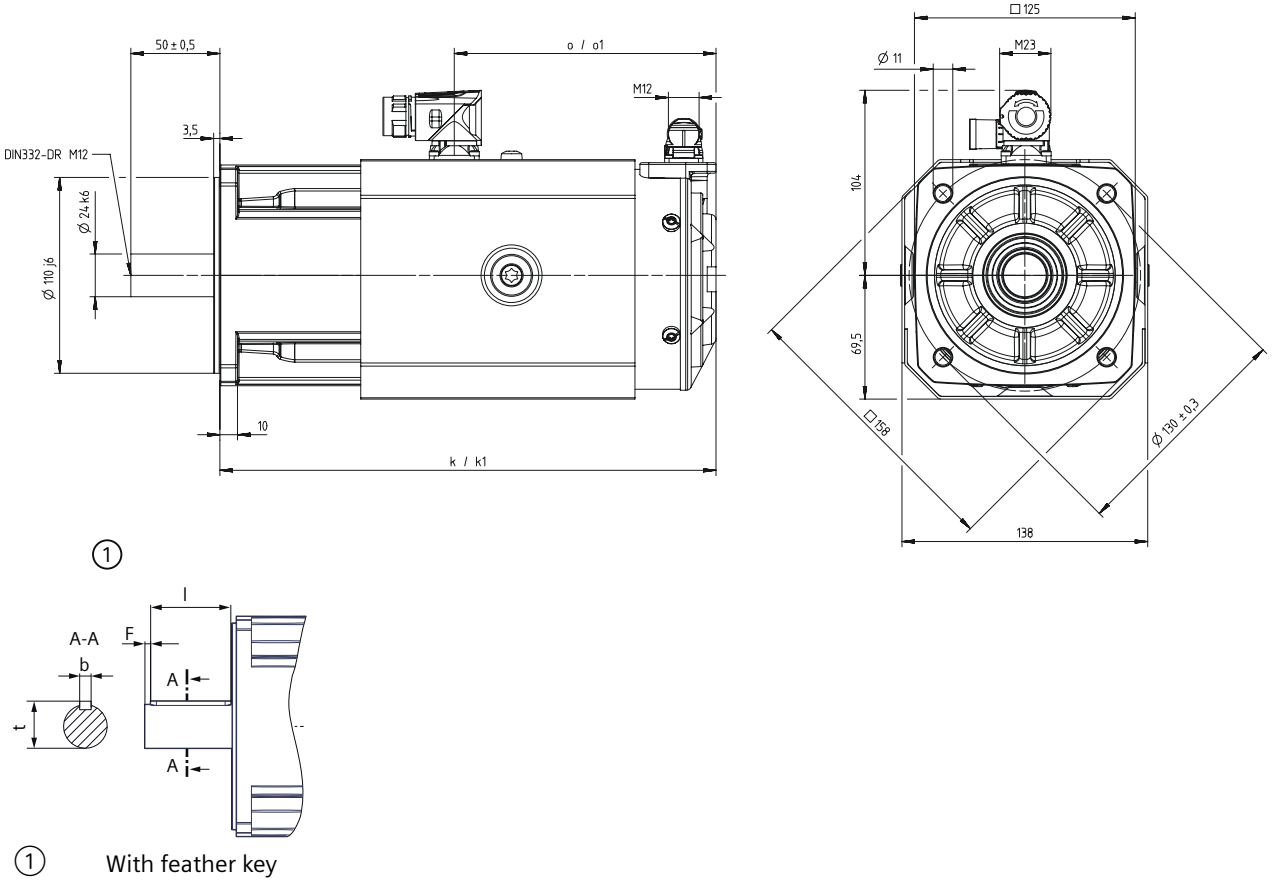
SIMOTICS S-1Fx2 Frame size 100	Dimensions	
	Without brake	With brake
	k	k1
1Fx2210-2Ax	174	233
1Fx2210-3Ax	198	257
1Fx2210-4Ax	223	282
1Fx2210-5Ax	248	307

Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 38 x 80 mm		Shaft diam. 32 x 58 mm	
	d	l	d	l
1Fx2210	38 (k6)	80	32 (k6)	58

Motor frame size	Feather key dimensions							
	Shaft diam. 38 x 80 mm				Shaft diam. 32 x 58 mm			
	l	b	F	t	l	b	F	t
1Fx2210	70	10	5	41	45	10	5	35

7.1.9 Dimension drawings 1FT2x06, force-ventilated

The motor has the following dimensions:

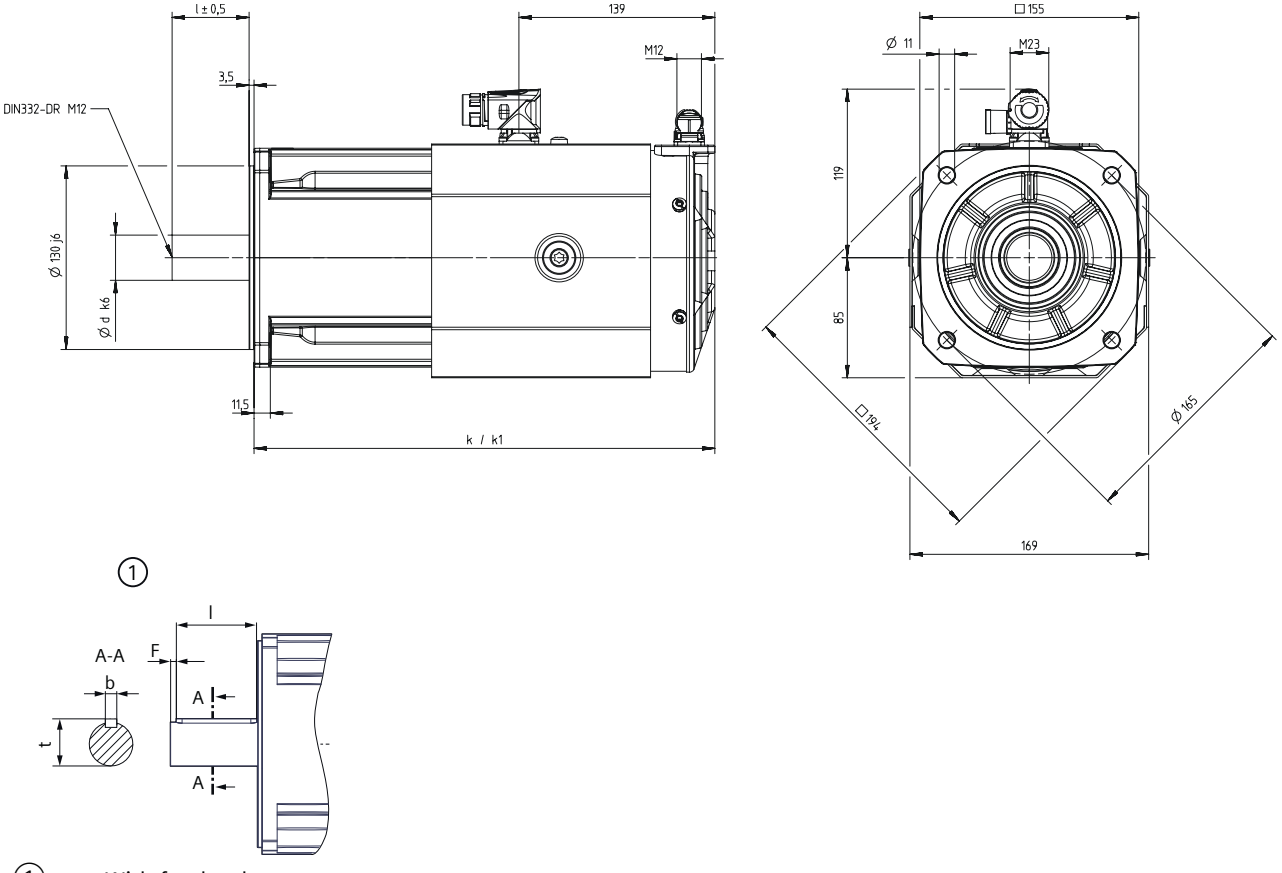


① With feather key

Motor frame size	Overall length of the motor			
	without brake		with brake	
	k / mm	o / mm	k1 / mm	o1 / mm
1FT2106-3SFxx	279	147	330	159
1FT2106-4SFxx	298		349	
1FT2106-6SFxx	338		389	
1FT2206-4Sxx	298		349	

7.1.10 Dimension drawings 1FT2x08, force-ventilated

The motor has the following dimensions:



① With feather key

Motor frame size	Overall length of the motor	
	without brake	with brake
	k / mm	k1 / mm
1FT2108-5SB	347	400
1FT2208-3Sx	283	336

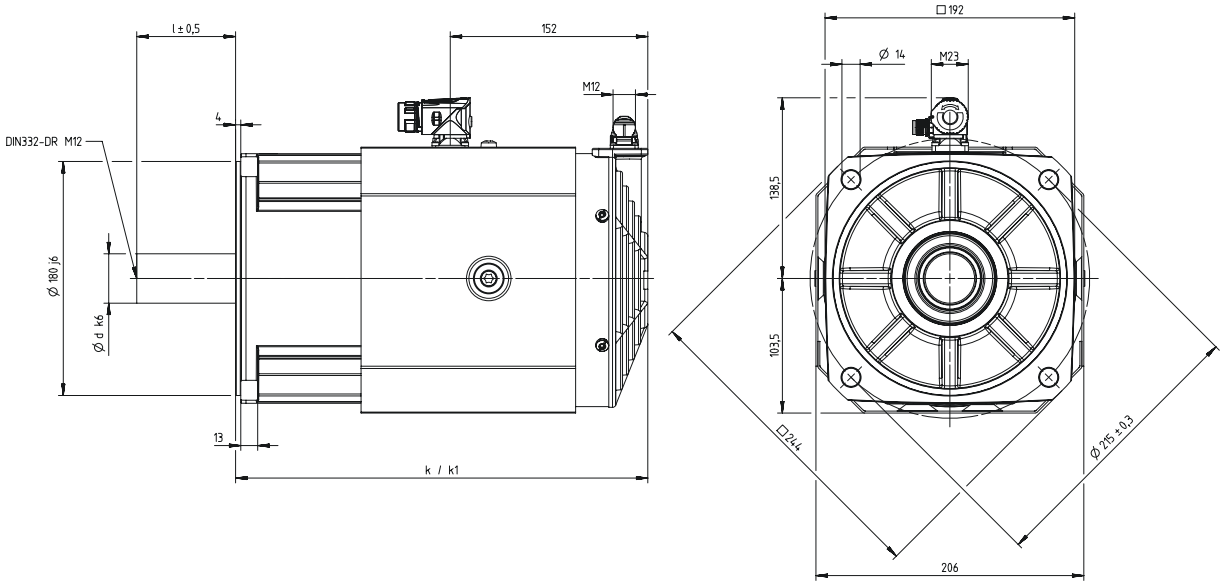
Motor frame size	Overall length of the motor	
	without brake	with brake
	k / mm	k1 / mm
1FT2208-4SB 1FT2208-4SC	303	356
1FT2208-5SB	323	376

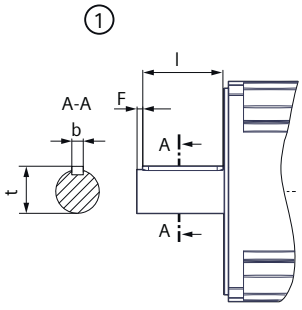
Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 32 x 58 mm		Shaft diam. 24 x 50 mm	
	d	l	d	l
1FT2x08	32 (k6)	58	24 (k6)	50

Motor frame size	Feather key dimensions							
	Shaft diam. 32 x 58 mm				Shaft diam. 24 x 50 mm			
	l	b	F	t	l	b	F	t
1FT2x08	45	10	5	35	40	8	5	27

7.1.11 Dimension drawings 1FT2x10, force-ventilated

The motor has the following dimensions:





① With feather key

Motor frame size	Overall length of the motor	
	without brake	with brake
	k / mm	k1 / mm
1FT2210-4SB	338	397

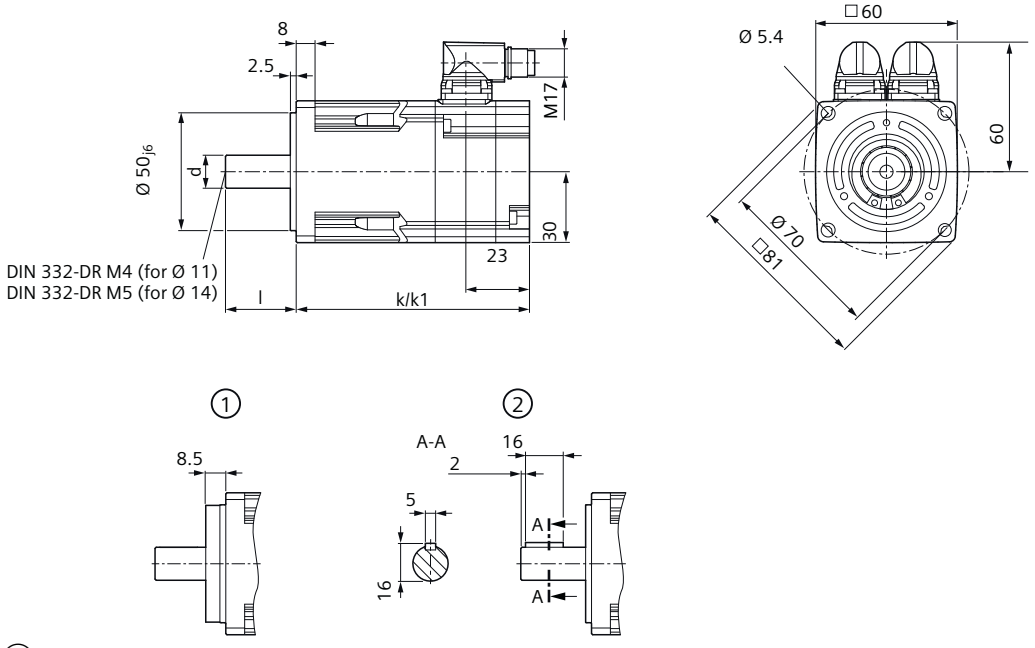
Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 38 x 80 mm		Shaft diam. 32 x 58 mm	
	d	l	d	l
1FT2210	38 (k6)	80	32 (k6)	58

