

8LT three-phase synchronous motors

User's manual

Version: **1.00 (July 2020)**
Order no.: **MAMOT4-ENG**

Translation of the original documentation

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1 General information

1.1 Manual history

Version	Date	Comment
1.00	July 2020	First edition (motor version 0)

Information:

B&R makes every effort to keep user's manuals as current as possible. New versions are available in electronic form on the B&R website (www.br-automation.com). Check regularly to determine if you have the latest version.

1.2 About this user's manual

This user's manual describes the product, informs you how to use it and warns of possible dangers.

The personnel responsible for installation, operation, fault rectification, maintenance and cleaning must read and understand this manual before starting any work. The machine documentation must also be taken into account; the product described here is a component of this. This, along with observing all specifications and safety guidelines, will ensure safe functionality and a long service life.

As a component of the machine, this manual must be made freely accessible and stored in the immediate vicinity of the machine.

In addition to the information in this manual, local accident prevention regulations and national industrial safety regulations apply.

This document is not intended for end customers! The safety guidelines required for end customers must be incorporated into the operating instructions for end customers in the respective national language by the machine manufacturer or system provider.

1.3 Safety

This chapter provides you with safety-related information about working with the product.

Safety guidelines relevant to certain phases of the product's service life have been documented in the relevant chapters in this manual.

1.3.1 Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Failure to observe these safety guidelines and notices can result in death.
Warning!	Failure to observe these safety guidelines and notices can result in severe injury or substantial damage to property.
Caution!	Failure to observe these safety guidelines and notices can result in injury or damage to property.
Note:	These instructions are important for avoiding malfunctions.

1.3.2 Intended use

B&R motors and gear motors are components designed for installation in electrical systems or machines. They were designed, developed and manufactured for general industrial use. They are intended to be operated in covered rooms and under normal climatic conditions, which is usually the case in modern production halls. When used in residential areas, commercial areas or small businesses, additional filtering measures are required or must be provided by the user. Only operate the motor with B&R drive systems.

Use in accordance with the intended purpose is prohibited until:

- It has been determined that the machine complies with the provisions of EC Directive 2006/42/EC (Machinery Directive) and EMC Directive 2014/30/EU.
- All values specified on the nameplate and in the user's manual (e.g. connection and ambient conditions) have been observed.

1.3.3 Reasonably foreseeable misuse

Use of this product in areas with fatal risks or dangers is prohibited!

Danger!

Severe personal injury and damage to property due to failure!

When used without ensuring exceptionally high safety measures, death, injury, severe physical impairments or other serious losses are possible.

Do not use the product in the following areas, as well as other areas associated with fatal risks or dangers:

- Explosive areas
- Monitoring nuclear reactions in nuclear power plants
- Flight control systems and air traffic control
- Controlling mass transport systems
- Medical life support systems
- Controlling weapons systems

In special cases – use in non-commercial installations – with additional requirements (e.g. protection of children's fingers), these requirements must be satisfied during setup on the system side.

1.3.4 General sources of danger

Tampering of protection or safety devices

Protective and/or safety devices protect you and other persons from dangerous voltage, rotating or moving elements and hot surfaces.

Danger!

Personal injury and damage to property due to tampering of protective equipment!

If protective or safety devices are removed or put out of operation, there is no longer any personal protection and serious personal injury and damage to property can occur.

- Do not remove any safety devices.
- Do not put any safety devices out of operation.
- Always use all safety devices during short-term test and trial operations!

Dangerous voltage

To operate the motors, dangerous voltage must be applied to certain parts.

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Danger due to electromagnetic fields

Electromagnetic fields are generated by the operation of electrical power engineering equipment such as transformers, drives and motors.

Danger!

Danger to health due to electromagnetic fields!

The functionality of a heart pacemaker can be impaired by electromagnetic fields to such an extent that the wearer experiences harm to his or her health, possibly with a fatal outcome.

- Observe relevant national health and safety regulations.
- Persons with pacemakers are not allowed to be in endangered areas.
- Warn staff by providing information, warnings and safety identification.
- Secure the danger zone by means of barriers.
- Reduce electromagnetic fields at their source (using shielding, for example).

Dangerous motion

By rotating and positioning motions of the motors, machine elements are moved or driven and loads conveyed.

After switching on the machine, movements of the motor shaft must always be expected! For this reason, higher-level protective measures must be put in place to ensure that personnel and machines are protected. This type of protection can be achieved, for example, by using stable mechanical protective equipment such as protective covers, protective fences, protective gates or photoelectric sensors.

In the immediate vicinity of the machine, provide sufficient and easily accessible emergency switching-off devices to stop the machine as quickly as possible in the event of an accident.

Danger!

Danger of injury due to rotating or moving elements and loads!

By rotating or moving elements, body parts can be drawn in or severed or subjected to impacts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Before working on the machine, secure it against unwanted movements. A holding brake is not suitable for this!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Motors can be started automatically via remote control! If appropriate, a corresponding warning symbol must be applied, and protective measures must be implemented to prevent entry into the high-risk area.

Warning!

Danger of injury due to incorrect control or a defect.

Improper control of motors or a defect can result in injuries and unintended and hazardous movements of motors.

Such incorrect behavior can be triggered by:

- Incorrect installation or faults when handling components
- Improper or incomplete wiring
- Defective devices (servo drive, motor, position encoder, cables, brake)
- Incorrect control (e.g. caused by software error)

Risk due to hot surfaces

Due to the power dissipation from the motor and friction in the gearbox, these components as well as their environment can reach a temperature of more than 100°C.

The resulting heat is released to the environment via the housing and the flange.

Warning!

Risk of burns due to hot surfaces!

Touching hot surfaces (e.g. motor and gearbox housings, as well as connected components), can lead to very severe burns due to the very high temperature of these parts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Never touch the motor or gearbox housing as well as adjacent surfaces during nominal load operation.
- Be aware of hot surfaces also during standstill.
- Allow the motor and gearbox to cool down sufficiently before working on them; there remains the risk of burns for a long period of time after they are switched off.
- Always operate the motor or gearbox with all safety devices. Do this even during short testing and trial operations!

1.3.5 Provisions and safety guidelines

To ensure proper commissioning and safe operation, be sure to observe the following:

- General safety regulations
- The applicable work safety regulations
- National accident prevention regulations (e.g. VBG 4) for working with high-voltage systems

- National, local and plant-specific regulations for your end product
- Relevant regulations for electrical installations (e.g. wire cross section, fuses, protective conductor connection). The values provided in chapter "Technical data" must also be taken into account here.

The operator is solely responsible for these and all other regulations applicable at the place of use.

1.3.6 Responsibilities of the operator

The operator is the person who uses the motor for commercial purposes or who provides it for use by a 3rd party while carrying legal product responsibility for the protection of the user, personnel or other 3rd parties.

Obligations of the operator

- Applicable industrial safety regulations must be observed.
- National, local and plant-specific regulations must be observed.
- A risk assessment must identify hazards that can arise due to on-site working conditions.
- Documentation including safety guidelines must be prepared for operating the finished system (with motors, gearboxes, servo drives, etc.).
- Whether the applicable operating instructions and manuals correspond to current rules and standards must be checked regularly.
- Responsibilities for installation, operation, fault correction, maintenance and cleaning must be clearly regulated and defined.
- It must be ensured that responsible personnel have read and understood this user's manual.
- Personnel must receive training on a regular basis and be informed of hazards.
- Personnel must be provided with the required protective equipment.

1.3.7 Qualified personnel

All tasks such as the transport, installation, commissioning and servicing of devices are only permitted to be carried out by qualified personnel. Qualified personnel are those familiar with the transport, mounting, installation, commissioning and operation of devices who also have the appropriate qualifications to perform these tasks (e.g. IEC 60364). National accident prevention regulations must be observed.

The safety guidelines, information about connection conditions (nameplate and documentation) and limit values specified in the technical data must be read carefully before installation and commissioning and must be strictly observed.

1.3.8 Safety notices

A "hot surface" warning label is provided with the product. Attach it to the assembled product so that it is visible at all times.



"Hot surface" warning label

1.3.9 Protective equipment

Always wear suitable safety clothing and equipment for your personal protection.

1.4 8LT torque motors



Direct drive torque motors from the 8LT series are permanently excited torque motors for applications that require extraordinary dynamic characteristics and positioning precision as well as compact size and reduced weight. These are available in self-cooling or externally-cooled format.

The 8LT series torque motors provide the user with the highest degree of flexibility - the ideal basis for mechatronic and efficient machine design.

All motor components are designed in such a way that saves maintenance.

This motor series features a relatively compact structure with a higher degree of rigidity and more dynamic properties as well as low detent torque. The externally-cooled format additionally ensures intensive surface cooling - the motor does not cause the environment around it to heat up.

The 8LT torque motors are designed as complete motors. Unlike built-in motors, there is no need to install bearings and encoders.

1.4.1 Standards, guidelines and certifications

The motors are intended for use in commercial plants and subject to the following standards and guidelines:

Standards

EN 60034-1	Drehende elektrische Maschinen - Teil 1: Bemessung und Betriebsverhalten Rotating electrical machines - Part 1: Rating and performance
EN 60034-5	Drehende elektrische Maschinen - Teil 5: Schutzarten aufgrund der Gesamtkonstruktion von drehenden elektrischen Maschinen (IP-Code) - Einteilung Rotating electrical machines - Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP code) - Classification
EN 60034-6	Drehende elektrische Maschinen - Teil 6: Einteilung der Kühlverfahren (IC-Code) Rotating electrical machines - Part 6: Methods of cooling (IC-Code)
EN 60034-7	Drehende elektrische Maschinen - Teil 7: Klassifizierung für Bauarten, der Aufstellungsarten und der Klemmkasten-Lage (IM-Code) Rotating electrical machines - Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM code)
EN 60034-8	Drehende elektrische Maschinen - Teil 8: Anschlussbezeichnungen und Drehsinn Rotating electrical machines - Part 8: Terminal markings and direction of rotation
EN 60034-9	Drehende elektrische Maschinen - Teil 9: Geräuschgrenzwerte Rotating electrical machines - Part 9: Noise limits
EN 60034-11	Drehende elektrische Maschinen - Teil 11: Thermischer Schutz Rotating electrical machines - Part 11: Thermal protection
EN 60034-14	Drehende elektrische Maschinen - Teil 14: Mechanische Schwingungen von bestimmten Maschinen mit einer Achshöhe von 56 mm und höher - Messung, Bewertung und Grenzwerte der Schwingstärke Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity
EN 60204-1	Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen Safety of machinery - Electrical equipment of machines - Part 1: General requirements
UL 1004-1	Standard for Rotating Electrical Machines - General Requirements
UL 1004-6	Standard for Servo and Stepper Motors
C22.2 No.100-14	Motors and Generators

Guidelines

Low Voltage Directive 2014/35/EU	The motors correspond to the low voltage directive (conformity).
EMC Directive 2014/30/EU	To operate the motor in accordance with its intended use, it must comply with the protection requirements of the EMC directive. Proper installation (e.g. spatial separation of signal lines and power cables, shielded lines and cables) is the responsibility of the plant installer and system provider. If operating with a power converter, then the EMC guidelines of the power converter, encoder and brake manufacturers must be observed.
RoHS Directive 2011/65/EU	The motors in this series comply with the RoHS Directive (2011/65/EU) for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Advice:

National, local and plant-specific regulations must also be taken into account!

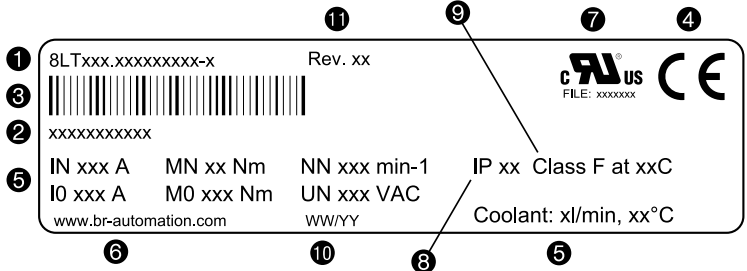
Certifications

General information	8LTA / 8LTB / 8LTQ	8LTJ / 8LTK / 8LTS
CE certification		Yes
C-UR-US listed		Yes
UL file number		E235396

1.4.2 Nameplate

The nameplate clearly identifies each motor. The serial number ensures traceability.

The nameplate adhesive label on the motor housing contains the following information:

1	Order code	 <p>11 8LTxxx.xxxxxxxxxx-x Rev. xx</p> <p>9</p> <p>7</p> <p>4</p> <p>11 8LTxxx.xxxxxxxxxx-x Rev. xx</p> <p>3</p> <p>2</p> <p>xxxxxxx</p> <p>5</p> <p>IN xxx A MN xx Nm NN xxx min-1 IP xx Class F at xx°C</p> <p>IO xxx A MO xxx Nm UN xxx VAC</p> <p>www.br-automation.com WW/YY</p> <p>6</p> <p>10</p> <p>8</p> <p>5</p> <p>Coolant: xl/min, xx°C</p>
2	11-digit serial number	
3	Serial number as a barcode (Code 128)	
4	CE marking	
5	Technical data (rated torque M_n , rated current I_n , continuous stall torque M_0 , continuous stall current I_0 , rated voltage U_N , rated speed n_n , coolant)	
6	Manufacturer	
7	UL-recognized component mark	
8	Protection class	
9	Insulation class	
10	Production period (week/year)	
11	Revision	

Advice:

The nameplate must be visible at all times when the motor is installed.

1.4.2.1 Embedded parameter chip

All relevant mechanical and electrical information and data is stored in the EnDat encoder used for B&R motors. This means that the user does not have to configure settings on the servo drive. As soon as the encoder is connected to the servo drive and the power supply to the electronics is switched on, the motor is automatically identified. The motor sends its nominal parameters and limit parameters to the servo drive. The drive then automatically determines the current limits and current control parameters required for optimal control of the motor. The only things that the user has to optimize are the speed and position controllers. Support for this is provided by the integrated commissioning environment of B&R Automation Studio™.

In addition to assistance during commissioning, routine service work is also simplified, and motors can be replaced without having to take extra time to set parameters.

2 Technical data

2.1 General description

Direct drive torque motors from the 8LT series are permanent magnet torque motors for applications with high requirements regarding dynamics and positioning precision as well as compact size and reduced weight. They are available both as self-cooling and external-cooling variants.

Advantages

- Easy to install
- Small installation dimensions
- Extremely easy to service
- Low costs
- High overload capability/peak torque
- Also available with hollow shaft
- Very good control properties because of low cogging torque
- Available with encoders for functional safety
- When used as a direct drive: No mechanical transfer elements that are subject to wear in the power transmission system, therefore high level of availability and no elasticity in the power transmission system

2.2 8LT - Order key

8LT b c d . ee nnn ff gg - h

Cooling / Construction type

A ... Self-cooling, ISO output flange
 B ... Self-cooling, hollow shaft
 J ... Liquid-cooled, ISO output flange
 K ... Liquid-cooled, hollow shaft
 Q ... Self-cooling, shaft with blind hole
 S ... Liquid-cooled, shaft with blind hole
 see "Cooling / Construction type (b)" on page 15

Size

Valid values: **9**, **C** see "Size (c)" on page 16

Length

Valid values: **3**, **4**, **5**, **6**, **7**, **8** see "Length (d)" on page 16

Motor encoder system

Magnetic EnDat encoders: **M0**
 Optical EnDat encoders: **D0**, **D1**, **E6**, **E7**, **S0**, **S1**
 see "Motor encoder system (ee)" on page 17

Nominal speed

A08 ... 800 rpm **003** ... 300 rpm **009** ... 900 rpm
001 ... 100 rpm **005** ... 500 rpm **010** ... 1000 rpm
 see "Nominal speed (nnn)" on page 20

Motor options

F0 ... Angled power connection and encoder connection (swivel)
F3 ... Angled power connection and encoder connection (swivel), with oil seal
F6 ... Straight power connection / Angled encoder connection (swivel)
F9 ... Straight power connection / Angled encoder connection (swivel), with oil seal
 see "Motor options (ff)" on page 21

Special motor options

00 ... No special motor options

Motor version

0 ... Version 0 (The motor version is specified as a code (h) in the model number. Motor version 0 is currently valid.)

Advice:

Order keys only provide information about possible combinations in exceptional cases. Information about possible combinations is available in the CAD configurator (cad.br-automation.com).

2.2.1 ExampleOrder 1

A torque motor of type **8LSA45** with a nominal speed of 300 rpm has been selected for an application. The motor should have a 2048-line EnDat single-turn encoder. Both the motor and the encoder plugs should be swivel plugs.

The code (ee) for the encoder system is **E6**.

The code (nnn) for a nominal speed of 300 rpm is **003**.

The code (ff) for the other options (connection direction) is **F0**.

The model number for the required motor is **8LTA93.E6003F000-0**

2.2.2 ExampleOrder 2

A three-phase synchronous motor of type **8LTJ97** with a nominal speed of 500 rpm has been selected for an application. The motor should have an oil seal and a 2048-line EnDat multi-turn encoder. The male motor connector should have a straight connection. The male encoder connector should have a "swivel (angled)" connection.

The code (ee) for the encoder system is **E7**.

The code (nnn) for a nominal speed of 500 rpm is **005**.

The code (ff) for the other options (oil seal and connection direction) is **F9**.

The model number for the required motor is **8LTJ97.E7005F900-0**

2.3 Cooling / Construction type (b)

8LT **b** c d . ee nnn ff gg - h

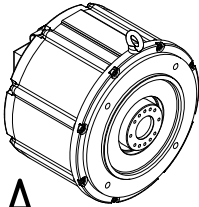
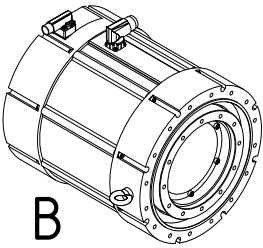
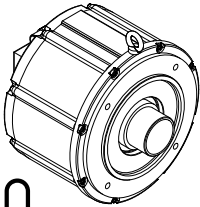
see "Order key" on page 13

8LT torque motors are available in cooling types 8LTA, 8LTB, 8LTJ, 8LTK, 8LTQ and 8LTS.

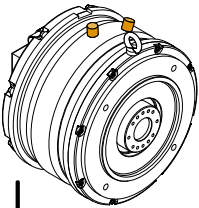
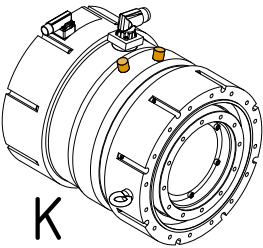
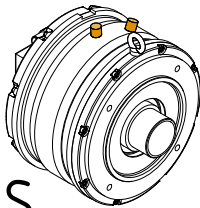
Cooling types are distinguished by a character (**b**) in the model number.

Cooling type (b)		Shaft end
8LTA	Self-cooling	ISO output flange
8LTB		Hollow shaft
8LTJ	Liquid-cooled	ISO output flange
8LTK		Hollow shaft
8LTQ	Self-cooling	Shaft with blind hole
8LTS	Liquid-cooled	

Self-cooling motors

ISO output flange	Hollow shaft	Shaft with blind hole
 A	 B	 Q

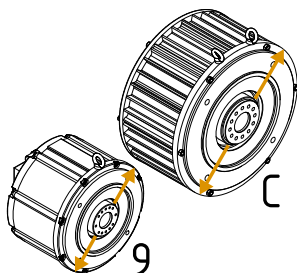
Liquid-cooled motors

ISO output flange	Hollow shaft	Shaft with blind hole
 J	 K	 S

2.4 Size (c)

8LT b c d . ee nnn ff gg - h

see "Order key" on page 13



8LT torque motors are available in various sizes (9 and C). These differ in dimensions (especially flange dimensions) and power data.

The sizes are distinguished by a character (c) in the model number. The list of sizes is ascending.

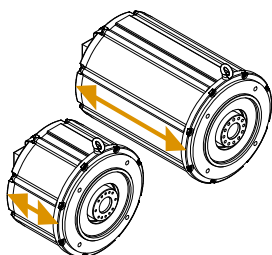
Availability

	Available sizes (c)	
	8LTx9	8LTxC
8LTA	Yes	Yes
8LTB	Yes	---
8LTJ	Yes	Yes
8LTK	Yes	---
8LTQ	Yes	Yes
8LTS	Yes	Yes

2.5 Length (d)

8LT b c d . ee nnn ff gg - h

see "Order key" on page 13



8LT torque motors are available in various lengths. These differ in the power data with identical flange dimensions.

The lengths are distinguished by a number (d) in the model number. The larger this number, the longer the respective motor.

Availability

	Available lengths (d)					
	8LTxx3	8LTxx4	8LTxx5	8LTxx6	8LTxx7	8LTxx8
8LTx9	Yes ¹⁾	Yes	Yes	Yes	Yes	---
8LTxC ²⁾	Yes	Yes	Yes	Yes	Yes	Yes

¹⁾ Not available for 8LTB / 8LTK

²⁾ Not available for 8LTB / 8LTK

2.6 Motor encoder system (ee)

8LT b c d . ee nnn ff gg - h

see "Order key" on page 13

8LT torque motors are equipped with a magnetic or EnDat encoder. The encoder system is specified as part of the order number in the form of a 2-digit code (**ee**).

Magnetic EnDat encoder

With the hollow-shaft motor variant (8LTB and 8LTK), EnDat 2.2 encoders (**M0**) with distance-coded absolute position are used.

Information:

Commissioning

When started for the first time, the motor does not detect its actual position. A shaft movement of $\leq 18^\circ$ degrees is required for detection. Preferably in single-phase mode (stepper mode).

Information:

Direction of rotation

Hollow shaft motors (8LTB / 8LTK) deviate from the usual direction of rotation (clockwise) and are delivered rotating counterclockwise. It is possible for the user to make an adjustment in the software to enable clockwise rotation.

Digital transfer

Digital encoders use a serial transfer protocol. This protocol is called EnDat. The EnDat protocol is a developed standard that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. The embedded parameter chip is stored by B&R in this encoder memory. This data and the B&R ACOPOS systems form a plug-and-play drive solution. Absolute positioning can be used within a revolution with the single-turn variants. A homing procedure is not required because of the absolute position measurement. For applications where the motor covers several revolutions for positioning, a multi-turn encoder that can save up to 65535 revolutions can be used. A solution with a single-turn encoder variant with a homing procedure is also possible. In EnDat 2.1 analog/digital sampling, a very fine resolution is achieved by the evaluation modules developed by B&R.

2.6.1 EnDat 2.2

For the advanced, fully digital EnDat 2.2 protocol, the positions are generated directly in the encoder and communicated serially with the drive system. This transfer is very robust in relation to disturbances and is even certified for safety applications.

EnDat 2.2 is therefore to be preferred over the older EnDat 2.1 variant.

2.6.2 General safety encoder

Safety-related position measurement systems

In machine and system manufacturing, the topic of safety is becoming more and more important. This is mirrored in legislation and stricter safety criteria in national and international standards. Most importantly, stricter requirements serve to protect personnel, but they also increasingly serve to protect property and the environment. The goal of functional safety is to minimize or eliminate dangerous situations that can occur in machines and systems either with or without operational errors. This is generally achieved by implementing redundant systems. Moving axes in safety applications require position information in order to be able to carry out their corresponding safety functions. Different system configurations can be implemented to get independent position values. One possibility is using two measuring instruments per axis. To keep costs down, the aim is often to create a solution with only one position measuring instrument. Until now, analog measuring instruments with sine/cosine signals were used for this purpose. The encoder manufacturer Heidenhain – as the first manufacturer with the purely serial EnDat 2.2 protocol for safety position measurement systems – offers a serial single-encoder solution per IEC 61 508 SIL 2. All the advantages of serial data transfer – such as cost optimization, diagnostics possibilities, automatic commissioning and high-speed generation of position values – can now benefit safety applications as well.

Technical data

100% inspection during production and additional measures during final testing ensure errors have not occurred related to shaft and coupling connections on rotary encoders when using motors with safety encoders (per EN ISO 13849-2).

There are also a number of safety functions that are already possible with D encoders.

2.6.3 Information: SafeMOTION

For information about the area of application and procedure for setting up the various safety functions, please refer to the SafeMOTION user's manual (MAACPMSAFEMC-ENG) in the Downloads section of the B&R website www.br-automation.com.

2.6.4 Technical data

2.6.4.1 Magnetic EnDat encoder

Encoder type / Order code	M0
Operating principle	Magnetic
EnDat protocol	2.2
Functional safety	No
Single-turn/Multi-turn	S
Revolutions	1
Resolution [bits single-turn / bits multi-turn]	14/0
Accuracy	Absolute after 18 degrees
Stator - Vibration during operation Max. [m/s ²]	300
Rotor - Vibration during operation Max. [m/s ²]	300
Max. shock during operation [m/s ²]	1000
Manufacturer's product ID	AK ERM 2410 EnDat22

Availability	Available encoders / Order code (ee)
	M0
8LTA	---
8LTB	Yes
8LTJ	---
8LTK	Yes
8LTQ	---
8LTS	---

2.6.4.2 Optical EnDat encoders

Technical data	Encoder type / Order code (ee)					
	E6	E7	D0	D1	S0	S1
Operating principle	Optical					
EnDat protocol	2.1		2.2			
Functional safety ¹⁾	---		Yes			
Single-turn/Multi-turn	S	M	S	M	S	M
Revolutions	1	4096	1	4096	1	4096
Resolution [bits single-turn / bits multi-turn]	13/0	13/12	25/0	25/12	25/0	25/12
Accuracy ±[°]	20					
Cutoff frequency ≥ [kHz]	400		Digital pos. in the encoder			
Stator - Vibration during operation Max. [m/s2]	300					
Rotor - Vibration during operation Max. [m/s2]	300					
Max. shock during operation [m/ s ²]	2000					
Probability of dangerous failure per hour (PFH) SIL 2	---		≤10 * 10 ⁻⁹			
Manufacturer's product ID	ECN 1313 EnDat01	EQN 1325 EnDat01	ECN 1325 FS EnDat22	EQN 1337 FS EnDat22	ECN 1325 FS EnDat22	EQN 1337 FS EnDat22

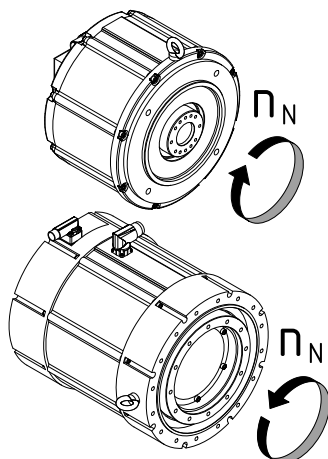
- 1) See appendix B "Safety level overview for ACOPOS product family safety functions" of the SafeMOTION user's manual (MAACPMSAFEMC-ENG), which is available in the Downloads section of the B&R website (www.br-automation.com).
There are additional limitations when combining B&R motors with a gearbox, see section "1.2.1 ACOPOS Multi SafeMOTION EnDat 2.2 and ACOPOS P3 SafeMOTION" of the SafeMOTION user's manual (MAACPMSAFEMC-ENG), which is available in the Downloads section of the B&R website (www.br-automation.com).

Availability	Available encoders / Order code (ee)					
	E6	E7	D0	D1	S0	S1
8LTA	Yes	Yes	Yes	Yes	Yes	Yes
8LTB	---	---	---	---	---	---
8LTJ	Yes	Yes	Yes	Yes	Yes	Yes
8LTK	---	---	---	---	---	---
8LTQ	Yes	Yes	Yes	Yes	Yes	Yes
8LTS	Yes	Yes	Yes	Yes	Yes	Yes

2.7 Nominal speed (nnn)

8LT b c d . ee nnn ff gg - h

see "Order key" on page 13



8LT torque motors are available with various nominal speeds.

The nominal speed is specified as part of the model number in the form of a 3-digit code (**nnn**).

Information:

Direction of rotation

Hollow shaft motors (8LTB / 8LTK) deviate from the usual direction of rotation (clockwise) and are delivered rotating counterclockwise. It is possible for the user to make an adjustment in the software to enable clockwise rotation.

	Order code (nnn)					
	A08	001	003	005	009	010
Nominal speed n_N [rpm]	80	100	300	500	900	1000

8LTx9 - Availability

	Available nominal speed n_N [rpm]					
	80	100	300	500	900	1000
8LTx93	---	---	Yes ¹⁾	Yes ¹⁾	---	Yes ¹⁾
8LTx94	---	---	Yes	Yes	---	Yes
8LTx95	---	---	Yes	Yes	---	Yes
8LTx96	---	---	Yes	Yes	---	Yes
8LTx97	---	---	Yes	Yes	Yes ²⁾	Yes
8LTx98	---	---	---	Yes	---	Yes

1) Not available for 8LTB / 8LTK

2) Not available for 8LTA / 8LTB / 8LTQ

8LTxC - Availability

	Available nominal speed n_N [rpm]					
	80	100	300	500	900	1000
8LTxC3	Yes	Yes	Yes ¹⁾	Yes ¹⁾	---	---
8LTxC4	Yes	Yes	Yes	Yes	---	---
8LTxC5	Yes	Yes	Yes	Yes	---	---
8LTxC6	Yes	Yes	Yes	Yes	---	---
8LTxC7	Yes	Yes	Yes	Yes	---	---
8LTxC8	Yes	Yes	Yes	Yes	---	---




1) Not available for 8LTB / 8LTK

2.8 Motor options (ff)

8LT b c d . ee nnn **ff** gg - h

see "Order key" on page 13

See the following table for the corresponding code (**ff**) in the order key.

Motor option			Order code (ff)
Connection direction			
Power connection	Encoder connection	Oil seal	
Angled (swivel) 	Angled (swivel) 	---	F0
		Yes	F3
Straight 		---	F6
		Yes	F9

2.8.1 Connection direction (ff)

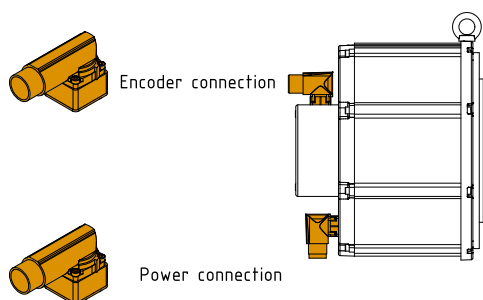
Power connection and encoder connection

8LT torque motors are available with 2 different connection options. The position of the connections is determined by the design of the shaft end.

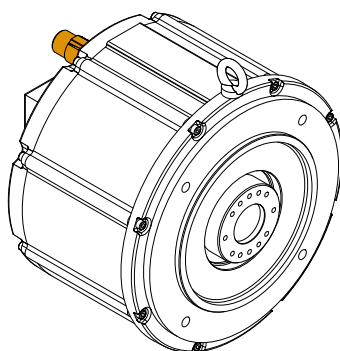
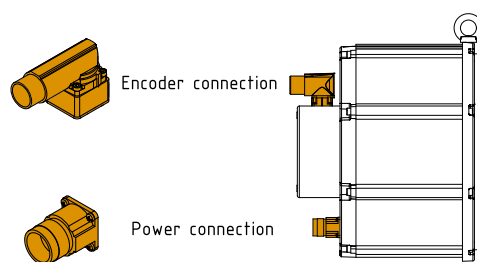
8LTA / 8LTJ / 8LTQ / 8LTS

For motors with ISO output flange or a shaft with blind hole, the connections are at the rear end.

Power connection: Angled (swivel)
Encoder connection: Angled (swivel)



Power connection: Straight
Encoder connection: Angled (swivel)



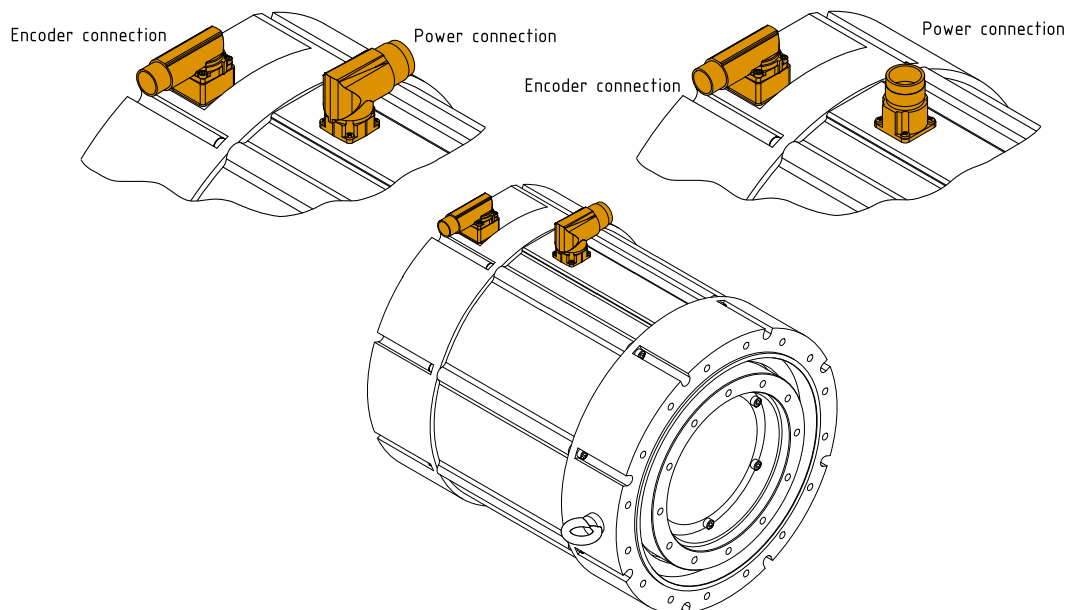
For details about whether connections can rotate, see the CAD configurator at [CAD configurator](#).

8LTB / 8LTK

Motors with hollow shafts have the connections on the top.

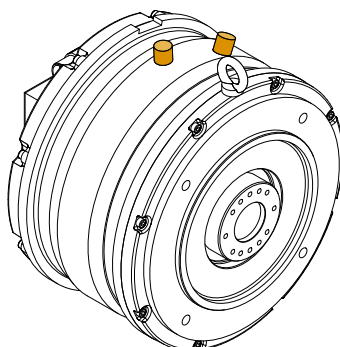
Power connection: Angled (swivel)
Encoder connection: Angled (swivel)

Power connection: Straight
Encoder connection: Angled (swivel)



For details about whether connections can rotate, see the CAD configurator at [CAD configurator](#).

8LTJ / 8LTK / 8LTS - Coolant line connection

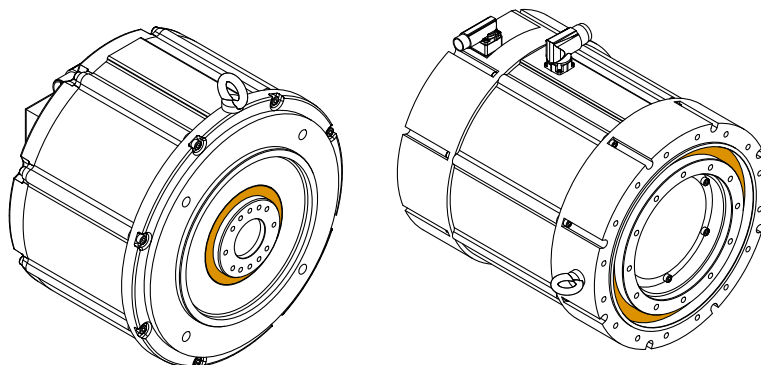


The coolant inlet and outlet are straight internal threads (1/4"G).

2.8.2 Oil seal (ff)

All 8LT torque motors are available with a form A oil seal per DIN 3760.

With an oil seal, the motors have IP65 protection per EN 60034-5.



Servicing

To maintain functionality of the oil seal, it must be lubricated regularly with oil. An oil seal that is not lubricated will harden due to increased frictional heat and will eventually provide only dust protection.

Advice:

Proper lubrication of the oil seal must be ensured throughout the entire service life of the motor.

For this reason, mounting a gearbox on motors with an oil seal is not permitted!

2.9 General motor data

General information	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
CE certification	Yes			
C-UR-US listed	Yes			
UL file number	E235396			
Electrical properties	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
Mains input voltage on the servo drive	3x 400 VAC ... 3x 480 VAC ±10%			
Connection type:	speedtec circular connector from Intercontec			
Power connection:	Size 1 and 1.5			
Encoder connection:	Size 1			
Efficiency	Typ. >90%			
Thermal properties	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
Insulation class per EN 60034-1	F			
Methods of cooling per EN 60034-6 (IC code)	Self-cooling Free circulation surface cooling (IC4A0A0)		External cooling Surface cooling with built-in heat exchanger (IC7A0W7, IC7A0U7)	
Thermal motor protection per EN 60034-11	Maximum winding temperature 145°C (limited to 110°C by the thermal motor protection in the ACOPOS servo drive or the ACOPOSmulti drive system)			
Mechanical properties	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
Vibration severity per EN 60034-14	Vibration severity level R ³⁾			
Bearing service life calculation	Based on DIN ISO 281			
Eye bolt per DIN 580	Yes			
Oil seal per DIN 3760	Form A			
Mounting flange per DIN 42948	Form A			
Radial runout, concentricity and axial runout of mounting flange per DIN 42955	Tolerance R			
Coating	Water-based coating			
Description	98160 *IDROLIN/E SM SEMIOPACO NERO RAL 9005-C.452			
Color	RAL 9005 flat; shaft end and flange front metallic glossy			
Operating conditions	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
Rating class, operating mode per EN 60034-1	S1 - Continuous operation			
Ambient temperature during operation	-15 to 40°C			
Relative humidity during operation	5 to 95%, non-condensing			
Reduction of nominal and stall current as well as nominal and stall torque at temperatures above 40°C	5% per 5°C			
Max. ambient temperature during operation	55°C ⁴⁾			
Reduction of nominal and stall current as well as nominal and stall torque at installation elevations starting at 1,000 m above sea level	5% per 1,000 m			
Maximum installation elevation	1,000 m ⁵⁾			
Max. flange temperature	65°C			
Degree of protection per EN 60034-5 (IP code): Degree of protection with optional oil seal (DIN 3760):	IP54 IP65			
Type of construction and mounting arrangement per EN 60034-7 (IM code)	Horizontal (IM3001) Vertical, motor suspended from the machine (IM 3011) ⁶⁾ Vertical, motor stands on the machine (IM3031)		Horizontal (IM 3001) ⁷⁾ Vertical, motor suspended from the machine (IM 3011) ⁸⁾⁹⁾ Vertical, motor standing on the machine (IM 3031) ¹⁰⁾	
Liquid cooling	8LTJ94	8LTJ95	8LTJ96	8LTJ97
Coolant	Water ¹¹⁾			
Materials in the motor that come into contact with coolant	Stainless steel, brass (connections)			
Coolant pH value (at 20°C)	6 - 7.5			
Total hardness of coolant	1.4 - 2.4 mmol/l			
Max. size of foreign bodies in coolant	<0.1 mm			
Chloride content of coolant	<120 mg/l (ppm)			
Sulphate content of coolant	<200 mg/l (ppm)			
Oil content of coolant	<1 mg/l (ppm)			
Coolant inlet temperature	5 to 25°C			

³⁾ Valid for all motors with an axis height greater than 56 mm.

⁴⁾ Continuous operation of torque motors from an ambient temperature 40°C to max. 55°C is possible, but this results in premature aging.

⁵⁾ Requirements that go beyond this must be arranged with B&R.

⁷⁾ Permissible water connection direction: Water inlet on top

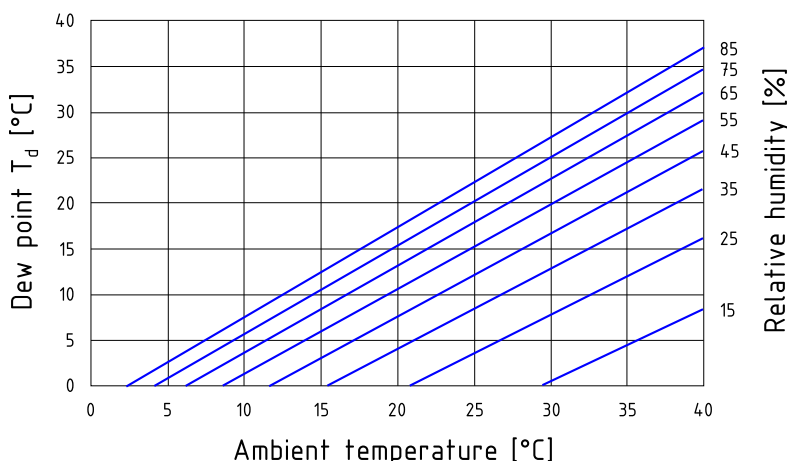
⁶⁾ With the IM 3011 type of construction and mounting arrangement (vertical, motor suspended from the machine), there is a risk of production fluids or oils penetrating the motor on the flange side. Motors or motor-gearbox combinations that should be used with this mounting arrangement must therefore have at least IP65 protection on the flange side.

⁸⁾ With the IM 3011 type of construction and mounting arrangement (vertical, motor suspended from the machine), there is a risk of production fluids or oils penetrating the motor on the flange side. Motors or motor-gearbox combinations that should be used with this mounting arrangement must therefore have at least IP65 protection on the flange side.

⁹⁾ Permissible water connection direction: Water inlet on bottom

¹⁰⁾ Permissible water connection direction: Water inlet on bottom

¹¹⁾ Water must be clean and demineralized. For corrosion and germ protection, sufficient additives must be added according to the recommendation of the additive manufacturer. Information as to whether these additives result in reduced heat capacity of the coolant must be requested from the additive manufacturer and taken into account during motor operation.

Liquid cooling	8LTJ94	8LTJ95	8LTJ96	8LTJ97
Max. coolant inlet temperature	30°C			
Dew point ¹²⁾				
Increase of nominal and stall current as well as nominal and stall torque for water cooling	70%			
Nominal flow rate	5 l/min ¹³⁾			
Pressure drop	0.060 bar	0.065 bar	0.065 bar	0.070 bar
Coolant inlet pressure	3.85 bar	3.80 bar	3.75 bar	3.70 bar
Max. coolant inlet pressure	10 bar ¹⁴⁾			
Coolant line connection	2 x 1/4"G (internal threads)			
Storage and transport conditions	8LTA / 8LTB / 8LTQ		8LTJ / 8LTK / 8LTS	
Storage temperature	-20 to 60°C			
Relative humidity during storage	Max. 90%, non-condensing			
Transport temperature	-20 to 60°C			
Relative humidity during transport	Max. 90%, non-condensing			

2.9.1 Power dissipation

Power dissipation from the servo motors takes place via the motor flange and surface of the motor. The following factors are important to ensure optimal heat dissipation:

- Thermally open installation
- Free convection

The motor data specified for the nominal operating point apply to a motor installed in a thermally open system. Generally speaking, the larger the flange, the better the heat dissipation.

¹²⁾ Diagram: The "dew point" (left) results from the intersection of "ambient temperature" (below) and "relative humidity" (right).

¹³⁾ The pressure drop depends on the volumetric flow rate.

¹⁴⁾ The max. coolant inlet pressure is the maximum permissible pressure in the water-cooled motor housing.

2.9.2 Formula symbols

Term	Symbol	Unit	Description
Nominal speed	n_N	rpm	Nominal speed of the motor
Nominal torque	M_N	Nm	The nominal torque is output by the motor ($n = n_N$) when the nominal current is being drawn. This is possible for any length of time if the ambient conditions are correct.
Nominal power	P_N	kW	The nominal power is supplied by the motor when $n = n_N$. This is possible for any length of time if the ambient conditions are correct.
Nominal current	I_N	A	The nominal current is the RMS value for the phase current (current in the motor supply line) when generating the nominal torque at the nominal speed. This is possible for any length of time if the ambient conditions are correct.
Stall torque	M_0	Nm	The stall torque is output by the motor at the speed n_0 and when the stall current is being applied. This is possible for any length of time if the ambient conditions are correct. Speed n_0 must be high enough for the temperature in all windings to be homogeneous and stationary (for B&R motors, $n_0 = 50$ rpm). The continuous torque is reduced when the motor is at a complete standstill.
Stall current	I_0	A	The stall current is the RMS value of the phase current (current in the motor supply line) for generating the stall torque at speed n_0 . This is possible for any length of time if the ambient conditions are correct. Speed n_0 must be high enough for the temperature in all windings to be homogeneous and stationary (for B&R motors, $n_0 = 50$ rpm).
Peak torque	M_{\max}	Nm	The peak torque is briefly output by the motor when the peak current is being drawn.
Peak current	I_{\max}	A	The peak current is the RMS value of the phase current (current in the motor supply line) for generating the peak torque. This is only permitted for a short time. The peak current is determined by the magnetic circuit. Exceeding this value for a short time can cause irreversible damage (demagnetization of the magnet material).
Maximum speed	n_{\max}	rpm	Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).
Average speed	n_{average}	rpm	Average speed for one cycle
Torque constant	K_T	Nm/A	The torque constant specifies the torque generated by the motor at 1 Arms phase current. This value applies at a motor temperature of 20°C. If the temperature increases, the torque constant is reduced (typically down to 10%). If the current increases, the torque constant is reduced (typically starting at twice the value of the nominal current).
Voltage constant	K_E	V/1000 rpm	The voltage constant specifies the RMS value (phase-phase) of the reverse voltage induced by the motor at a speed of 1000 rpm (EMF). This value applies at a motor temperature of 20°C. When the temperature increases, the voltage constant is reduced (usually down to 5%). If the current increases, the voltage constant is reduced (typically starting at twice the value of the nominal current).
Stator resistance	R_{2ph}	Ohm	Resistance measured in ohms between two motor leads (phase-phase) at 20°C winding temperature. On B&R motors, the windings use a star connection.
Stator inductance	L_{2ph}	mH	Winding inductance measured between two motor leads. Stator inductance depends on the rotor position.
Electrical time constant	t_{el}	ms	Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.
Thermal time constant	t_{therm}	Min	Corresponds to 1/5 of the time needed for the motor temperature to stabilize with constant operating conditions.
Moment of inertia without brake	J	kgcm ²	Moment of inertia for a motor without a holding brake
Weight without brake	m	kg	Mass of motor without holding brake
Moment of inertia of brake	J_{Br}	kgcm ²	Moment of inertia for the built-in holding brake
Mass of brake	m_{Br}	kg	Mass of built-in holding brake
Brake holding torque	M_{Br}	Nm	Minimum torque required to hold the rotor when the brake is activated
Installed load	P_{on}	W	Installed load for the built-in holding brake
Installed current	I_{on}	A	Installed current for the built-in holding brake
Connection voltage	U_{on}	V	Operating voltage for the built-in holding brake
Activation delay	t_{on}	ms	Delay time required for the holding torque of the brake to be established after the operating voltage has been removed from the holding brake
Release delay	t_{off}	ms	Delay time required until the holding torque of the holding brake is reduced by 90% (the brake is released) after operating voltage has been returned to the holding brake

2.10 8LTA9 - Technical data

Model number	8LTA93.ee003ffgg-0	8LTA93.ee005ffgg-0	8LTA93.ee010ffgg-0	8LTA94.ee003ffgg-0	8LTA94.ee005ffgg-0
Motor					
Nominal speed n_N [rpm]	300	500	1000	300	500
Number of pole pairs	12				
Nominal torque M_N [Nm]	48	45	39	95	90
Nominal power P_N [W]	1508	2356	4084	2985	4712
Nominal current I_N [A]	2.86	4.48	8.19	5.71	9.12
Stall torque M_0 [Nm]	50			100	
Stall current I_0 [A]	3	5	10.5	6	10.1
Maximum torque M_{max} [Nm]	173			345	
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1
Electrical time constant t_{el} [ms]	7.6	7.8	8	9.28	9.17
Thermal time constant t_{therm} [min]	50			70	
Moment of inertia J [kgcm ²]	409			784	
Weight without brake m [kg]	33			50	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1045	1090	1180	1090	1180
ACOPOSmulti 8BVLxxx...	0028	0055	0110	0055	0110
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0				

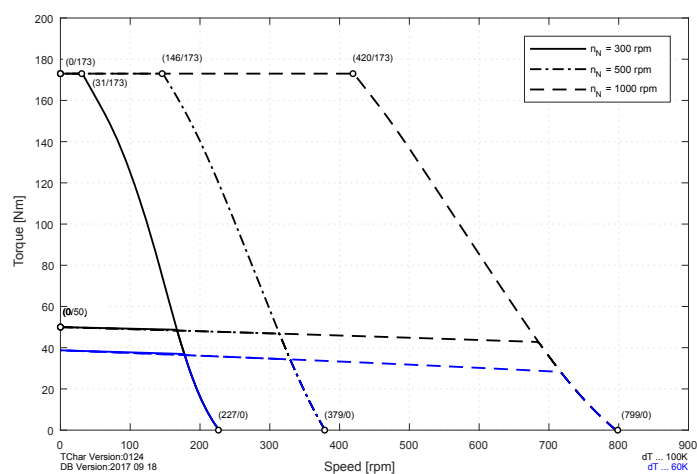
Technical data

Model number	8LTA94.ee010ffgg-0	8LTA95.ee003ffgg-0	8LTA95.ee005ffgg-0	8LTA95.ee010ffgg-0	8LTA96.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	1000	300	500	1000	300
Number of pole pairs	12				
Nominal torque M_n [Nm]	77	142	135	116	188
Nominal power P_N [W]	8063	4461	7069	12147	5906
Nominal current I_N [A]	15.88	8.45	13.67	23.5	11.19
Stall torque M_0 [Nm]	100	150			200
Stall current I_0 [A]	20.6	8.9	15.2	30.4	11.9
Maximum torque M_{max} [Nm]	345	510			680
Maximum current I_{max} [A]	116.55	48.85	83.17	166.16	65.15
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	4.85	16.8	9.87	4.94	16.8
Voltage constant K_E [V/1000 rpm]	293.2	1015.8	596.9	298.4	1015.8
Stator resistance R_{2ph} [Ω]	0.4	2.82	0.96	0.24	1.97
Stator inductance L_{2ph} [mH]	3.42	27.5	9.41	2.42	20.86
Electrical time constant t_{el} [ms]	8.38	9.91	9.92	10.21	10.89
Thermal time constant t_{therm} [min]	70	90			110
Moment of inertia J [kgcm ²]	784	1159			1534
Weight without brake m [kg]	50	67			84
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1320	1180		1320	1180
ACOPOSmulti 8BVlxxx...	0330	0110	0220	0440	0110
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0			1.5	1.0

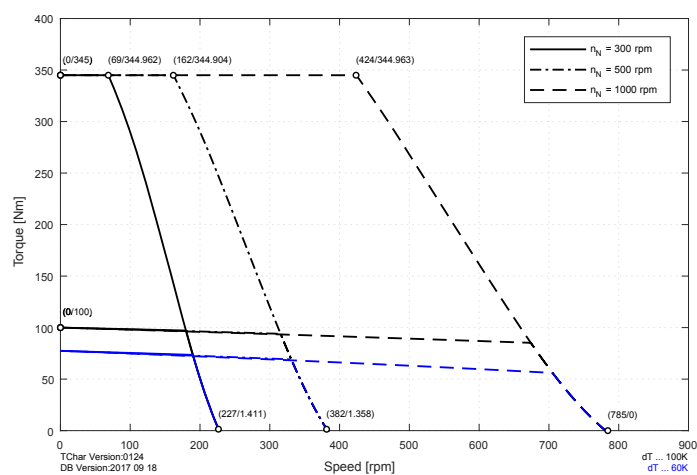
Model number	8LTA96.ee005ffgg-0	8LTA96.ee010ffgg-0	8LTA97.ee003ffgg-0	8LTA97.ee005ffgg-0	8LTA97.ee010ffgg-0
Motor					
Nominal speed n_N [rpm]	500	1000	300	500	1000
Number of pole pairs	12				
Nominal torque M_n [Nm]	180	153	225	212	182
Nominal power P_N [W]	9425	16022	7069	11100	19059
Nominal current I_N [A]	17.92	31	13.39	21.1	36.87
Stall torque M_0 [Nm]	200		240		
Stall current I_0 [A]	19.9	40.5	14.3	23.9	48.6
Maximum torque M_{max} [Nm]	680		816		
Maximum current I_{max} [A]	108.9	221.55	78.17	130.68	265.85
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	10.05	4.94	16.8	10.05	4.94
Voltage constant K_E [V/1000 rpm]	607.4	298.4	1015.8	607.4	298.4
Stator resistance R_{2ph} [Ω]	0.72	0.17	1.76	0.6	0.16
Stator inductance L_{2ph} [mH]	7.4	1.76	18.09	6.63	1.52
Electrical time constant t_{el} [ms]	10.31	10.3	10.2	10	9.8
Thermal time constant t_{therm} [min]	110		130		
Moment of inertia J [kgcm ²]	1534		1833		
Weight without brake m [kg]	84		98		
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1320	1640	1180	1320	1640
ACOPOSmulti 8BVlxxx...	0220	0660	0220	0330	0660
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0	1.5	1.0		1.5

2.10.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

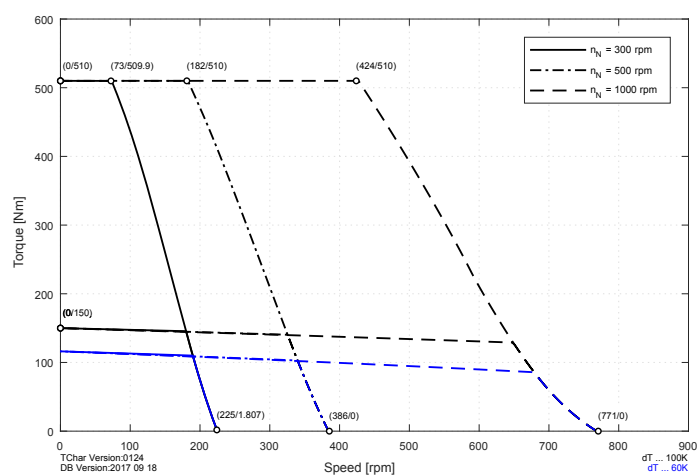
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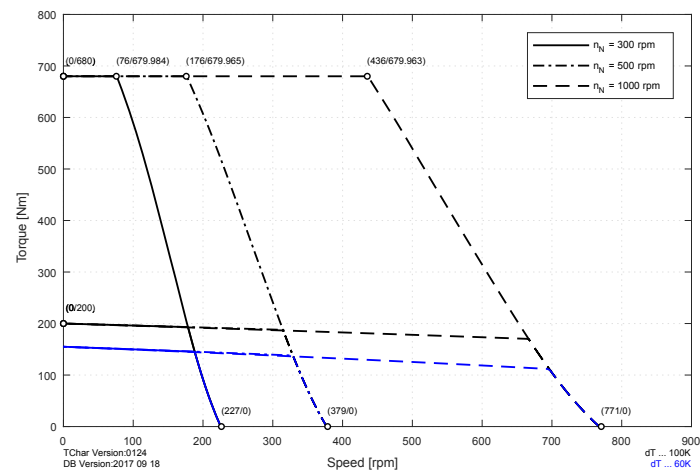
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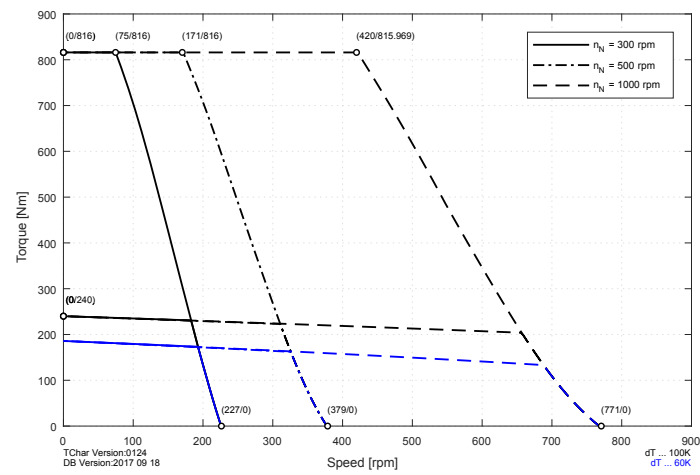
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8LTA96.eennnffgg-0

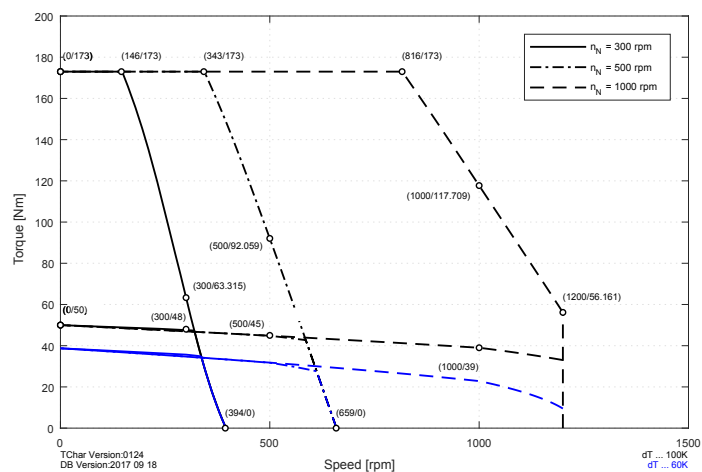


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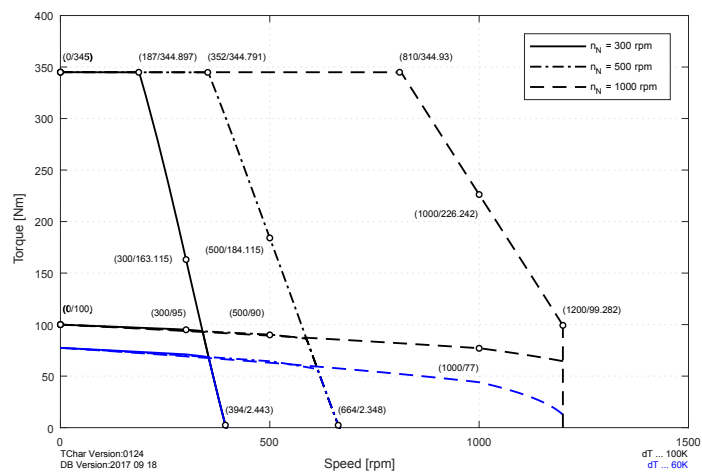


2.10.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

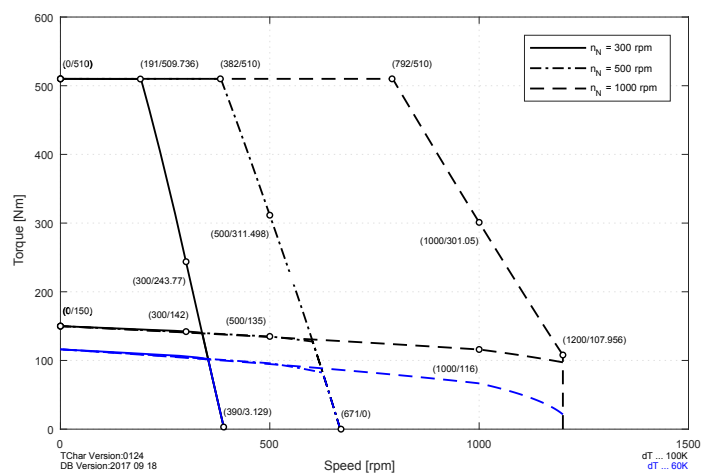
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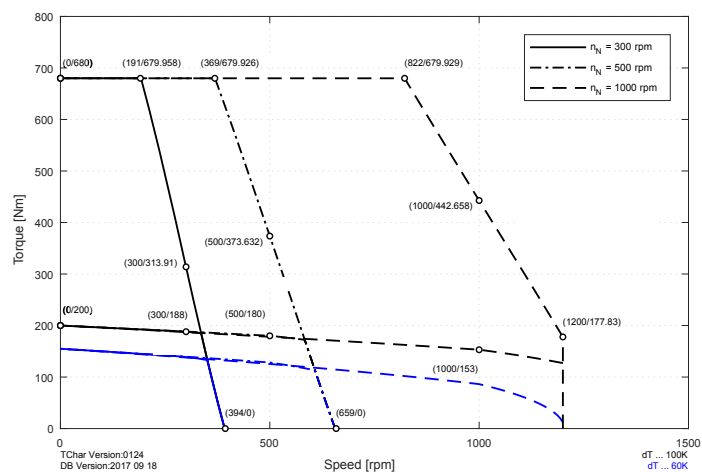
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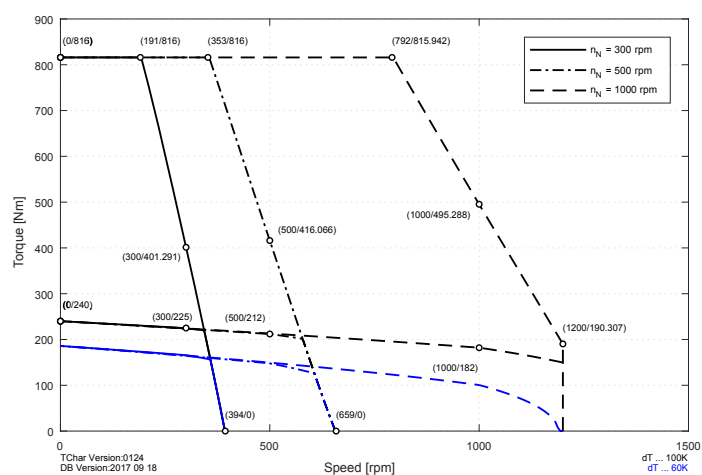
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8LTA96.eennnffgg-0

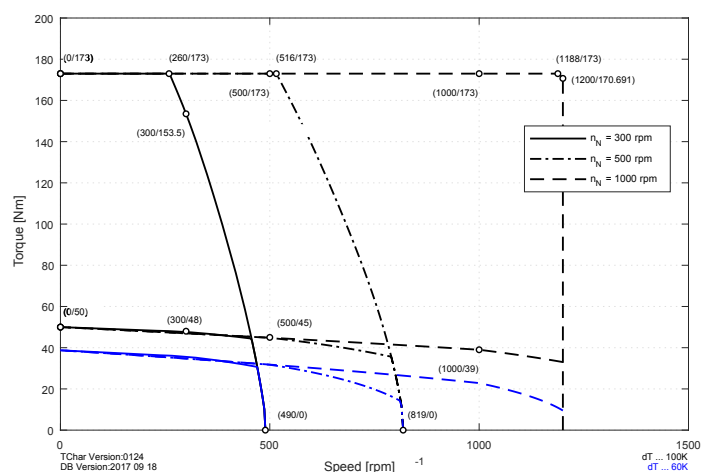


8LTA97.eennnffgg-0

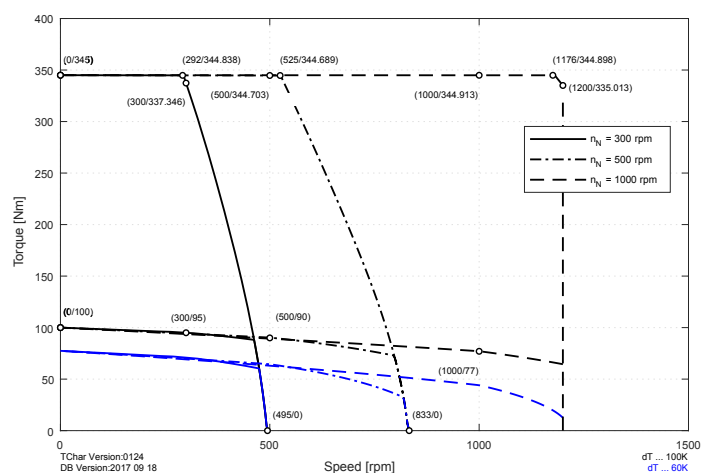


2.10.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

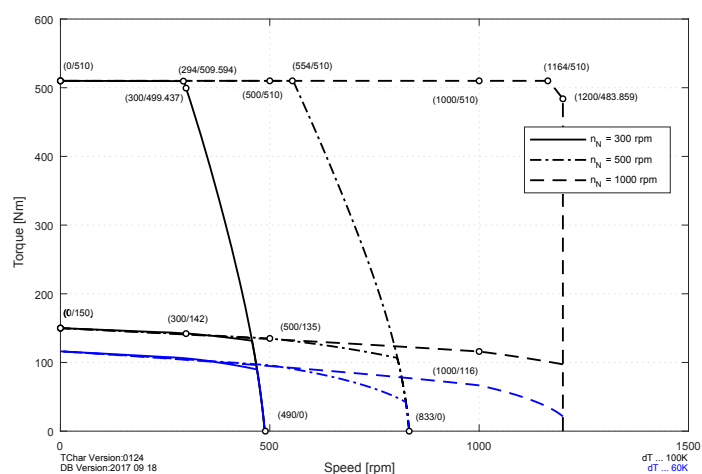
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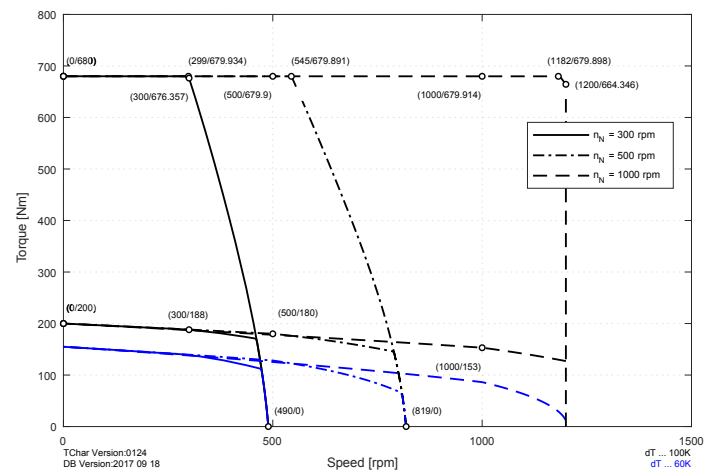
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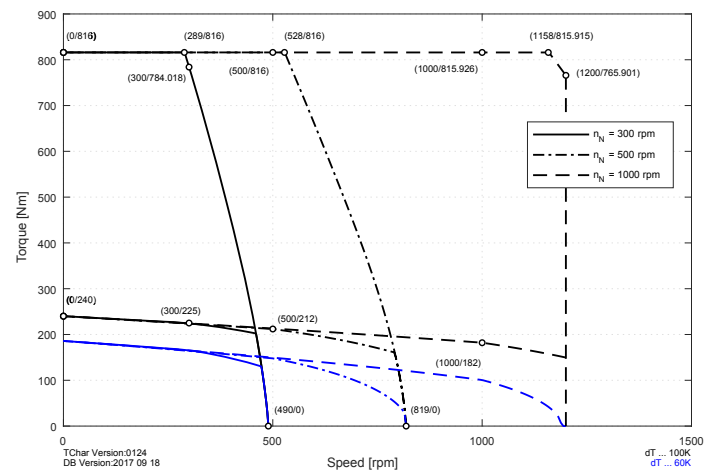
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8LTA96.eennnffgg-0

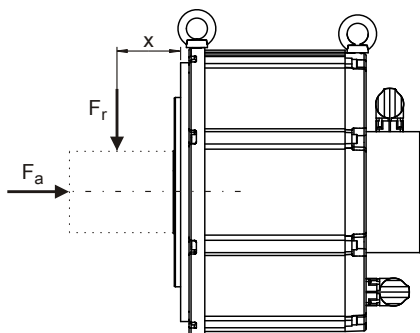


8LTA97.eennnffgg-0



2.10.4 8LTA9 - Permissible shaft load

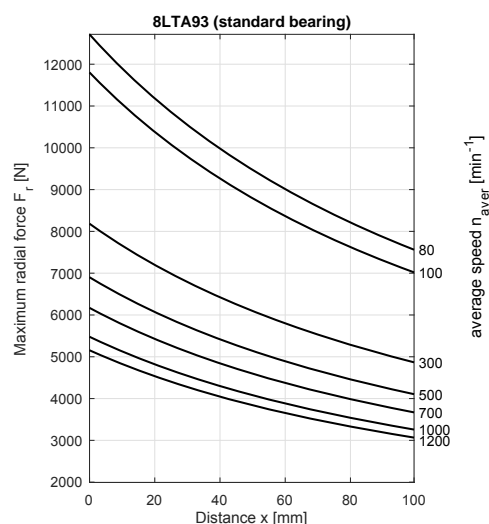
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



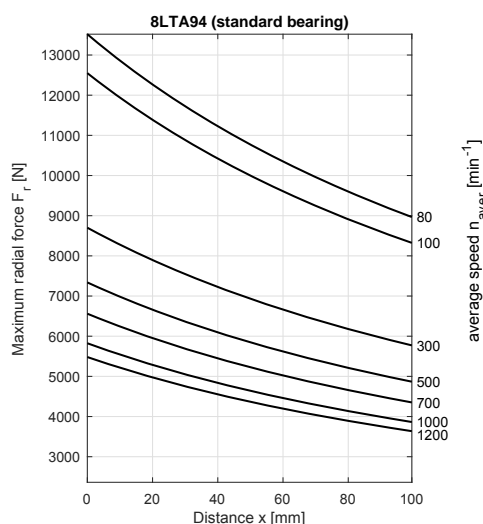
F_r ... Radial force

F_a ... Axial force

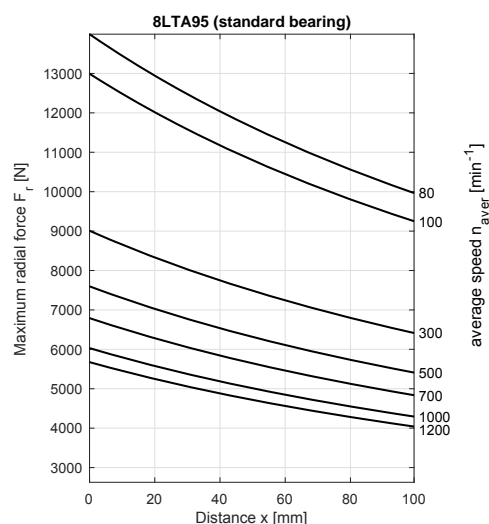
x ... Distance between the motor flange and the point where radial force F_r is applied.



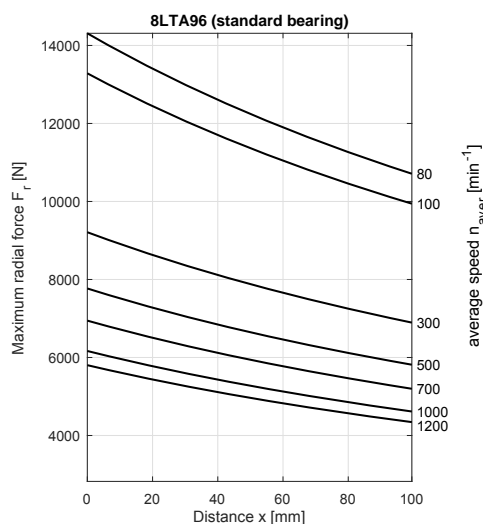
maximum allowed axial force: $F_{amax} = 979 \text{ N}$



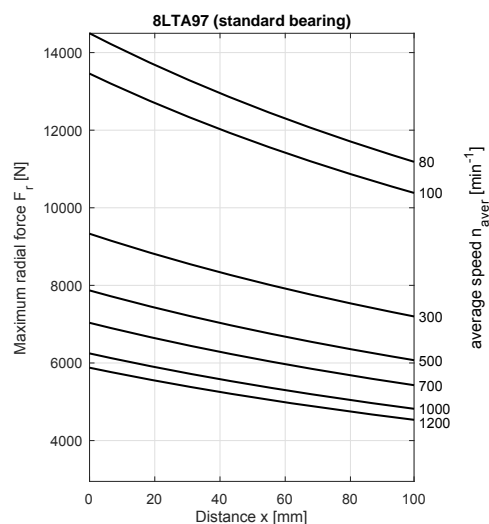
maximum allowed axial force: $F_{amax} = 1113 \text{ N}$



maximum allowed axial force: $F_{amax} = 1202 \text{ N}$

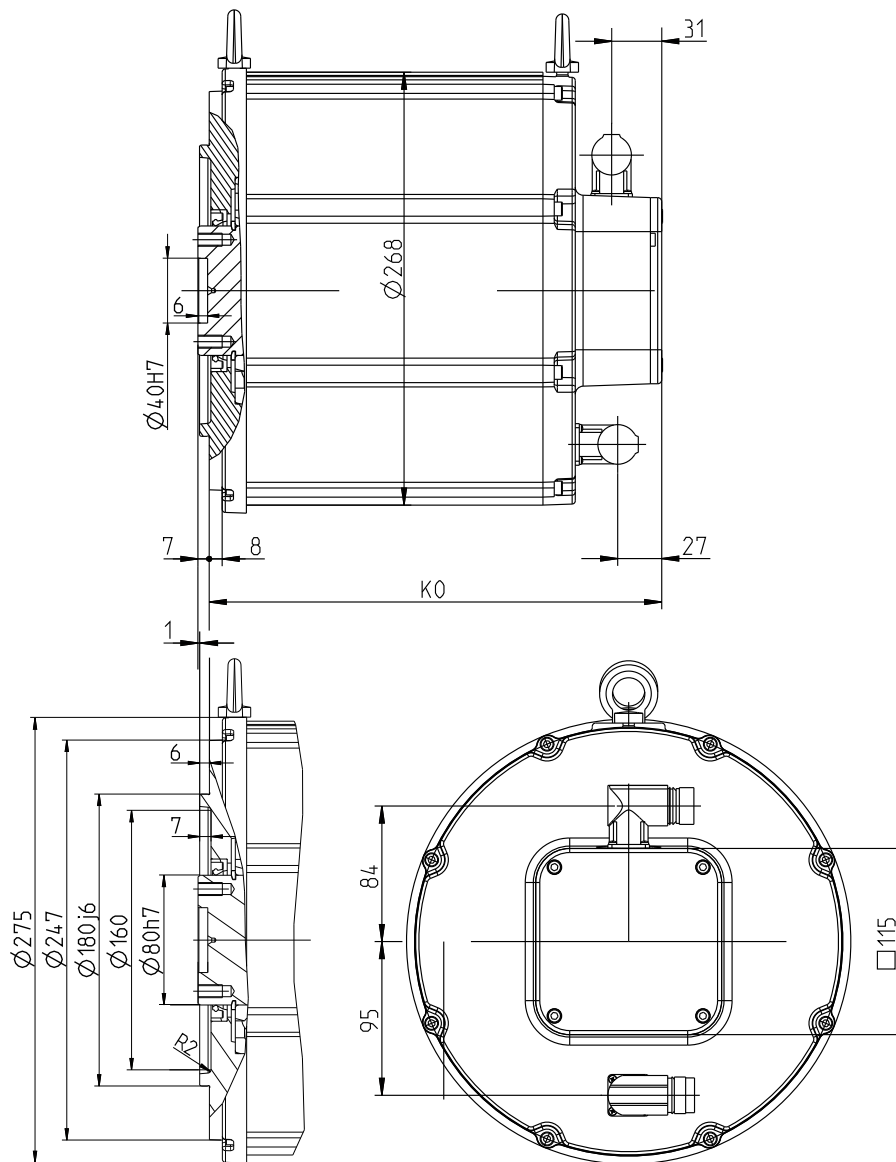


maximum allowed axial force: $F_{amax} = 1265 \text{ N}$

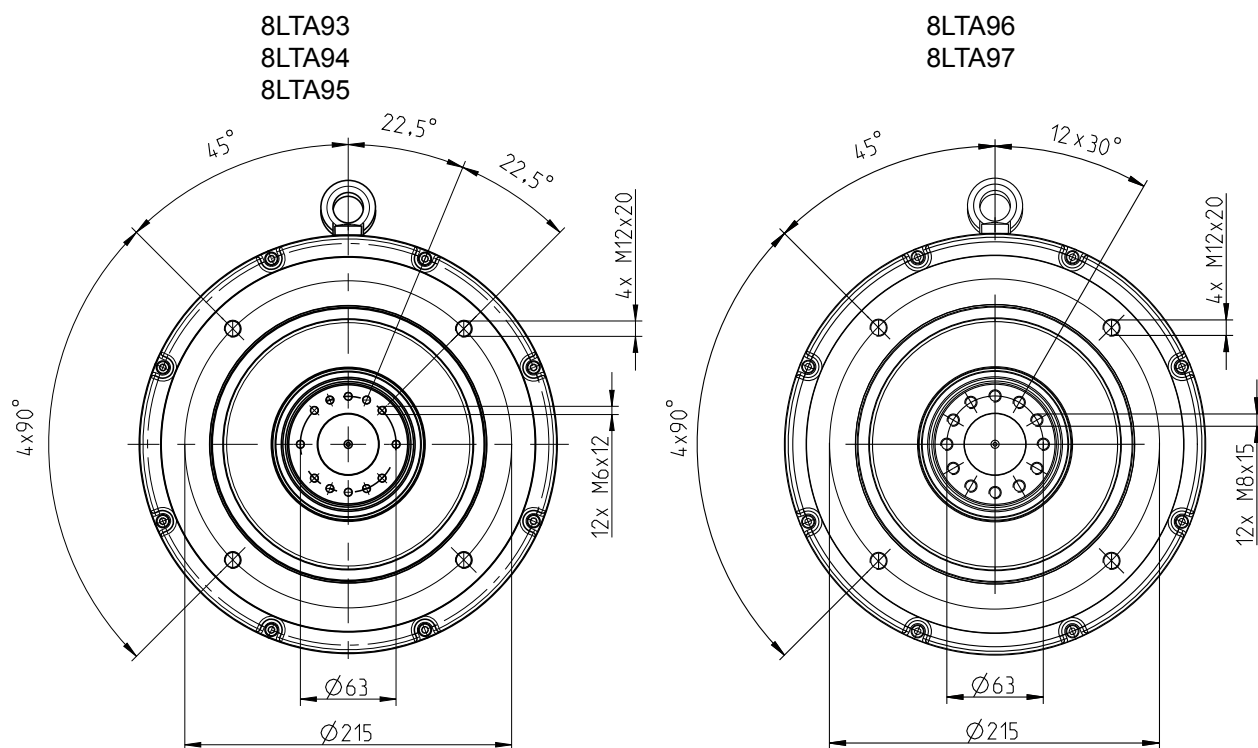


maximum allowed axial force: $F_{amax} = 1303 \text{ N}$

2.10.5 8LTA9 - Dimensions



	K_0
8LTA93	230
8LTA94	280
8LTA95	330
8LTA96	380
8LTA97	420



2.11 8LTAC - Technical data

Model number	8LTAC3. ee001ffgg-0	8LTAC3. ee003ffgg-0	8LTAC3. ee005ffgg-0	8LTAC4. ee001ffgg-0	8LTAC4. ee003ffgg-0	8LTAC4. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	100	300	500	100	300	500
Number of pole pairs	15					
Nominal torque M_N [Nm]	108.1	100.05	88.55	211.5	195.75	173.25
Nominal power P_N [W]	1132	3143	4636	2215	6150	9071
Nominal current I_N [A]	2.21	6.14	9.06	4.33	12.02	17.74
Stall torque M_0 [Nm]	115			225		
Stall current I_0 [A]	2.4	7.1	11.8	4.6	13.8	23
Maximum torque M_{\max} [Nm]	345			703		
Maximum current I_{\max} [A]	10.24	30.71	51.18	20.86	62.58	104.3
Maximum speed n_{\max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	17.1	1.9	0.75	7.61	0.91	0.32
Stator inductance L_{2ph} [mH]	297.7	33.08	12.5	154	17.9	6.62
Electrical time constant t_{el} [ms]	17.41		16.58	20.24	19.76	20.88
Thermal time constant t_{therm} [min]	68			95.2		
Moment of inertia J [kgcm ²]	1600			3000		
Weight without brake m [kg]	63			89		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1045	1090	1180	1090	1180	1320
ACOPOSmulti 8BVxxxx...	0028	0110		0055	0220	0330
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0					