Motor frame size	Feather key dimensions							
	Shaft diam. 32 x 58 mm				Shaft diam. 24 x 50 mm			
	l	b	F	t	l	b	F	t
1FT2210	70	10	5	41	45	10	5	35

7.2 Motors with two connectors

7.2.1 Dimension drawings 1Fx2x03

The motor has the following dimensions:

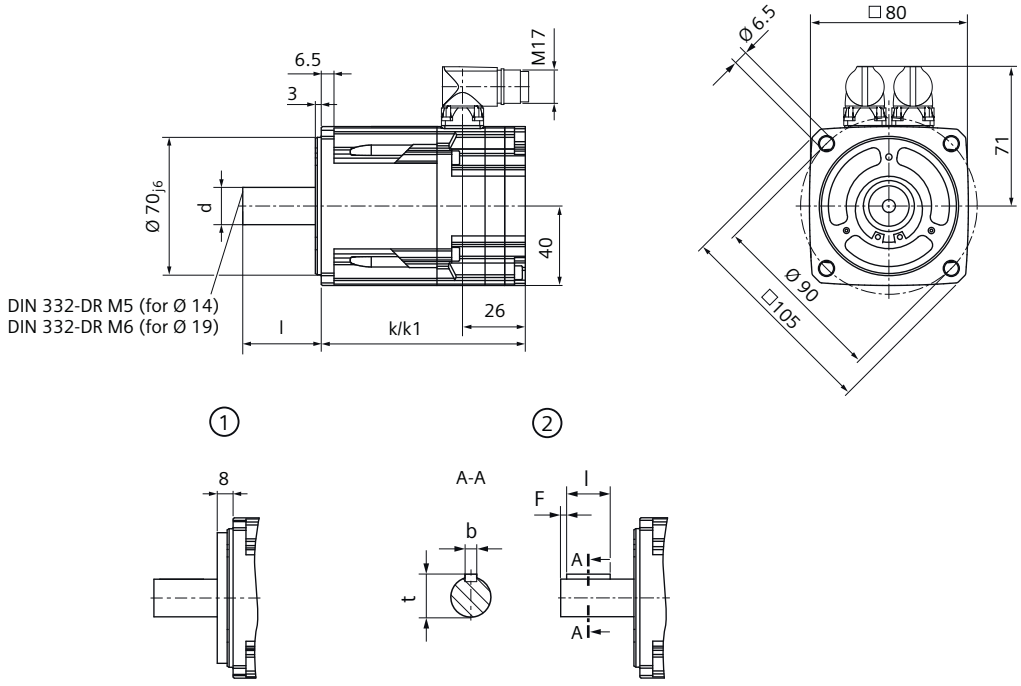


① Option with shaft sealing ring
② Option with feather key

Motor frame size	Overall length of the motor		Shaft diam. 14 x 30 mm		Shaft diam. 11 x 23 mm	
	without brake	with brake				
	k / mm	k1 / mm	d / mm	l / mm	d / mm	l / mm
Motors max. 480 V						
1Fx2103-2AH	99	131	14 (h6)	30	11 (k6)	23
1Fx2203-2AK						
1Fx2103-4AH	123	155				
1Fx2203-4AK						

7.2.2 Dimension drawings 1Fx2x04

The motor has the following dimensions:



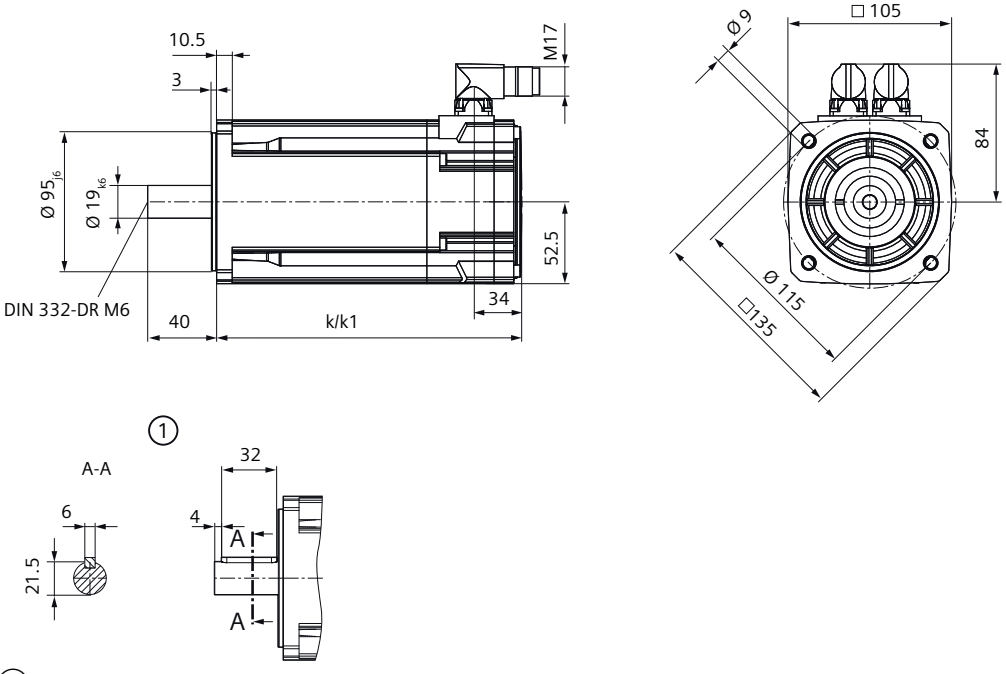
① Option with shaft sealing ring
② Option with feather key

Motor frame size	Overall length of the motor		Dimensions for the shaft geometry (13th position of the Article No.)			
	without brake	with brake	Shaft diam. 19 x 40 mm		Shaft diam. 14 x 30 mm	
	k / mm	k1 / mm	d / mm	l / mm	d / mm	l / mm
1Fx2104-4	98	142	19 (k6)	40	14 (k6)	30
1Fx2x04-5	126	170				
1Fx2x04-6	144	188				

Motor frame size	Feather key dimensions							
	Shaft diam. 19 x 40 mm				Shaft diam. 14 x 30 mm			
	l / mm	b / mm	F / mm	t / mm	l / mm	b / mm	F / mm	t / mm
1Fx2x04	22	6	3	21.5	16	5	2	16

7.2.3 Dimension drawings 1Fx2105

The motor has the following dimensions:

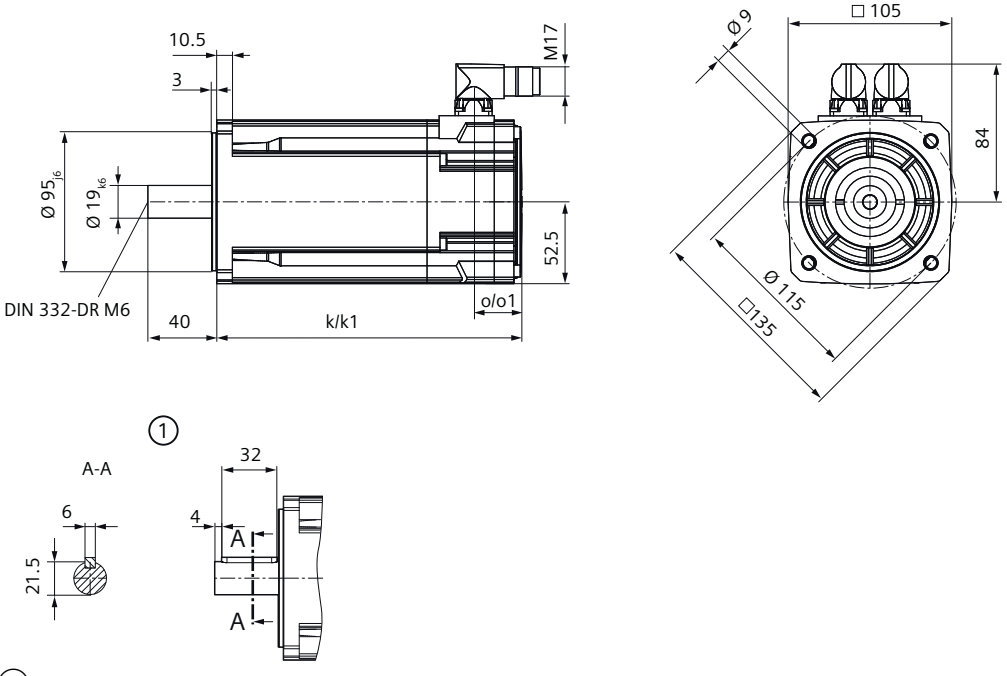


① Option with feather key

Motor frame size	Overall length of the motor	
	without brake	with brake
	k / mm	k1 / mm
1Fx2105-4	173	200
1Fx2105-6	215	242

7.2.4 Dimension drawings 1Fx2205

The motor has the following dimensions:

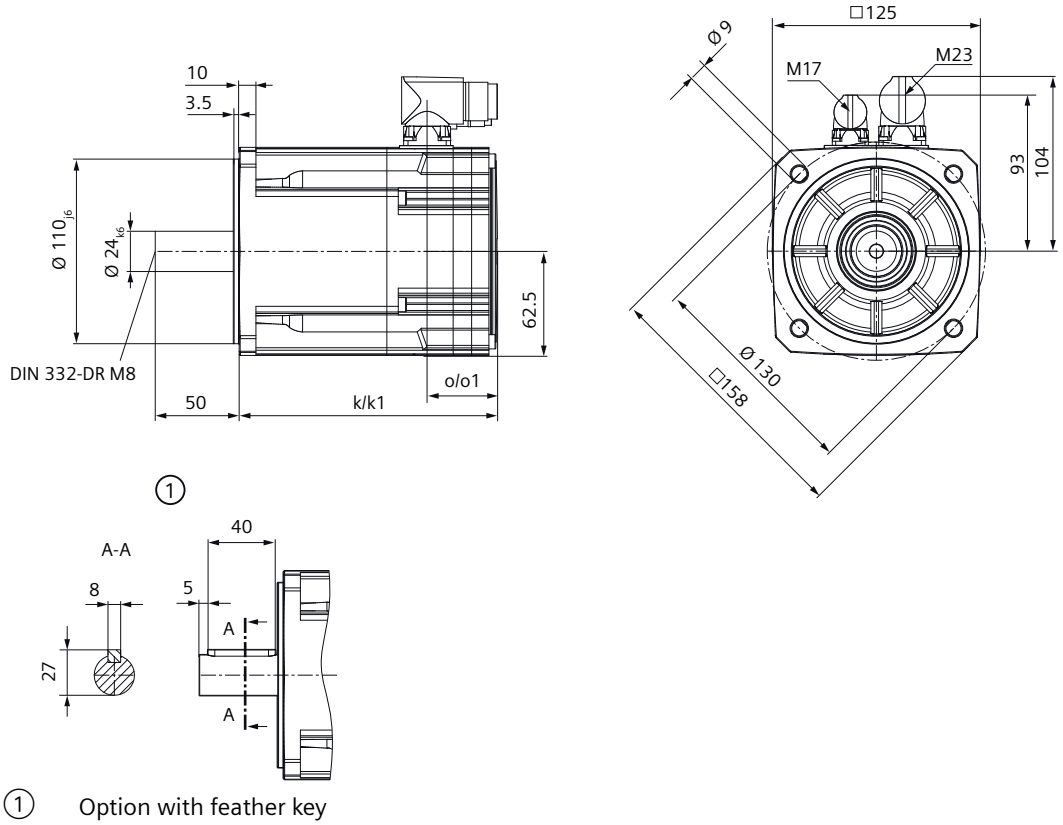


① Option with feather key

Motor frame size	Overall length of the motor			
	without brake		with brake	
	k / mm	o / mm	k1 / mm	o1 / mm
1Fx2205-2	145	28	188	34
1Fx2205-4	177		220	

7.2.5 Dimension drawings 1Fx2x06

The motor has the following dimensions:

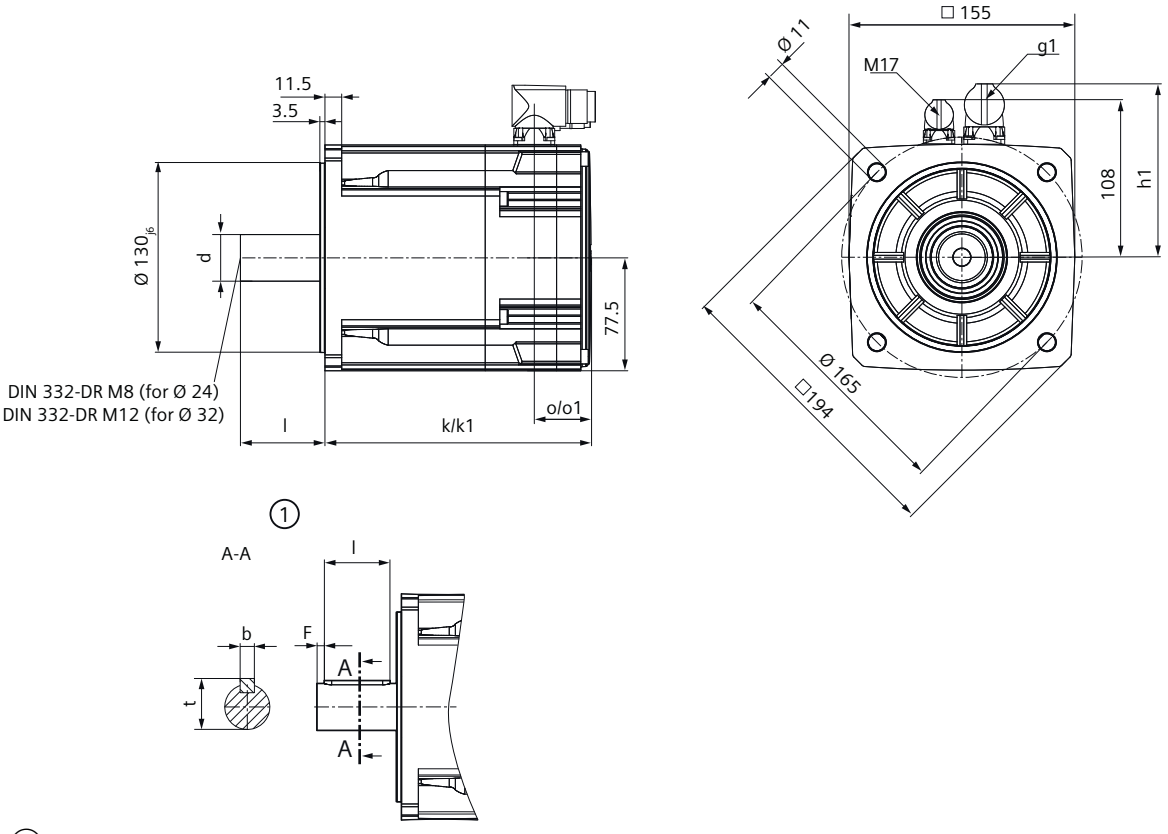


① Option with feather key

Motor frame size	Overall length of the motor			
	without brake		with brake	
	k / mm	o / mm	k1 / mm	o1 / mm
1Fx2106-3	174	41	225	53
1Fx2106-4	193		244	
1Fx2106-6	232		283	
1Fx2206-2	154		205	
1Fx2206-3	174		225	
1Fx2206-4	193		244	
1Fx2306-2	205	53	242	
1Fx2306-3	225		262	
1Fx2306-4	244		281	

7.2.6 Dimension drawings 1Fx2x08

The motor has the following dimensions:



① Option with feather key

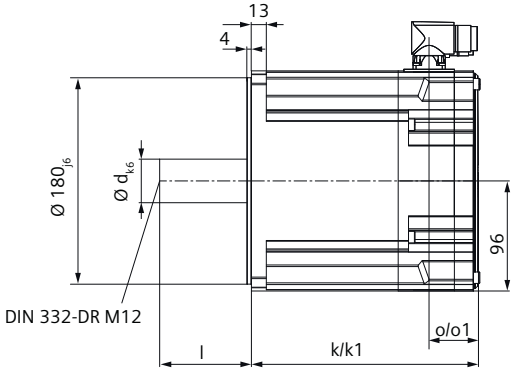
Motor frame size	Connectors			Overall length of the motor	
				without brake	with brake
	g1	h1	o / o1	k / mm	k1 / mm
1FT2108-4Ax	M23	119	39	227	280
1FT2108-5AB	M23	119	39	247	300
1FT2108-5AC	M40	139	45		
1FT2108-7AB	M23	119	39	287	340
1FT2108-7AC 1FT2108-7AE	M40	139	45		
1Fx2208-2Ax	M23	119	39	168	221
1Fx2208-3Ax				183	236
1Fx2208-4Ax				203	256
1Fx2208-5Ax				223	276
1Fx2308-2xx				221	254
1Fx2308-3xx				236	270
1Fx2308-4xx				256	290

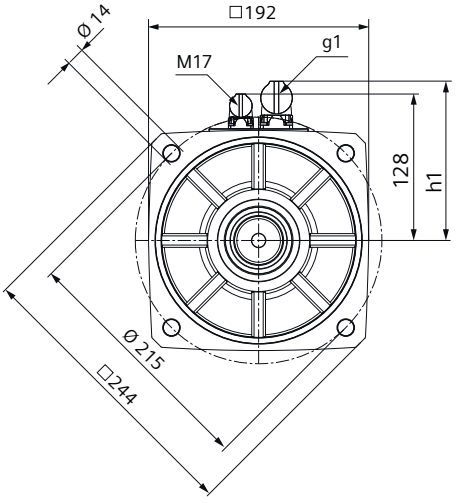
Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 32 x 58 mm		Shaft diam. 24 x 50 mm	
	d / mm	l / mm	d / mm	l / mm
1Fx2x08	32 (k6)	58	24 (k6)	50

Motor frame size	Feather key dimensions							
	Shaft diam. 32 x 58 mm				Shaft diam. 24 x 50 mm			
	l / mm	b / mm	F / mm	t / mm	l / mm	b / mm	F / mm	t / mm
1Fx2x08	45	10	5	35	40	8	5	27

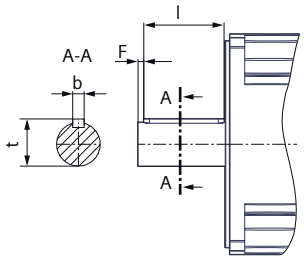
7.2.7 Dimension drawings 1Fx2210

The motor has the following dimensions:





①



① Option with feather key

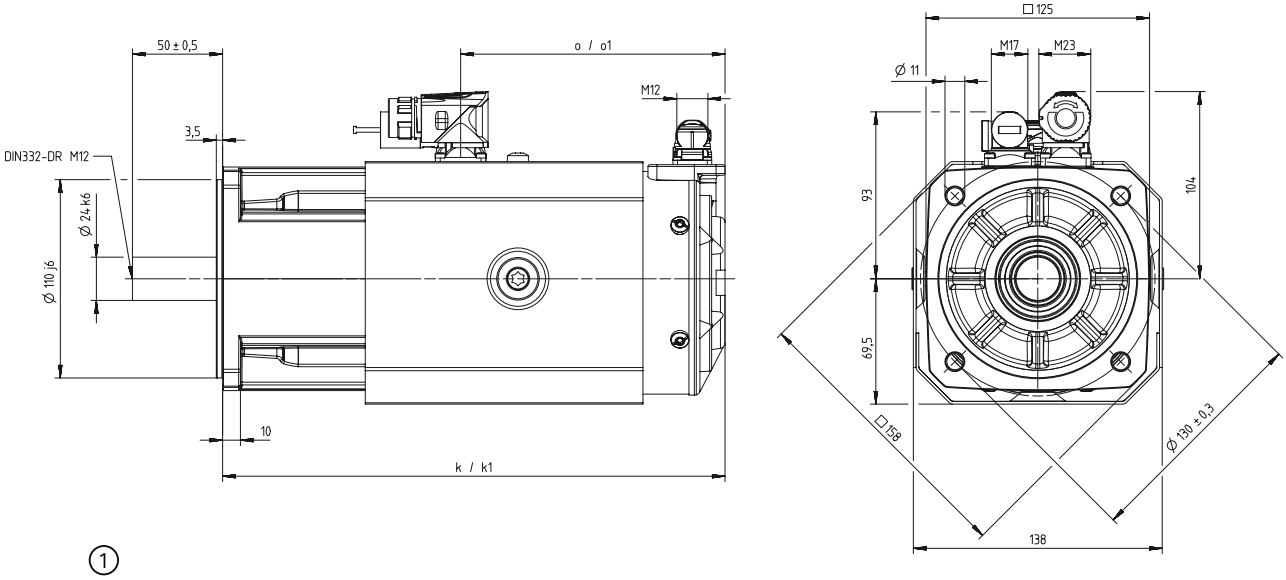
Motor frame size	Connectors		Overall length of the motor		
			without brake	with brake	o / mm
	g1	h1	k / mm	k1 / mm	o1 / mm
1FT2210-2Ax	M23	139	174	233	37
1FT2210-3Ax			198	257	
1FT2210-4AB			223	282	
1FT2210-4AC					
1FT2210-5AB			248	307	
1FT2210-3AF	M40	159	198	257	43
1FT2210-4AF			223	282	
1FT2210-5AC			248	307	

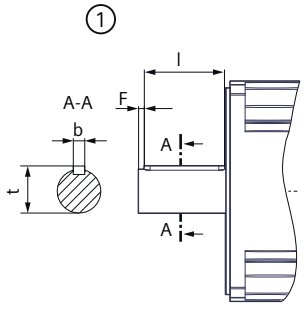
Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 38 x 80 mm		Shaft diam. 32 x 58 mm	
	d / mm	l / mm	d / mm	l / mm
1Fx2210	38 (k6)	80	32 (k6)	58

Motor frame size	Feather key dimensions							
	Shaft diam. 38 x 80 mm				Shaft diam. 32 x 58 mm			
	l / mm	b / mm	F / mm	t / mm	l / mm	b / mm	F / mm	t / mm
1Fx2210	70	10	5	41	45	10	5	35

7.2.8 Dimension drawing 1FT2x06, force-ventilated

The motor has the following dimensions:

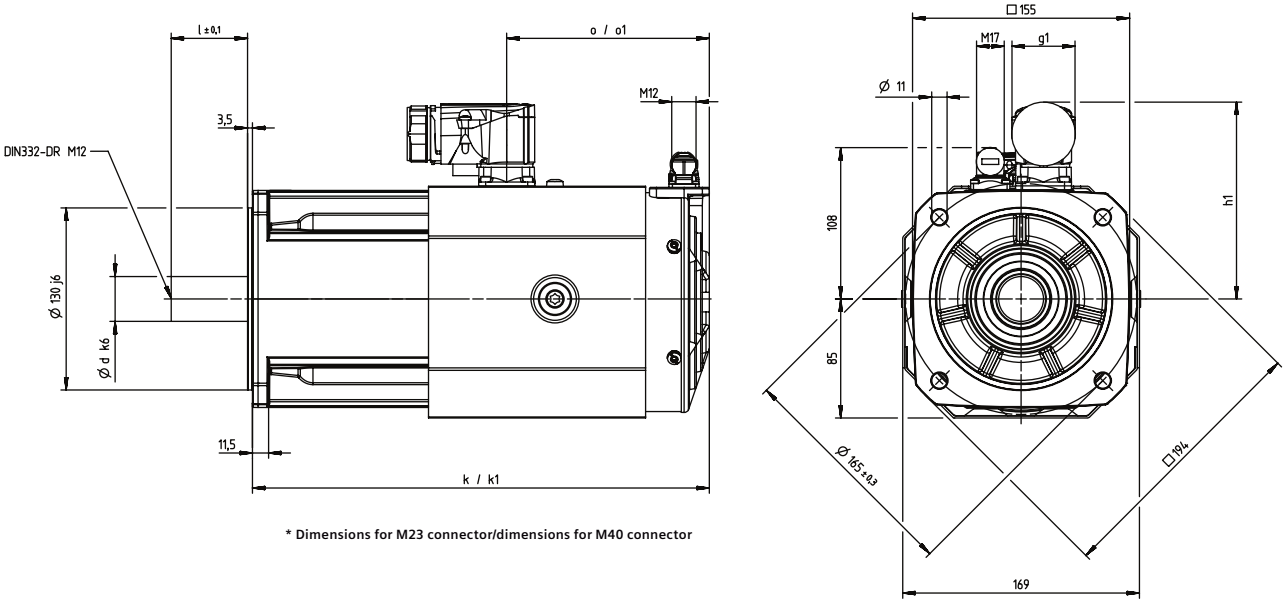




Motor frame size	Overall length of the motor			
	without brake		with brake	
	k / mm	o / mm	k1 / mm	o1 / mm
1FT2106-3SF	279	147	330	158
1FT2106-4SF	298		349	
1FT2106-6SF	338		389	
1FT2206-4Sx	298		349	

7.2.9 Dimension drawing 1FT2x08, force-ventilated

The motor has the following dimensions:



* Dimensions for M23 connector/dimensions for M40 connector

① Option with feather key

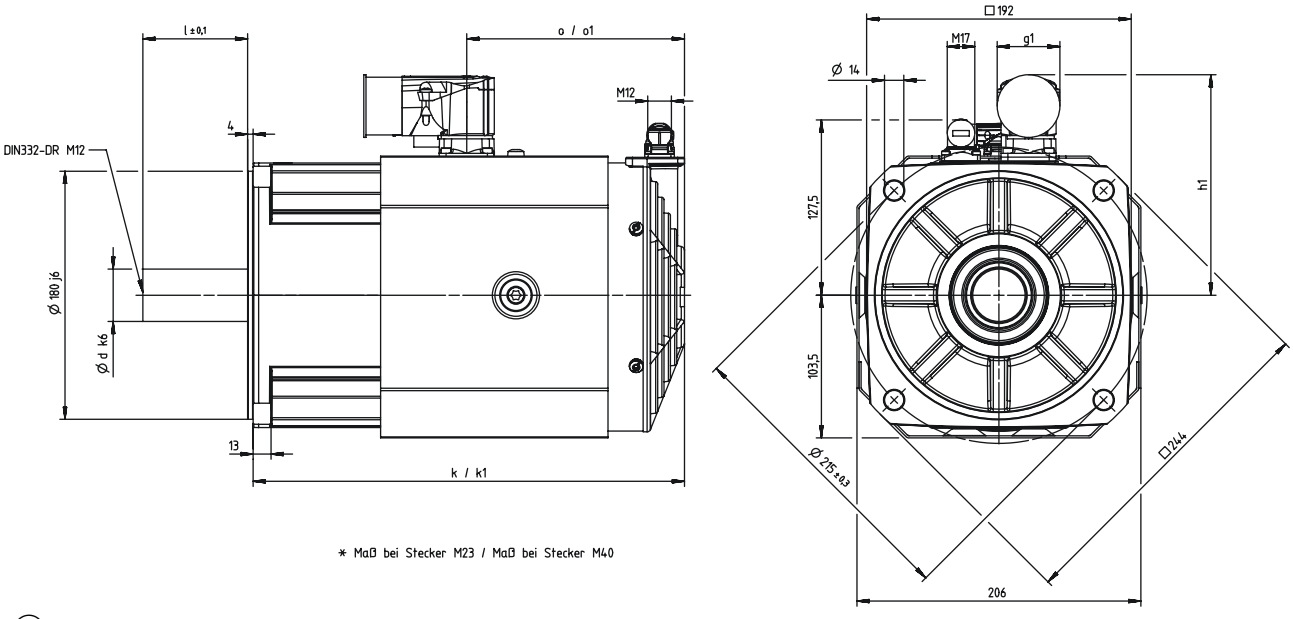
Motor frame size	Power connector		Overall length of the motor		
	Connector size	Connector height	without brake	with brake	o / mm
	g1 / mm	h1 / mm	k / mm	k1 / mm	o1 / mm
1FT2108-4Sx	M40	139	327	380	145
1FT2108-5SB	M23	119	347	400	139
1FT2108-5SC	M40	139			145
1FT2108-7Sx	M40	139	387	440	145
1FT2208-3Sx	M23	119	283	336	139
1FT2208-4SB 1FT2208-4SC	M23	119	303	356	139
1FT2208-4SF	M40	139			145
1FT2208-5SB	M23	119	323	376	139
1FT2208-5SC	M40	139			145

Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 32 x 58 mm		Shaft diam. 24 x 50 mm	
	d / mm	l / mm	d / mm	l / mm
1FT2x08	32 (k6)	58	24 (k6)	50

Motor frame size	Feather key dimensions							
	Shaft diam. 32 x 58 mm				Shaft diam. 24 x 50 mm			
	l / mm	b / mm	F / mm	t / mm	l / mm	b / mm	F / mm	t / mm
1FT2x08	45	10	5	35	40	8	5	27

7.2.10 Dimension drawing 1FT2x10, force-ventilated

The motor has the following dimensions:



① With feather key

Motor frame size	Power connector		Overall length of the motor		
	Connector size	Connector height	without brake	with brake	o / mm
	g1 / mm	h1 / mm	k / mm	k1 / mm	o1 / mm
1FT2210-3Sx	M40	158.5	313	372	158
1FT2210-4SB	M23	138.5	338	397	152
1FT2210-4SC	M40	158.5	338	397	158
1FT2210-4SF	M40	158.5	338	397	158
1FT2210-5Sx	M40	158.5	363	422	158

Motor frame size	Dimensions for the shaft geometry (13th position of the Article No.)			
	Shaft diam. 38 x 80 mm		Shaft diam. 32 x 58 mm	
	d / mm	l / mm	d / mm	l / mm
1FT2210	38 (k6)	80	32 (k6)	58

Motor frame size	Feather key dimensions							
	Shaft diam. 38 x 80 mm				Shaft diam. 32 x 58 mm			
	l / mm	b / mm	F / mm	t / mm	l / mm	b / mm	F / mm	t / mm
1FT2210	70	10	5	41	45	10	5	35

7.2.11 SIEMENS Product Configurator

Description

The SIEMENS Product Configurator supports you when configuring your motor and supplies you with important product information.

You will find the following information in the SIEMENS Product Configurator:

- Technical data
- Characteristics
- dimension drawings
- 2D/3D CAD data

Note

The 3D model in the SIEMENS Product Configurator is a simplified representation that does not show every detail.

You can find further information on the Internet at SIEMENS Product Configurator (www.siemens.com/SPC):

Recency of dimensional drawings

Note

Changing motor dimensions

Siemens reserves the right to change the dimensions of the motors as part of mechanical design improvements without prior notice. This means that dimensional drawings can become out of date.

You can request free of charge current dimension drawings from Technical Support or your local sales partner.

Preparation for use

8

8.1 Transporting

Note

Comply with the local national regulations for the transportation of motors.

Precondition

- Use suitable load suspension devices when transporting and installing the motor.
- Do not lift the motor by the connector.
- Transport the motor carefully.

Procedure for lifting and transporting using slings

You can lift and transport the motor using lifting slings.



⚠ WARNING

Incorrectly dimensioned or incorrectly used lifting slings

If lifting slings are incorrectly dimensioned or incorrectly used, the motor can fall and cause death, severe injury and/or damage to property.

- Only use lifting slings that are suitable for the weight of the motor.
- Attach the lifting slings as shown in the figure "Lifting and transporting with lifting slings".

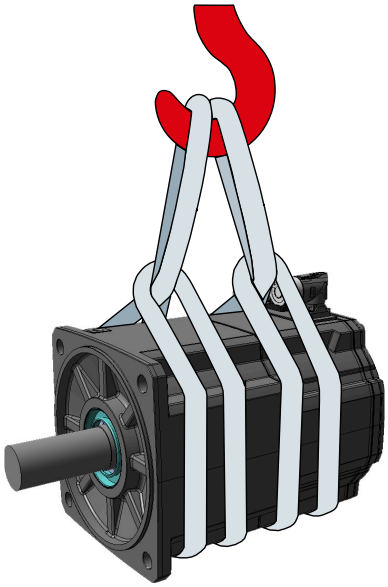


Figure 8-1 Lifting and transporting with lifting slings (sample figure)

Procedure for lifting and transporting using lifting eye bolts

For the 1FT2108 and 1FT2x10 motors, you can use lifting eyebolts and a crossbar for lifting and transporting.



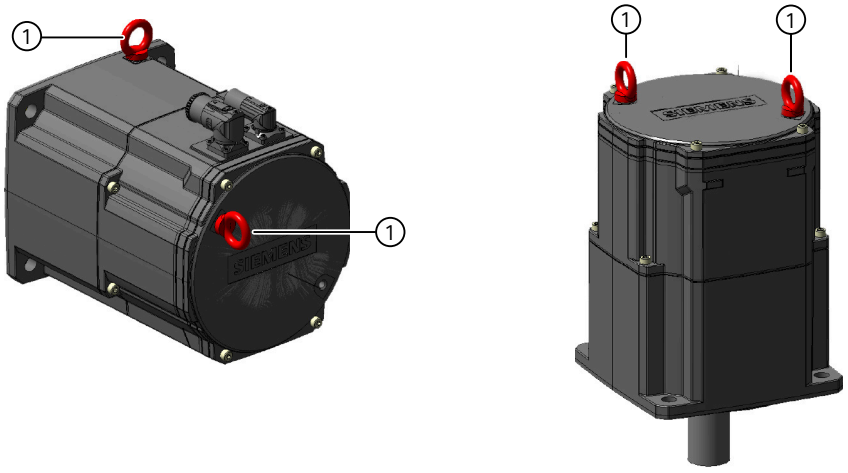
⚠ WARNING

Incorrect or unused attachment points

Due to incorrect or unused attachment points, the motor can fall and cause death, severe injury and/or damage to property.

- Only lift and transport larger motors using the lifting eye bolts screwed on to the end shields.
- Completely screw in the lifting eye bolts and tighten by hand (approx. 8 Nm).
- Do not use bent or damaged lifting eye bolts.
- Only use lifting eye bolts with laminated fiber washers.
- It is not permissible to apply loads transversely to the plane of the lifting eye bolts.

1. Screw the lifting eyes (lifting eye bolts) in at appropriate locations for the motor position when it is being transported.



① Position of the lifting eye bolts

2. Hook the crossbar into the lifting eye bolts (lifting eyes).

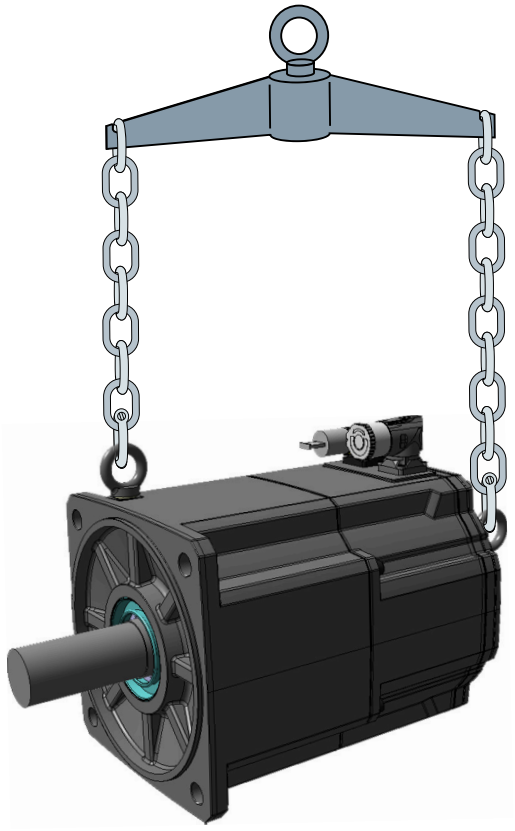


Figure 8-2 Transporting the motor with a beam (example)

3. Set the motor down on a firm, level surface.



⚠ WARNING

Danger of severe injury due to unintentional movements of the motor

If the motor is not secured after being set down, unintentional movements of the motor can cause serious injury.

- After the motor has been set down, secure it in position.
- Do not release the lifting devices until the motor has been secured in position.

4. Secure the motor against unintentional movement.

Procedure when transporting a motor with forced ventilation in the horizontal position



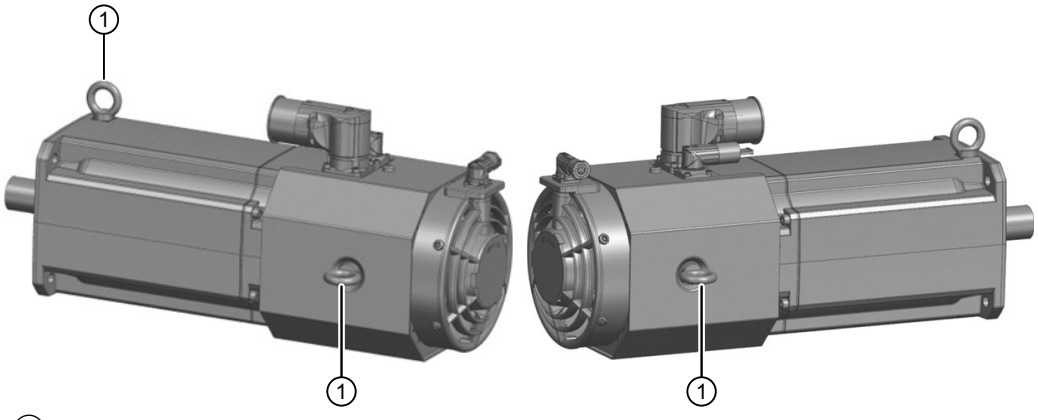
⚠ WARNING

Incorrect or unused attachment points

Due to incorrect or unused attachment points, the motor can fall and cause death, severe injury and/or damage to property.

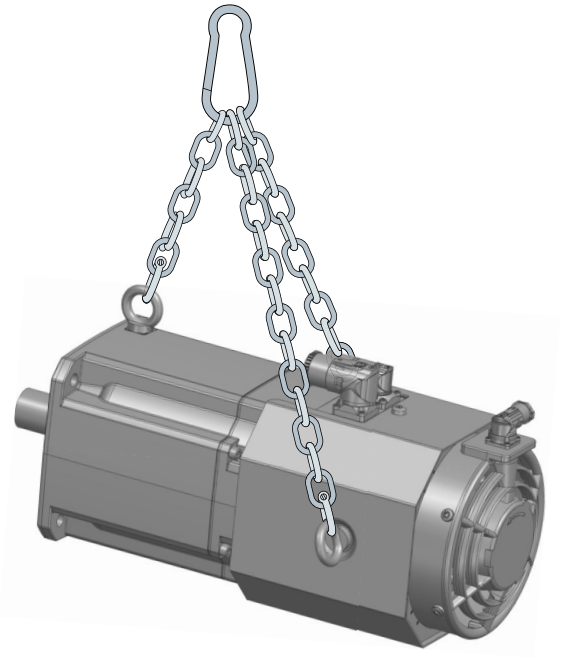
- Only lift and transport larger motors using the lifting eye bolts screwed on to the end shields.
- Completely screw in the lifting eye bolts and tighten by hand (approx. 8 Nm).
- Do not use bent or damaged lifting eye bolts.
- Only use lifting eye bolts with laminated fiber washers.
- It is not permissible to apply loads transversely to the plane of the lifting eye bolts.

1. Remove the screws from the threads into which you wish to screw the lifting eye bolts.
2. Screw the lifting eyes (lifting eye bolts) in at appropriate locations for the motor position when it is being transported.



① Position of the lifting eye bolts

3. Attach the load suspension device, e.g. chains to each of the three lifting eye bolts.



4. Set the motor down on a firm, level surface.



⚠ WARNING

Danger of severe injury due to unintentional movements of the motor

If the motor is not secured after being set down, unintentional movements of the motor can cause serious injury.

- After the motor has been set down, secure it in position.
- Do not release the lifting devices until the motor has been secured in position.

5. Secure the motor against unintentional movement.
6. Remove the lifting eye bolts.
7. Close and seal the threads using screws that you removed for transport.

8.2 Storage

Description

Note

If possible, store the motor in its original packaging.

Preserve the free shaft ends, sealing elements, and flange surfaces with a protective coating.

NOTICE
Seizure damage to bearings If the motors are stored incorrectly, bearing seizure damage can occur, e.g. brinelling, as a result of vibration. • Comply with the storage conditions.

Storage conditions

Observe the warning notes and symbols for handling on the packaging and labels.

Store the motor in a dry, dust-free, and vibration-free indoor storage facility.

Adhere to the following values:

- $v_{rms} < 0.2$ mm/s
- Max. temperatures: -15 °C to 55 °C
- Mean relative humidity < 75 %

Storage conditions for long-term storage

Note

Storage time of up to a maximum of 2 years

The storage time affects the properties of the rolling bearing grease.

- Complying with the conditions for long-term storage, store the motor for a maximum of 2 years.

If you store the motor for longer than 6 months, the storage area/room must meet the following environmental conditions.