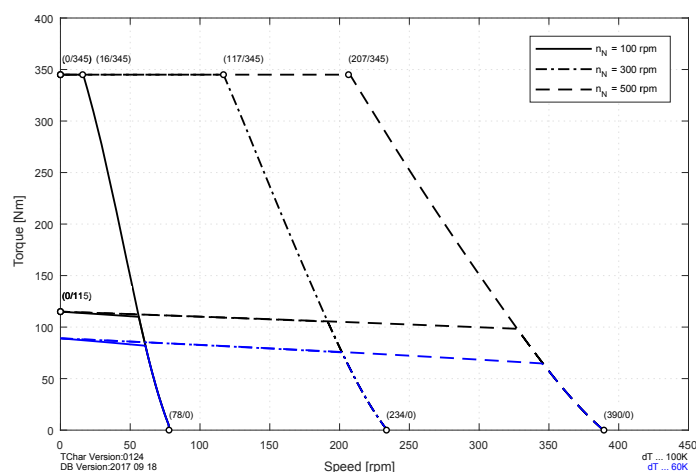
Technical data

Model number	8LTAC5. ee001ffgg-0	8LTAC5. ee003ffgg-0	8LTAC5. ee005ffgg-0	8LTAC6. ee001ffgg-0	8LTAC6. ee003ffgg-0	8LTAC6. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	100	300	500	100	300	500
Number of pole pairs	15					
Nominal torque M_n [Nm]	305.5	282.75	250.25	394.8	365.4	323.4
Nominal power P_N [W]	3199	8883	13103	4134	11479	16933
Nominal current I_N [A]	6.26	17.37	25.62	8.08	22.44	33.11
Stall torque M_0 [Nm]	325			420		
Stall current I_0 [A]	6.7	20	33.3	8.6	25.8	43
Maximum torque M_{max} [Nm]	1054			1405		
Maximum current I_{max} [A]	31.27	93.82	156.37	41.69	125.07	208.44
Maximum speed n_{max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	4.31	0.53	0.21	3.4	0.38	0.13
Stator inductance L_{2ph} [mH]	99.2	11.4	4.35	77	8.66	3.1
Electrical time constant t_{el} [ms]	23.03	21.63	20.62	22.65	22.73	23.66
Thermal time constant t_{therm} [min]	122.4			149.6		
Moment of inertia J [kgcm ²]	4400			5800		
Weight without brake m [kg]	115			141		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1090	1320	1640	1180	1320	1640
ACOPOSmulti 8BVIxxxx...	0055	0220	0440	0110	0330	0660
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0		1.5	1.0		1.5

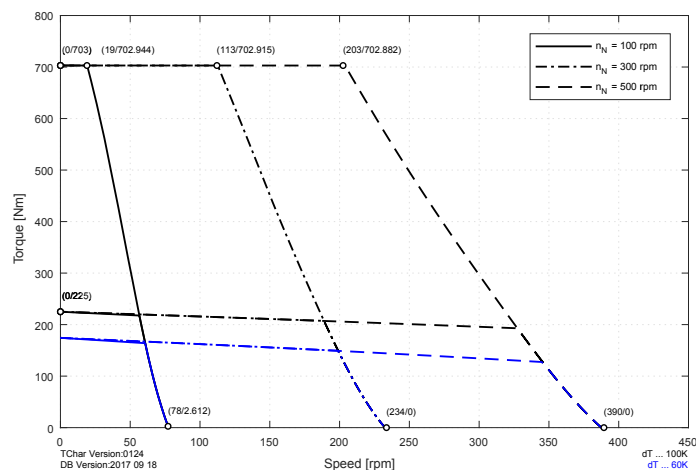
Model number	8LTAC7.ee001ffgg-0	8LTAC7.ee003ffgg-0	8LTAC7.ee005ffgg-0	8LTAC8.ee001ffgg-0	8LTAC8.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	100	300	500	100	300
Number of pole pairs	15				
Nominal torque M_n [Nm]	479.4	443.7	392.7	564	522
Nominal power P_N [W]	5020	13939	20562	5906	16399
Nominal current I_N [A]	9.82	27.25	40.2	11.55	32.06
Stall torque M_0 [Nm]	600				
Stall current I_0 [A]	10.4	31.3	52.2	12.3	36.9
Maximum torque M_{max} [Nm]	1750			2108	
Maximum current I_{max} [A]	51.93	155.78	259.63	62.55	187.64
Maximum speed n_{max} [rpm]	700				
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4
Stator resistance R_{2ph} [Ω]	2.66	0.32	0.11	2.29	0.25
Stator inductance L_{2ph} [mH]	62.3	7.07	2.42	52.9	5.86
Electrical time constant t_{el} [ms]	23.42	21.75	22.36	23.1	23.07
Thermal time constant t_{therm} [min]	204				
Moment of inertia J [kgcm ²]	7200			8600	
Weight without brake m [kg]	167			192	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxxx.xx...	1180	1640		1180	1640
ACOPOSMulti 8BVlxxxx...	0110	0440	0660	0110	0440
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0	1.5		1.0	1.5

2.11.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

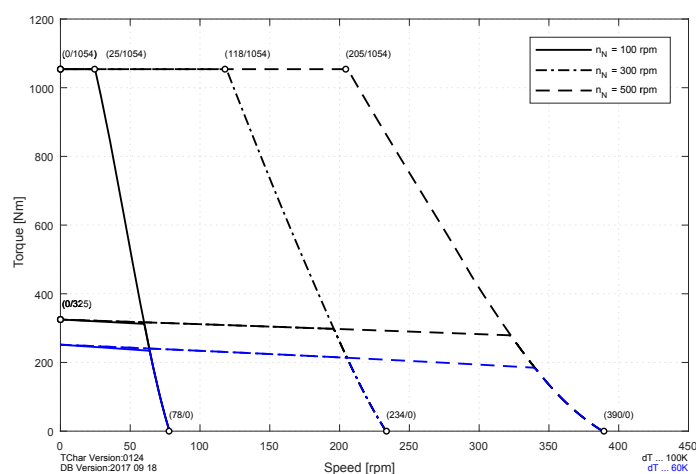
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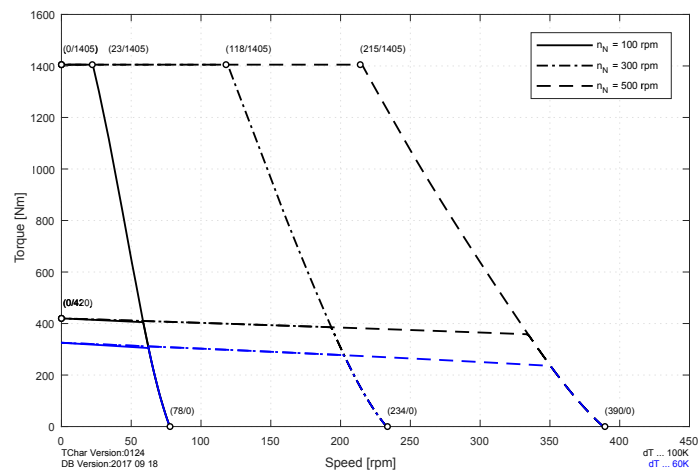
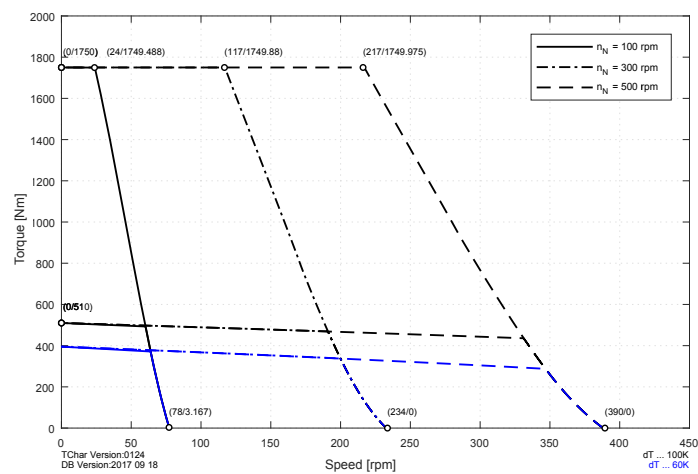
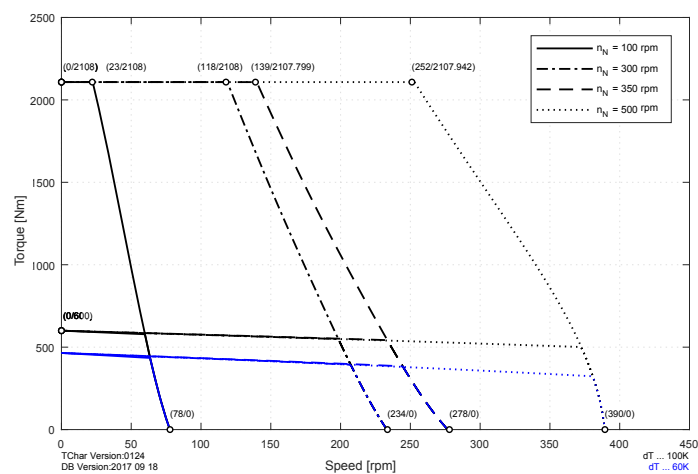


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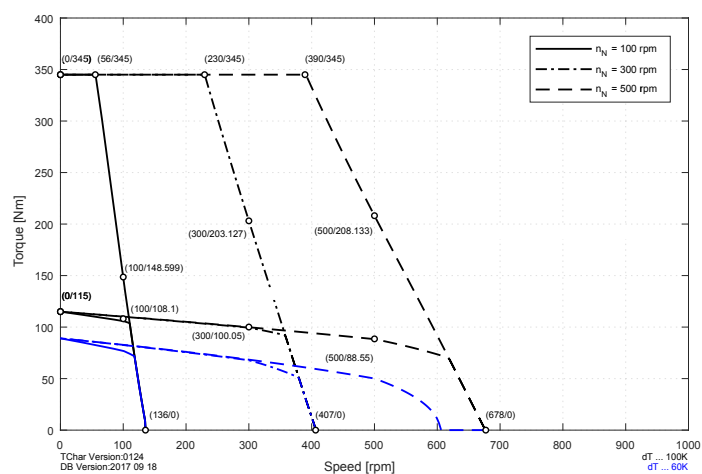
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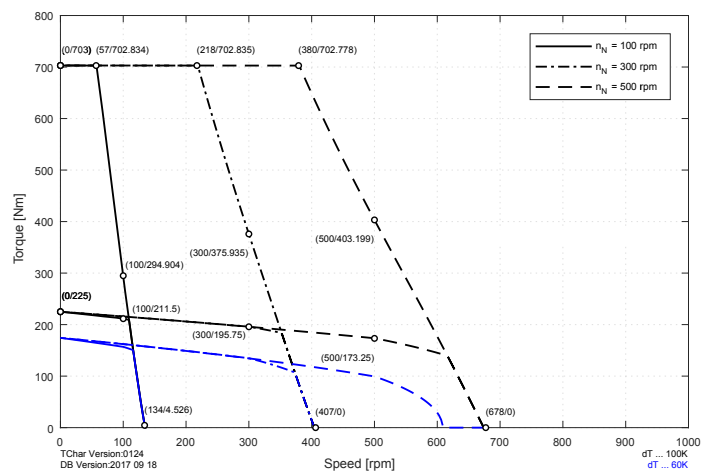
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8LTAC7.eennnffgg-0

8LTAC8.eennnffgg-0


2.11.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

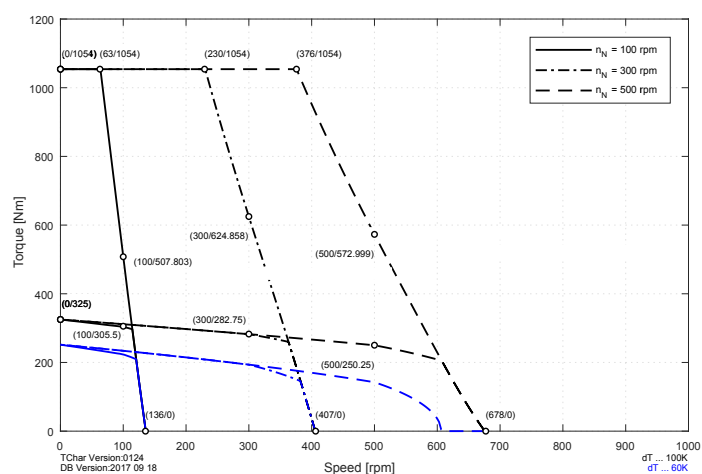
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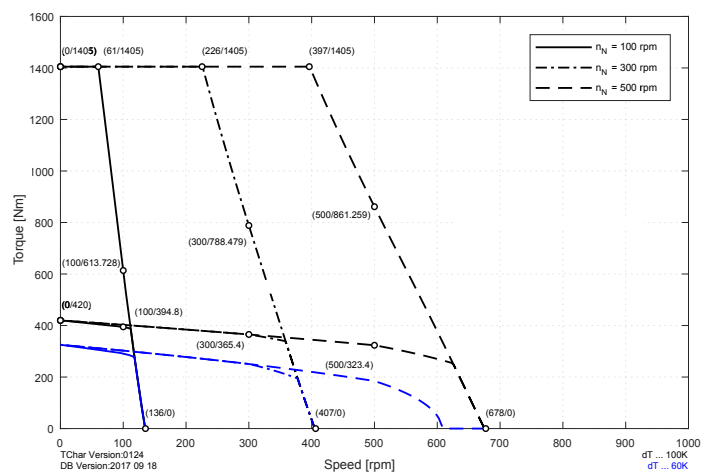
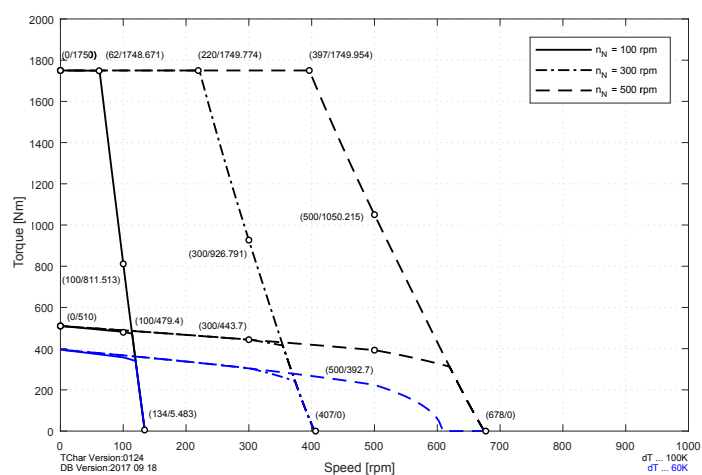
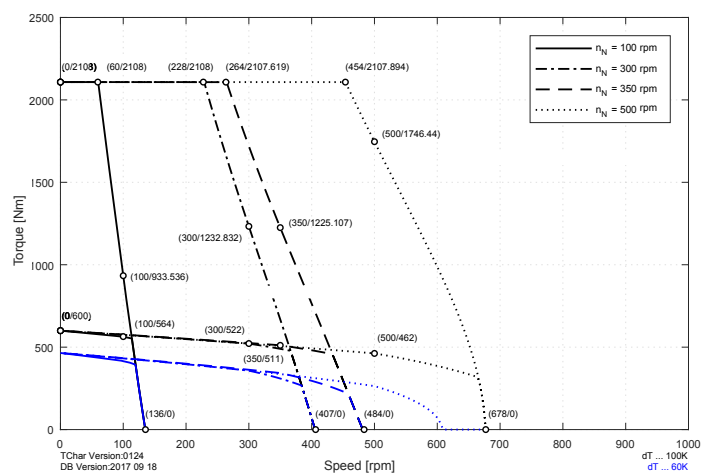


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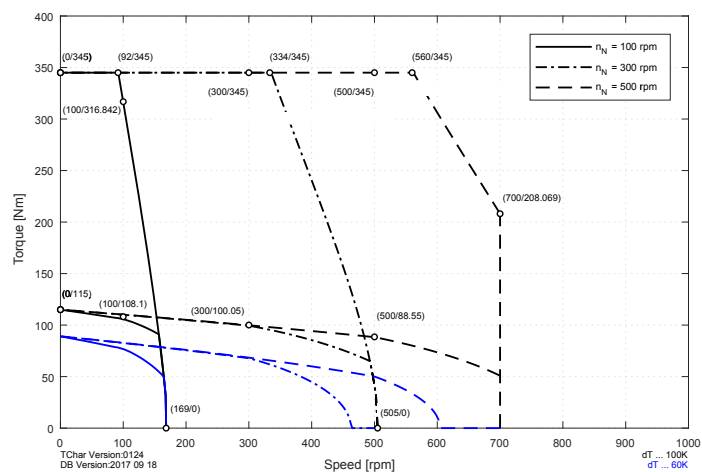
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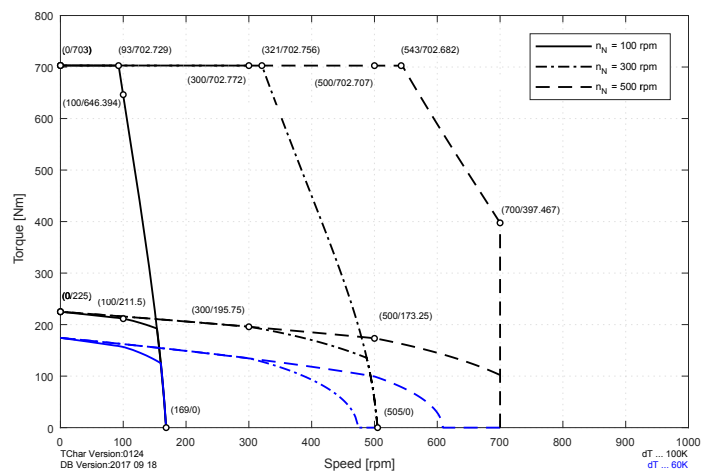
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8LTAC7.eennnffgg-0

8LTAC8.eennnffgg-0


2.11.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

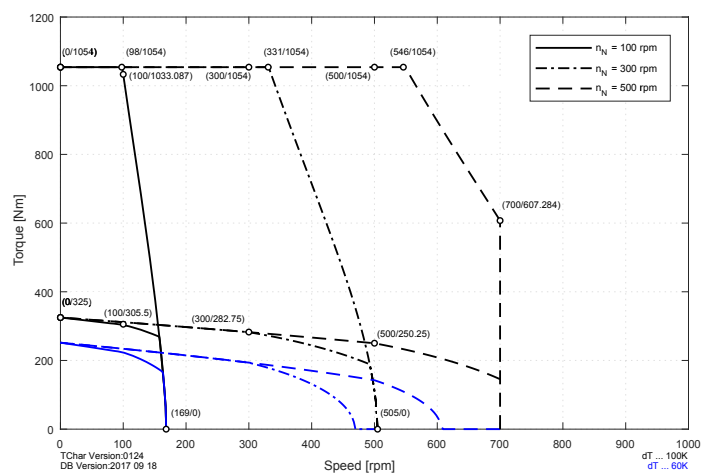
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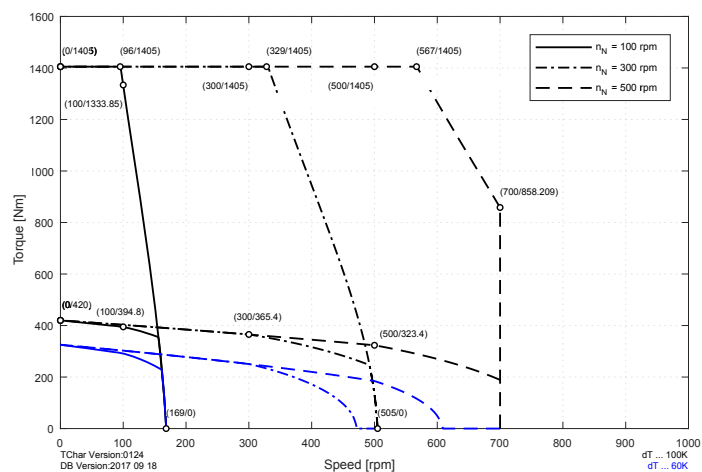
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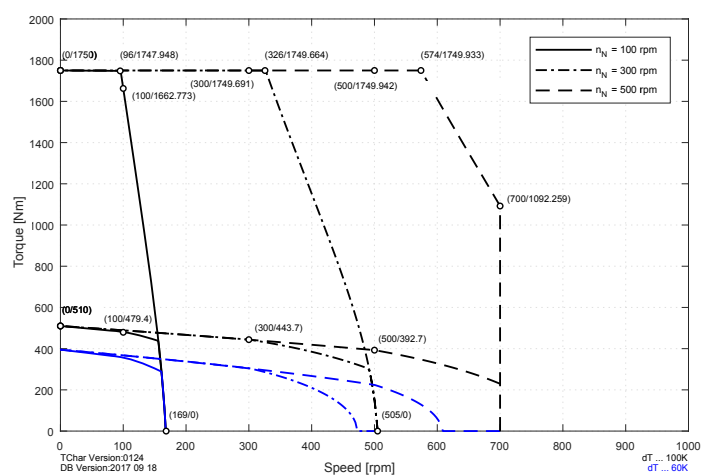
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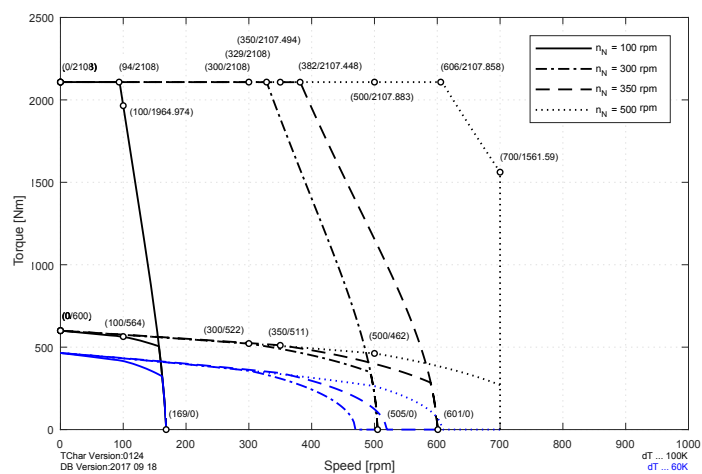
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8LTAC7.eennnffgg-0

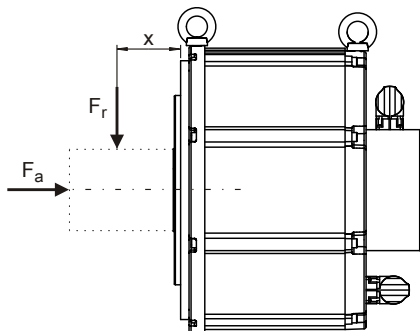


8LTAC8.eennnffgg-0



2.11.4 8LTAC - Permissible shaft load

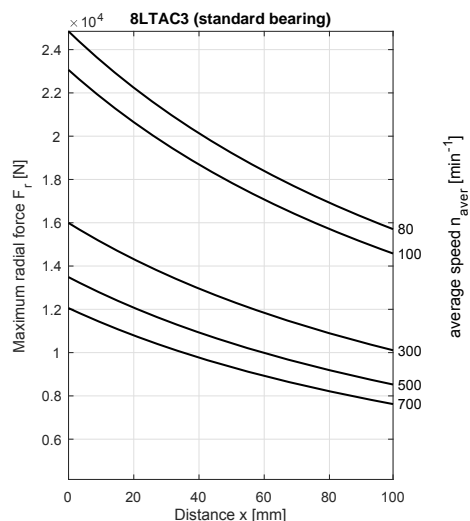
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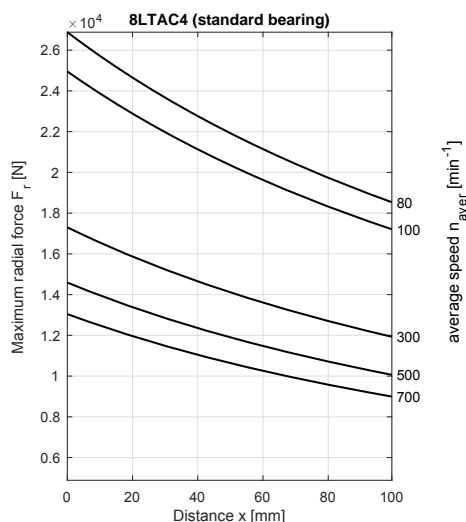
F_r ... Radial force

F_a ... Axial force

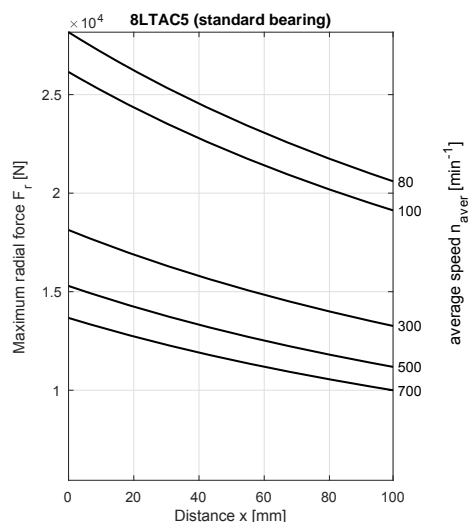
x ... Distance between the motor flange and the point where radial force F_r is applied.



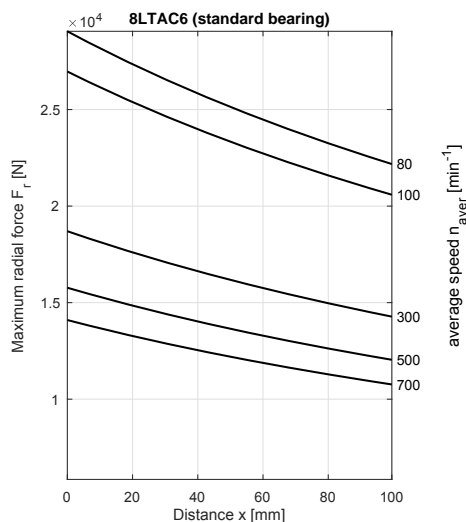
maximum allowed axial force: $F_{amax} = 1987$ N



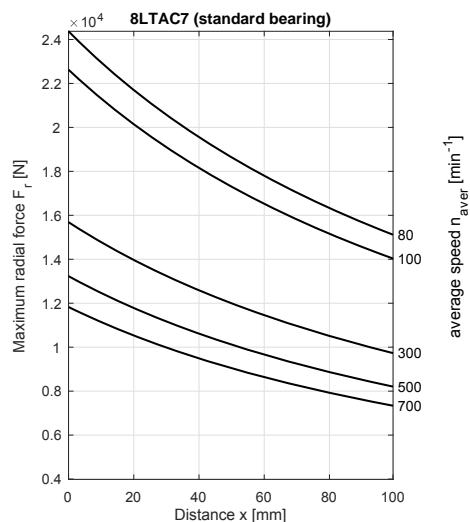
maximum allowed axial force: $F_{amax} = 2265$ N



maximum allowed axial force: $F_{amax} = 2457$ N

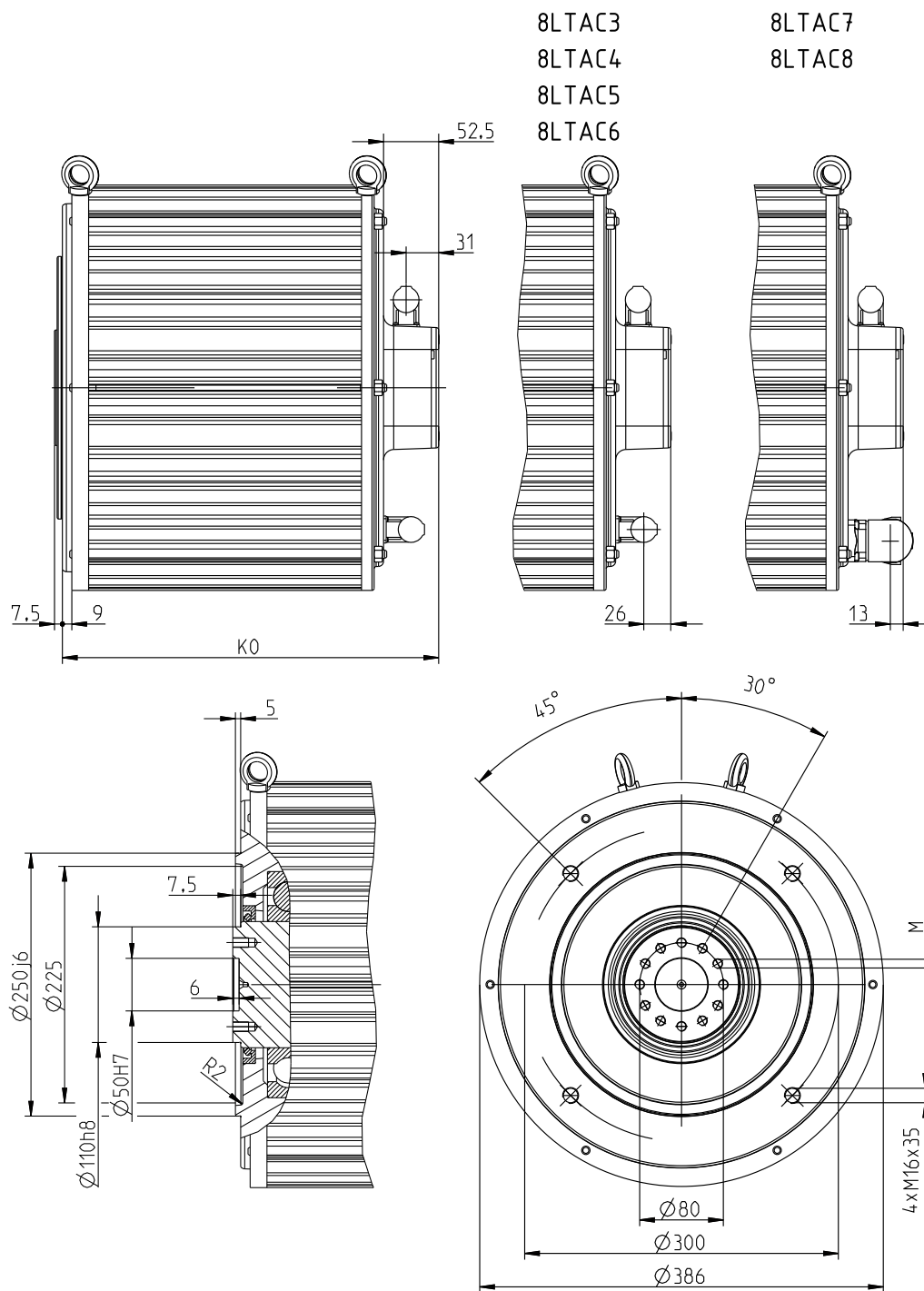


maximum allowed axial force: $F_{amax} = 2596$ N



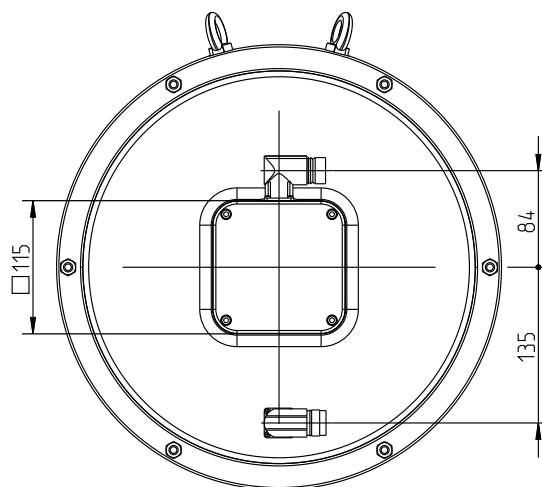
maximum allowed axial force: $F_{amax} = 1927$ N

2.11.5 8LTAC - Dimensions

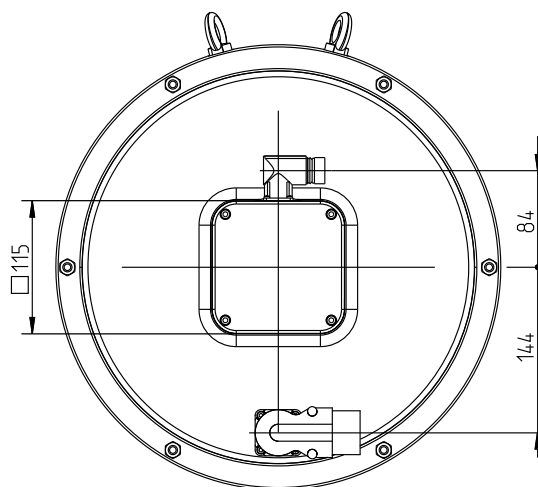


	K_0	M
8LTAC3	259	(12x) M10x15
8LTAC4	309	
8LTAC5	359	
8LTAC6	409	
8LTAC7	459	(12x) M12x20
8LTAC8	509	

8LTAC3
8LTAC4
8LTAC5
8LTAC6



8LTAC7
8LTAC8



2.12 8LTB9 - Technical data

Model number	8LTB93.ee003ffgg-0	8LTB93.ee005ffgg-0	8LTB93.ee010ffgg-0	8LTB94.ee003ffgg-0	8LTB94.ee005ffgg-0
Motor					
Nominal speed n_N [rpm]	300	500	1000	300	500
Number of pole pairs	12				
Nominal torque M_N [Nm]	48	45	39	95	90
Nominal power P_N [W]	1508	2356	4084	2985	4712
Nominal current I_N [A]	2.86	4.48	8.19	5.71	9.12
Stall torque M_0 [Nm]	50			100	
Stall current I_0 [A]	3	5	10.5	6	10.1
Maximum torque M_{max} [Nm]	173			345	
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1
Electrical time constant t_{el} [ms]	7.6	7.28	7.51	9.28	9.17
Thermal time constant t_{therm} [min]	50			70	
Moment of inertia J [kgcm ²]	1372			1651	
Weight without brake m [kg]	53			65	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1045	1090	1180	1090	1180
ACOPOSmulti 8BVLxxx...	0028	0055	0110	0055	0110
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0				