Table 8-1 **Environmental conditions for long-term storage in the transport packaging according to Class 1K3 to EN 60721-3-1 except for the "Air temperature", "Highest relative air humidity" and "Condensation" environmental factors**

Climatic ambient conditions	- 15 °C ... + 55 °C
Highest relative air humidity	< 60%, condensation not permissible
Mechanical ambient conditions	Vibration-free storage space, $v_{rms} < 0.2$ mm/s
Protection against chemical substances	Protected according to Class 1C2
Biological ambient conditions	Suitable according to Class 1B2
Duration	• 6 months for the above-mentioned conditions. • Special preservation measures are required for storage periods of 6 months up to a maximum of 2 years.

Check the correct state of the motor every 6 months.

- Check the motor for any damage.
- Perform any necessary maintenance work.
- Check the state of the dehydrating agent and replace when necessary.
- Record the preservation work so that all preservation coating can be removed prior to the commissioning.

Condensation

The following ambient conditions encourage the formation of condensation.

- Significant ambient temperature fluctuations,
- Direct sunshine,
- High air humidity during storage.

Avoid these ambient conditions.

Use a dehydrating agent in the packaging.

Mounting

9

9.1 Checklist before installation

Procedure

Note

Required checks

The checklists below do not purport to be complete. It may be necessary to perform additional checks and tests in accordance with the situation specific to the particular installation site.

- Install the motor as described in the following chapters of the operating instructions.
- Thoroughly familiarize yourself with the safety instructions and observe the checklists below before starting any work.

Table 9-1 Checklist prior to installation

Check	OK
General checks	
Are all necessary components of the configured drive available?	
Are the ambient conditions in the permissible range? • Section "Environmental conditions (Page 45)"	

Table 9-2 Checklist to check the mechanical system

Check	OK
Is the motor free of visible damage?	
Have the mounting surfaces (e.g. flange, shaft) on the customer machine and on the motor been cleaned?	
Are the mounting surfaces free of corrosion?	
Do the mounting dimensions (e.g. shaft diameter, shaft length, true run) on the customer machine meet the specification?	

9.2 Mounting instructions

Description

NOTICE
Damage to shaft sealing rings caused by solvent If shaft sealing rings come into contact with solvents when preservation coating is removed, the shaft sealing rings can be damaged. • Avoid contact between solvents and shaft sealing rings.

NOTICE
Damage to the motor due to radial eccentricity at the shaft extension Radial eccentricity and axial forces at the shaft extension can damage the motor. • Mount the motor in such as way that no radial eccentricity and axial forces at the shaft extension occur.

- Adhere to the specifications on the rating plate.
- Observe the warning and information plates on the motor.
- Check the permissible ambient conditions (e.g. temperature, installation altitude) at the installation location.
- Thoroughly remove any anti-corrosion agents from the shaft extension. Use commercially available solvents.
- Ensure sufficient dissipation of heat losses. More information is provided in Chapter "Cooling (Page 47)".
- If the motor is installed vertically with the shaft extension facing up, ensure that no liquid can enter the upper bearing.
- Ensure that the flange is in even contact with the mounting surface.
- Use hexagon socket-head screws with a property class of at least 8.8.
- When tightening the fastening bolts avoid any uneven stressing.
- Observe the tightening torques for the fixing screws (see table below).

Tightening torques for fastening bolts

The general tolerance for the tightening torque is 10%. The tightening torque is based on a friction coefficient of $\mu = 0.14$.

Motor	Bolt DIN 7984	Washer ISO 7092 in mm	Tightening torque for bolts (not for electrical connections)
1Fx2x02	M4	4 (d2 = 8)	2.2 Nm
1Fx2x03	M5	5 (d2 = 9)	4 Nm
1Fx2x04	M6	6 (d2 = 11)	8 Nm

Motor	Bolt DIN 7984	Washer ISO 7092 in mm	Tightening torque for bolts (not for electrical connections)
1Fx2x05	M8	8 (d2 = 15)	20 Nm
1Fx2x06	M8	8 (d2 = 15)	20 Nm
1Fx2x08	M10	10 (d2 = 18)	35 Nm
1Fx2x10	M12	12 (d2 = 20)	60 Nm

Tightening torques for fastening bolts

9.3 Mounting the feather key

⚠ WARNING

Injuries due to ejected feather key

When the motor with feather key is running, the key on the shaft can be ejected by centrifugal force. This can result in personal injury or property damage.

- Before operating the motor, the feather key must be secured on the shaft to prevent it from being ejected by centrifugal force.

NOTICE

Damage to motor bearings due to improper operation

Never install the feather key by hammering it into the slot, as this may damage the bearing.

- Mount the feather key without hammering on the keyway or the shaft extension.

Precondition

To avoid damage to the shaft extension or feather key, use water pump pliers or siphon pliers with soft tips made of plastic or measurement to mount the feather key.

Procedure

1. Place the feather key straight on the keyway.
2. Press the feather key lightly into the keyway using the pliers.

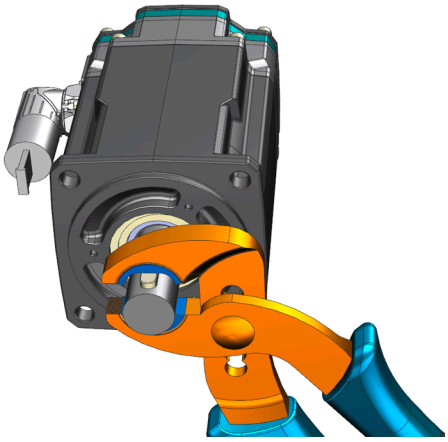


Figure 9-1 Mounting the feather key

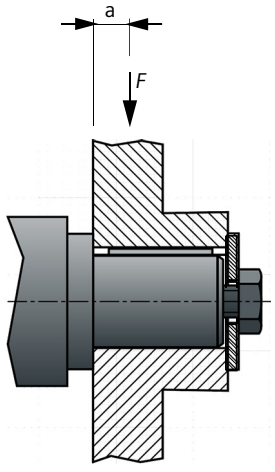
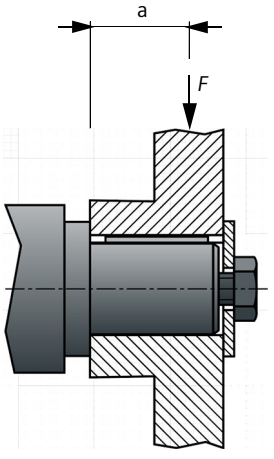
3. Before operating the motor, you must mount drive elements, e.g. a belt pulley or a coupling, on the shaft end using a feather key.

9.4 Pulling on drive output elements

Description

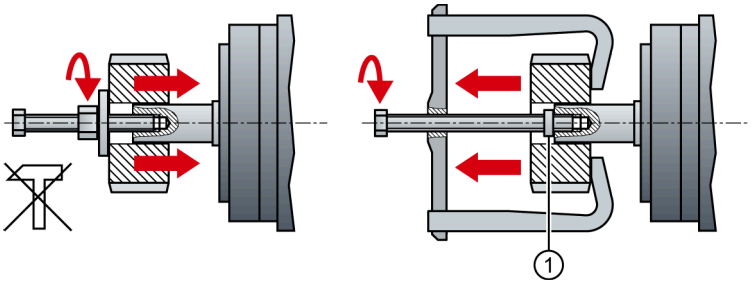
Reduce the bending torque load applied to the shaft and the bearing by appropriately arranging the output elements.

- Mount the output elements as close as possible to the motor bearing.

Optimal	Unfavorable
	
Low stress on shafts and bearings	High stress on shafts and bearings

Mount or remove the power output elements (e.g. couplings, gear wheels, belt pulleys) using suitable devices only (see figure).

- Use the threaded hole in the shaft extension.
- If required, heat up the output elements before mounting or removing.
- When removing the output elements, use an intermediate disk to protect the centering in the shaft extension.



1 Intermediate washer/disk (to protect the centering in the shaft extension)

Figure 9-2 Pulling on and pulling off drive output elements

- If necessary, completely balance the motor together with the output elements according to ISO 1940.

Note

Motors with feather key are half-key balanced. The motors have been balanced with half a feather key.

The motor dimensions can be found in section "Dimension drawings (Page 339)".

Connecting

10

10.1 Connection notes

10.1.1 Motor connection

NOTICE
Destruction of the motor if it is directly connected to the three-phase line supply
The motor will be destroyed if it is directly connected to the three-phase line supply. • Only operate the motors with the appropriately configured converters.

- The manufacturer of the plant/machine is responsible for the ensuring that the installation is performed correctly.
- Observe the data on the rating plate and the circuit diagrams.
- Adapt the connecting cables to the type of use and the voltages and currents that occur.
- Use prefabricated cables from SIEMENS (not in the scope of delivery). These cables reduce installation costs and increase operational reliability (see the Product Information).
- Make sure that the inside of the connector is clean and free of cable cuttings and moisture.
- Check that the degree of protection is complied with at the seals and sealing surfaces of the connectors.
- Secure connecting cables against torsion, tensile and compressive strain, and protect them against kinking. It is not permissible to subject the connector to continuous force.

Current-carrying capacity for power and signal cables

The current-carrying capacity of PVC/PUR-insulated copper cables is specified for routing types B1, B2 and C under continuous operating conditions in the table with reference to an ambient air temperature of 40° C. For other ambient temperatures, the values must be corrected by the factors from the "Derating factors" table.

Table 10-1 Cable cross-section and current-carrying capacity

Cross-section in mm²	Current-carrying capacity rms; AC 50/60 Hz or DC for routing type		
	B1 in A	B2 in A	C in A
Electronics (according to EN 60204-1)			
0.20	-	4.3	4.4
0.50	-	7.5	7.5
0.75	-	9	9.5

Cross-section in mm²	Current-carrying capacity rms; AC 50/60 Hz or DC for routing type		
	B1 in A	B2 in A	C in A
Power (according to EN 60204-1)			
0.75	8.6	8.5	9.8
1.00	10.3	10.1	11.7
1.50	13.5	13.1	15.2
2.50	18.3	17.4	21
4	24	23	28
6	31	30	36
10	44	40	50
16	59	54	60

Table 10-2 Derating factors for power and signal cables

Ambient air temperature in °C	Derating factor according to EN 60204-1 Table D1
30	1.15
35	1.08
40	1.00
45	0.91
50	0.82
55	0.71
60	0.58

10.1.2 Rotating the connector on the motor

You can rotate power connectors and signal connectors within a limited range of angles.

Use a suitable socket connector to rotate the angle plug.

Unscrew and open the socket connector completely to avoid damaging the pin contacts.

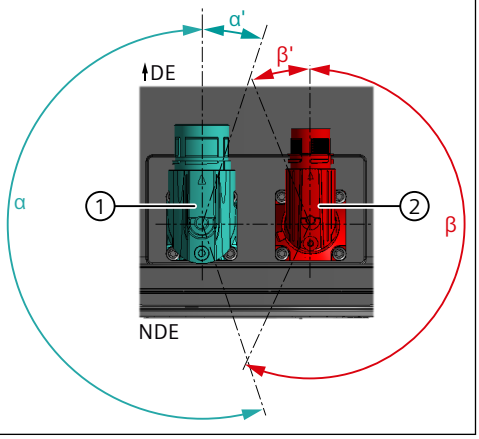
Note

Rotating the connectors

- Do not exceed the permissible range of rotation.
- To ensure the degree of protection, do not rotate more than 10 times.

Ability to rotate the connectors on motors with Two Cable Connection (2CC)

Table 10-3 Rotation range of the power connector ①

Motor	Connector size of the power connector ①	Angle α	Angle α'	Drawing
1Fx2x03	M17	205	29	
1Fx2x04		205	25	
1Fx2x05		228	35	
1Fx2x06	M23	222	40	
1Fx2x08		222	46	
1Fx2x10		222	55	
1Fx2x08	M40	195	48	
1Fx2x10		228	48	

Motor	Connector size of the signal connector ②	Angle β	Angle β'	Drawing
1Fx2x03	M17	209	25	See table "Rotation range of the power connector"
1Fx2x04		205	25	
1Fx2x05		215	48	
1Fx2x06		215	41	
1Fx2x08*)		215	46	
1Fx2x08**)		205	20	
1Fx2x10*)		215	57	
1Fx2x10**)		210	48	

*) For power connector M23

**) For power connector M40

Table 10-4 Rotation range of the fan connector ③

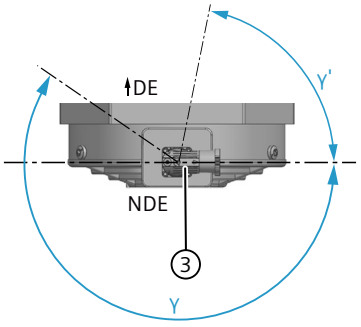
Size of the fan connector ③	Angle γ	Angle γ'	Drawing
M12	225°	81°	

Table 10-5 Maximum rotating torque for the connectors

Connector size	Max. torque when rotating
M12 connector	4 Nm
Connector M17	10 Nm
Connector M23	12 Nm
Connector M40	20 Nm

Connector rotation range for motors with One Cable Connection (OCC)

The specifications apply to the 1FK2 and 1Fx2 motors.

You can rotate the motor plug. Use a suitable socket connector as lever to rotate the connector.

Note

A maximum of 10 rotations are permitted so as not to impair the degree of protection of the motor.

Table 10-6 Rotational range of the connector ①

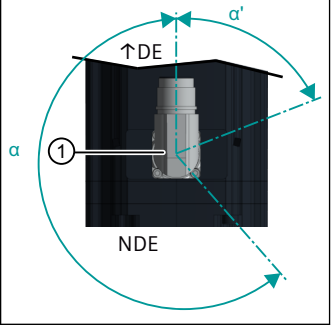
Motor	Angle α	Angle α'	Connector size	Drawing
1Fx2x02 1Fx2x03-xxG	261°	45°	M12	

Table 10-7 Rotational range of the connector ①

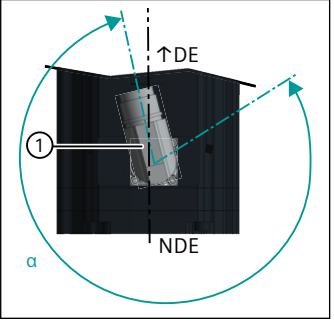
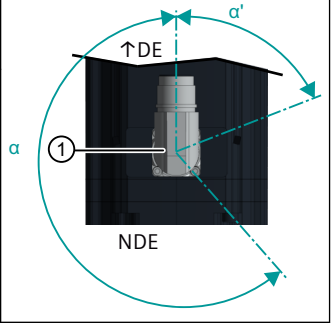
Motor	Angle α	Connector size	Drawing
1Fx2x03-xxH 1Fx2x03-xxK	10° - 295°	M17	

Table 10-8 Rotational range of the connector ①

Motor	Angle α	Angle α'	Connector size	Drawing
1Fx2x04	205°	80°	M17	
1Fx2x05	255°	35°		
1Fx2x06 1Fx2x08 1Fx2x10	312°	13°	M23	

10.1.3 Handling the quick-action locking

The chapter describes how you connect a power cable to the motor.

Overview

The motors are equipped with SPEED-CONNECT connectors.

The optional fan has a round connector with screw lock.

You can connect quick-connection cables with SPEED-CONNECT as well as conventional cables with screw locks (fully threaded) to the motor connector.

Note

We recommend cables with SPEED-CONNECT because they are easier to use.

Establishing a SPEED-CONNECT connection (does not apply to the fan connection)

Procedure

Note

- Only tighten the connector by hand.
- Do not use any wrenches or similar tools.

1. Ensure that the union nut of the SPEED-CONNECT connector is rotated to the end stop in the direction of the "open" arrow.
2. Align the SPEED-CONNECT connector so that the triangles on the top of the connectors are opposite one another.



3. Push the power connector onto the motor connecting socket as far as it will go.
4. Turn the union nut by hand in the direction of "close" by at least 45° (position A) or up to the end stop (position B)



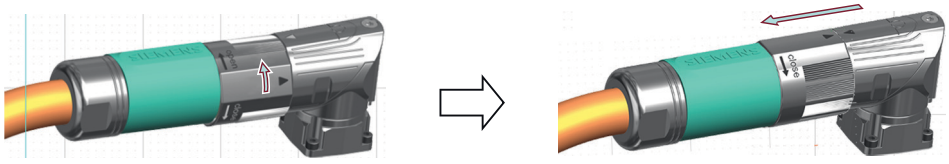
A Minimum locking
B Maximum locking up to the end stop

Note

A secure connection is only guaranteed from position A onward.

Releasing a SPEED-CONNECT connection

Procedure



1. Turn the union nut of the SPEED-CONNECT connector in the direction of "open" to the end stop. The triangles on the top of the connectors must be opposite one another.
2. Withdraw the connector.

Note

Pull out the connector at the connector itself, do not pull on the cable.

10.1.4 Routing cables in a damp environment

Description

Note

If the motor is mounted in a humid environment, the power and signal cables must be routed as shown in the following figure.

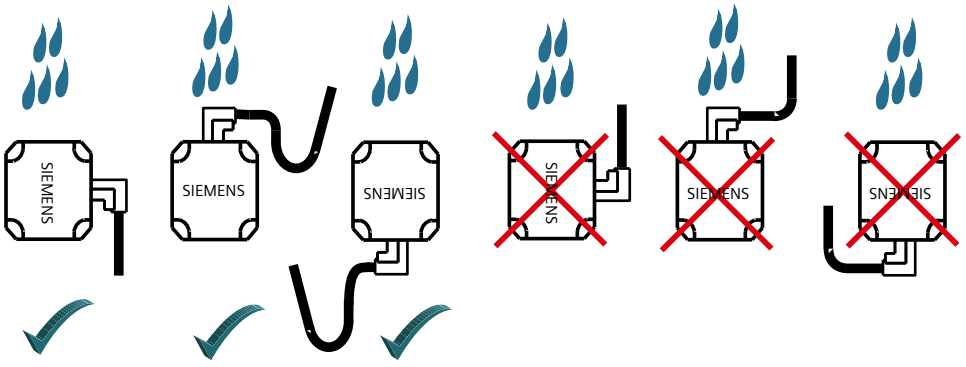
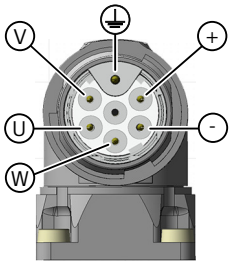
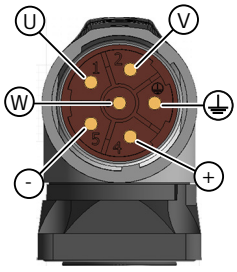
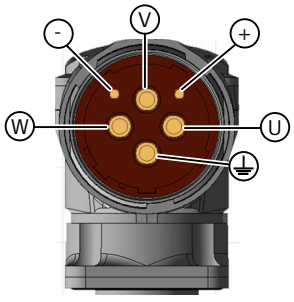


Figure 10-1 Routing cables in a damp environment

10.2 Power cable

Power connector versions

The motors are equipped with the following power connectors depending on the frame size and performance level.

Round connector M17	Round connector M23	Round connector M40
		
Brake connection 24 V: "+" = BD1+; "-" = BD2-		

The power connectors can be rotated within a certain range.

More precise information about the equipping of the motors and the angles of rotation is provided in Chapter "Rotating the connector on the motor (Page 378)".

Selecting and connecting the power cables

- Use prefabricated MOTION CONNECT cables from SIEMENS or shielded connecting cables. The appropriate cables for your motor are listed in the Chapter "Motor overview / Motor Module assignment (Page 111)".
- The prefabricated MOTION CONNECT cables reduce installation costs and increase the operational reliability

Note

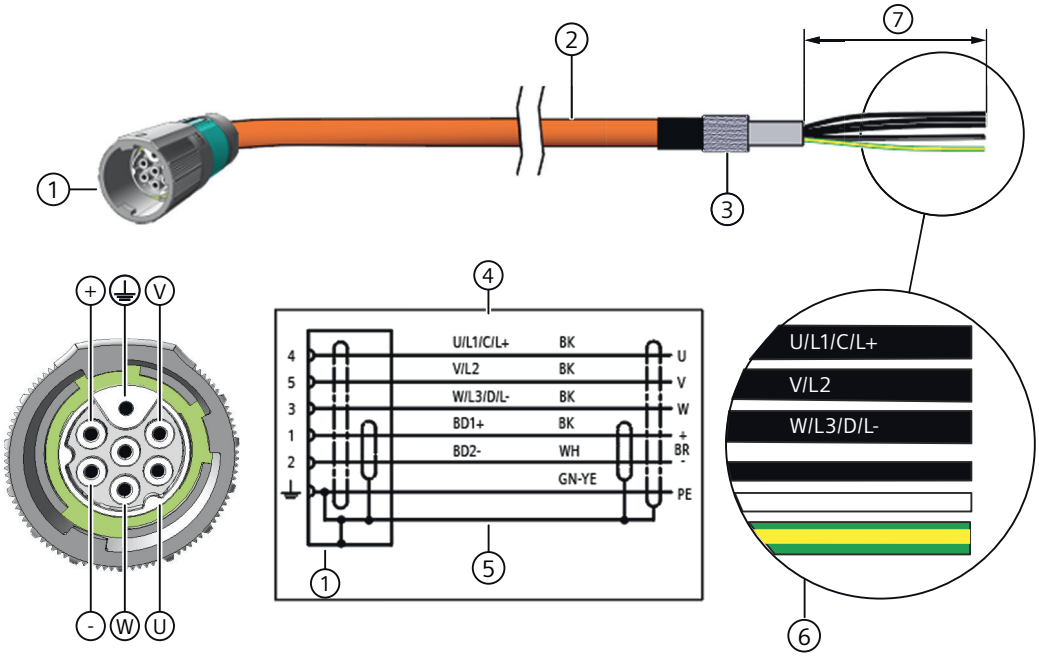
The cable shielding, made up of as many strands as possible, must have a high electrical conductivity. Braided shields made of copper or aluminum are well suited.

Comply with the following when connecting power cables:

- Connect the protective braided shield at the converter.
- Keep the unshielded cable ends as short as possible.
- Connect the protective braided shield over a large surface area so that high-frequency currents are effectively discharged.

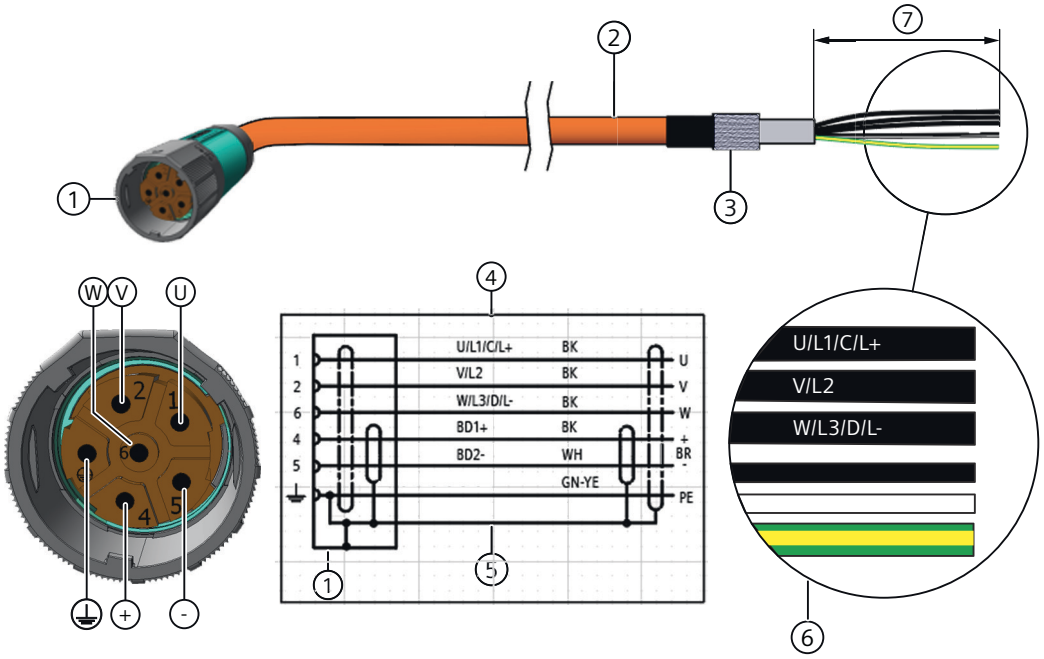
Connection diagram for connecting the motor to S120 using a MOTION-CONNECT cable

For connector size M17



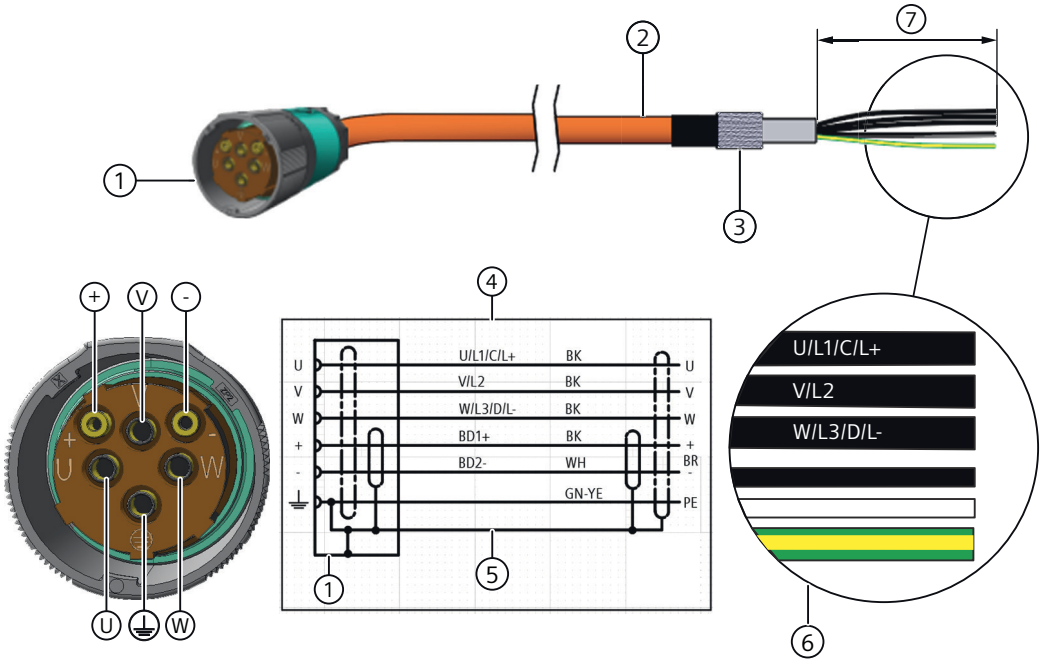
1 SPEED CONNECT connector, size M17
2 MOTION CONNECT cable
3 Protective braided shield
4 Connection diagram
U; V; W = power cables, 1.5 mm^2, each cable with separate shielding
BD1+ and BD2- = brake cable without lettering, 1.5 mm^2, shielded together
PE = protective conductor
5 Protective braided shield
6 Conductor designations
7 The length and design of the cable ends depends on the converter selected.

For connector size M23



1 SPEED CONNECT connector, size M23
2 MOTION CONNECT cable
3 Protective braided shield
4 Connection diagram
U; V; W = power cables, 1.5 mm^2 or 2.5 mm^2, each cable is separately shielded
BD1+ and BD2- = brake cable without lettering, 1.5 mm^2, shielded together
PE = protective conductor
5 Protective braided shield
6 Conductor designations
7 The length and design of the cable ends depends on the converter selected.