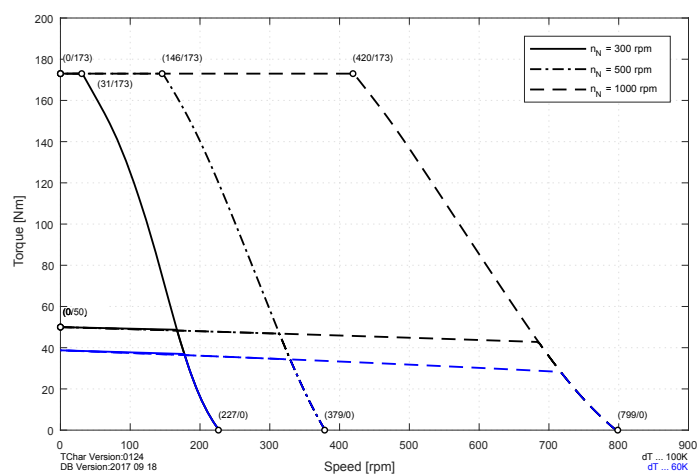
Technical data

Model number	8LTB94.ee010ffgg-0	8LTB95.ee003ffgg-0	8LTB95.ee005ffgg-0	8LTB95.ee010ffgg-0	8LTB96.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	1000	300	500	1000	300
Number of pole pairs	12				
Nominal torque M_N [Nm]	77	142	135	116	188
Nominal power P_N [W]	8063	4461	7069	12147	5906
Nominal current I_N [A]	15.88	8.45	13.67	23.5	11.19
Stall torque M_0 [Nm]	100	150			200
Stall current I_0 [A]	20.6	8.9	15.2	30.4	11.9
Maximum torque M_{\max} [Nm]	345	510			680
Maximum current I_{\max} [A]	116.55	48.85	83.17	166.16	65.15
Maximum speed n_{\max} [rpm]	1200				
Torque constant K_T [Nm/A]	4.85	16.8	9.87	4.94	16.8
Voltage constant K_E [V/1000 rpm]	293.2	1015.8	596.9	298.4	1015.8
Stator resistance R_{2ph} [Ω]	0.4	2.82	0.96	0.24	1.97
Stator inductance L_{2ph} [mH]	3.42	27.5	9.41	2.42	20.86
Electrical time constant t_{el} [ms]	8.38	9.91	9.92	10.21	10.89
Thermal time constant t_{therm} [min]	70	90			110
Moment of inertia J [kgcm ²]	1651	1931			2210
Weight without brake m [kg]	65	77			89
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1320	1180		1320	1180
ACOPOSmulti 8BVIxxx...	0330	0110	0220	0440	0110
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0			1.5	1.0

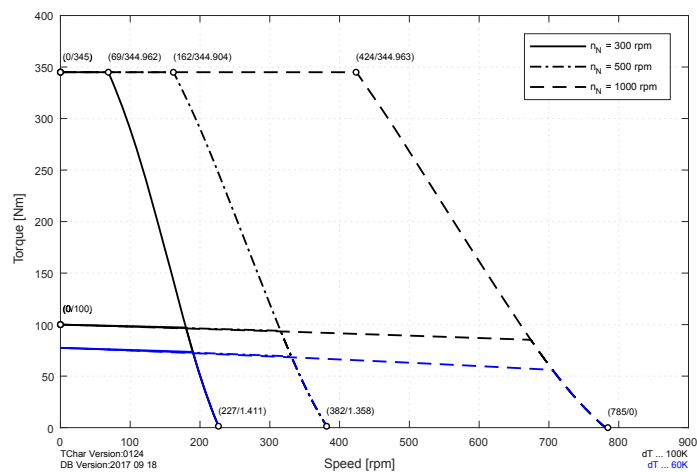
Model number	8LTB96.ee005ffgg-0	8LTB96.ee010ffgg-0	8LTB97.ee003ffgg-0	8LTB97.ee005ffgg-0	8LTB97.ee010ffgg-0
Motor					
Nominal speed n_N [rpm]	500	1000	300	500	1000
Number of pole pairs	12				
Nominal torque M_n [Nm]	180	153	225	212	182
Nominal power P_N [W]	9425	16022	7069	11100	19059
Nominal current I_N [A]	17.92	31	13.39	21.1	36.87
Stall torque M_0 [Nm]	200		240		
Stall current I_0 [A]	19.9	40.5	14.3	23.9	48.6
Maximum torque M_{max} [Nm]	680		816		
Maximum current I_{max} [A]	108.9	221.55	78.17	130.68	265.85
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	10.05	4.94	16.8	10.05	4.94
Voltage constant K_E [V/1000 rpm]	607.4	298.4	1015.8	607.4	298.4
Stator resistance R_{2ph} [Ω]	0.72	0.17	1.76	0.66	0.16
Stator inductance L_{2ph} [mH]	7.4	1.76	18.09	6.63	1.52
Electrical time constant t_{el} [ms]	10.31	10.63		10	10.98
Thermal time constant t_{therm} [min]	110		130		
Moment of inertia J [kgcm ²]	2210		2434		
Weight without brake m [kg]	89		99		
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1320	1640	1180	1320	1640
ACOPOSmulti 8BVlxxx...	0220	0660	0220	0330	0660
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0	1.5	1.0		1.5

2.12.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

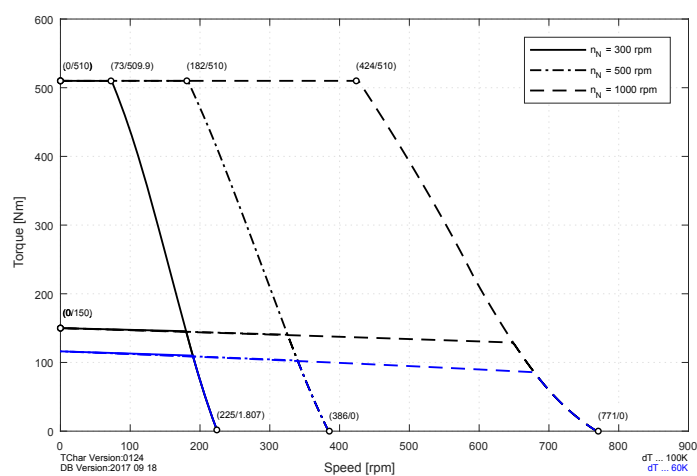
8LTB93.eennnffgg-0



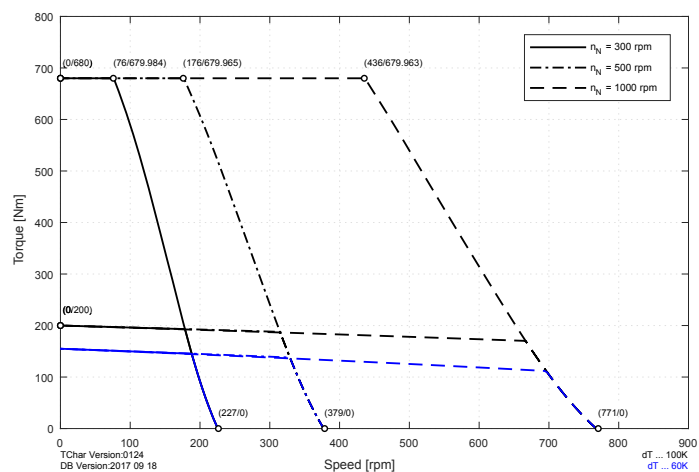
8LTB94.eennnffgg-0



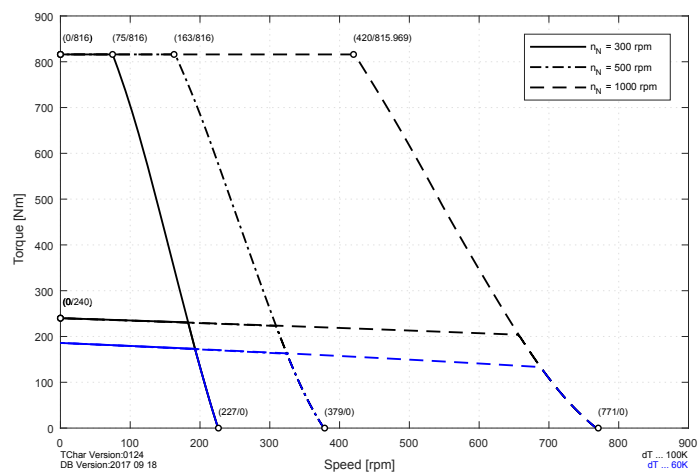
8LTB95.eennnffgg-0



8LTB96.eennnffgg-0

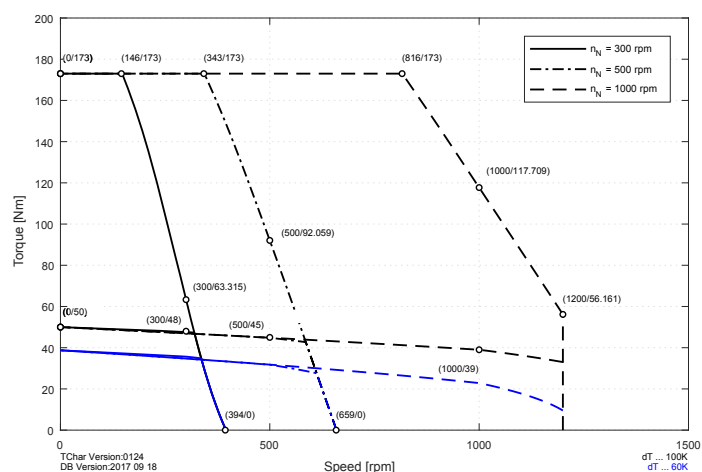


8LTB97.eennnffgg-0

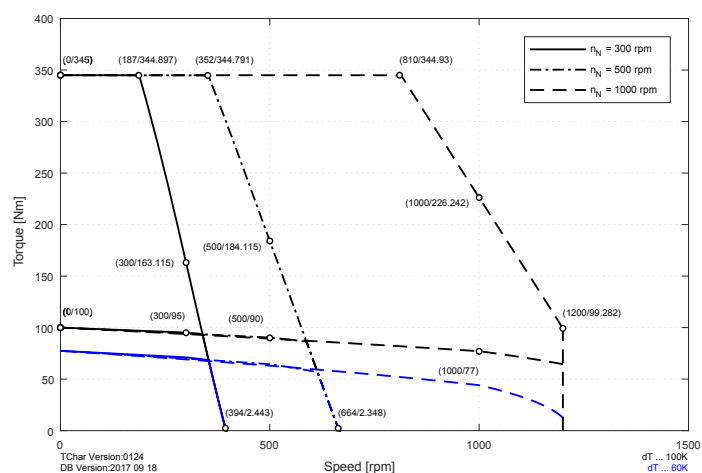


2.12.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

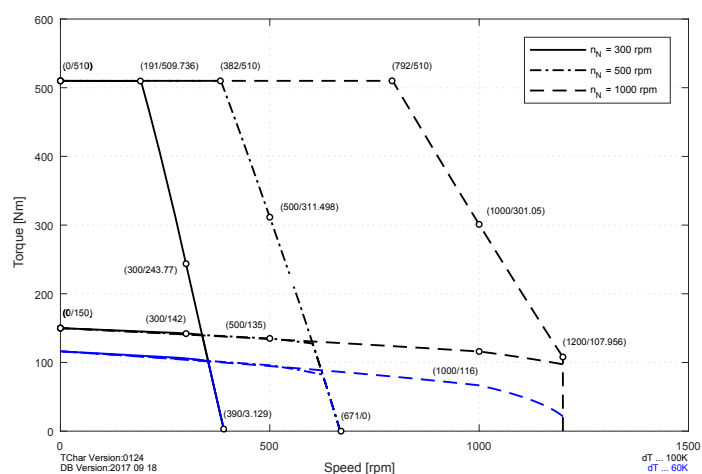
8LTB93.eennnffgg-0



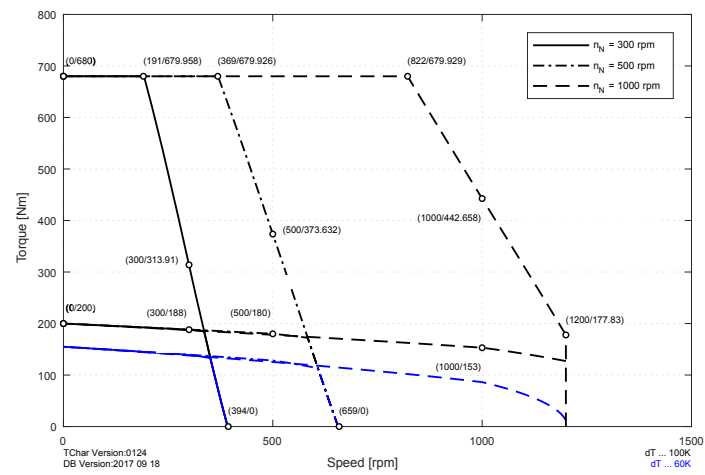
8LTB94.eennnffgg-0



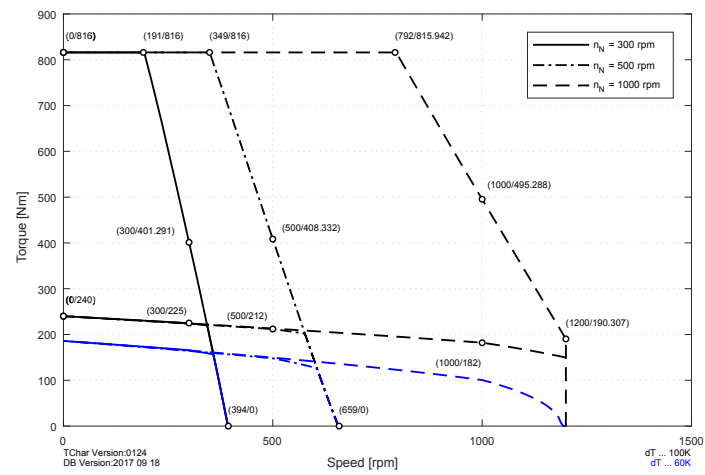
8LTB95.eennnffgg-0



8LTB96.eennnffgg-0

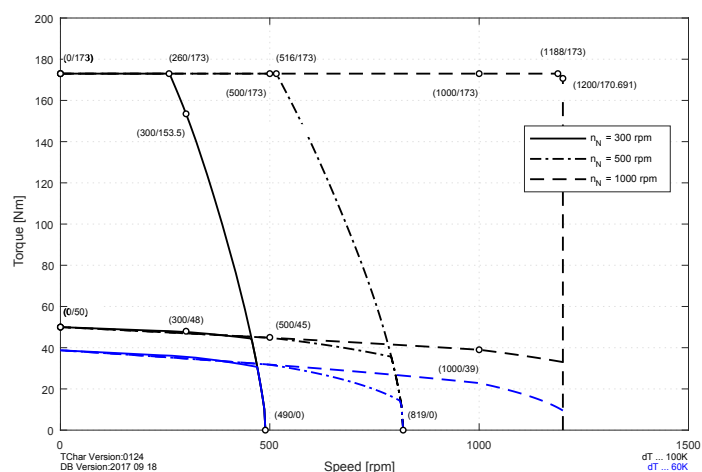


8LTB97.eennnffgg-0

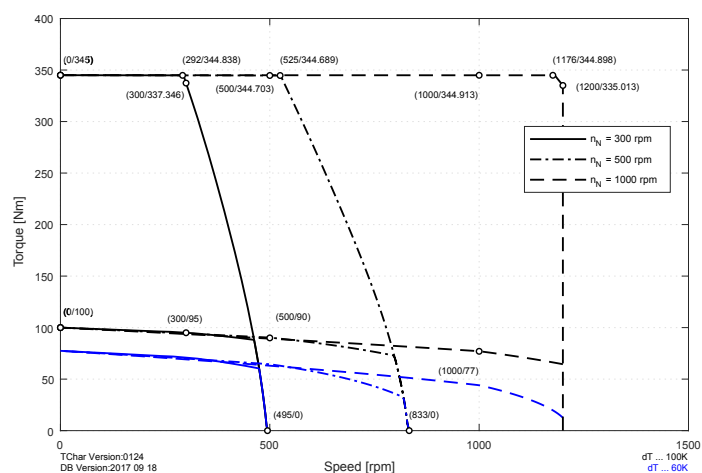


2.12.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

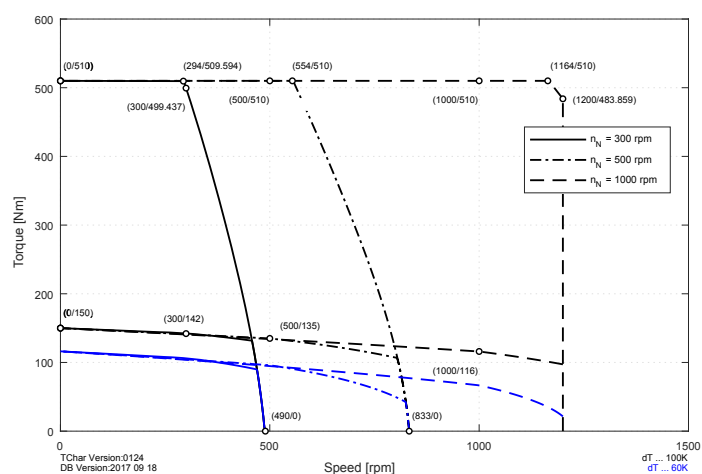
8LTB93.eennnffgg-0



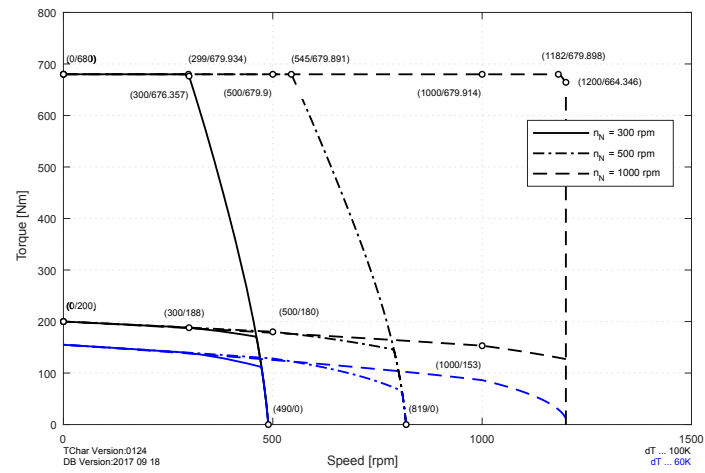
8LTB94.eennnffgg-0



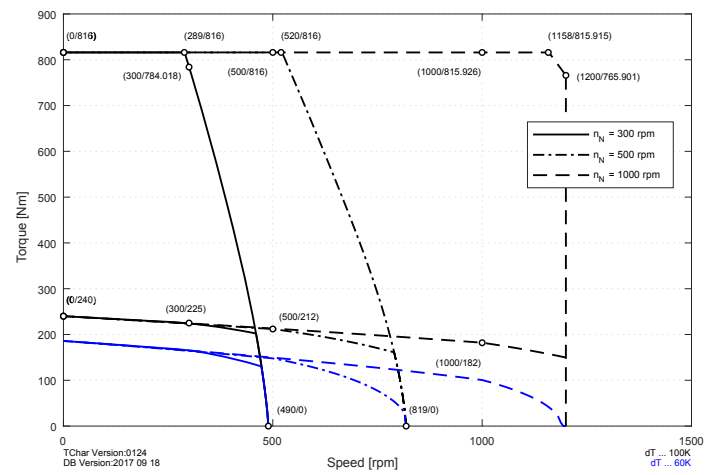
8LTB95.eennnffgg-0



8LTB96.eennnffgg-0

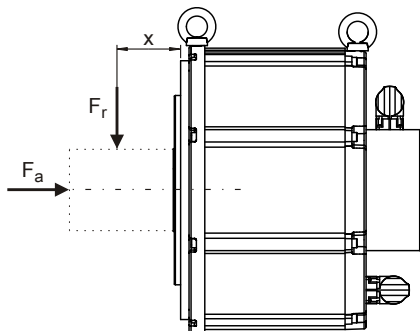


8LTB97.eennnffgg-0



2.12.4 8LTB9 - Permissible shaft load

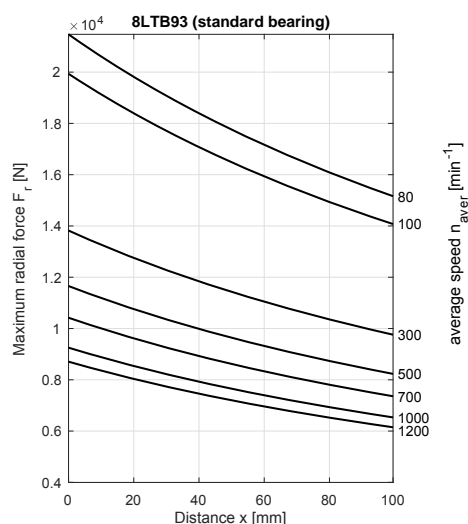
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



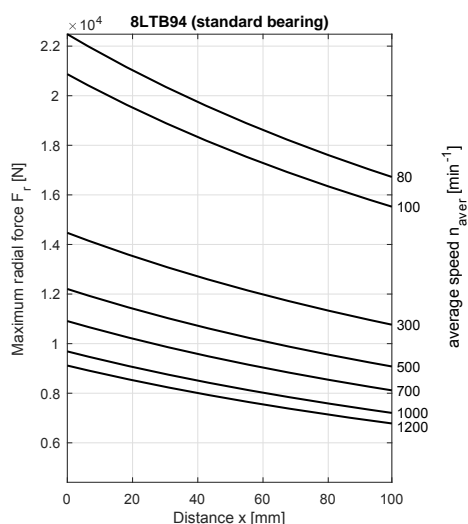
F_r ... Radial force

F_a ... Axial force

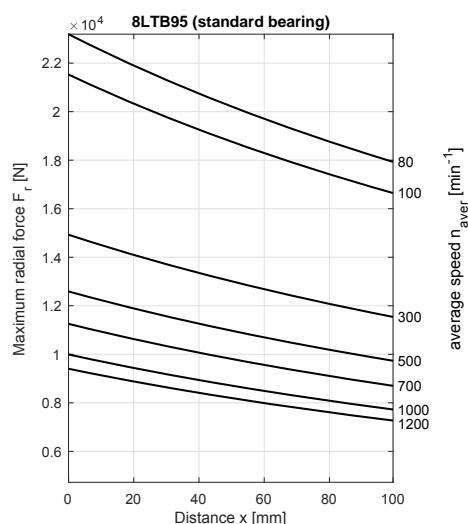
x ... Distance between the motor flange and the point where radial force F_r is applied.



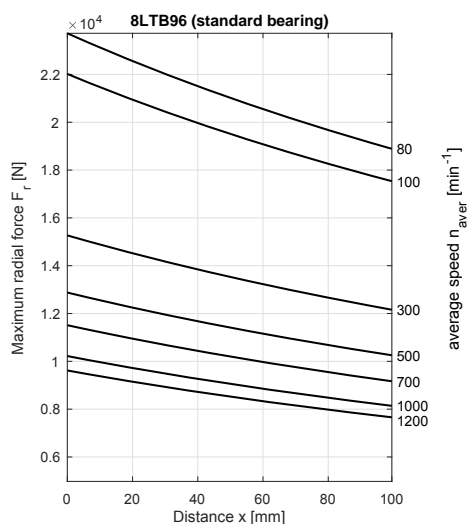
maximum allowed axial force: $F_{amax} = 1835 \text{ N}$



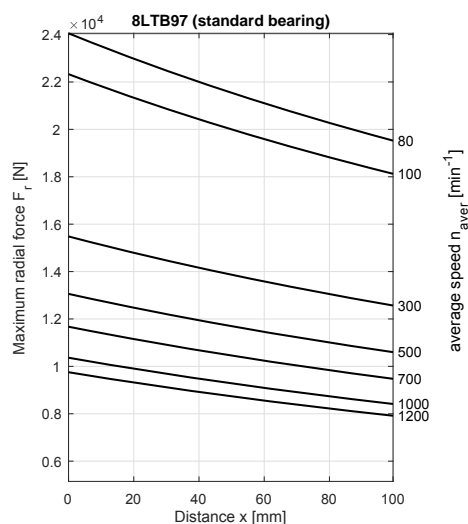
maximum allowed axial force: $F_{amax} = 1980 \text{ N}$



maximum allowed axial force: $F_{amax} = 2087 \text{ N}$

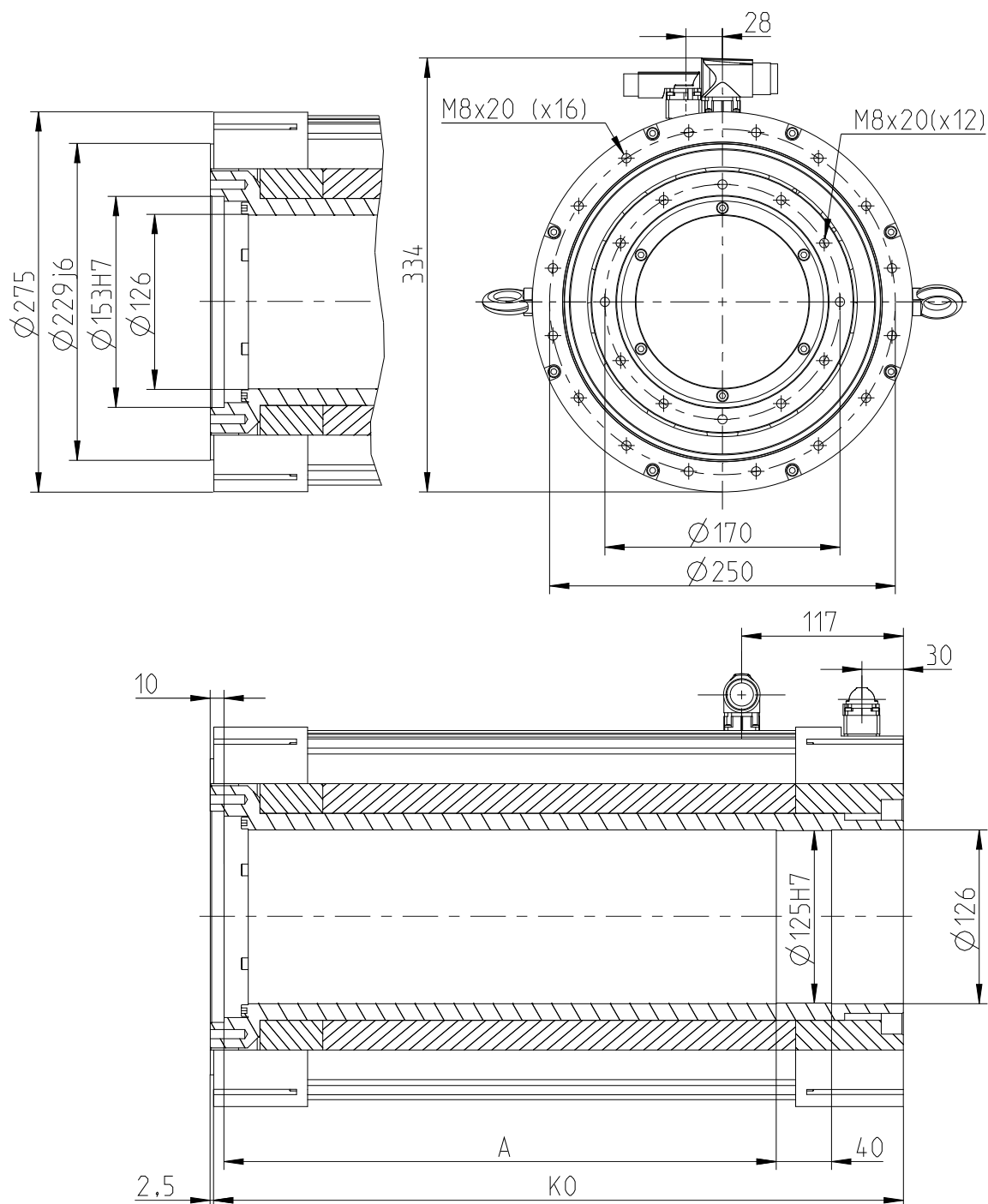


maximum allowed axial force: $F_{amax} = 2171 \text{ N}$



maximum allowed axial force: $F_{amax} = 2224 \text{ N}$

2.12.5 8LTB9 - Dimensions



	K_0	A
8LTB93	310	210
8LTB94	360	260
8LTB95	410	310
8LTB96	460	360
8LTB97	500	400

2.13 8LTJ9 - Technical data

Model number	8LTJ93.ee003ffgg-0	8LTJ93.ee005ffgg-0	8LTJ93.ee010ffgg-0	8LTJ94.ee003ffgg-0	8LTJ94.ee005ffgg-0
Motor					
Nominal speed n_N [rpm]	300	500	1000	300	500
Number of pole pairs	12				
Nominal torque M_n [Nm]	81.6	76.5	66.3	161.5	153
Nominal power P_N [W]	2564	4006	6943	5074	8011
Nominal current I_N [A]	4.86	7.62	13.92	9.71	15.5
Stall torque M_0 [Nm]	85			170	
Stall current I_0 [A]	5.1	8.5	17.8	10.2	17.2
Maximum torque M_{max} [Nm]	173			345	
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1
Electrical time constant t_{el} [ms]	7.6	7.28	7.51	9.28	9.17
Thermal time constant t_{therm} [min]	50			70	
Moment of inertia J [kgcm ²]	409			784	
Weight without brake m [kg]	34			53	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1090	1180	1320	1180	
ACOPOSmulti 8BVIxxx...	0055	0110	0220	0110	0220
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0				

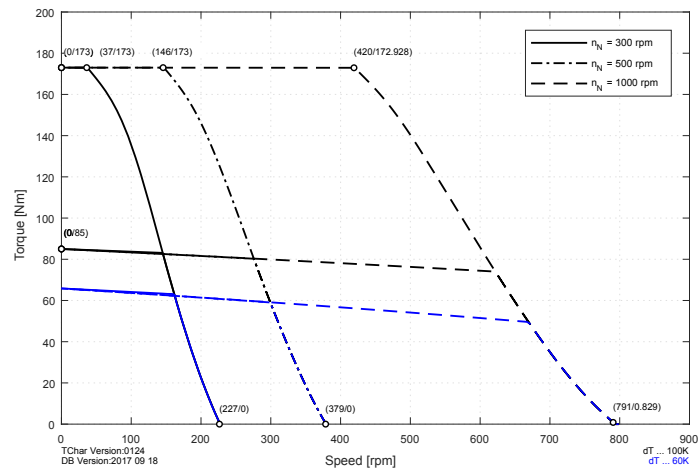
Model number	8LTJ94.ee010ffgg-0	8LTJ95.ee003ffgg-0	8LTJ95.ee005ffgg-0	8LTJ95.ee010ffgg-0	8LTJ96.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	1000	300	500	1000	300
Number of pole pairs	12				
Nominal torque M_N [Nm]	130.9	241.4	229.5	197.2	319.6
Nominal power P_N [W]	13708	7584	12017	20651	10041
Nominal current I_N [A]	26.99	14.37	23.25	39.95	19.02
Stall torque M_0 [Nm]	170	255			340
Stall current I_0 [A]	35.1	15.2	25.8	51.7	20.2
Maximum torque M_{max} [Nm]	345	510			680
Maximum current I_{max} [A]	116.55	48.85	83.17	166.16	65.15
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	4.85	16.8	9.87	4.94	16.8
Voltage constant K_E [V/1000 rpm]	293.2	1015.8	596.9	298.4	1015.8
Stator resistance R_{2ph} [Ω]	0.4	2.82	0.96	0.24	1.97
Stator inductance L_{2ph} [mH]	3.42	27.5	9.41	2.42	20.86
Electrical time constant t_{el} [ms]	8.38	9.91	9.92	10.21	10.89
Thermal time constant t_{therm} [min]	70	90			110
Moment of inertia J [kgcm ²]	784	1159			1534
Weight without brake m [kg]	53	71			89
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1640	1180	1320	1640	1320
ACOPOSmulti 8BVlxxx...	0440	0220	0330	0660	0330
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.5	1.0		1.5	1.0

Technical data

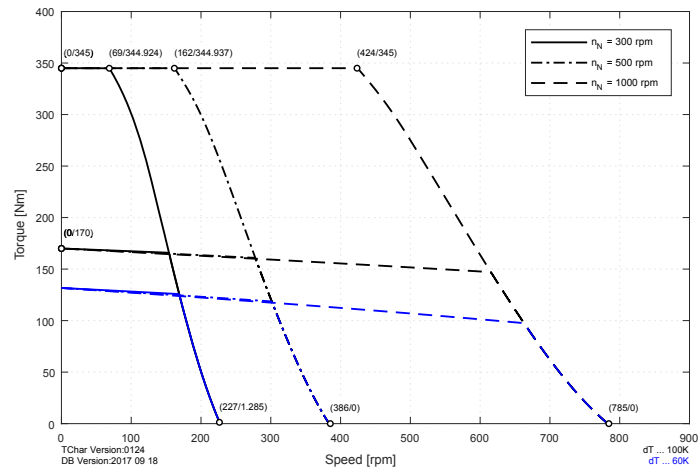
Model number	8LTJ96.ee005ffgg-0	8LTJ96.ee010ffgg-0	8LTJ97.ee003ffgg-0	8LTJ97.ee005ffgg-0	8LTJ97.ee009ffgg-0
Motor					
Nominal speed n_N [rpm]	500	1000	300	500	900
Number of pole pairs	12				
Nominal torque M_N [Nm]	306	260.1	382.5	360.4	320
Nominal power P_N [W]	16022	27238	12017	18871	30159
Nominal current I_N [A]	30.46	52.69	22.77	35.88	58.58
Stall torque M_0 [Nm]	340		408		
Stall current I_0 [A]	33.8	68.9	24.3	40.6	74.7
Maximum torque M_{max} [Nm]	680		816		
Maximum current I_{max} [A]	108.9	221.55	78.17	130.68	240.55
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	10.05	4.94	16.8	10.05	5.46
Voltage constant K_E [V/1000 rpm]	607.4	298.4	1015.8	607.4	330.3
Stator resistance R_{2ph} [Ω]	0.72	0.17	1.76	0.66	0.18
Stator inductance L_{2ph} [mH]	7.4	1.76	18.09	6.63	1.85
Electrical time constant t_{ei} [ms]	10.31	10.63		10	10.3
Thermal time constant t_{therm} [min]	110		130		
Moment of inertia J [kgcm ²]	1534		1833		
Weight without brake m [kg]	89		104		
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1640	128M	1320	1640	128M
ACOPOSmulti 8BVlxxx...	0440	0880	0330	0660	0880
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.5	-	1.0	1.5	-

2.13.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

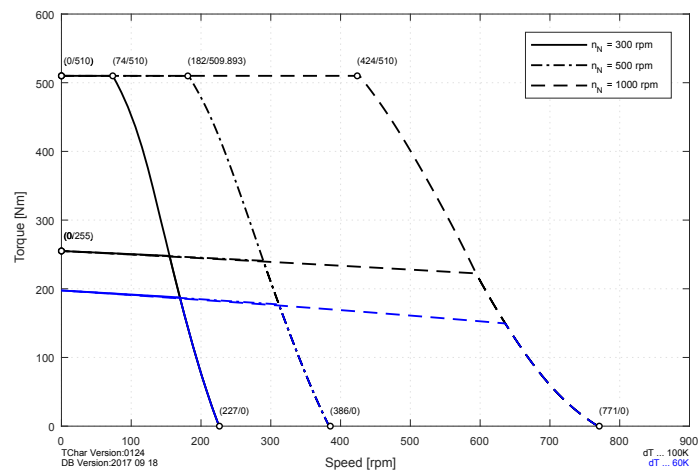
8LTJ93.eennnffgg-0



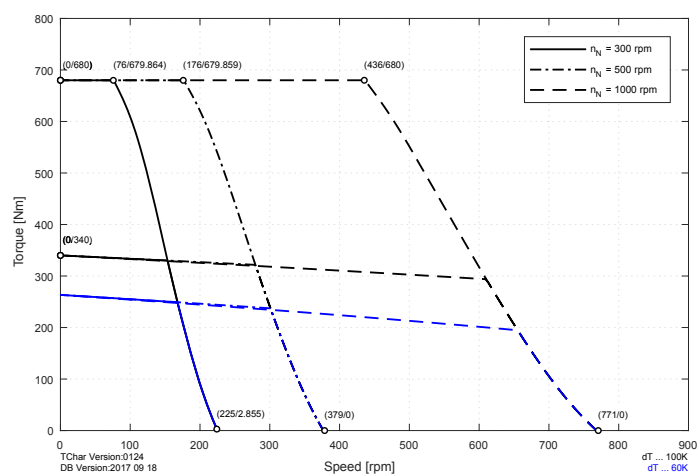
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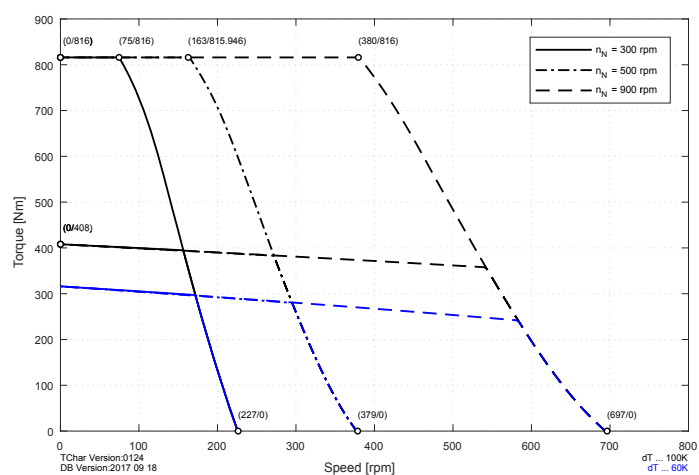
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8LTJ96.eennnffgg-0