For connector size M40



1 SPEED CONNECT connector, size M40
2 MOTION CONNECT cable
3 Protective braided shield
4 Connection diagram
U; V; W = power cables, 1.5 mm^2, 2.5 mm^2, 4 mm^2, 6 mm^2 or 10 mm^2, each cable separately shielded
BD1+ and BD2- = brake cable without lettering, 1.5 mm^2, shielded together
PE = protective conductor
5 Protective braided shield
6 Conductor designations
7 The length and design of the cable ends depends on the converter selected.

Locking the round connectors

Properly lock the connected round connector at the motor.

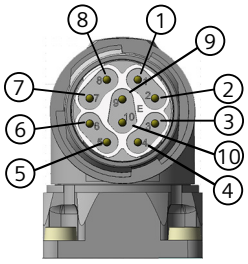
Information on locking is provided in Chapter "Handling the quick-action locking (Page 381)".

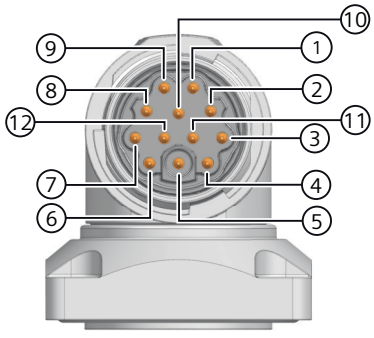
10.3 Signal cable

Signal connector design

The signal connection is established using a round connector M17.

The connector pin assignment is as follows.

M17 signal connector with DRIVE-CLiQ (2CC)		
	1	TX-P
	2	TX-N
	3	-
	4	-
	5	RX-P
	6	RX-N
	7	-
	8	-
	9	24 V
	10	0 V

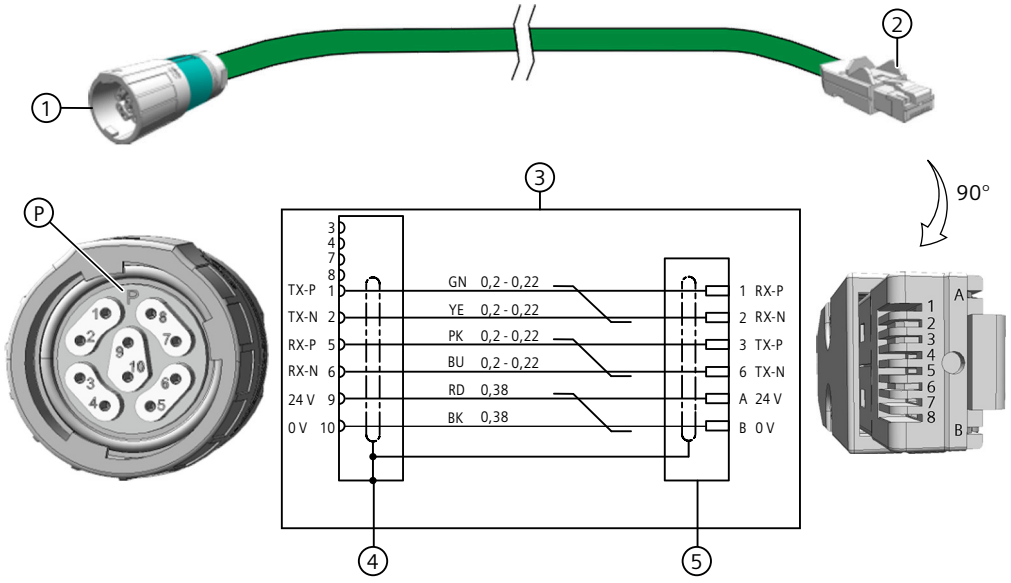
Signal connector M17 for resolver (2CC)		
	1	S2
	2	S4
	3	Not connected
	4	
	5	
	6	
	7	R2 / R3
	8	Not connected
	9	
	10	R1
	11	S1
	12	S3

The signal connectors can be rotated within a certain range.

More precise information on the angle of rotation is available in Chapter "Rotating the connector on the motor (Page 378)"

Connection diagram for the signal cable between the motor and S120

The connection is made on a signal line with connector M17, 10-pin and RJ45 connector



1	M17 round connector, 10-pin	4	Pin assignment of M17 round connector, 10-pin
2	RJ45/IP20 connector	5	Pin assignment of the RJ45 connector
3	Connection diagram	P	0° coded

Locking the round connector

Lock the round connector properly on the motor

Information on locking is provided in Chapter "Handling the quick-action locking (Page 381)".

10.4 OCC cable

NOTICE
Destruction of the motor if it is directly connected to the three-phase line supply
The motor will be destroyed if it is directly connected to the three-phase line supply. • Only operate motors with the permitted converters.

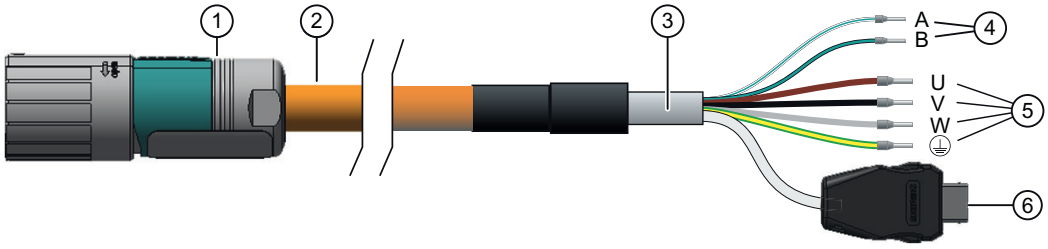
The manufacturer of the system/machine is responsible for ensuring that installation is performed correctly.

Ensure that the associated warning labels in the appropriate national language are attached.

The motors have SPEED-CONNECT M12, M17 or M23 connectors that can be rotated.

You connect the motor to the converter using a MOTION-CONNECT OCC cable. The cables for the power, the holding brake, the encoder and the shielding are integrated in the OCC cable.

- Use the prefabricated MOTION-CONNECT OCC cables from SIEMENS. This reduces the installation time and costs, and increases the operational reliability of the drive.



① Round connector M12, M17 or M23, 10-pole
② MOTION-CONNECT OCC cable
③ Shielding
④ Cables for a holding brake, A (WT) = "-", B (BK) = "+"
⑤ Power cables
⑥ SIEMENS IX connector for signal line

Figure 10-2 MOTION-CONNECT OCC (example)

- Check that the sealing surfaces of the connectors have not been damaged.

Clearance required when connecting the motor

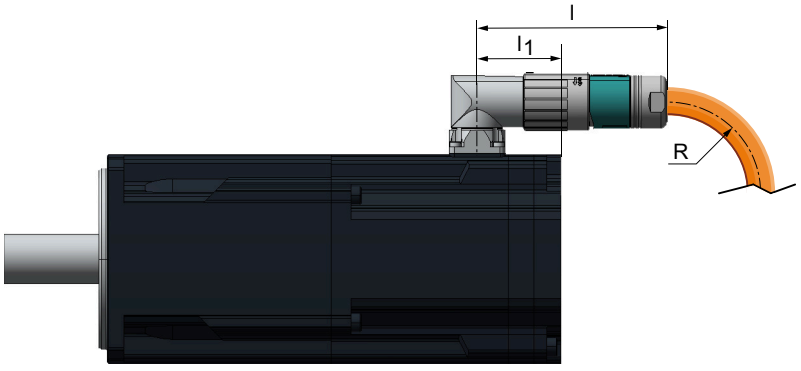


Figure 10-3 Example

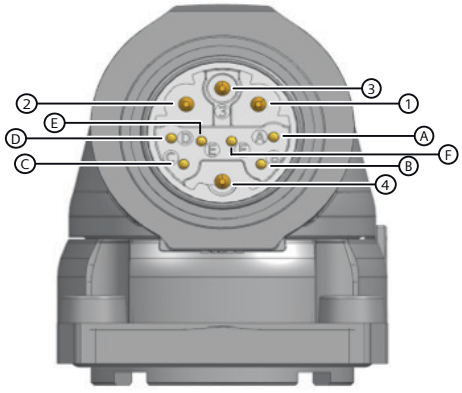
Table 10-9 Clearance required when connecting the motor

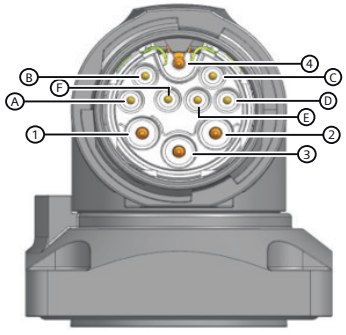
Motor	Connector size	Distance, point of rotation to NDE		Length of the plug connection	Minimum bending radius, static	
		Without brake	With brake		MC500	MC800 PLUS
		l_1 / mm		l / mm	R_{static} / mm	
1Fx2x02	M12	33		61	23.5	28.2
1Fx2x03-xxG		23				
1Fx2x03-xxH	M17			70	25.5	30.6
1Fx2x03-xxK						
1Fx2x04		26				
1Fx2205		28	34			
1Fx2105		34				

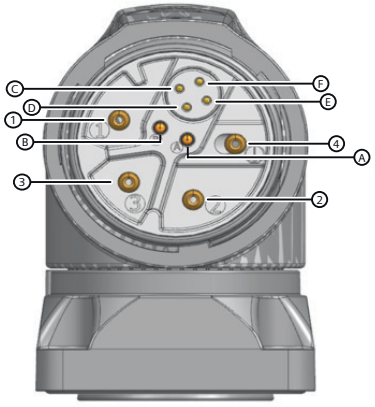
Motor	Connector size	Distance, point of rotation to NDE		Length of the plug connection	Minimum bending radius, static	
		Without brake	With brake		MC500	MC800 PLUS
		l_1 / mm		l / mm	R_{static} / mm	
1Fx2x06	M23	41	53	99	30.7	36.9
1Fx2x08		39				
1Fx2x10		43				

OCC connector design

The connector pin assignment is as follows.

M12 (OCC)		
	1	U
	2	W
	3	V
	4	GNYE
	A	BD1+
	B	BD2-
	C	RX-N
	D	RX-P
	E	TX-N
	F	TX-P

M17 (OCC)		
	1	U
	2	W
	3	V
	4	GNYE
	A	BD1+
	B	BD2-
	C	RX-N
	D	RX-P
	E	TX-N
	F	TX-P

M23 (OCC)		
	1	U
	2	W
	3	V
	4	GNYE
	A	BD1+
	B	BD2-
	C	RX-N
	D	RX-P
	E	TX-N
	F	TX-P

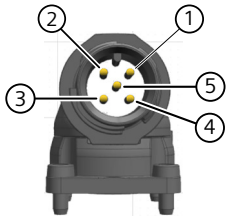
The connectors can be rotated through a certain range.

More precise information on the angle of rotation is available in Chapter "Rotating the connector on the motor (Page 378)"

10.5 Fan cable

Fan connector design

In the force-ventilated version, the 1FT2 is equipped with a fan, which is connected to 24 V DC via a 5-pole M12 round connector, A-coded according to IEC 61076-2-101. The maximum current drawn by the fan is 1.1 A at 24 V DC ± 10 %.

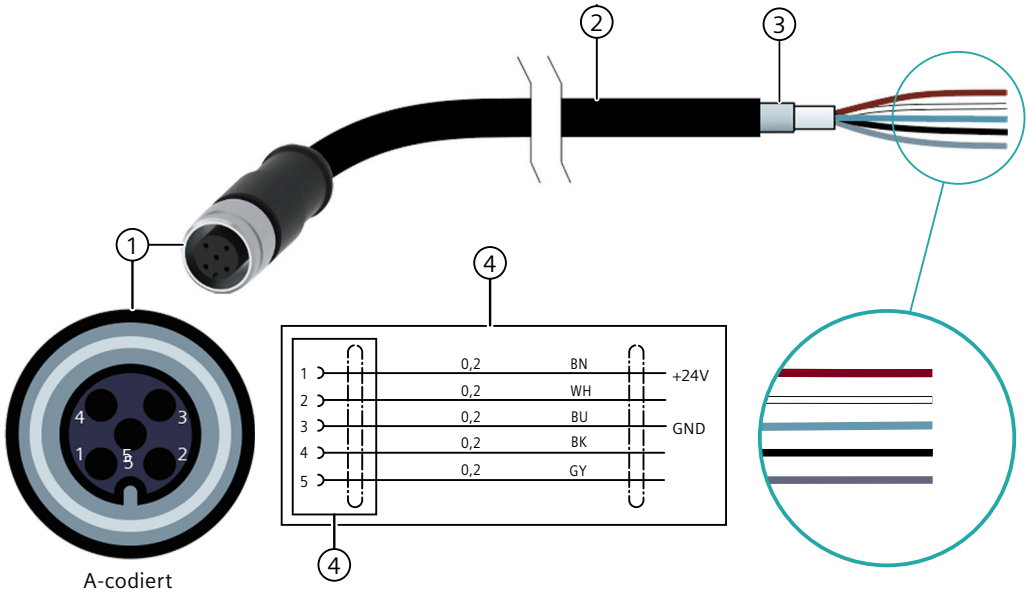
M12 fan connector, 5-pole, A-coded according to IEC 61076-2-101		
	1	+24 V DC
	2	-
	3	GND
	4	-
	5	-

The fan connector can be rotated through a certain range.

More precise information about the equipping of the motors and the angles of rotation is provided in Chapter "Rotating the connector on the motor (Page 378)".

Connection diagram of the fan cable for a force-ventilated 1FT2 motor at the S120

The connection is established using a fan cable with M12 connector, 5-pole, A-coded according to IEC 61076-2-101.



① Round connector with socket, M12, 5-pole, A-coded according to IEC 61076-2-101
② Fan cable
③ Protective braided shield
④ Connection diagram
⑤ Connector pin assignment

The cores at pins 2, 4 and 5 are not used.

Commissioning

11

11.1 Checklists for commissioning

Precondition

The system has been correctly installed and connected.

All safety relays are functional and activated.

Procedure

Note

Required checks

The lists below do not purport to be complete. It may be necessary to perform additional checks and tests in accordance with the situation specific to the particular installation site.

- Commission the drive system according to the Operating Instructions of the converter or inverter being used.