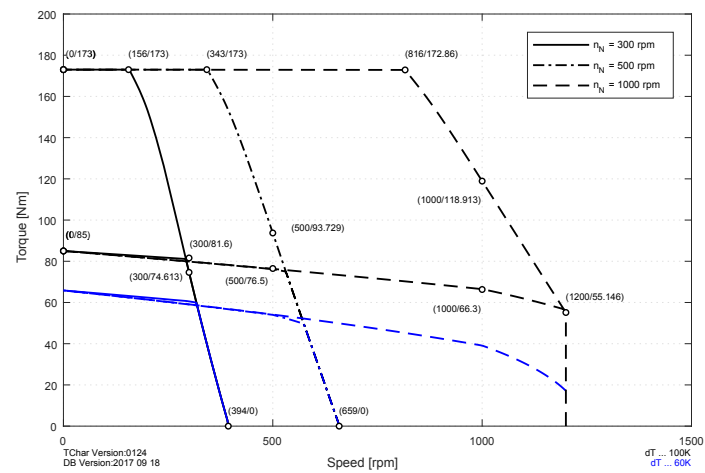


8LTJ97.eennnffgg-0

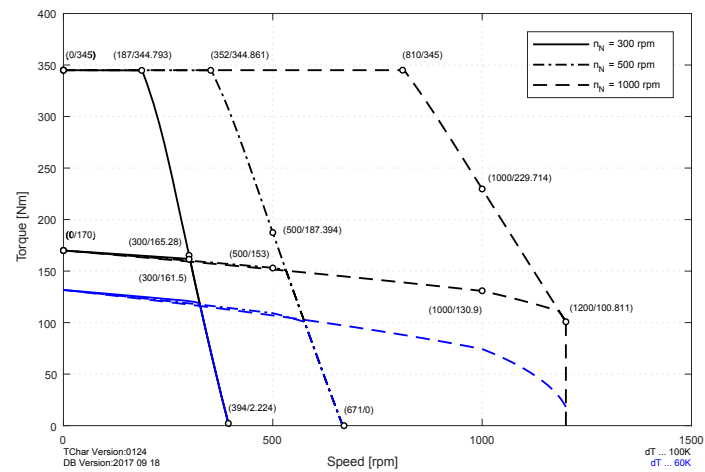


2.13.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

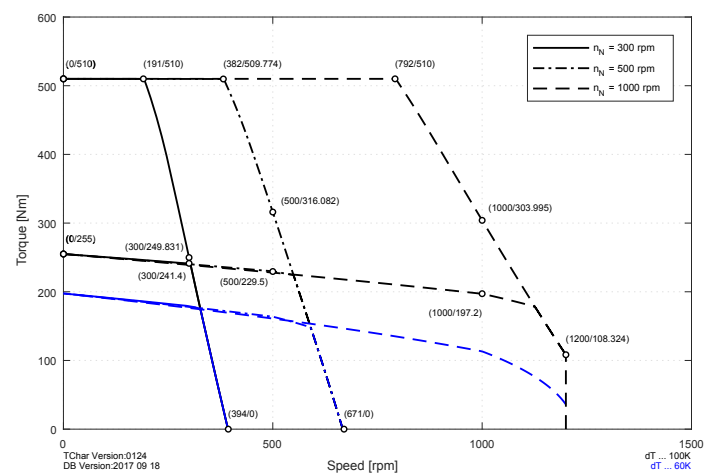
8LTJ93.eennnffgg-0



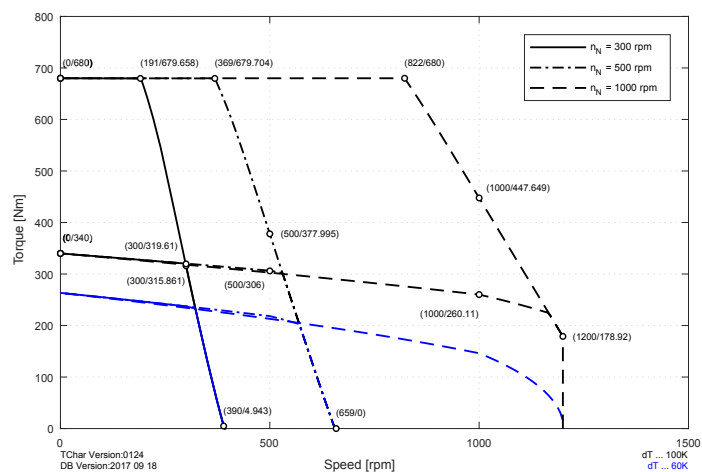
8LTJ94.eennnffgg-0



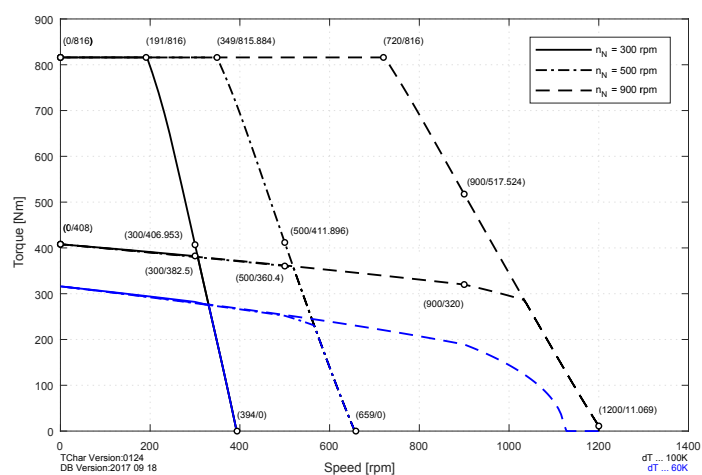
8LTJ95.eennnffgg-0



8LTJ96.eennnffgg-0

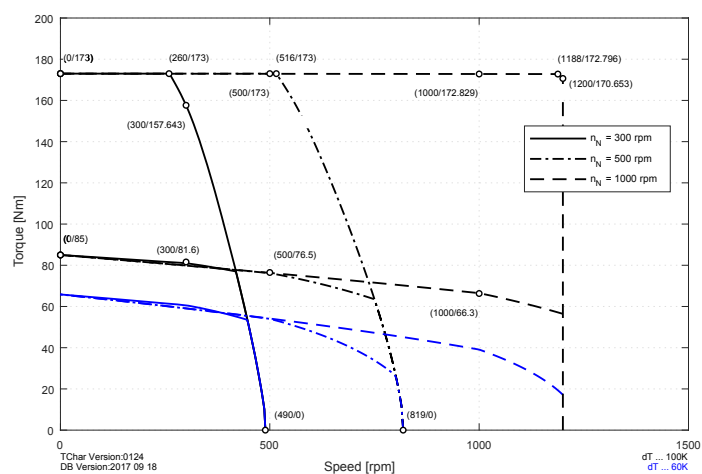


8LTJ97.eennnffgg-0

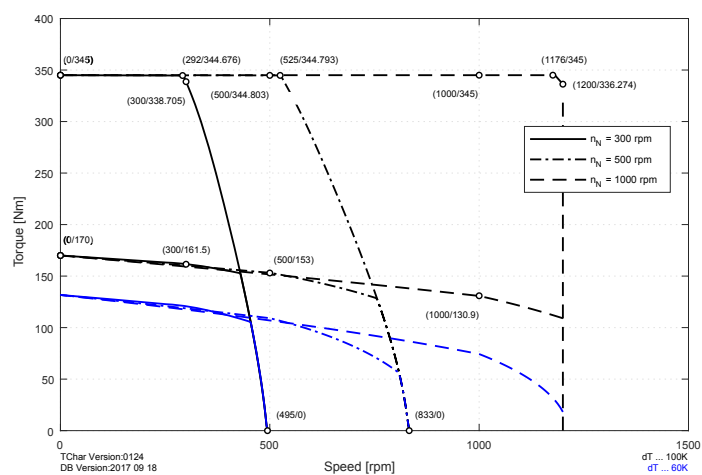


2.13.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

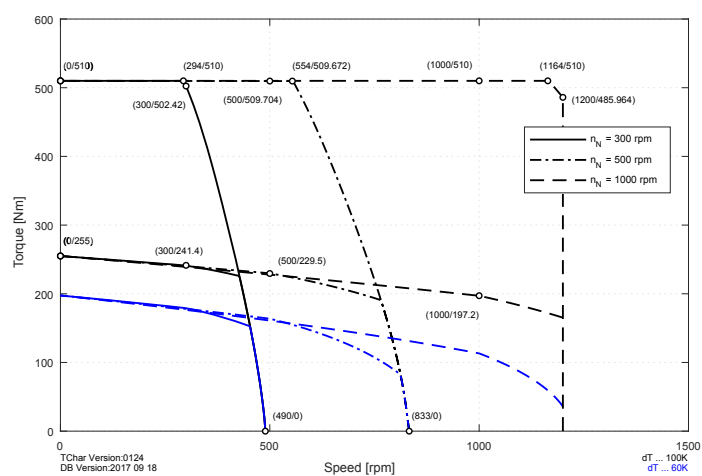
8LTJ93.eennnffgg-0



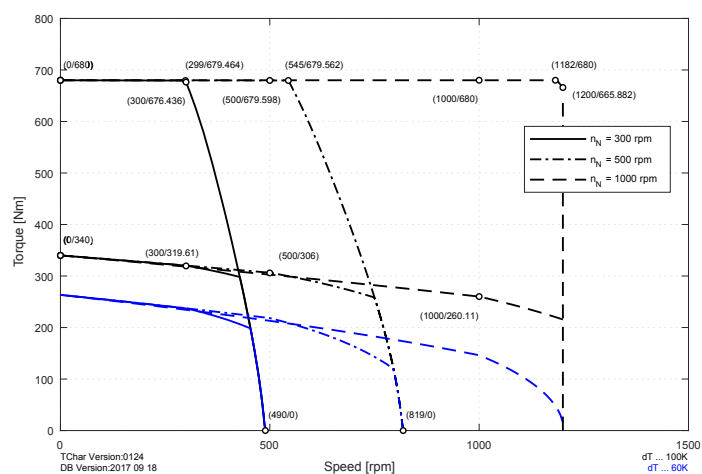
8LTJ94.eennnffgg-0



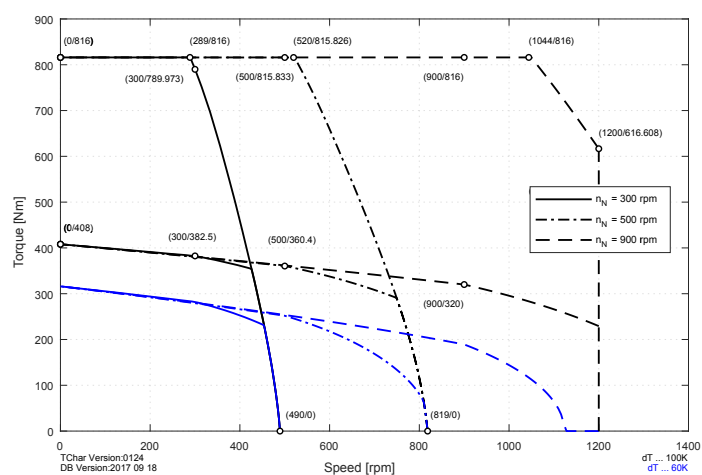
8LTJ95.eennnffgg-0



8LTJ96.eennnffgg-0

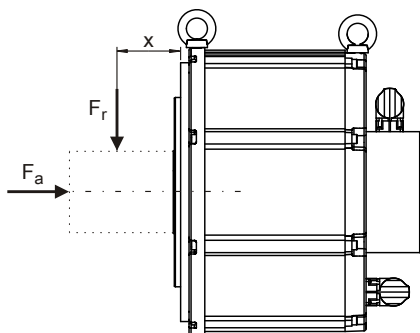


8LTJ97.eennnffgg-0



2.13.4 8LTJ9 - Permissible shaft load

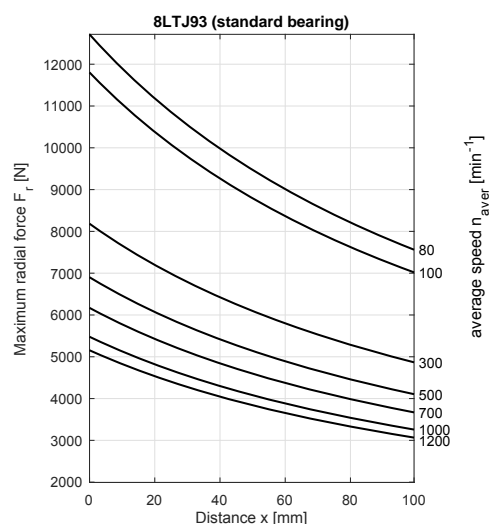
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



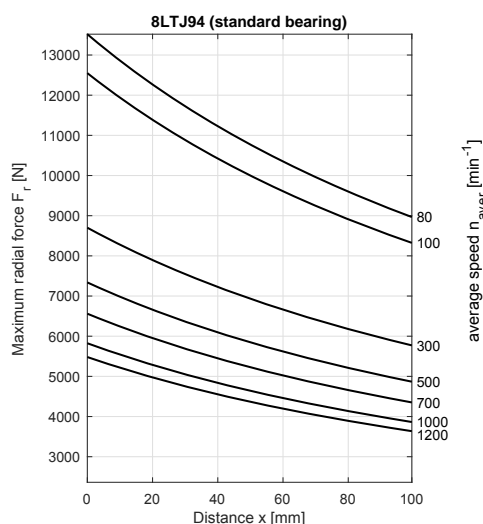
F_r ... Radial force

F_a ... Axial force

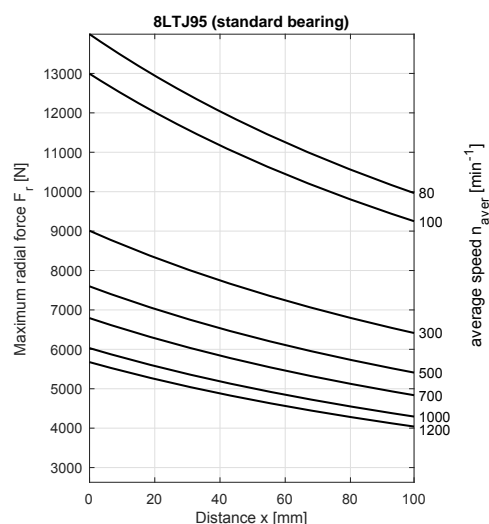
x ... Distance between the motor flange and the point where radial force F_r is applied.



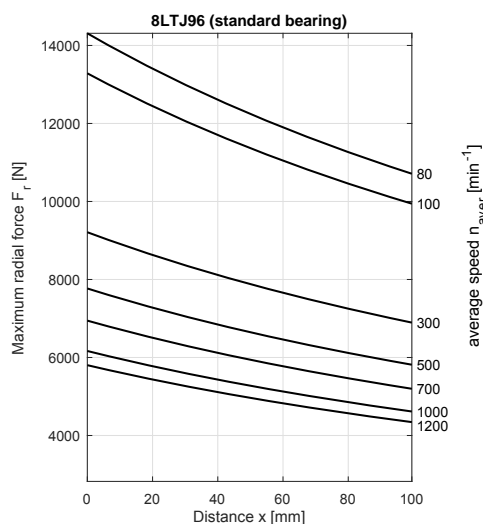
maximum allowed axial force: $F_{amax} = 979 \text{ N}$



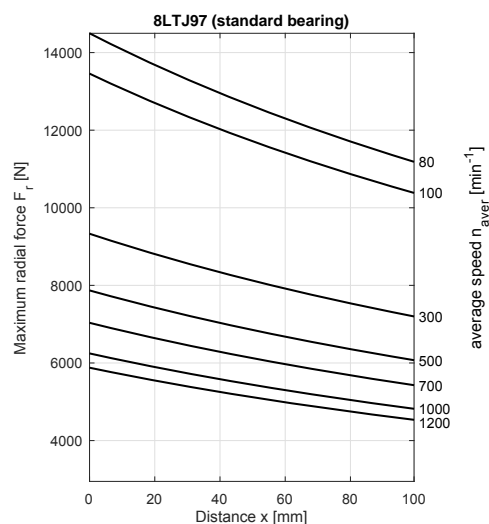
maximum allowed axial force: $F_{amax} = 1113 \text{ N}$



maximum allowed axial force: $F_{amax} = 1202 \text{ N}$

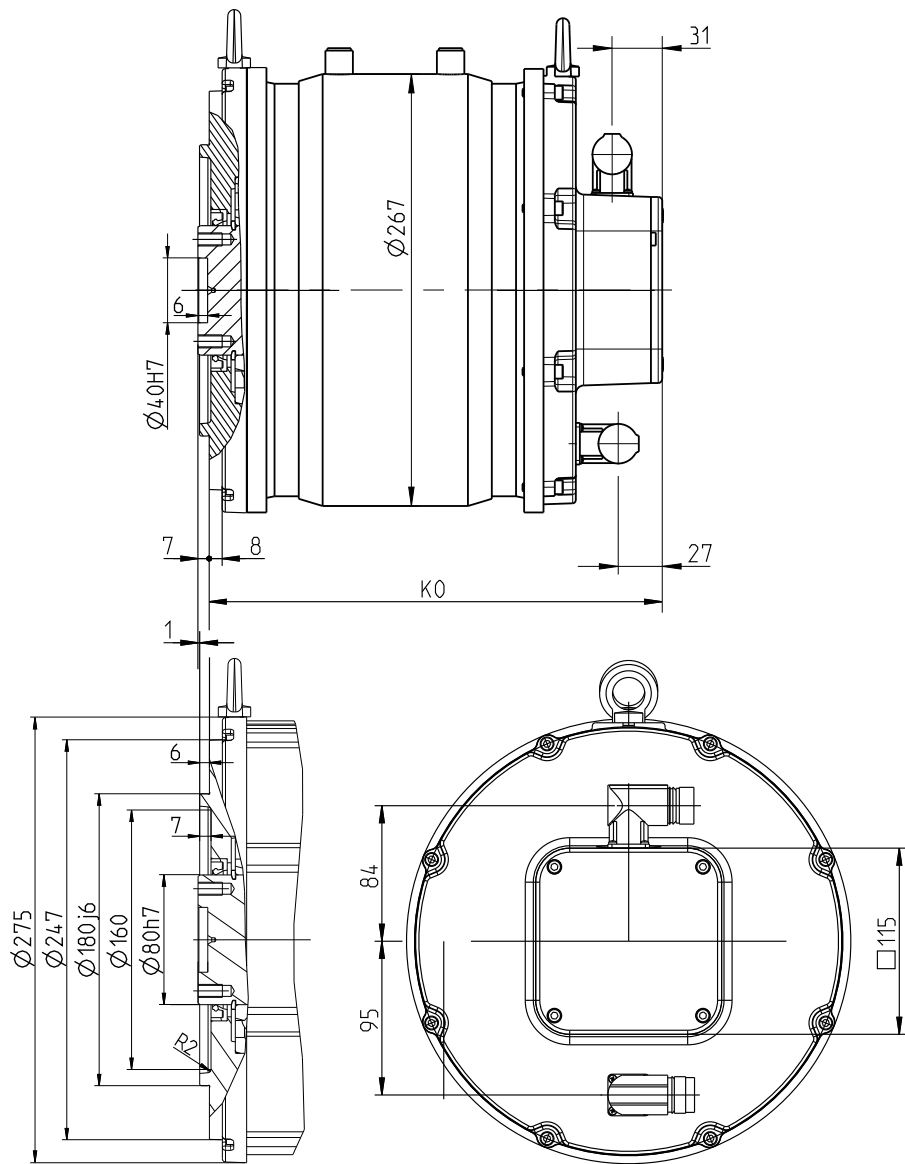


maximum allowed axial force: $F_{amax} = 1265 \text{ N}$

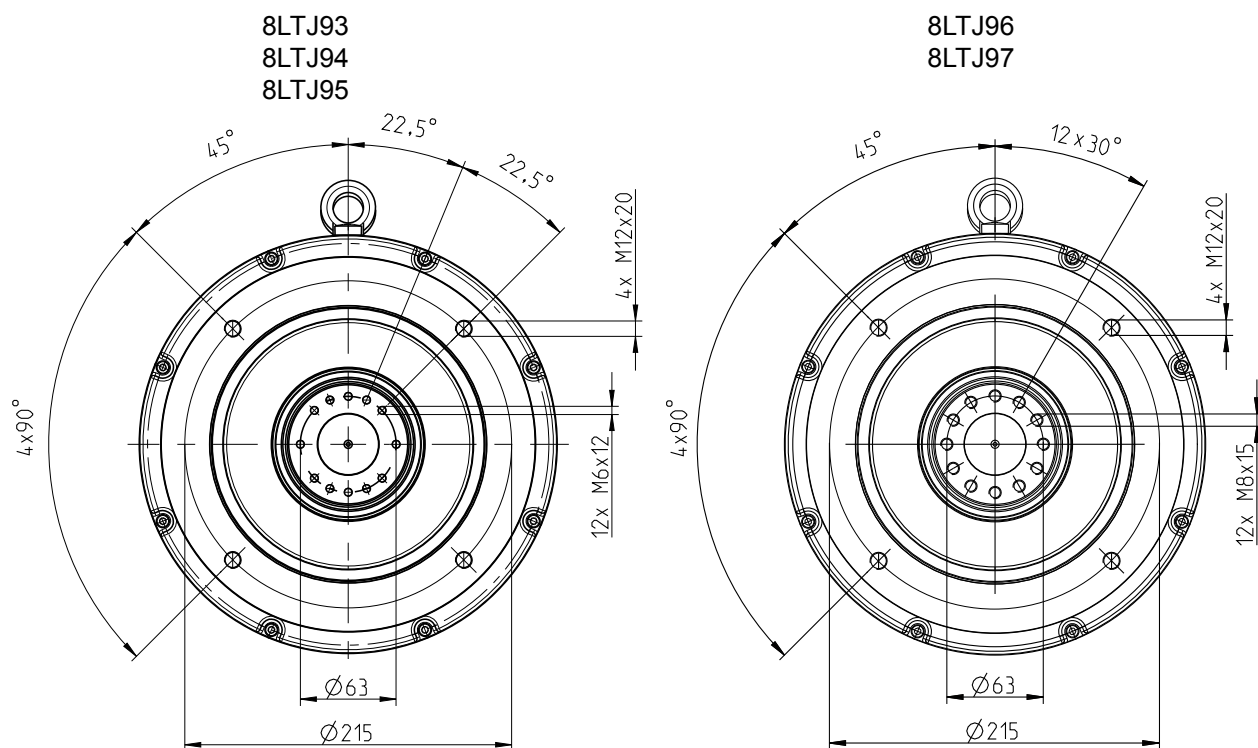


maximum allowed axial force: $F_{amax} = 1303 \text{ N}$

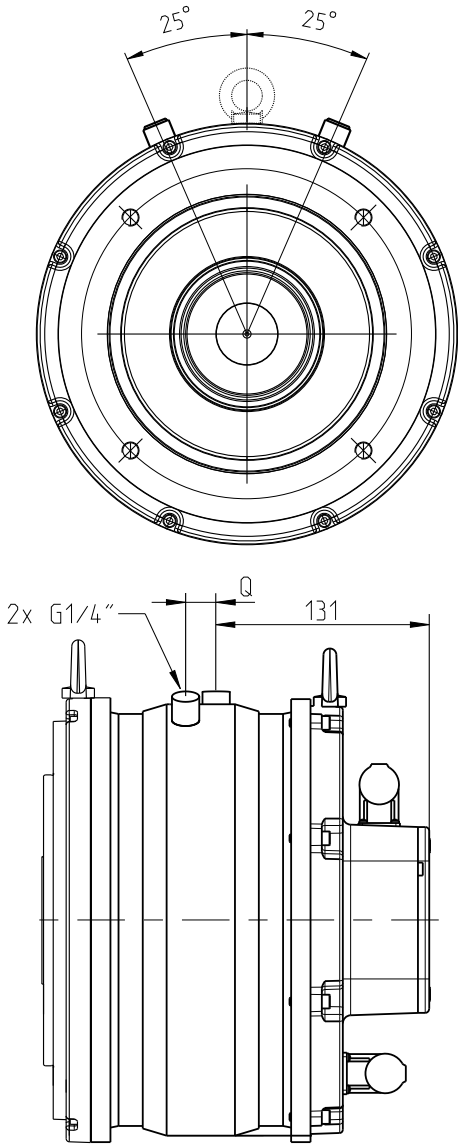
2.13.5 8LTJ9 - Dimensions



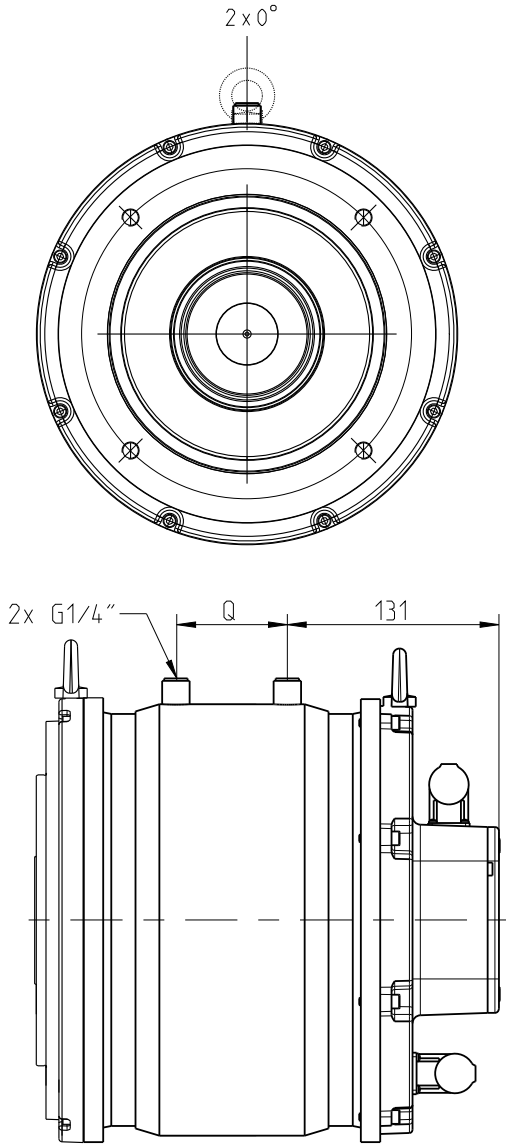
	K_0
8LTJ93	230
8LTJ94	280
8LTJ95	330
8LTJ96	380
8LTJ97	420



8LTJ93



8LTJ94
8LTJ95
8LTJ96
8LTJ97



	Q
8LTJ93	19
8LTJ94	69
8LTJ95	119
8LTJ96	169
8LTJ97	209

2.14 8LTJC - Technical data

Model number	8LTJC3. eeA08ffgg-0	8LTJC3. ee003ffgg-0	8LTJC3. ee005ffgg-0	8LTJC4. eeA08ffgg-0	8LTJC4. ee003ffgg-0	8LTJC4. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	80	300	500	80	300	500
Number of pole pairs	15					
Nominal torque M_N [Nm]	190	176	163	372	344	318
Nominal power P_N [W]	1592	5529	8535	3116	10807	16650
Nominal current I_N [A]	3.89	10.81	16.69	7.62	21.13	32.55
Stall torque M_0 [Nm]	196		383			
Stall current I_0 [A]	4	12	20.1	7.8	23.5	39.2
Maximum torque M_{max} [Nm]	345		703			
Maximum current I_{max} [A]	10.24	30.71	51.18	20.86	62.58	104.3
Maximum speed n_{max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	17.1	1.9	0.75	7.61	0.91	0.32
Stator inductance L_{2ph} [mH]	297.7	33.08	12.5	154	17.9	6.62
Electrical time constant t_{el} [ms]	17.41		16.58	20.24	19.76	20.88
Thermal time constant t_{therm} [min]	68		95.2			
Moment of inertia J [kgcm ²]	1600		3000			
Weight without brake m [kg]	66		94			
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1090	1180	1320	1090	1320	1640
ACOPOSmulti 8BVxxxx...	0055	0110	0330	0110	0330	0440
Cross section for B&R motor cables [mm ²]	1.5	4		1.5	4	10
Connector size	1.0					1.5

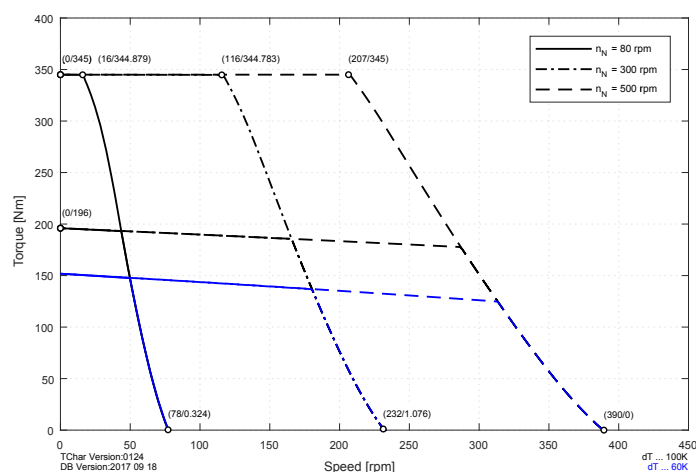
Technical data

Model number	8LTJC5.eeA08ffgg-0	8LTJC5.ee003ffgg-0	8LTJC5.ee005ffgg-0	8LTJC6.eeA08ffgg-0	8LTJC6.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	80	300	500	80	300
Number of pole pairs	15				
Nominal torque M_N [Nm]	540	498	461	695	643
Nominal power P_N [W]	4524	15645	24138	5822	20200
Nominal current I_N [A]	11.06	30.59	47.19	14.23	39.49
Stall torque M_0 [Nm]	553			714	
Stall current I_0 [A]	11.3	34	56.6	14.6	43.9
Maximum torque M_{max} [Nm]	1054			1405	
Maximum current I_{max} [A]	31.27	93.82	156.37	41.69	125.07
Maximum speed n_{max} [rpm]	700				
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4
Stator resistance R_{2ph} [Ω]	4.31	0.53	0.21	3.4	0.38
Stator inductance L_{2ph} [mH]	99.2	11.4	4.35	77	8.66
Electrical time constant t_{el} [ms]	23.03	21.63	20.62	22.65	22.73
Thermal time constant t_{therm} [min]	122.4			149.6	
Moment of inertia J [kgcm ²]	4400			5800	
Weight without brake m [kg]	123			151	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1180	1640		1180	1640
ACOPOSmulti 8BVlxxx...	0110	0440	0660	0220	0660
Cross section for B&R motor cables [mm ²]	4	10		4	10
Connector size	1.0	1.5		1.0	1.5

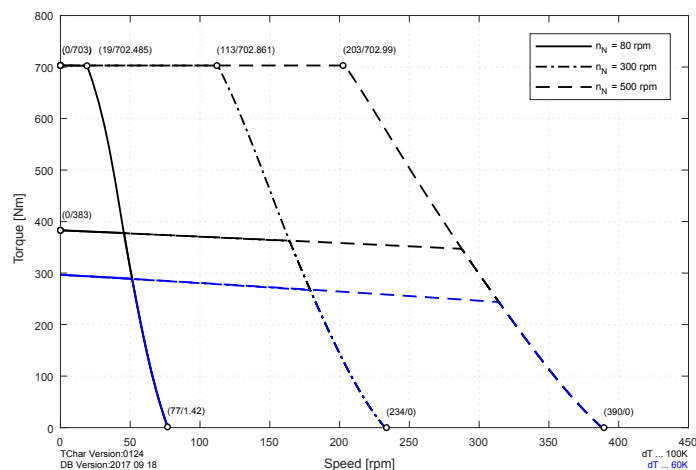
Model number	8LTJC6.ee005ffgg-0	8LTJC7.eeA08ffgg-0	8LTJC7.ee003ffgg-0	8LTJC8.eeA08ffgg-0	8LTJC8.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	500	80	300	80	300
Number of pole pairs	15				
Nominal torque M_n [Nm]	596	845	780	993	918
Nominal power P_N [W]	31206	7079	24504	8319	28840
Nominal current I_N [A]	61.01	17.3	47.91	20.33	56.38
Stall torque M_0 [Nm]	714	867		1020	
Stall current I_0 [A]	73.1	17.8	53.3	20.9	62.6
Maximum torque M_{max} [Nm]	1405	1750		2108	
Maximum current I_{max} [A]	208.44	51.93	155.78	62.55	187.64
Maximum speed n_{max} [rpm]	700				
Torque constant K_T [Nm/A]	9.77	48.84	16.28	48.84	16.28
Voltage constant K_E [V/1000 rpm]	590.6	2953.1	984.4	2953.1	984.4
Stator resistance R_{2ph} [Ω]	0.13	2.66	0.32	2.29	0.25
Stator inductance L_{2ph} [mH]	3.1	62.3	7.07	52.9	5.86
Electrical time constant t_{el} [ms]	23.66	23.42	21.75	23.1	23.07
Thermal time constant t_{therm} [min]	149.6	177		204	
Moment of inertia J [kgcm ²]	5800	7200		8600	
Weight without brake m [kg]	151	180		209	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	128M	1320	1640	1320	128M
ACOPOSmulti 8BVlxxx...	0880	0220	0660	0330	0880
Cross section for B&R motor cables [mm ²]	0	4	10	4	0
Connector size	-	1.0	1.5	1.0	-

2.14.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

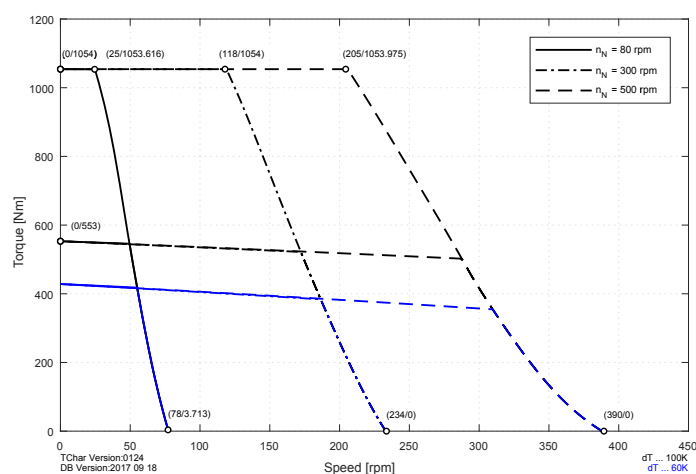
8LTJC3.eennnffgg-0

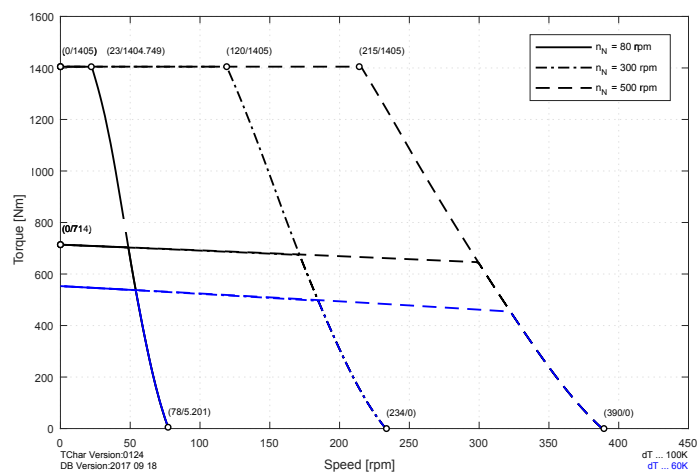
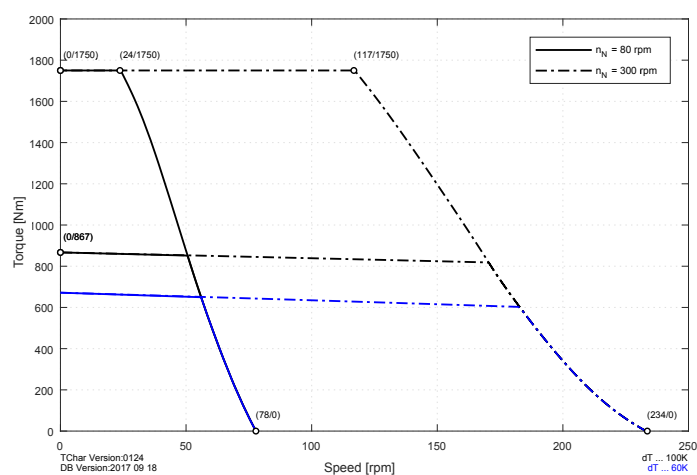
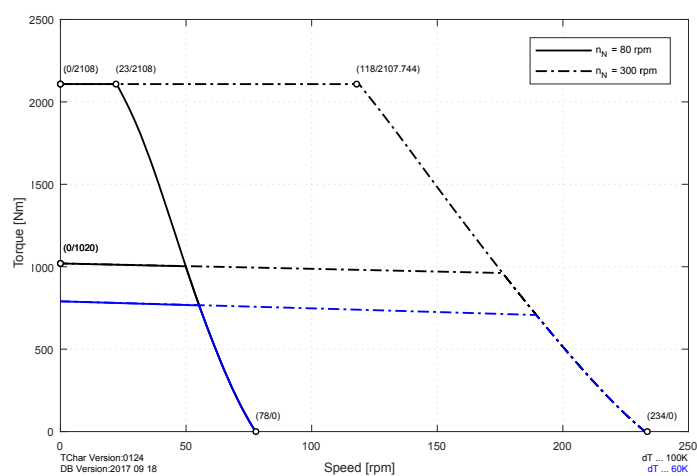