Checklists for commissioning motors

- Thoroughly familiarize yourself with the safety instructions and observe the checklists below before starting any work.

Table 11-1 Checklist (1) - general checks

Check	OK
Are all of the necessary components of the configured drive line-up available, correctly dimensioned, installed and connected?	
Is the manufacturer documentation for the system components (e.g. drive system, brake) available?	
Is the motor type to be commissioned known? (e.g. 1Fx2 _ _ _ – _ _ _ _ _ – _ _ _ _)	
Are the ambient conditions in the permissible range?	

Table 11-2 Checklist (2) - checks regarding the mechanical system

Check	OK
Have all touch protection measures for moving and live parts been fitted and are they functional?	
Has the motor been correctly mounted and aligned?	

Check	OK
Can you rotate the rotor without it touching the stator?	
Have all fixing screws, connecting elements, and electrical connections been tightened with the prescribed torques and properly attached?	
Do the operating conditions correspond to the data specified on the rating plate?	
Do the output elements have the correct setting conditions according to type? Examples: • Have the couplings been aligned and balanced? • Has the belt drive tension been correctly adjusted? • Have the gear tooth flank and gear tooth tip play as well as radial play been correctly adjusted for geared outputs?	

Table 11-3 Checklist (3) - checks regarding the electrical system

Check	OK
Has the motor been connected so that it rotates in the specified direction?	
Have the minimum insulation resistance values been maintained?	
Have the grounding and equipotential bonding connections been correctly established?	
Is the specified limit speed n_{max} maintained during the operation on the converter?	

Table 11-4 Checklist (4) - Monitoring equipment checks

Check	OK
Has it been ensured that speeds higher than the maximum speed n_{max} cannot be reached?	
Have all supplementary motor monitoring devices been correctly connected and are they working properly?	

Table 11-5 Checklist (5) - Cooling system checks

Check	OK
Natural cooling	
Have you adapted the torque and power of the motor to the ambient conditions? You will find information on the derating in the configuration manual. Observe the information provided in the converter operating instructions.	
Separately driven fan	
Do the separately driven fan data match the connection data?	
Has the separately driven fan been correctly mounted and connected?	
Are the safety-relevant components, e.g. protective grilles, fan motor circuit breaker, correctly installed and function properly?	
Are the air intake area and fan blades free of foreign objects?	
Does the fan direction of rotation match the direction of the arrow on the fan cover?	

Table 11-6 Checklist (6) - optional holding brake checks

Check	OK
Is the holding brake open when applying the operating voltage?	
Does the holding brake open and close correctly?	

11.2 First commissioning

The chapter describes the commissioning of the motor

Precondition

- You have mounted and connected the motor correctly.
- You have connected the fan for force-ventilated motors.
- All safety relays are functional and activated.
- Ensure that the frequency converter is correctly parameterized.
- You have established a connection with the converter, e.g. via PROFINET.

Procedure

Note

Incorrect first commissioning due to power interruptions

Software updates are loaded when commissioning the motor at the converter for the first time. These updates can take some time. The system does not respond in this time.

The drive will not be correctly commissioned if you interrupt the system power supply in this phase.

- During the complete commissioning phase, ensure that the power supply is never interrupted.

1. Start the commissioning tool in the converter, e.g. STARTDRIVE or the web server.
2. Follow the steps of the commissioning tool to commission the motor.

Switching off

- Switch off the motor at the frequency converter.

11.3 Switching on and switching off

The preconditions for switching on

Note

EMERGENCY OFF

To avoid accidents, inform yourself about the EMERGENCY-OFF function before you switch on the system.

The motor is switched on and off via the converter.

- For more information on this topic, see the chapter in the operating instructions for the converter.
- Ensure that the converter is correctly parameterized.
- All safety relays are functional and activated.
- Check that the motor is always adequately cooled.
- For force-ventilated motors, check that the fan runs when the motor is in operation.

Procedure when switching on

1. Switch on the motor via the converter.
2. Observe any uneven running and abnormal noise of the motor.
3. For force-ventilated motors carefully check that the fan is functioning correctly.
4. Check the function of the safety equipment.
5. Check whether the motor reaches the required parameters

Switching off

- Switch off the motor at the frequency converter.

Maintenance 12

12.1 Operation

Checking the operational behavior

While the motor is operating, ensure that the specified parameters are maintained.

Make sure that:

- The power consumption is in the specified range
- Cooling is ensured, for force-ventilated motors, the fan is running
- There is no abnormal motor noise
- The motor does not overheat

12.2 Stoppages

Measures for stationary motors that are ready for operation

- Operate the motor regularly, at least once a month, in the event of longer non-operational periods.

NOTICE
Damage due to improper storage The motor can be damaged if it is not stored properly. • Before taking the motor out of service for extended periods of time, take suitable anti-corrosion and preservation measures and ensure that the motor is kept dry.

- For lengthy non-operational periods carefully read the notes in Chapter "Storage (Page 367)".
- When recommissioning the system after longer non-operational periods, perform the checks and measures described in Chapter "Commissioning (Page 395)".
- Before switching on to recommission the system, carefully observe the notes in Chapter "Switching on and switching off (Page 398)".

12.3 Inspection and maintenance

12.3.1 Service and inspection intervals

Description

To avoid motor faults, perform maintenance work, inspections and overhauls at regular intervals.

Note

Inspection if there are faults or unusual conditions

Unusual conditions or faults that represent overstressing of the motor, e.g. overload or short-circuit, can result in consequential damage to the machine.

Immediately perform an inspection when faults or exceptional conditions occur.

Maintenance measures, inspection/maintenance times intervals

The maintenance intervals depend on the operating conditions.

- Adapt the maintenance intervals to match the local conditions, such as pollution/dirt, switching frequency, load, etc.
- Perform the following maintenance measures as specified in the table.

NOTICE
Improper maintenance Service and maintenance must only be performed by properly authorized qualified personnel. Use original Siemens parts only.

Table 12-1 Maintenance measures after operating times or intervals

Machine operation times and intervals	Measure
As required	Monitor and check the motor for unusual noises, vibrations and changes
If required or after 25000 operating hours	Check the radial shaft sealing ring and replace it if worn.

Machine operation times and intervals	Measure
If required or after 25000 operating hours	For 1Fx2x02 ... 1Fx2x05 motors: Check motor and replace if necessary. For 1Fx2x06 ... 1Fx2x10 motors: Check motor bearing and replace if necessary.
If required or after 10000 operating hours	For motors with a radial shaft sealing ring with degree of protection IP67: Check motor and replace if necessary.

The maintenance and repair of the motor can be performed in authorized Siemens Service Centers all over the world.

Contact your sales partner if you would like to utilize this service.

12.3.2 Cleaning

Description

⚠ WARNING

Electric shock when cleaning due to failing to observe the protection class

During cleaning, water may splash against live parts and cause an electric shock.

- Do not use high-pressure washers for cleaning.
- Clean the motor in a manner appropriate for its protection class.
- Avoid applying pressurized water onto connectors, terminal boxes and other live parts.

NOTICE

Motor defect due to cleaning with high-pressure washers

When cleaning with high-pressure washers, the seals may displace and liquid may enter the motor. If liquid gets into the motor, it can lead to motor failure.

- Do not use high-pressure washers for cleaning.

Clean the motor of dust and dirt as required. In this way, you ensure adequate heat dissipation.

12.3.3 Motor replacement on reaching the bearing life

Corrective maintenance measure

Motor bearings are wearing parts. They must be replaced after a defined number of operating hours.

At medium loads, the motor bearings last approx. 25000 h.

The procedure for replacing the motor bearing depends on the size of the motor.

The motor bearings on 1Fx2x02 ... 1Fx2x05 motors are not intended to be replaced. Completely replace these motors.

Starting with the 1Fx2x06 motor, the motor bearings can be replaced.

Especially favorable ambient conditions, such as low average speed, low radial force (transverse force) and vibration load can prolong the interval until motor replacement.

Note

Premature bearing and motor replacement

Harsh operating conditions, e.g. continuous operation at n_{max}, high vibration/shock loads, frequent reversing duty reduce the bearing or motor replacement interval by up to 50 %.

The motor can be maintained and repaired in authorized workshops around the world.

Contact your local sales partner if you would like to utilize this service.

More information is provided in Chapter "Repair, replacing the motor (Page 402)".

12.4 Repair, replacing the motor

The chapter briefly describes the exchange of a motor

Precondition

The new motor has the same article number as the motor to be replaced.

Note

You can replace a motor with an AS22DQC single-turn encoder (1Fx2xxx_xxxxx-xSxx) with an otherwise identical motor with an AM22DQC multiturn encoder (1Fx2xxx_xxxxx-xMxx) without recommissioning.

You can replace a motor with an AS26DQC single-turn encoder (1Fx2xxx_xxxxx-xBxx) with an otherwise identical motor with an AM26DQC multiturn encoder (1Fx2xxx_xxxxx-xCxxx) without recommissioning.

Note

If you want to replace the motor with a motor with a different article number, you must perform recommissioning after replacing the motor.

More detailed information is available in the manual for the corresponding converter.

Procedure

1. Verify absence of operating voltage to the converter.



⚠ WARNING

Danger to life due to unintentional starting of the drive unit

Unintentional starting of the drive unit can cause death or severe injury.

- Make sure that the drive unit cannot be started accidentally.
- Post a warning notice to this effect at the point where the switch is located.

2. Replace the motor.



⚠ CAUTION

Burns as a result of touching hot surfaces

In operation, the motor enclosure can reach high temperatures, which can cause burns if touched.

- Do not touch any hot surfaces.
- Allow the motor to cool down before starting any work.
- Use the appropriate personnel protective equipment, e.g. gloves.

   – Disconnect all plugs from the motor. Detailed information is provided in Chapter "Handling the quick-action locking (Page 381)".
   – Release the motor mounting screws.
   – Remove the motor.
   – Mount and install the new motor. Detailed information is provided in Chapter "Mounting instructions (Page 372)".
   – Reconnect all plugs to the motor. Detailed information is provided in Chapter "Handling the quick-action locking (Page 381)

3. Switch the converter on.

12.5 Faults and their rectification

Description

⚠ WARNING

Operation without functioning protective devices

Operation without functioning protective devices can cause death or severe injury.

- Operate the motor, even in test operation, only with functioning protective devices.

Proceed as follows if there are deviations from normal operation or if faults occur.

NOTICE
Motor damage caused by faults Faults can cause damage to the motor. • Correct the fault cause as specified in the remedial measures. • Repair any damage to the machine/motor.

- Identify the fault using the "Possible faults" table.
  Also observe the converter messages.
- Try to correct the fault using the "Fault causes and remedial measures" key table.

Note

Motors driven by belt

Unfavorable material combinations generate static electricity between the belt pulley and the belt. Electrostatic charging must be prevented, since this can discharge via the motor shaft and the encoder, thereby causing disturbances in the encoder signals. One remedy is to use an anti-static belt, for example.

Possible faults

Fault	Fault causes (see "Fault causes and remedial measures")															
Motor does not start	A	B														
Motor starts slowly	A		C		F											
Humming sound when starting			C		F											
Humming sound in operation	A		C		F											
High temperature rise under no-load operation				D		I	J									
High temperature rise under load	A		C			I	J									
Uneven running								K	C C W							
Grinding sound, running noise										M						
Radial vibrations											N	O	P	Q		S
Axial vibrations													P		R	S

"Fault causes and remedial measures" key table

No.	Fault cause	Remedial measures
A	Overload	Reduce load
B	Interruption of a phase in the supply cable / motor winding	Check the frequency converter and supply cables, measure the winding resistances and insulation resistances, repair after consultation with manufacturer
C	Interrupted phase in the feeder cable after switching on	Check the frequency converter, supply cables and the winding resistances
D	Converter output voltage too high, frequency too low	Check the settings on the frequency converter, perform automatic motor identification
F	Winding short-circuit or phase short-circuit in stator winding	Measure the winding resistances and insulation resistances, repair after consultation with the manufacturer, if required, replace the motor
I	Heat dissipation impeded by dirt	Clean the surface of the drives and ensure that the cooling air can flow in and out unimpeded
	Cooling air inlet/outlet is blocked by foreign bodies	Remove the reason for the blocking and ensure that the cooling air can flow in and out unimpeded
J	Fan motor does not start	Check that the fan motor functions correctly
K	Insufficient shielding for motor and/or encoder cable	Check the shielding and grounding
CCW	Excessive drive controller gain	Adjust the controller
M	Rotating parts are grinding	Determine cause and adjust parts
	Foreign bodies inside the motor	Replace the motor
	Bearing damage	Replace the motor
N	Rotor not balanced	Replace the motor
O	Rotor out of true, shaft bent	Consult the manufacturer
P	Poor alignment	Align motor set, check coupling
Q	Coupled machine not balanced	Re-balance coupled machine
R	Shocks from coupled machine	Check coupled machine
S	Fault originating from the gearbox	Adjust/repair gearbox

If the fault still cannot be resolved after taking the measures listed above, then please contact the sales partner responsible or the Siemens Service Center.

Decommissioning and disposal

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13.1 Removing the motor

The removal of the motor must be performed and/or supervised by qualified personnel with appropriate expert knowledge.

Removing the motor from the machine

Procedure

1. Check to make sure that the motor is voltage-free on all sides.
2. Let the motor cool down enough so that you are not burnt.
3. Disconnect all electrical connections. Information on this is provided in Chapter "Handling the quick-action locking (Page 381)".
4. Remove the fixing elements from the motor.
5. Transport the motor to a suitable location for disposal.

Dispose of the motor in accordance with the local legal requirements.

13.2 Disposal

Recycling and disposal



For environmentally-friendly recycling and disposal of your old device, please contact a company certified for the disposal of waste electrical and electronic equipment, and dispose of the old device as prescribed in the respective country of use.

More information

SIMOTICS:
www.siemens.com/simotics

SiePortal:
www.siemens.com/sieportal