8LTJC4.eennnffgg-0



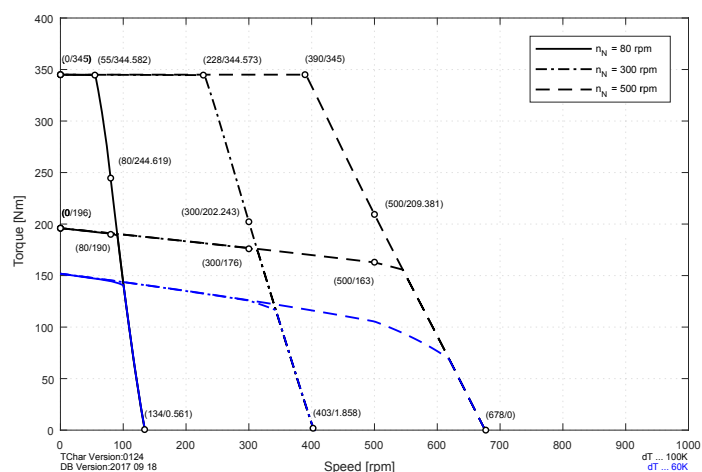
8LTJC5.eennnffgg-0



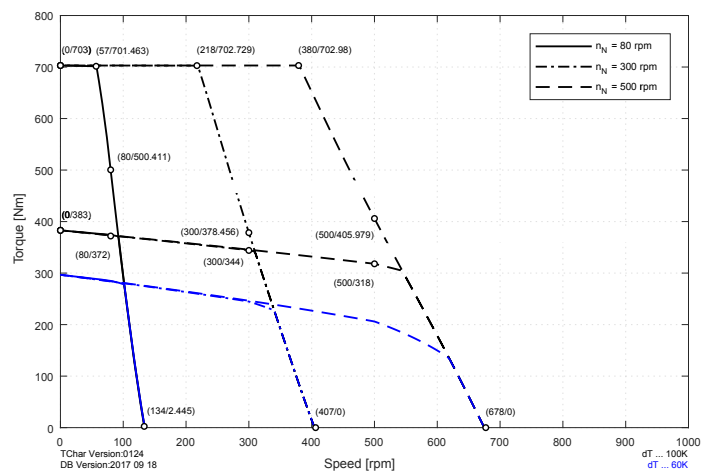
8LTJC6.eennnffgg-0

8LTJC7.eennnffgg-0

8LTJC8.eennnffgg-0


2.14.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

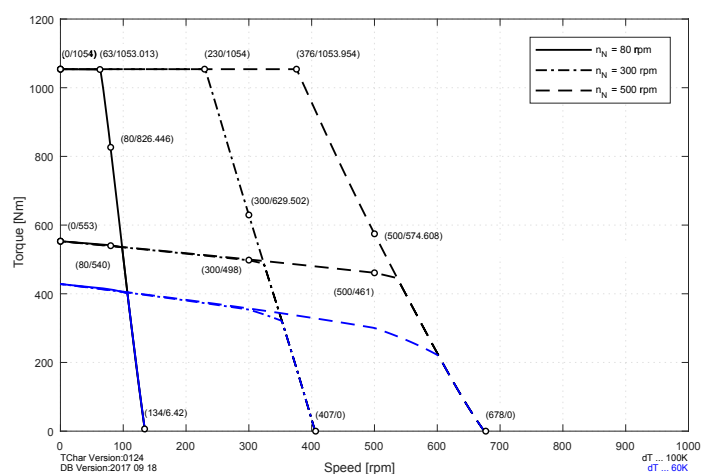
8LTJC3.eennnffgg-0



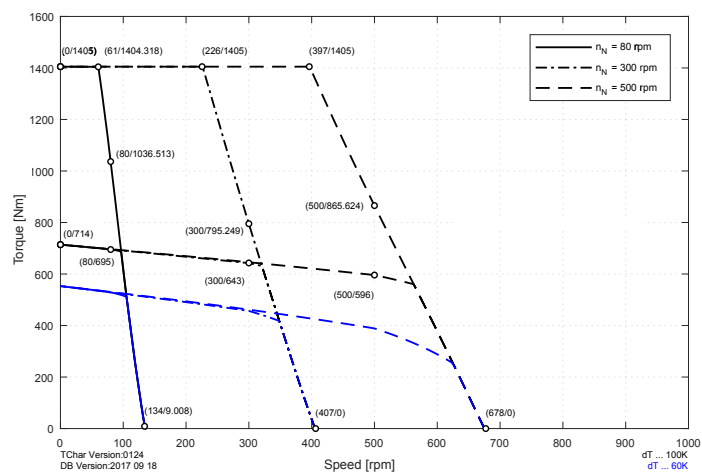
8LTJC4.eennnffgg-0



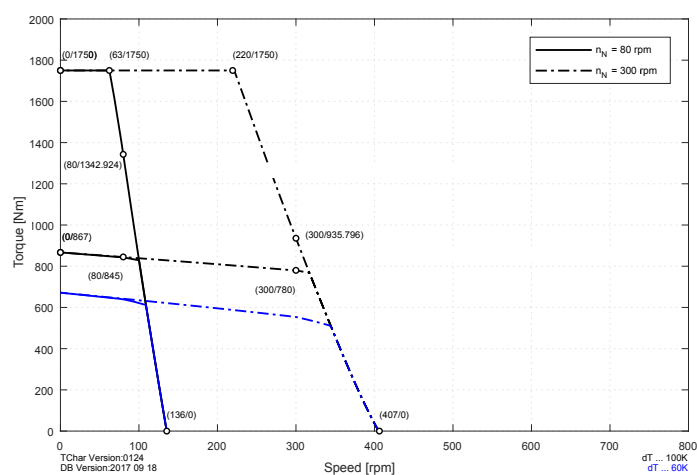
8LTJC5.eennnffgg-0



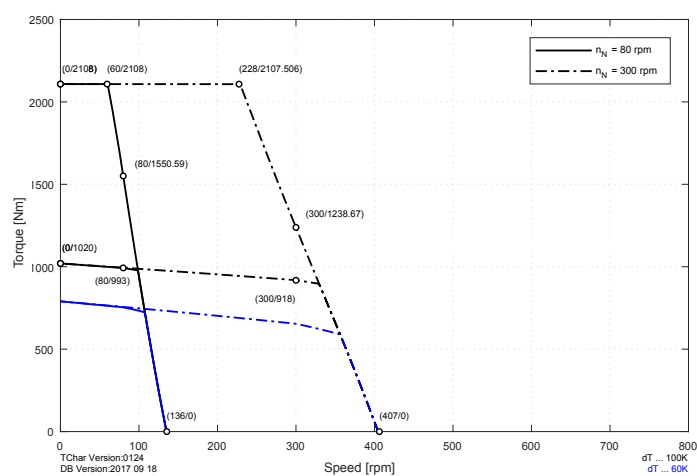
8LTJC6.eennnffgg-0



8LTJC7.eennnffgg-0

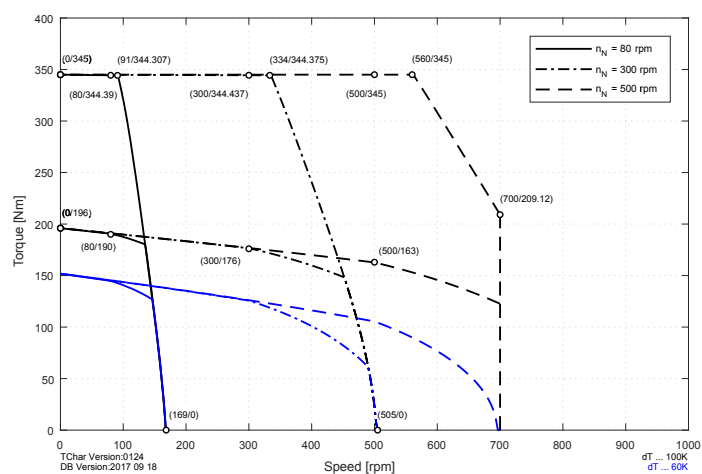


8LTJC8.eennnffgg-0

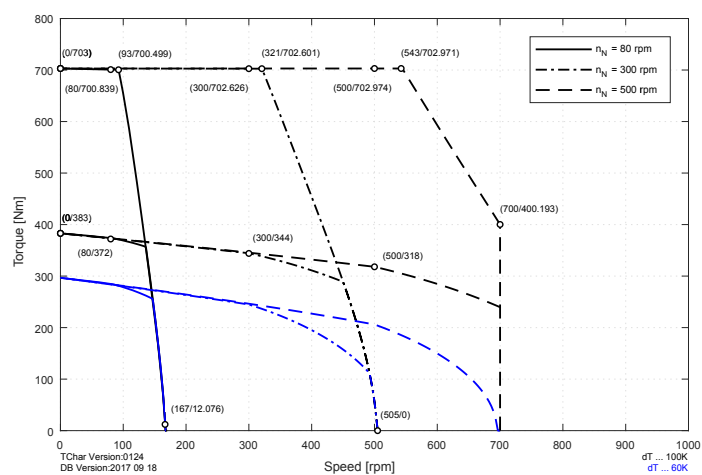


2.14.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

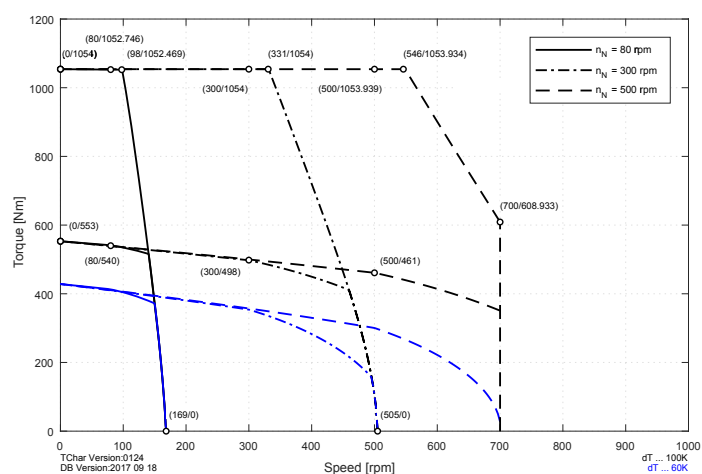
8LTJC3.eennnffgg-0



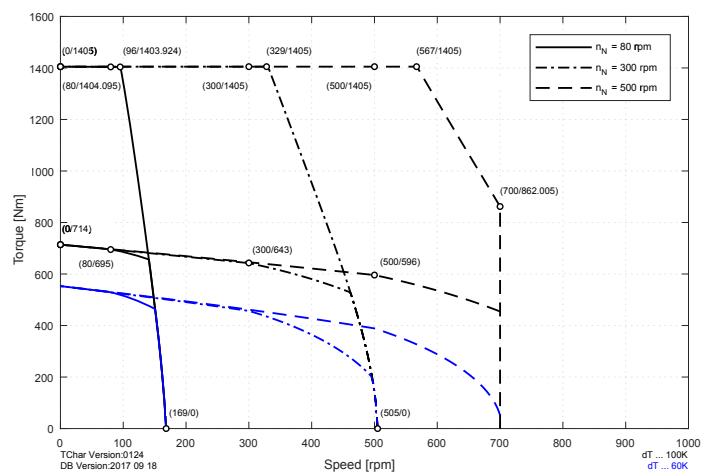
8LTJC4.eennnffgg-0



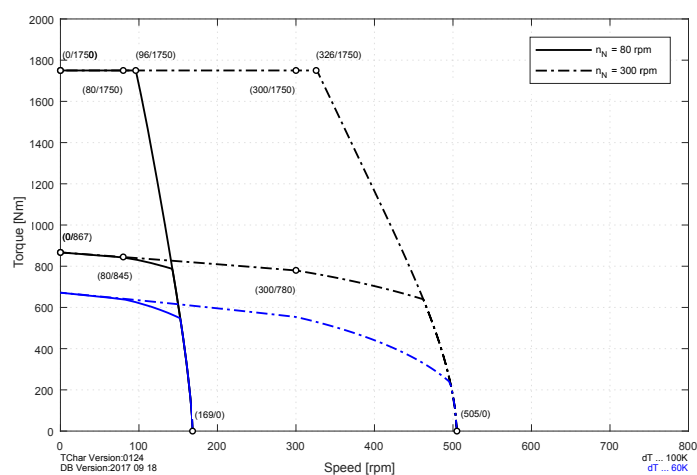
8LTJC5.eennnffgg-0



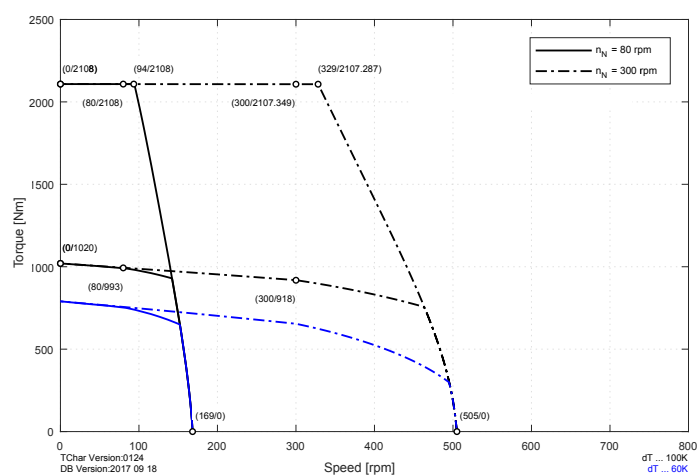
8LTJC6.eennnffgg-0



8LTJC7.eennnffgg-0

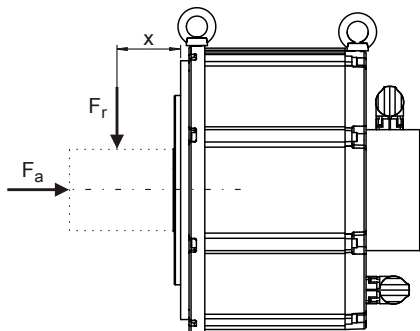


8LTJC8.eennnffgg-0



2.14.4 8LTJC - Permissible shaft load

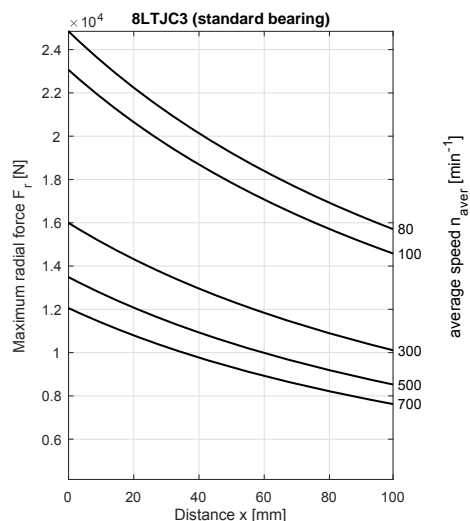
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



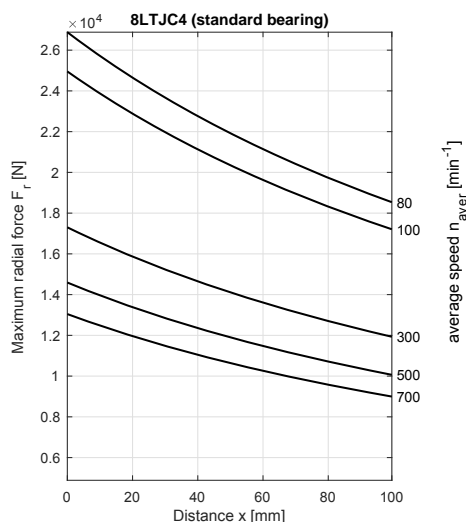
F_r ... Radial force

F_a ... Axial force

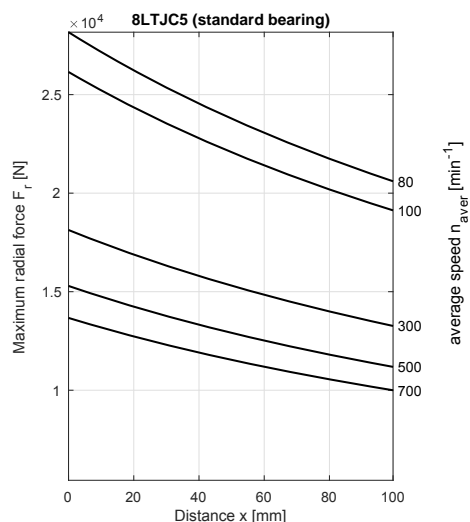
x ... Distance between the motor flange and the point where radial force F_r is applied.



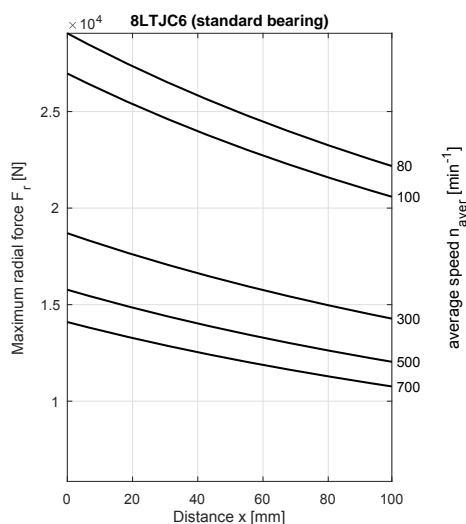
maximum allowed axial force: $F_{amax} = 1987$ N



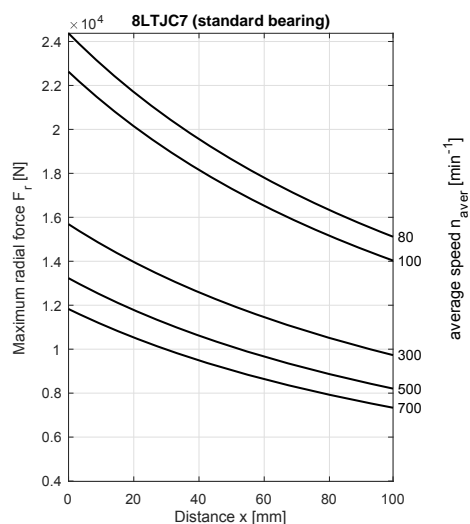
maximum allowed axial force: $F_{amax} = 2265$ N



maximum allowed axial force: $F_{amax} = 2457$ N

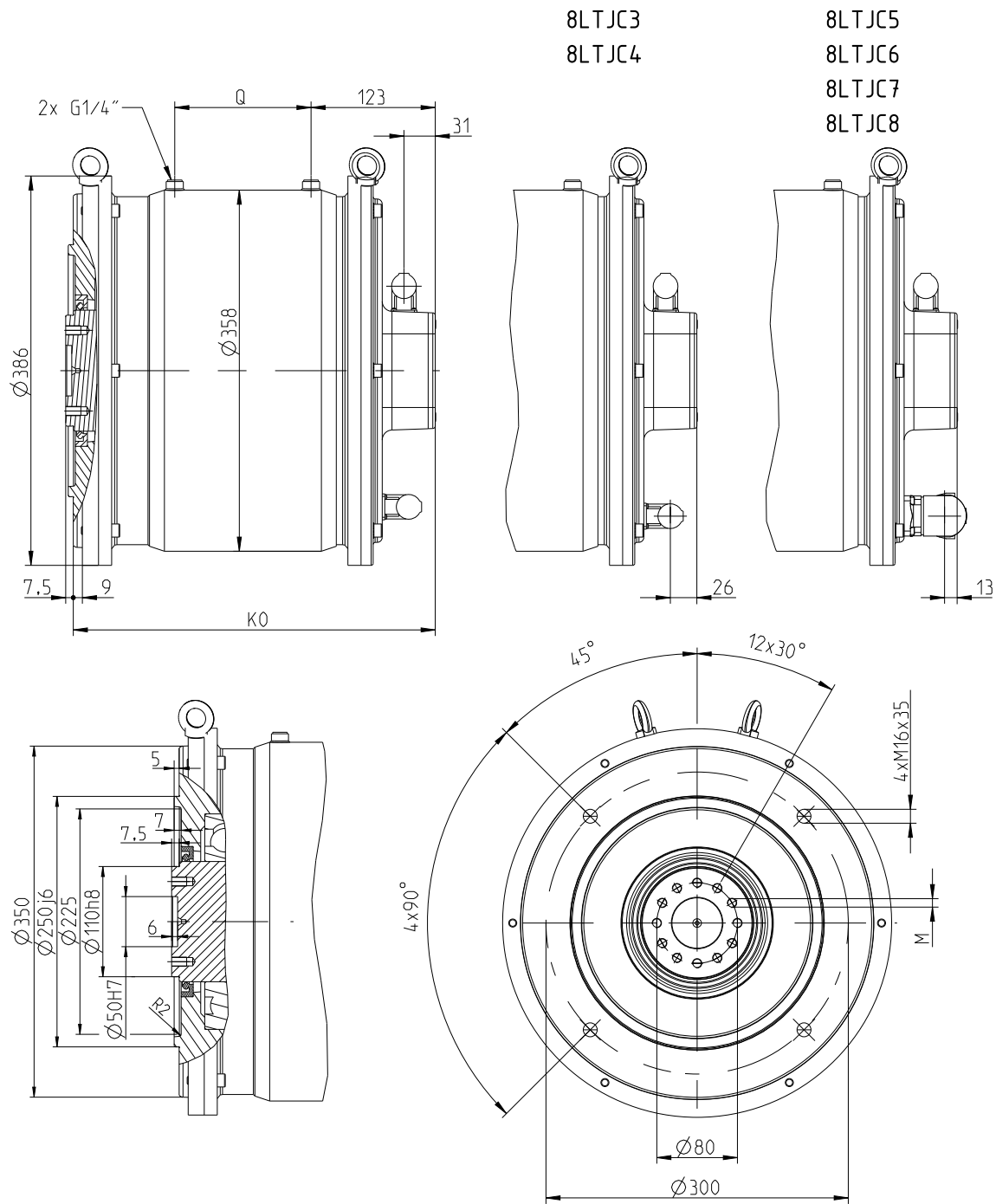


maximum allowed axial force: $F_{amax} = 2596$ N



maximum allowed axial force: $F_{amax} = 1927$ N

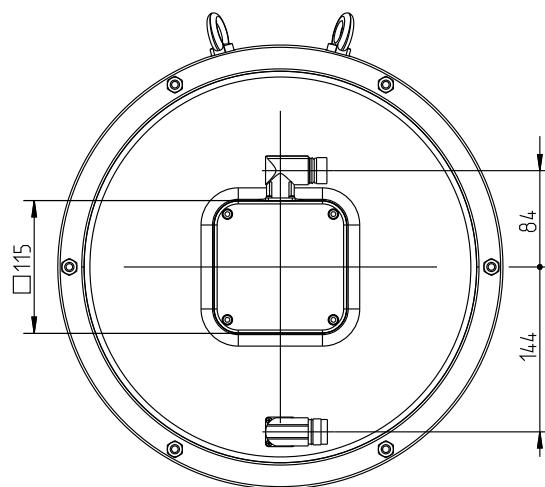
2.14.5 8LTJC - Dimensions



	K_0	Q	M
8LTJC3	259	35	(12x) M10x15
8LTJC4	309	85	
8LTJC5	359	135	
8LTJC6	409	185	
8LTJC7	459	235	(12x) M12x20
8LTJC8	509	285	

8LTJC3

8LTJC4

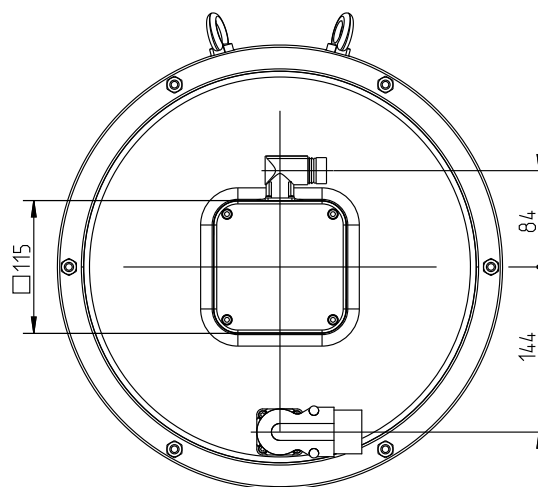


8LTJC5

8LTJC6

8LTJC7

8LTJC8



2.15 8LTK9 - Technical data

Model number	8LTK93.ee003ffgg-0	8LTK93.ee005ffgg-0	8LTK93.ee010ffgg-0	8LTK94.ee003ffgg-0	8LTK94.ee005ffgg-0
Motor					
Nominal speed n_N [rpm]	300	500	1000	300	500
Number of pole pairs	12				
Nominal torque M_N [Nm]	81.6	76.5	66.3	161.5	153
Nominal power P_N [W]	2564	4006	6943	5074	8011
Nominal current I_N [A]	4.86	7.62	13.92	9.71	15.5
Stall torque M_0 [Nm]	85		170		
Stall current I_0 [A]	5.1	8.5	17.8	10.2	17.2
Maximum torque M_{max} [Nm]	173		345		
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1
Electrical time constant t_{el} [ms]	7.6	7.28	7.51	9.28	9.17
Thermal time constant t_{therm} [min]	50		70		
Moment of inertia J [kgcm ²]	1372		1651		
Weight without brake m [kg]	55		67		
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1090	1180	1320	1180	
ACOPOSmulti 8BVIxxx...	0055	0110	0220	0110	0220
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.0				

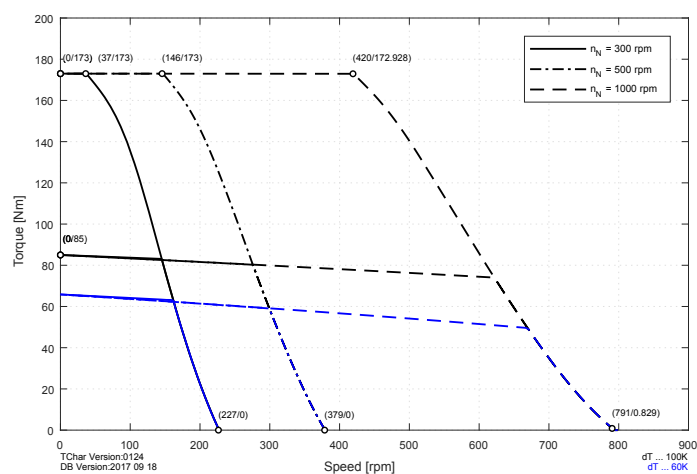
Technical data

Model number	8LTK94.ee010ffgg-0	8LTK95.ee003ffgg-0	8LTK95.ee005ffgg-0	8LTK95.ee010ffgg-0	8LTK96.ee003ffgg-0
Motor					
Nominal speed n_N [rpm]	1000	300	500	1000	300
Number of pole pairs	12				
Nominal torque M_N [Nm]	130.9	241.4	229.5	197.2	319.6
Nominal power P_N [W]	13708	7584	12017	20651	10041
Nominal current I_N [A]	26.99	14.37	23.25	39.95	19.02
Stall torque M_0 [Nm]	170	255			340
Stall current I_0 [A]	35.1	15.2	25.8	51.7	20.2
Maximum torque M_{\max} [Nm]	345	510			680
Maximum current I_{\max} [A]	116.55	48.85	83.17	166.16	65.15
Maximum speed n_{\max} [rpm]	1200				
Torque constant K_T [Nm/A]	4.85	16.8	9.87	4.94	16.8
Voltage constant K_E [V/1000 rpm]	293.2	1015.8	596.9	298.4	1015.8
Stator resistance R_{2ph} [Ω]	0.4	2.82	0.96	0.24	1.97
Stator inductance L_{2ph} [mH]	3.42	27.5	9.41	2.42	20.86
Electrical time constant t_{el} [ms]	8.38	9.91	9.92	10.21	10.89
Thermal time constant t_{therm} [min]	70	90			110
Moment of inertia J [kgcm ²]	1651	1931			2210
Weight without brake m [kg]	67	80			93
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1640	1180	1320	1640	1320
ACOPOSmulti 8BVlxxx...	0440	0220	0330	0660	0330
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.5	1.0		1.5	1.0

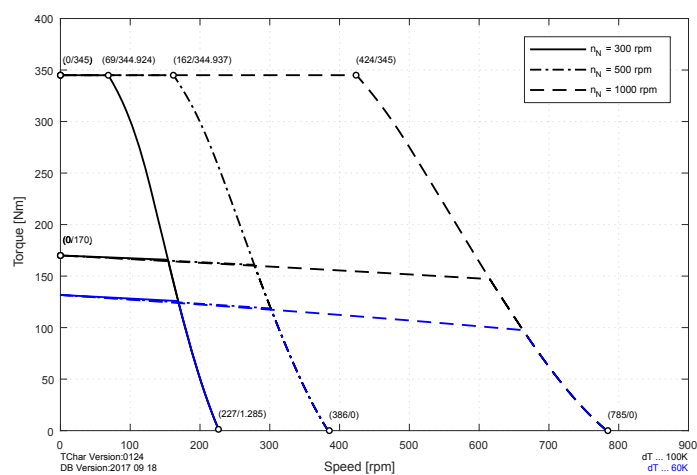
Model number	8LTK96.ee005ffgg-0	8LTK96.ee010ffgg-0	8LTK97.ee003ffgg-0	8LTK97.ee005ffgg-0	8LTK97.ee009ffgg-0
Motor					
Nominal speed n_N [rpm]	500	1000	300	500	900
Number of pole pairs	12				
Nominal torque M_N [Nm]	306	260.1	382.5	360.4	320
Nominal power P_N [W]	16022	27238	12017	18871	30159
Nominal current I_N [A]	30.46	52.69	22.77	35.88	58.58
Stall torque M_0 [Nm]	340		408		
Stall current I_0 [A]	33.8	68.9	24.3	40.6	74.7
Maximum torque M_{max} [Nm]	680		816		
Maximum current I_{max} [A]	108.9	221.55	78.17	130.68	240.55
Maximum speed n_{max} [rpm]	1200				
Torque constant K_T [Nm/A]	10.05	4.94	16.8	10.05	5.46
Voltage constant K_E [V/1000 rpm]	607.4	298.4	1015.8	607.4	330.3
Stator resistance R_{2ph} [Ω]	0.72	0.17	1.76	0.66	0.18
Stator inductance L_{2ph} [mH]	7.4	1.76	18.09	6.63	1.85
Electrical time constant t_{el} [ms]	10.31	10.63		10	10.98
Thermal time constant t_{therm} [min]	110		130		
Moment of inertia J [kgcm ²]	2210		2434		
Weight without brake m [kg]	93		103		
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1640	128M	1320	1640	128M
ACOPOSmulti 8BVlxxx...	0440	0880	0330	0660	0880
Cross section for B&R motor cables [mm ²]	1.5				
Connector size	1.5	-	1.0	1.5	-

2.15.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

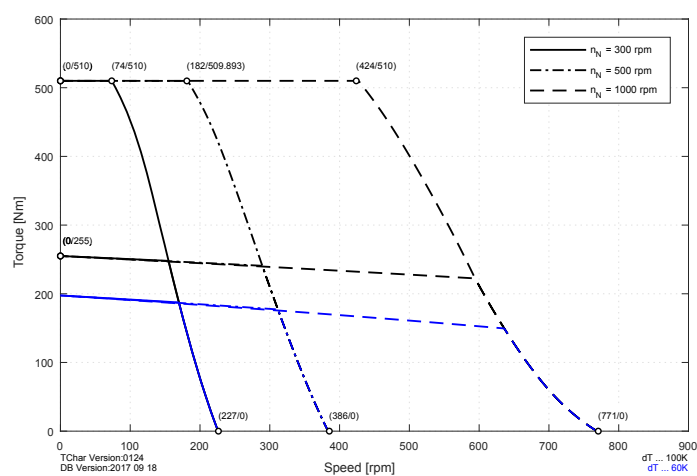
8LTK93.eennnffgg-0

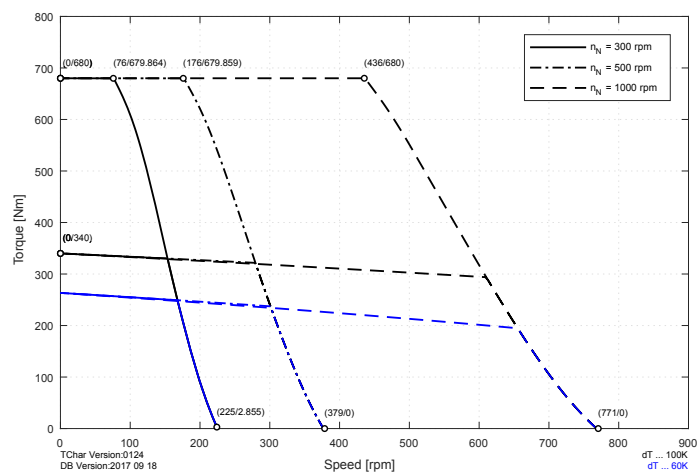
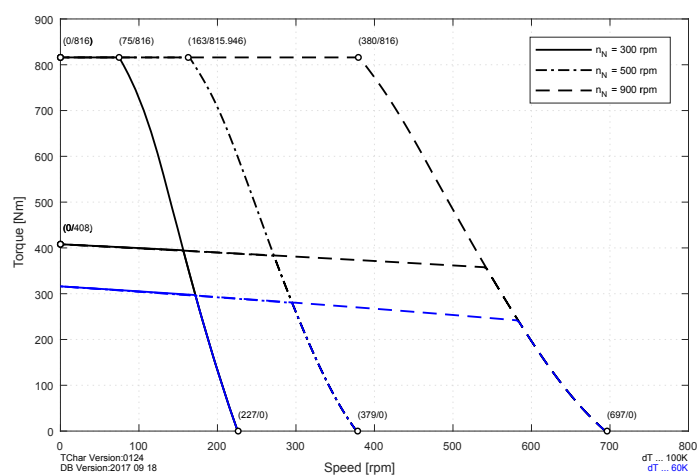


8LTK94.eennnffgg-0



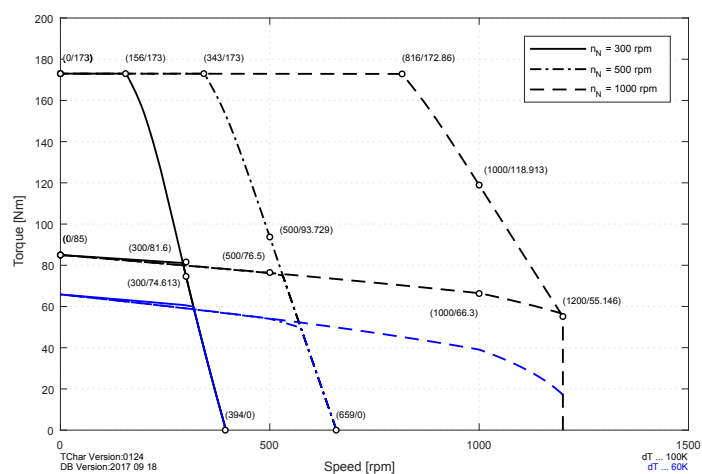
8LTK95.eennnffgg-0



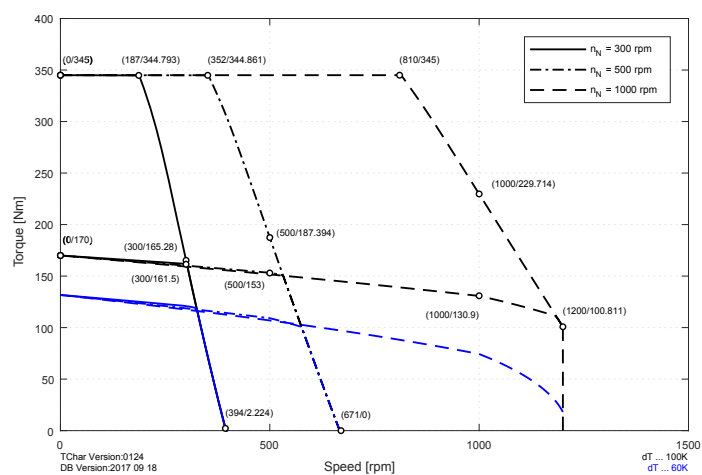
8LTK96.eennnffgg-0

8LTK97.eennnffgg-0


2.15.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

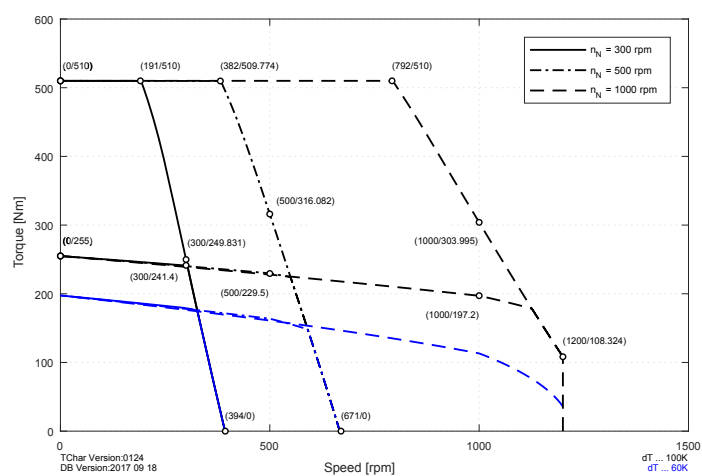
8LTK93.eennnffgg-0



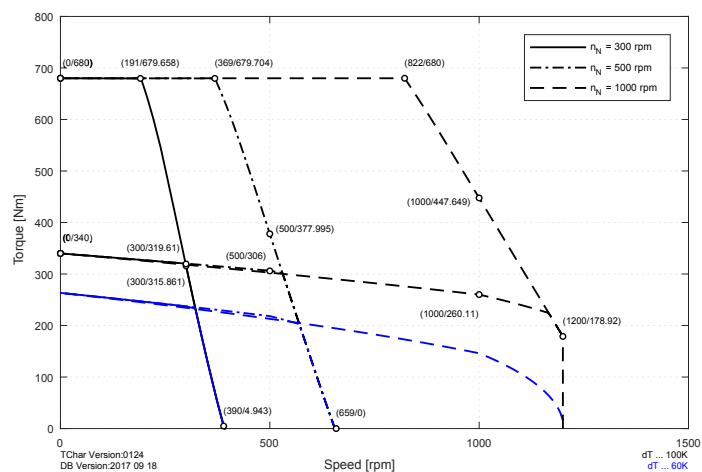
8LTK94.eennnffgg-0



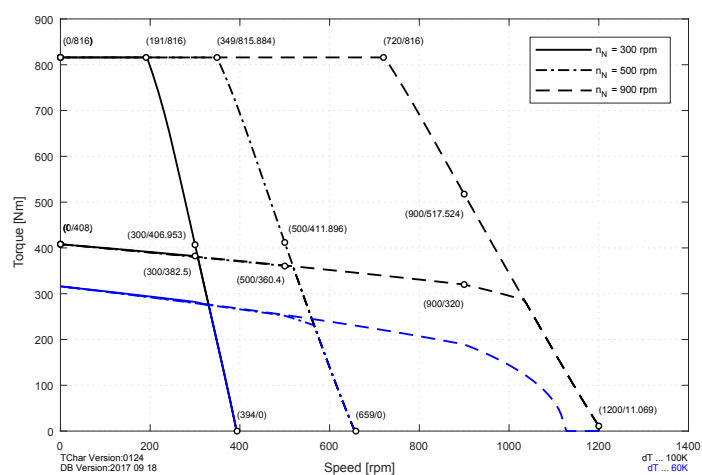
8LTK95.eennnffgg-0



8LTK96.eennnffgg-0

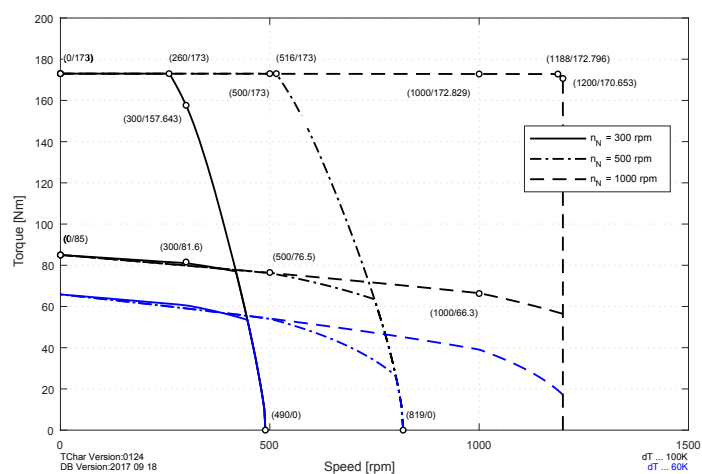


8LTK97.eennnffgg-0

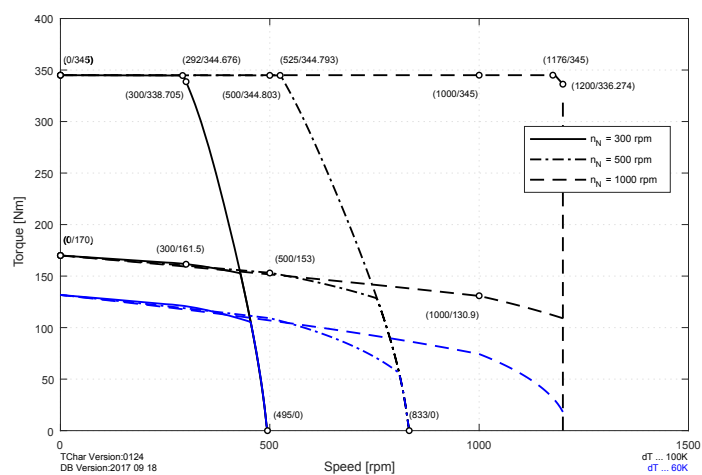


2.15.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

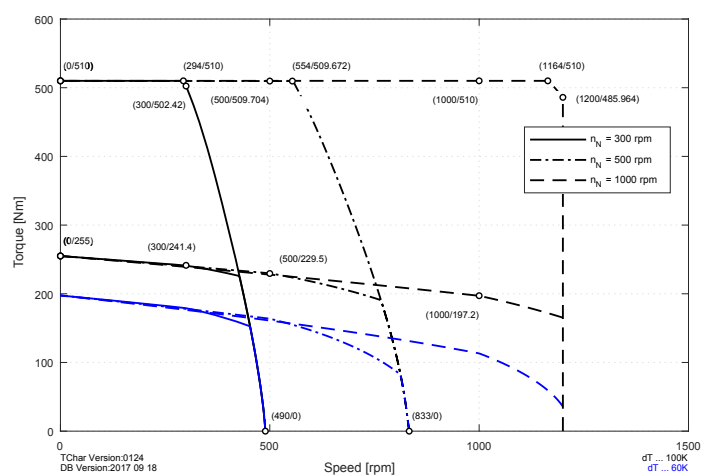
8LTK93.eennnffgg-0

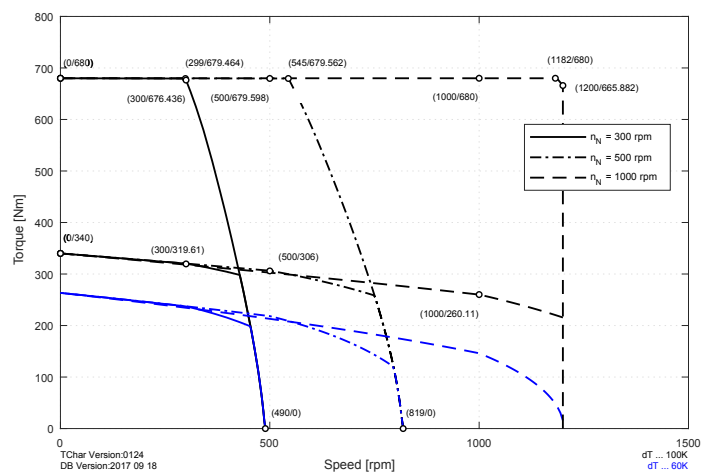
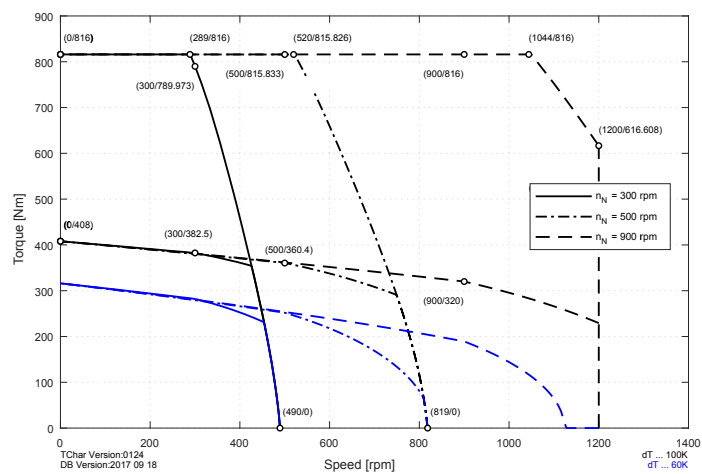


8LTK94.eennnffgg-0



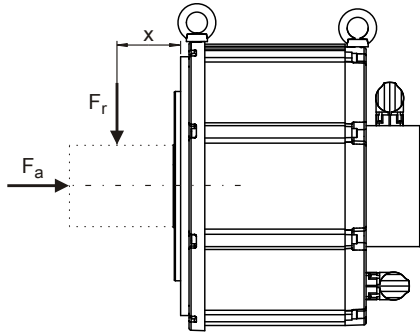
8LTK95.eennnffgg-0



8LTK96.eennnffgg-0

8LTK97.eennnffgg-0


2.15.4 8LTK9 - Maximum shaft load

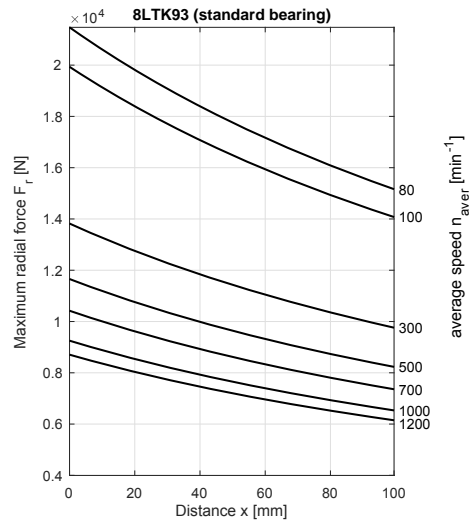
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



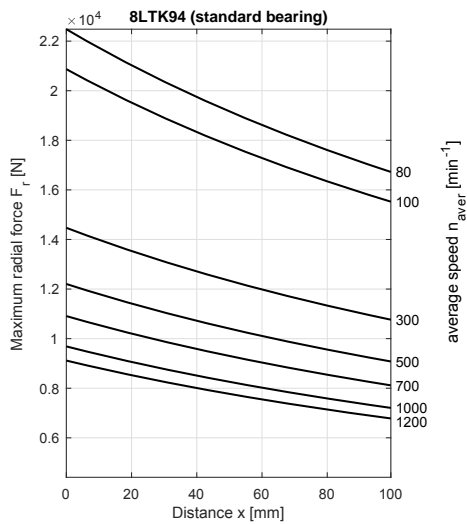
F_r ... Radial force

F_a ... Axial force

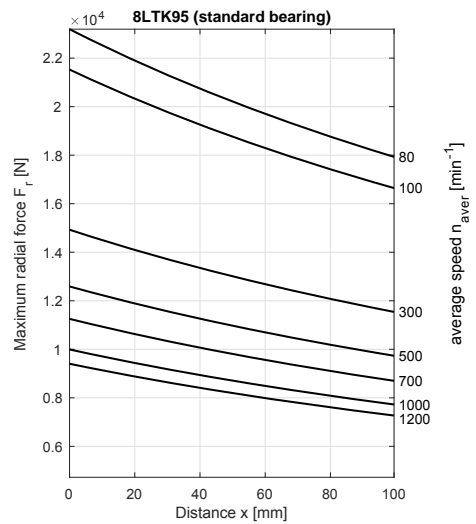
x ... Distance between the motor flange and the point where radial force F_r is applied.



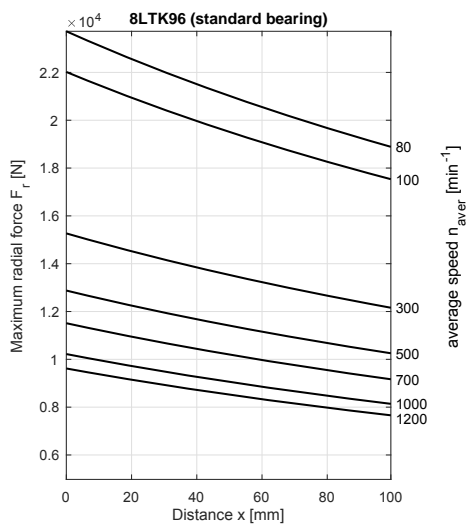
maximum allowed axial force: $F_{amax} = 1835 \text{ N}$



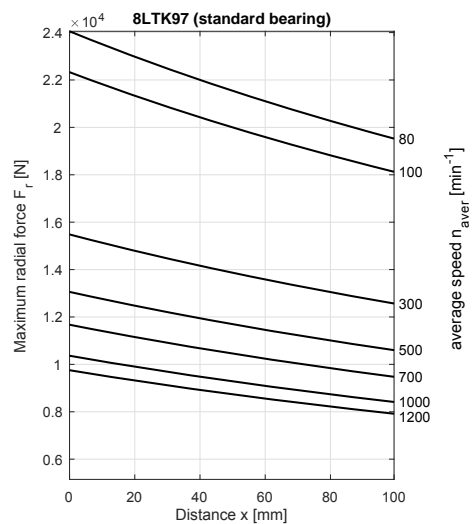
maximum allowed axial force: $F_{amax} = 1980 \text{ N}$



maximum allowed axial force: $F_{amax} = 2087 \text{ N}$

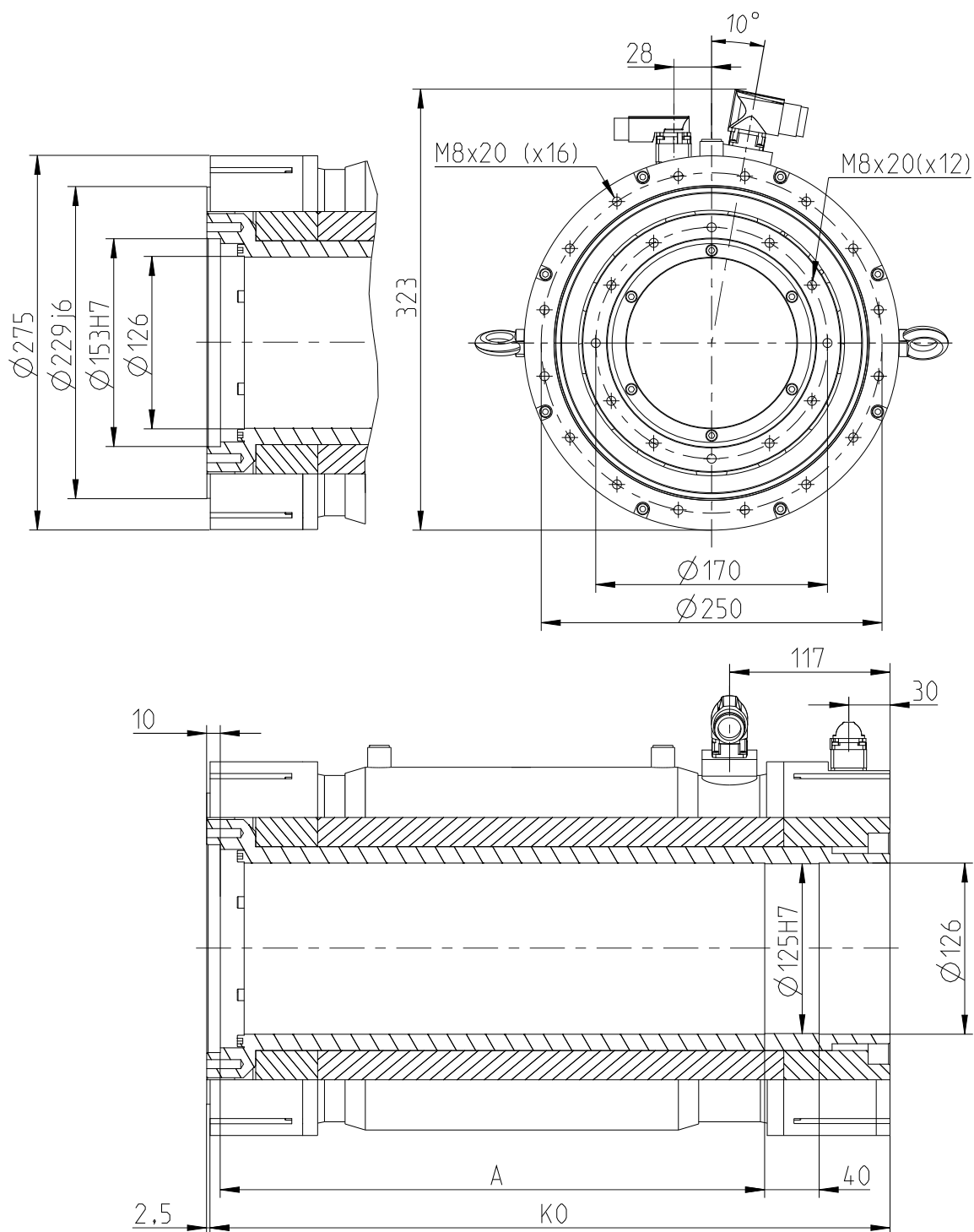


maximum allowed axial force: $F_{amax} = 2171 \text{ N}$



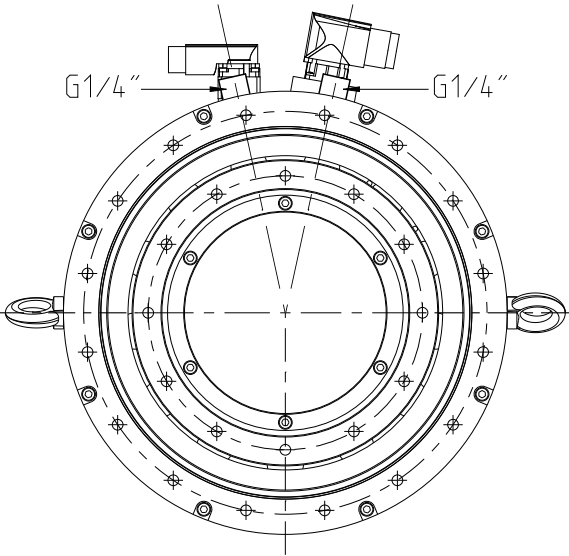
maximum allowed axial force: $F_{amax} = 2224 \text{ N}$

2.15.5 8LTK9 - Dimensions



	K_0	A
8LTK93	310	210
8LTK94	360	260
8LTK95	410	310
8LTK96	460	360
8LTK97	500	400

8LTK93

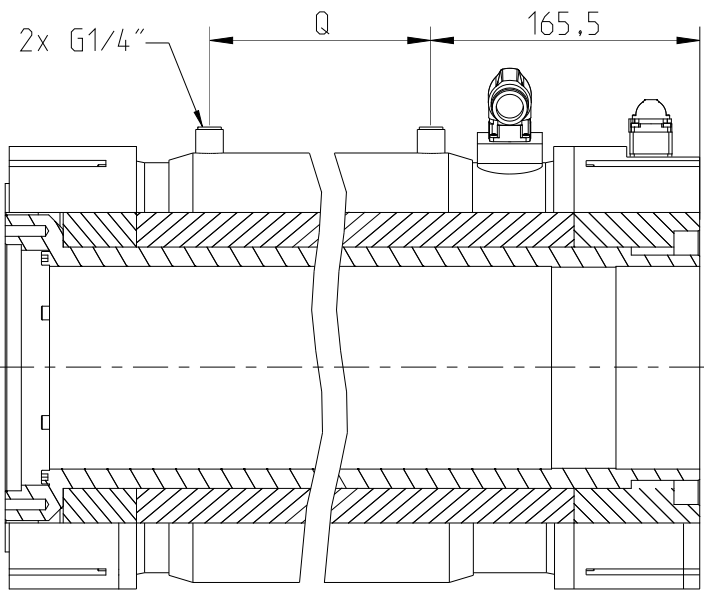
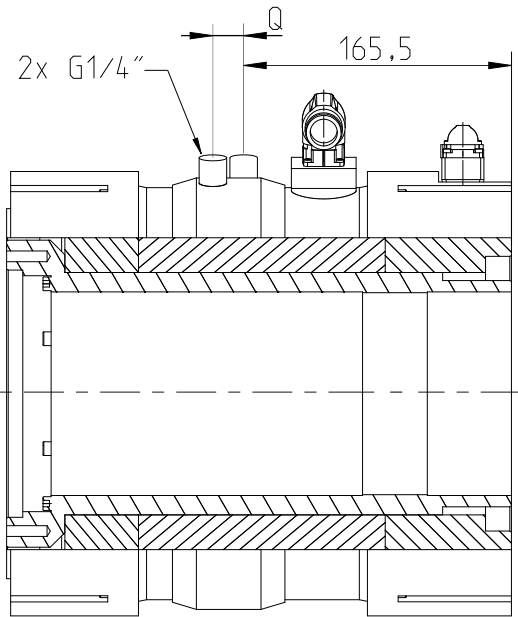
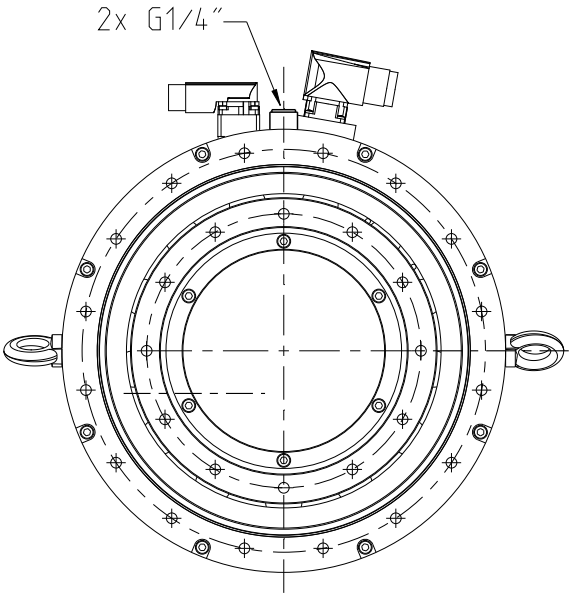


8LTK94

8LTK95

8LTK96

8LTK97



	Q
8LTK93	19
8LTK94	69
8LTK95	119
8LTK96	169
8LTK97	209

2.16 8LTQ9 - Technical data

Model number	8LTQ93. ee003ffgg-0	8LTQ93. ee005ffgg-0	8LTQ93. ee010ffgg-0	8LTQ94. ee003ffgg-0	8LTQ94. ee005ffgg-0	8LTQ94. ee010ffgg-0
Motor						
Nominal speed n_N [rpm]	300	500	1000	300	500	1000
Number of pole pairs	12					
Nominal torque M_n [Nm]	48	45	39	95	90	77
Nominal power P_N [W]	1508	2356	4084	2985	4712	8063
Nominal current I_N [A]	2.86	4.48	8.19	5.71	9.12	15.88
Stall torque M_0 [Nm]	50			100		
Stall current I_0 [A]	3	5	10.5	6	10.1	20.6
Maximum torque M_{max} [Nm]	173			345		
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27	116.55
Maximum speed n_{max} [rpm]	1200					
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87	4.85
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9	293.2
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63	0.4
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1	3.42
Electrical time constant t_{el} [ms]	7.6	7.28	7.51	9.28	9.17	8.38
Thermal time constant t_{therm} [min]	50			70		
Moment of inertia J [kgcm ²]	404			774		
Weight without brake m [kg]	31			48		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1045	1090	1180	1090	1180	1320
ACOPOSmulti 8BVxxxx...	0028	0055	0110	0055	0110	0330
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0					

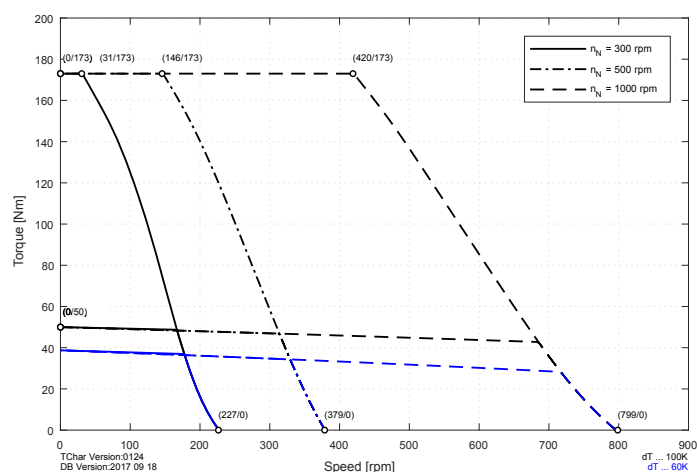
Technical data

Model number	8LTQ95. ee003ffgg-0	8LTQ95. ee005ffgg-0	8LTQ95. ee010ffgg-0	8LTQ96. ee003ffgg-0	8LTQ96. ee005ffgg-0	8LTQ96. ee010ffgg-0
Motor						
Nominal speed n_N [rpm]	300	500	1000	300	500	1000
Number of pole pairs	12					
Nominal torque M_N [Nm]	142	135	116	188	180	153
Nominal power P_N [W]	4461	7069	12147	5906	9425	16022
Nominal current I_N [A]	8.45	13.67	23.5	11.19	17.92	31
Stall torque M_0 [Nm]	150		200			
Stall current I_0 [A]	8.9	15.2	30.4	11.9	19.9	40.5
Maximum torque M_{max} [Nm]	510		680			
Maximum current I_{max} [A]	48.85	83.17	166.16	65.15	108.9	221.55
Maximum speed n_{max} [rpm]	1200					
Torque constant K_T [Nm/A]	16.8	9.87	4.94	16.8	10.05	4.94
Voltage constant K_E [V/1000 rpm]	1015.8	596.9	298.4	1015.8	607.4	298.4
Stator resistance R_{2ph} [Ω]	2.82	0.96	0.24	1.97	0.72	0.17
Stator inductance L_{2ph} [mH]	27.5	9.41	2.42	20.86	7.4	1.76
Electrical time constant t_{ei} [ms]	9.91	9.92	10.21	10.89	10.31	10.63
Thermal time constant t_{therm} [min]	90		110			
Moment of inertia J [kgcm ²]	1146		1519			
Weight without brake m [kg]	64		81			
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxx.xx...	1180		1320	1180	1320	1640
ACOPOSmulti 8BVIxxx...	0110	0220	0440	0110	0220	0660
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0		1.5	1.0		1.5

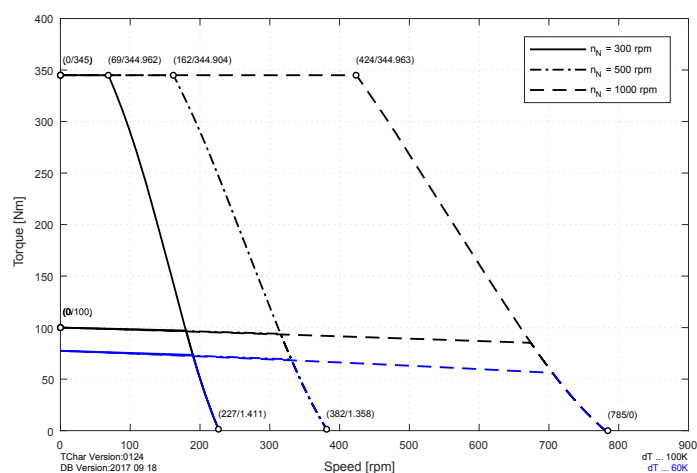
Model number	8LTQ97.ee003ffgg-0	8LTQ97.ee005ffgg-0	8LTQ97.ee010ffgg-0
Motor			
Nominal speed n_N [rpm]	300	500	1000
Number of pole pairs		12	
Nominal torque M_N [Nm]	225	212	182
Nominal power P_N [W]	7069	11100	19059
Nominal current I_N [A]	13.39	21.1	36.87
Stall torque M_0 [Nm]		240	
Stall current I_0 [A]	14.3	23.9	48.6
Maximum torque M_{max} [Nm]		816	
Maximum current I_{max} [A]	78.17	130.68	265.85
Maximum speed n_{max} [rpm]		1200	
Torque constant K_T [Nm/A]	16.8	10.05	4.94
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	298.4
Stator resistance R_{2ph} [Ω]	1.76	0.66	0.16
Stator inductance L_{2ph} [mH]	18.09	6.63	1.52
Electrical time constant t_{el} [ms]	10.63	10	10.98
Thermal time constant t_{therm} [min]		130	
Moment of inertia J [kgcm ²]		1816	
Weight without brake m [kg]		94	
Holding brake			
Holding torque of brake M_{Br} [Nm]		0	
Mass of brake [kg]		0	
Moment of inertia of brake J_{Br} [kgcm ²]		0	
Recommendations			
ACOPOS 8Vxxx.xx...	1180	1320	1640
ACOPOSmulti 8BVlxxx...	0220	0330	0660
Cross section for B&R motor cables [mm ²]		1.5	
Connector size	1.0		1.5

2.16.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

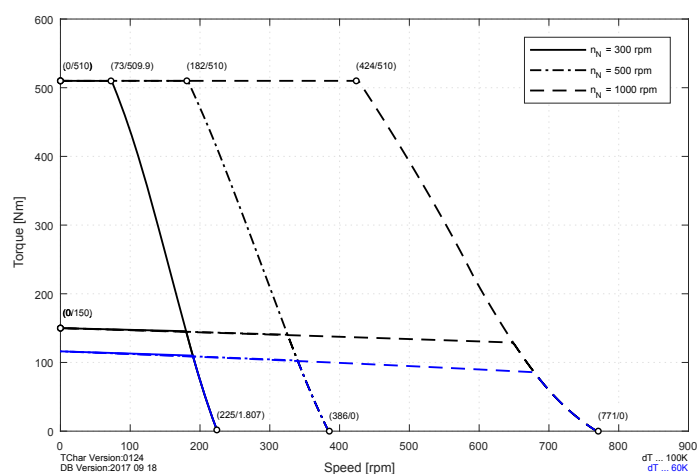
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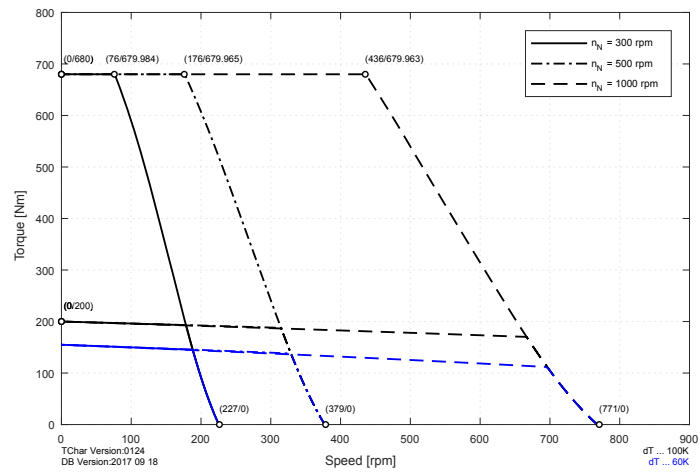
8LTQ94.eennnffgg-0



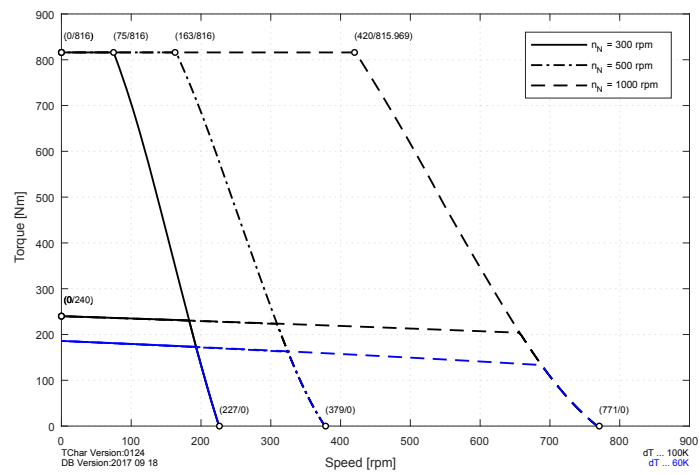
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8LTQ96.eennnffgg-0

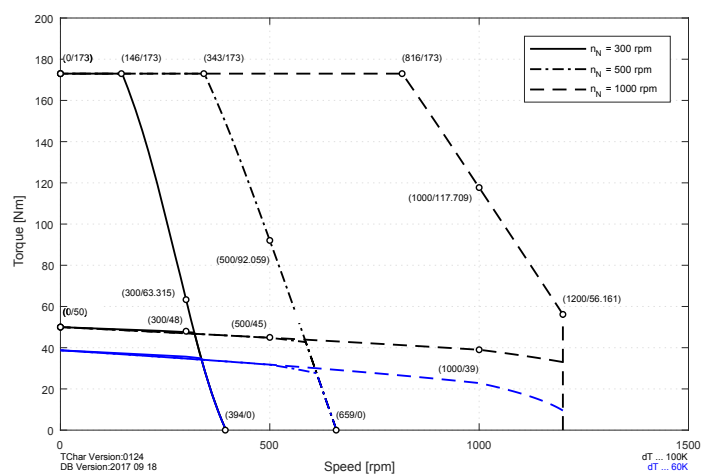


8LTQ97.eennnffgg-0

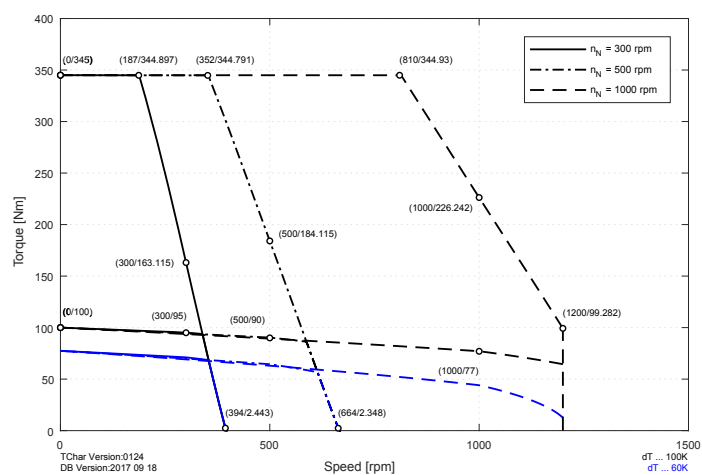


2.16.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

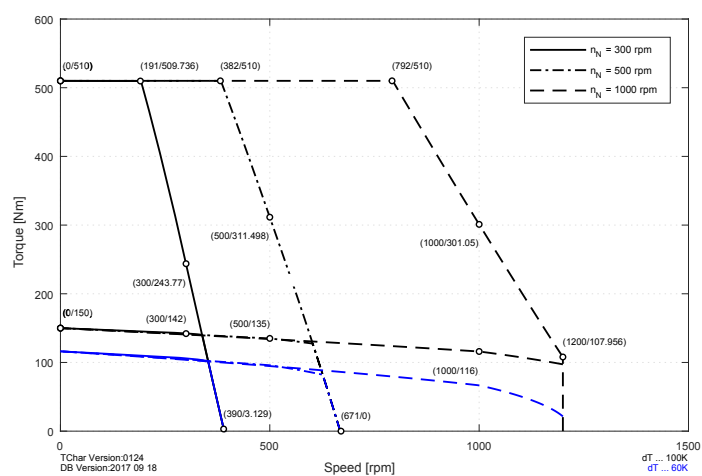
8LTQ93.eennnffgg-0



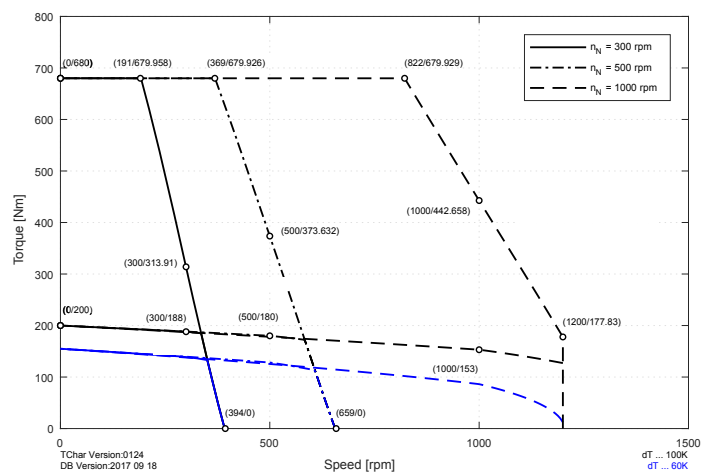
8LTQ94.eennnffgg-0



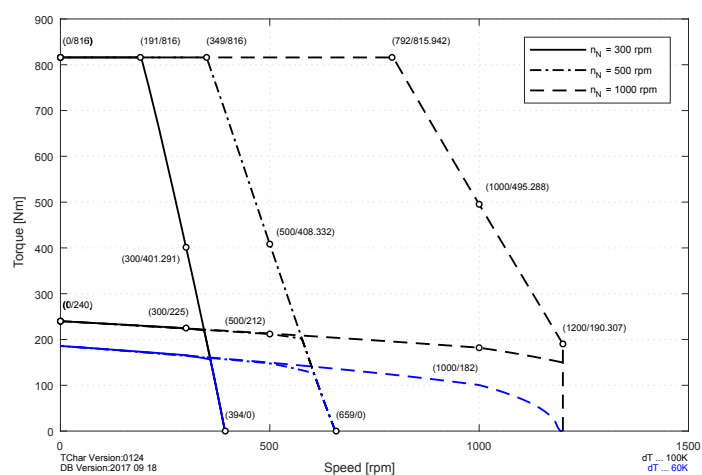
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8LTQ96.eennnffgg-0

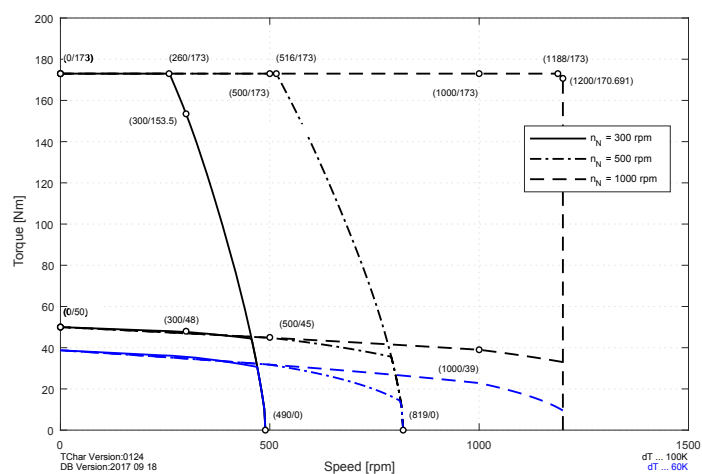


8LTQ97.eennnffgg-0

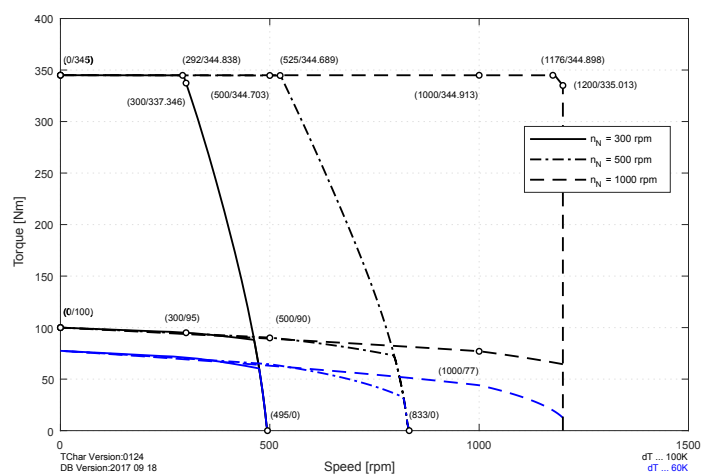


2.16.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

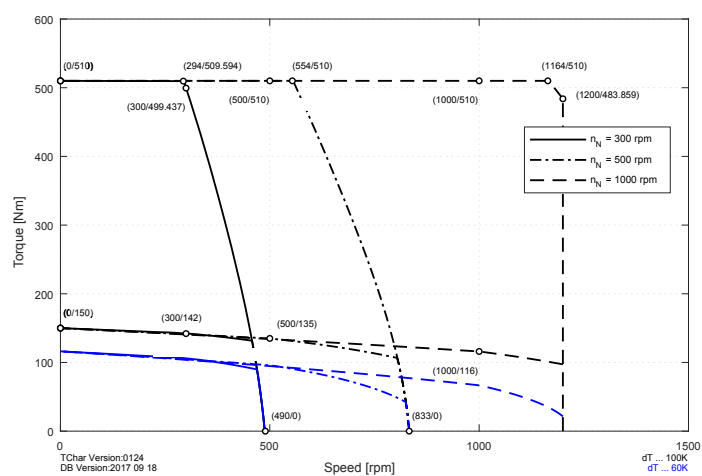
8LTQ93.eennnffgg-0



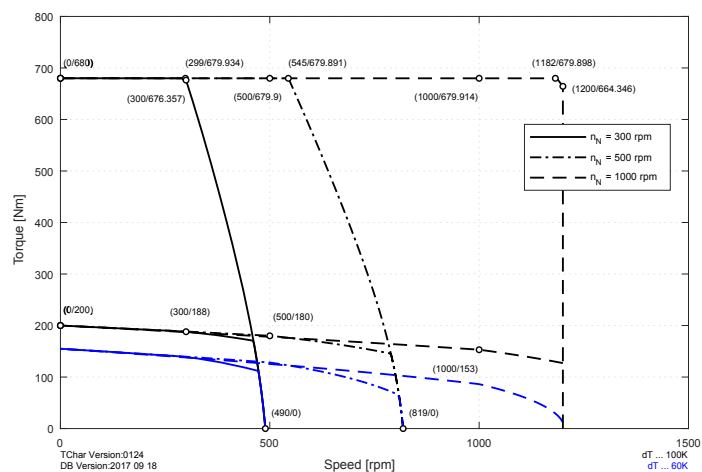
8LTQ94.eennnffgg-0



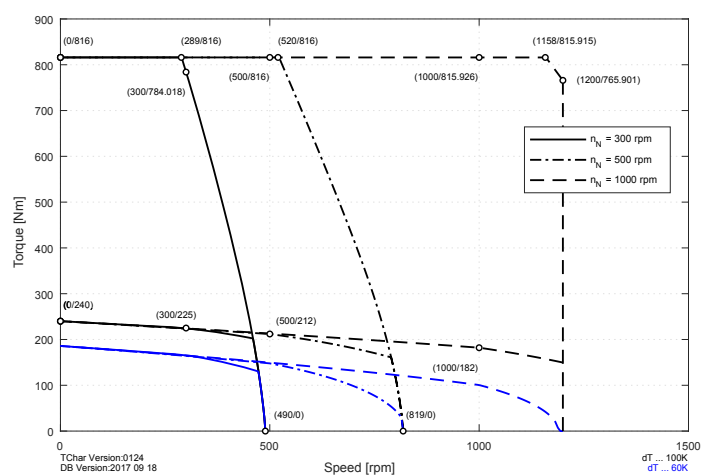
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8LTQ96.eennnffgg-0

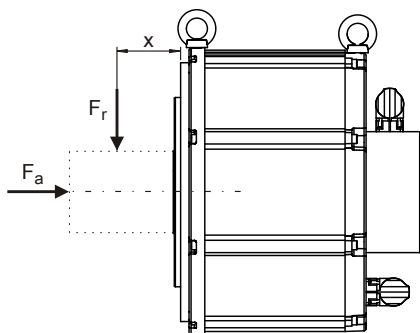


8LTQ97.eennnffgg-0



2.16.4 8LTQ9 - Permissible shaft load

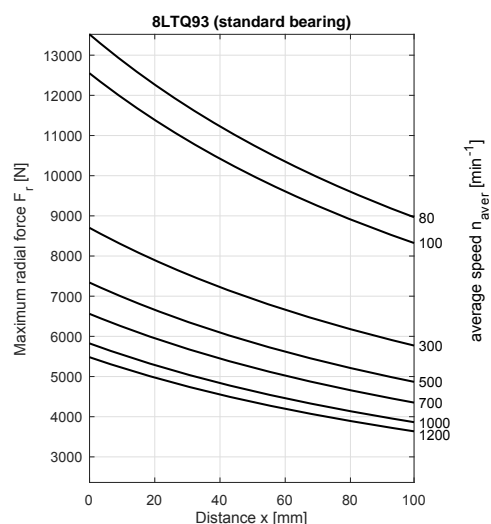
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



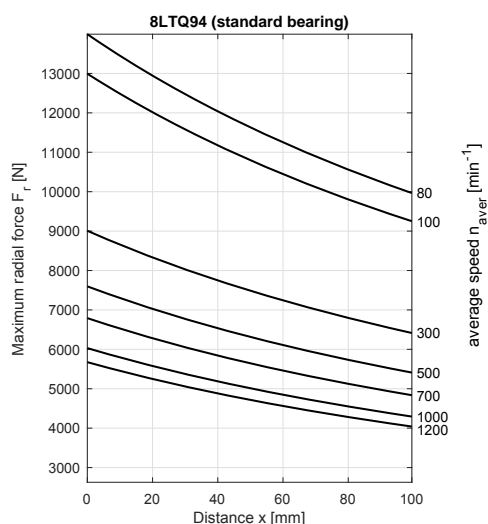
F_r ... Radial force

F_a ... Axial force

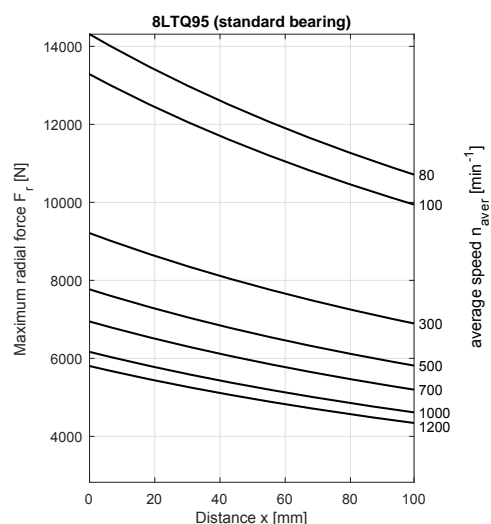
x ... Distance between the motor flange and the point where radial force F_r is applied.



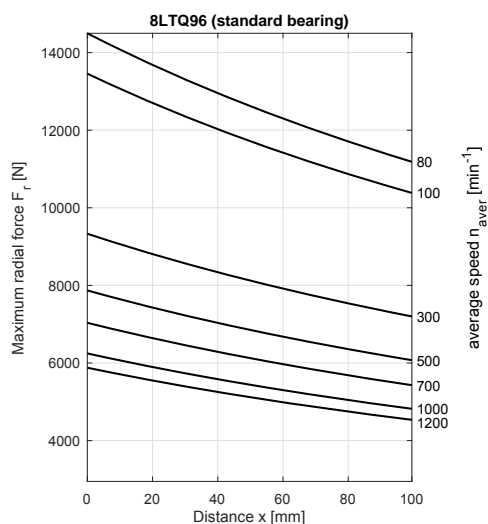
maximum allowed axial force: $F_{amax} = 1113$ N



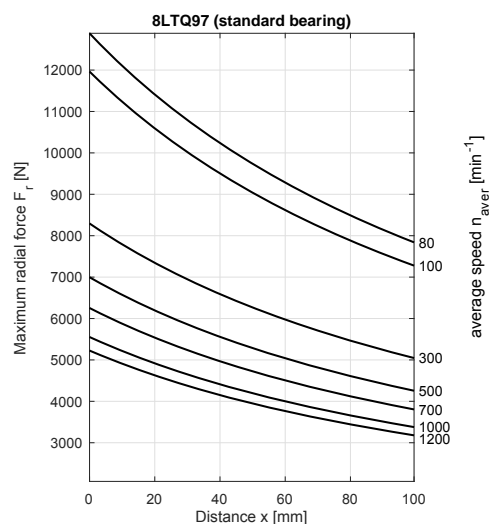
maximum allowed axial force: $F_{amax} = 1202$ N



maximum allowed axial force: $F_{amax} = 1265$ N

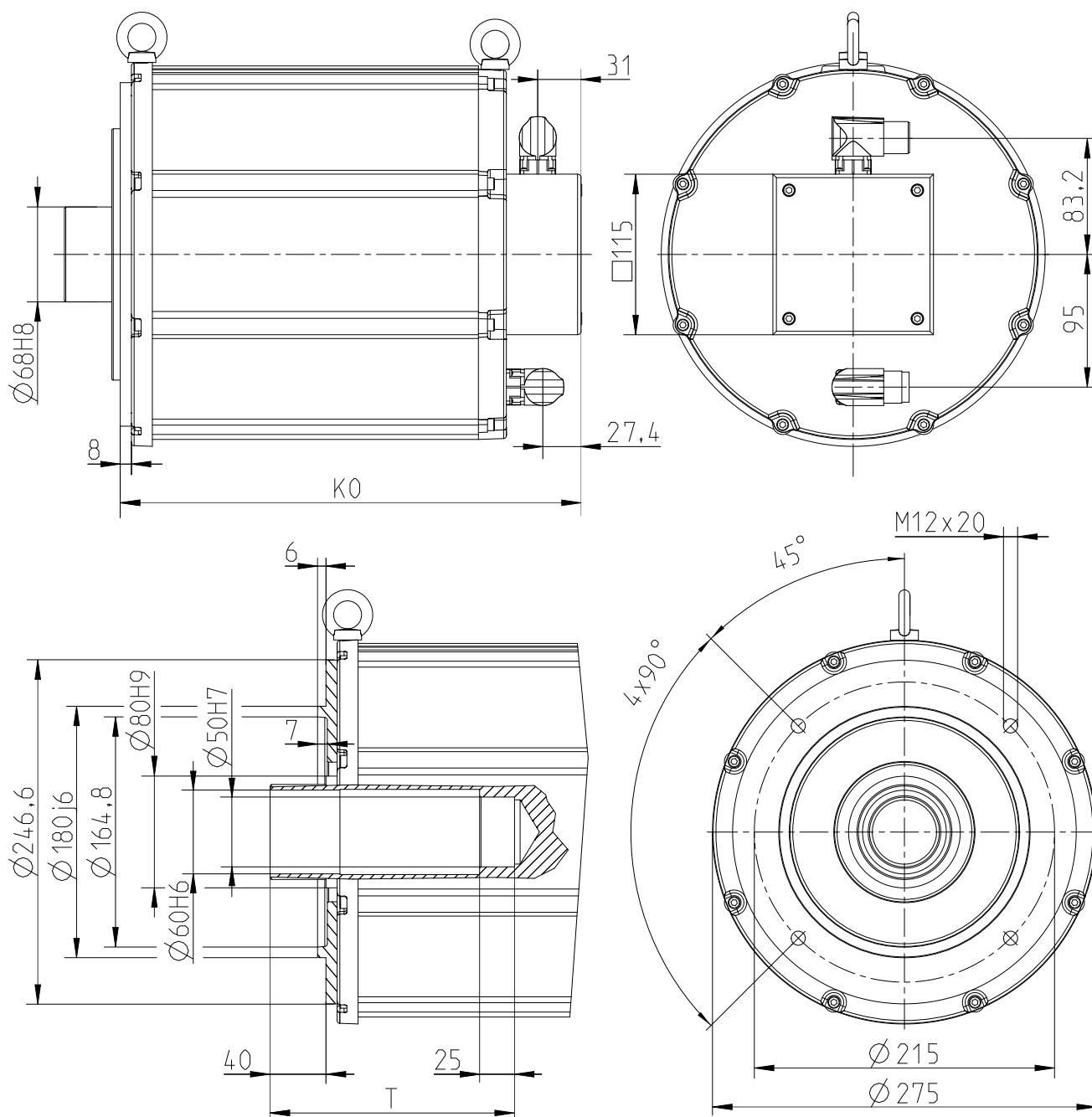


maximum allowed axial force: $F_{amax} = 1303$ N



maximum allowed axial force: $F_{amax} = 1007$ N

2.16.5 8LTQ9 - Dimensions



	K_0	T
8LTQ93	230	125
8LTQ94	280	150
8LTQ95	330	175
8LTQ96	380	200
8LTQ97	420	225

2.17 8LTQC - Technical data

Model number	8LTQC3. ee001ffgg-0	8LTQC3. ee003ffgg-0	8LTQC3. ee005ffgg-0	8LTQC4. ee001ffgg-0	8LTQC4. ee003ffgg-0	8LTQC4. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	100	300	500	100	300	500
Number of pole pairs	15					
Nominal torque M_N [Nm]	108.1	100.05	88.55	211.5	195.75	173.25
Nominal power P_N [W]	1132	3143	4636	2215	6150	9071
Nominal current I_N [A]	2.21	6.14	9.06	4.33	12.02	17.74
Stall torque M_0 [Nm]	115			225		
Stall current I_0 [A]	2.4	7.1	11.8	4.6	13.8	23
Maximum torque M_{\max} [Nm]	345			703		
Maximum current I_{\max} [A]	10.24	30.71	51.18	20.86	62.58	104.3
Maximum speed n_{\max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	17.1	1.9	0.75	7.61	0.91	0.32
Stator inductance L_{2ph} [mH]	297.7	33.08	12.5	154	17.9	6.62
Electrical time constant t_{el} [ms]	17.41		16.58	20.24	19.76	20.88
Thermal time constant t_{therm} [min]	68		95.2			
Moment of inertia J [kgcm ²]	1700		3000			
Weight without brake m [kg]	63		88			
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1045	1090	1180	1090	1180	1320
ACOPOSmulti 8BVIxxxx...	0028	0110		0055	0220	0330
Cross section for B&R motor cables [mm ²]	1.5		4	1.5	4	
Connector size	1.0					

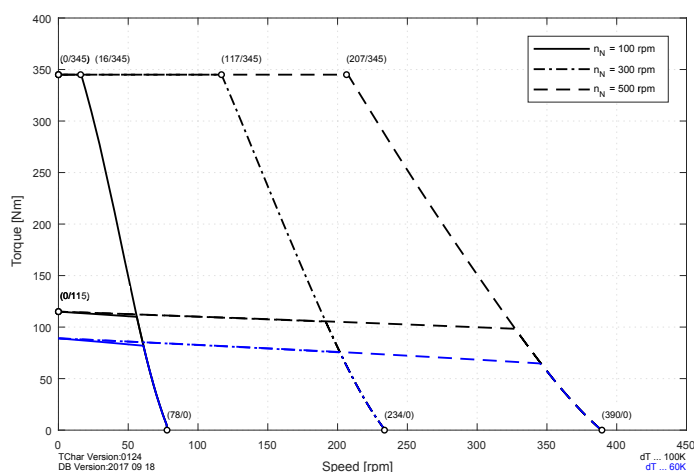
Model number	8LTQC5. ee001ffgg-0	8LTQC5. ee003ffgg-0	8LTQC5. ee005ffgg-0	8LTQC6. ee001ffgg-0	8LTQC6. ee003ffgg-0	8LTQC6. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	100	300	500	100	300	500
Number of pole pairs	15					
Nominal torque M_n [Nm]	305.5	282.75	250.25	394.8	365.4	323.4
Nominal power P_N [W]	3199	8883	13103	4134	11479	16933
Nominal current I_N [A]	6.26	17.37	25.62	8.08	22.44	33.11
Stall torque M_0 [Nm]	325			420		
Stall current I_0 [A]	6.7	20	33.3	8.6	25.8	43
Maximum torque M_{max} [Nm]	1054			1405		
Maximum current I_{max} [A]	31.27	93.82	156.37	41.69	125.07	208.44
Maximum speed n_{max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	4.31	0.53	0.21	3.4	0.38	0.13
Stator inductance L_{2ph} [mH]	99.2	11.4	4.35	77	8.66	3.1
Electrical time constant t_{el} [ms]	23.03	21.63	20.62	22.65	22.73	23.66
Thermal time constant t_{therm} [min]	122.4			149.6		
Moment of inertia J [kgcm ²]	4400			5800		
Weight without brake m [kg]	113			138		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxx.xx...	1090	1320	1640	1180	1320	1640
ACOPOSMulti 8BVIxxx...	0055	0220	0440	0110	0330	0660
Cross section for B&R motor cables [mm ²]	1.5	4	10	4		10
Connector size	1.0		1.5	1.0		1.5

Technical data

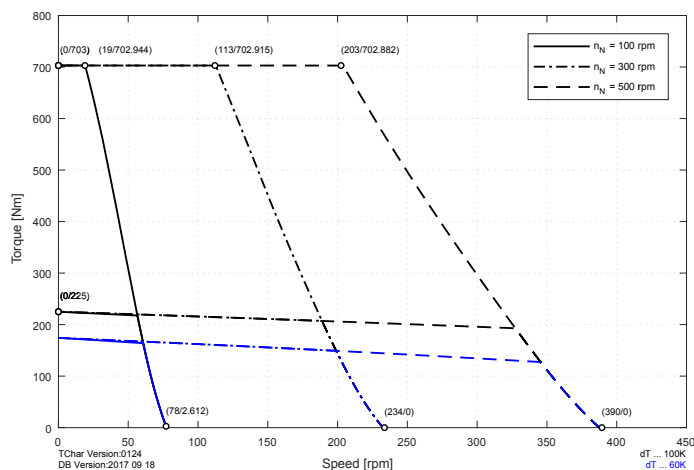
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Motor					
Nominal speed n_N [rpm]	100	300	500	100	300
Number of pole pairs	15				
Nominal torque M_n [Nm]	479.4	443.7	392.7	564	522
Nominal power P_N [W]	5020	13939	20562	5906	16399
Nominal current I_N [A]	9.82	27.25	40.2	11.55	32.06
Stall torque M_0 [Nm]	510			600	
Stall current I_0 [A]	10.4	31.3	52.2	12.3	36.9
Maximum torque M_{max} [Nm]	1750			2108	
Maximum current I_{max} [A]	51.93	155.78	259.63	62.55	187.64
Maximum speed n_{max} [rpm]	700				
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4
Stator resistance R_{2ph} [Ω]	2.66	0.32	0.11	2.29	0.25
Stator inductance L_{2ph} [mH]	62.3	7.07	2.42	52.9	5.86
Electrical time constant t_{el} [ms]	23.42	21.75	22.36	23.1	23.07
Thermal time constant t_{therm} [min]	177			204	
Moment of inertia J [kgcm ²]	7150			8500	
Weight without brake m [kg]	163			187	
Holding brake					
Holding torque of brake M_{Br} [Nm]	0				
Mass of brake [kg]	0				
Moment of inertia of brake J_{Br} [kgcm ²]	0				
Recommendations					
ACOPOS 8Vxxx.xx...	1180	1640		1180	1640
ACOPOSmulti 8BVlxxx...	0110	0440	0660	0110	0440
Cross section for B&R motor cables [mm ²]	4	10		4	10
Connector size	1.0	1.5		1.0	1.5

2.17.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

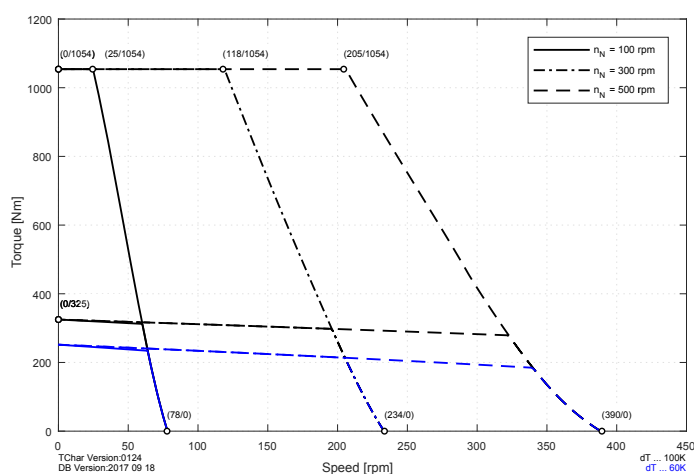
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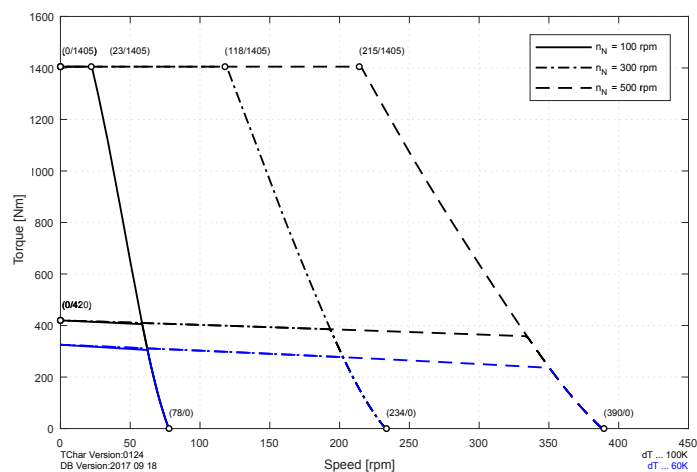
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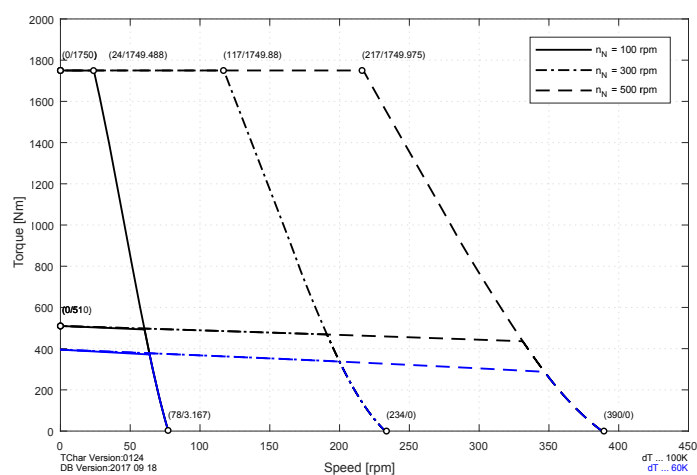
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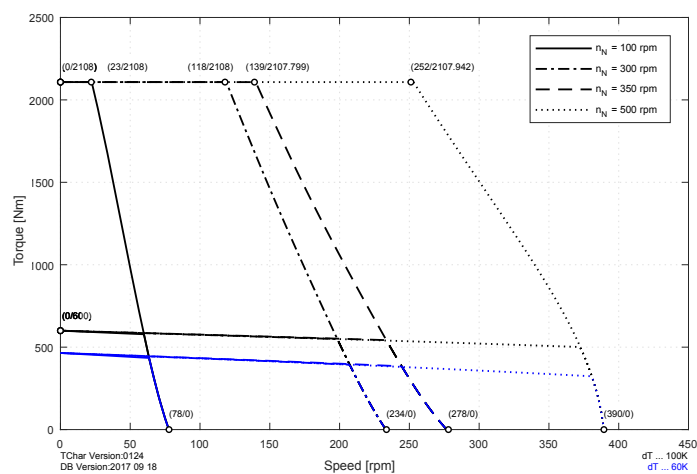
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8LTQC7.eennnffgg-0

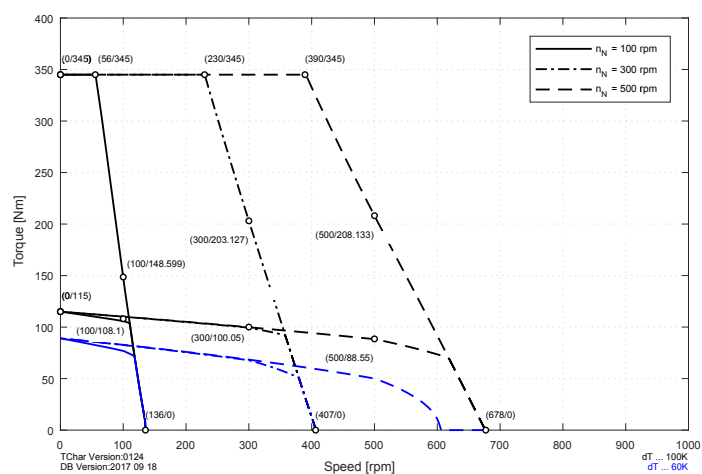


8LTQC8.eennnffgg-0

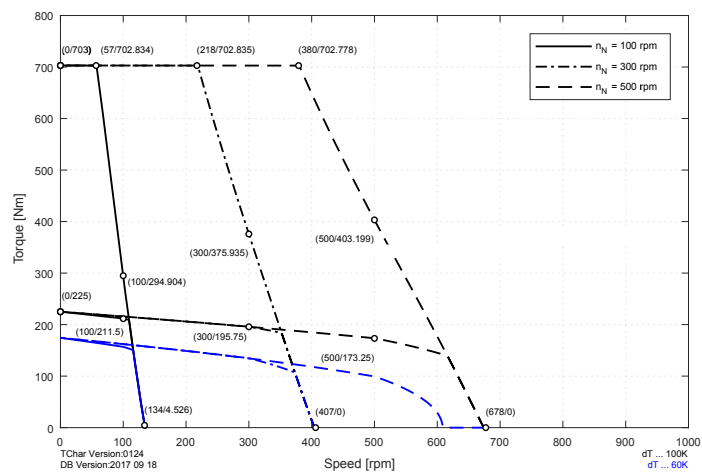


2.17.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

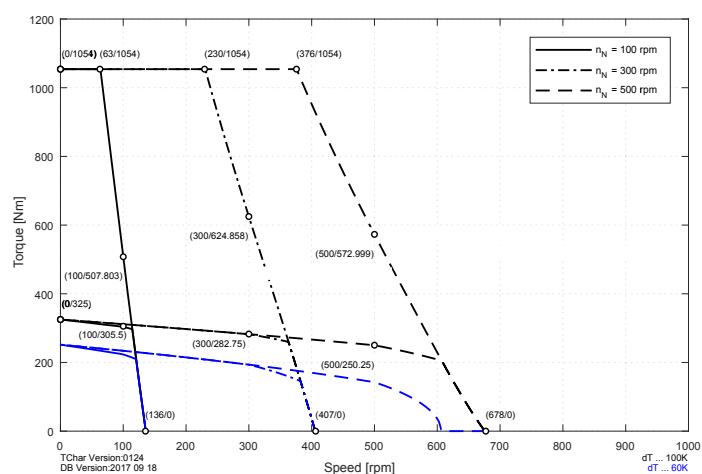
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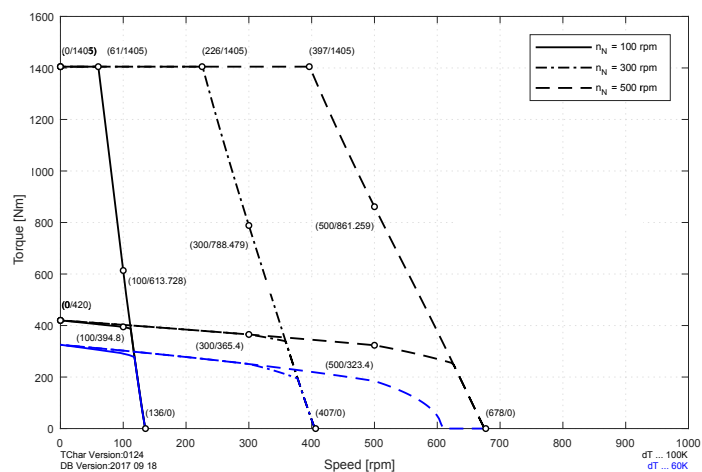
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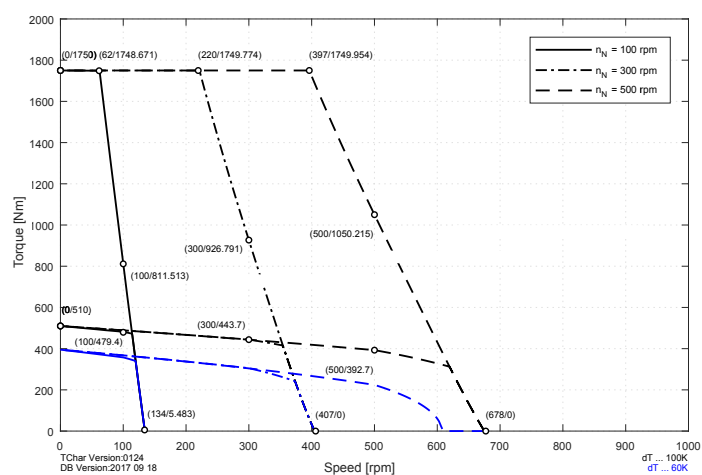
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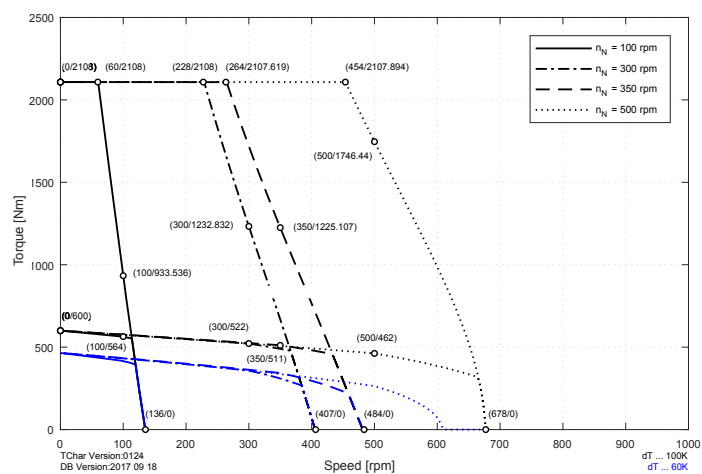
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8LTQC7.eennnffgg-0

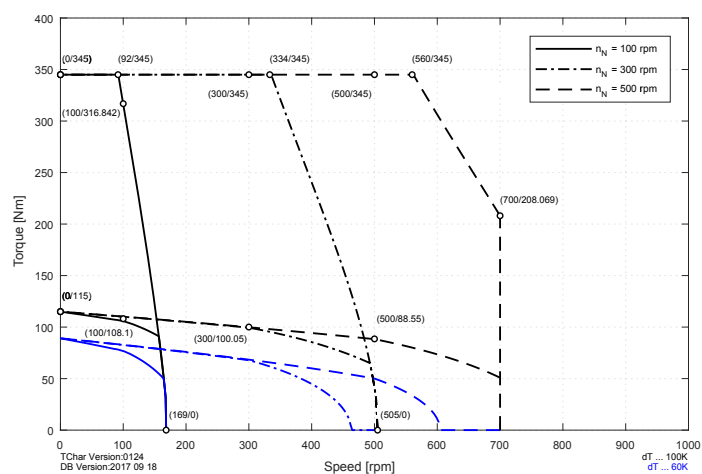


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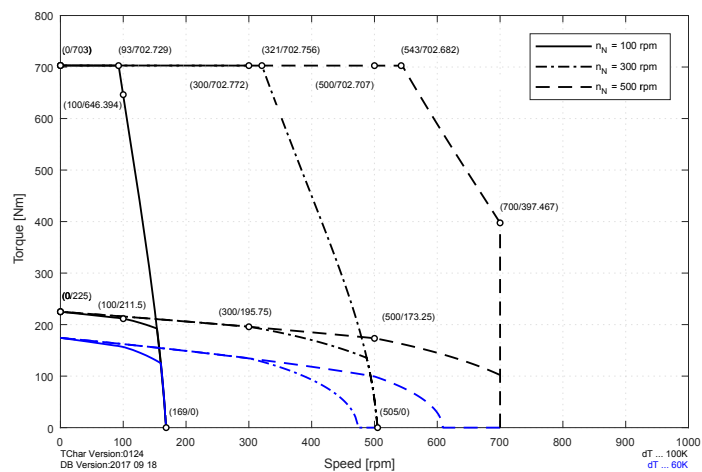


2.17.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

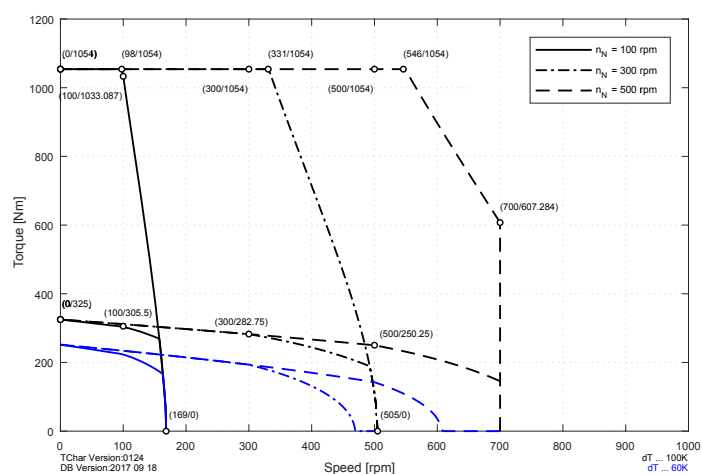
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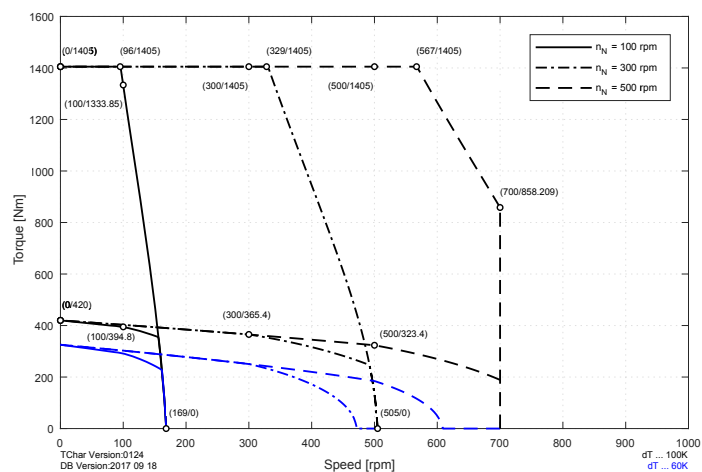
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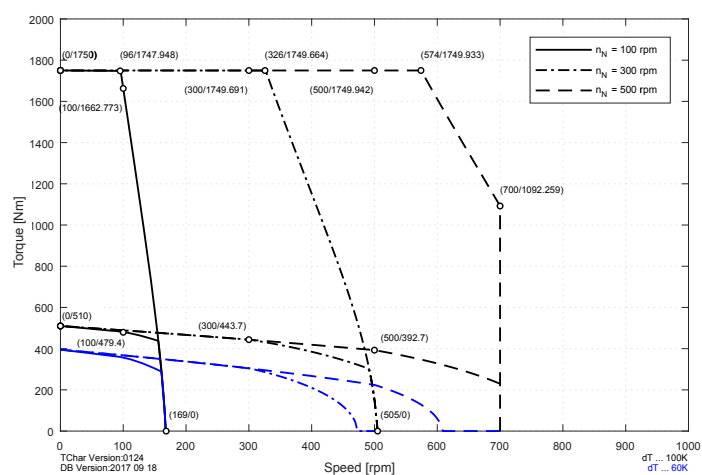
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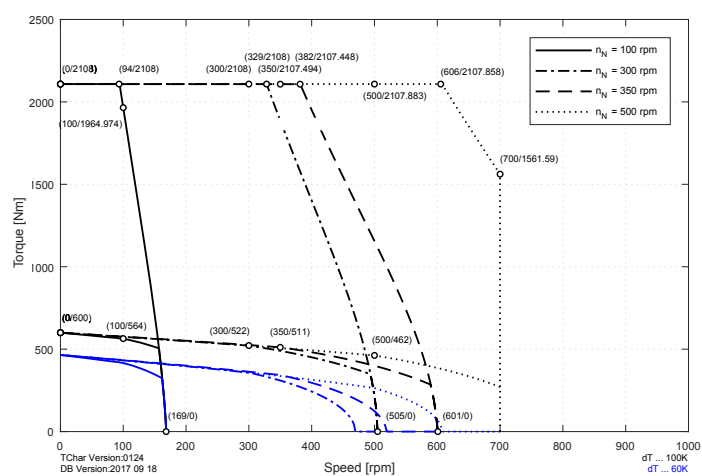
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8LTQC7.eennnffgg-0

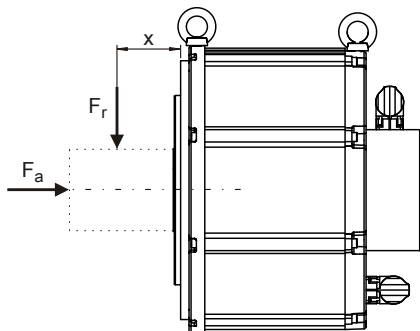


8LTQC8.eennnffgg-0



2.17.4 8LTQC - Permissible shaft load

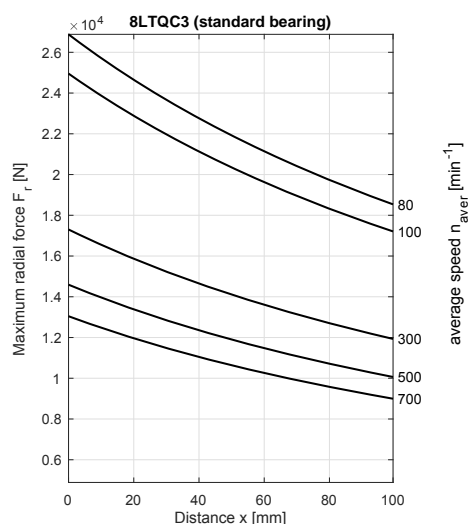
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



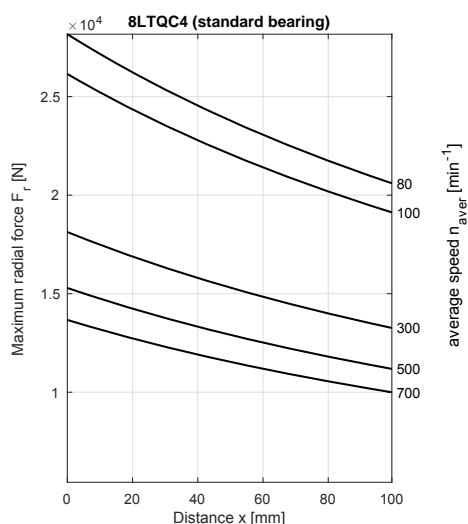
F_r ... Radial force

F_a ... Axial force

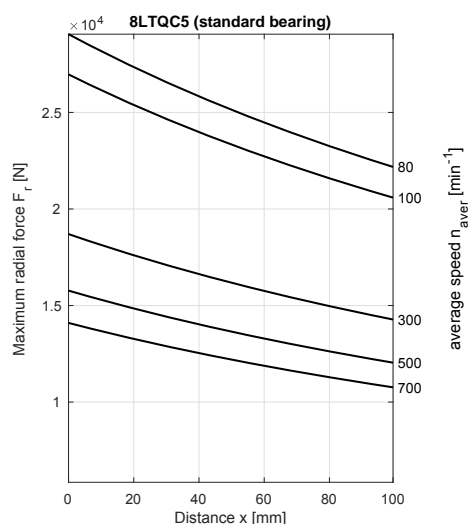
x ... Distance between the motor flange and the point where radial force F_r is applied.



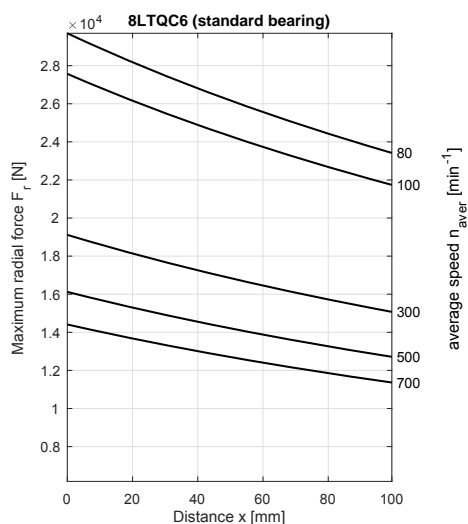
maximum allowed axial force: $F_{amax} = 2265 \text{ N}$



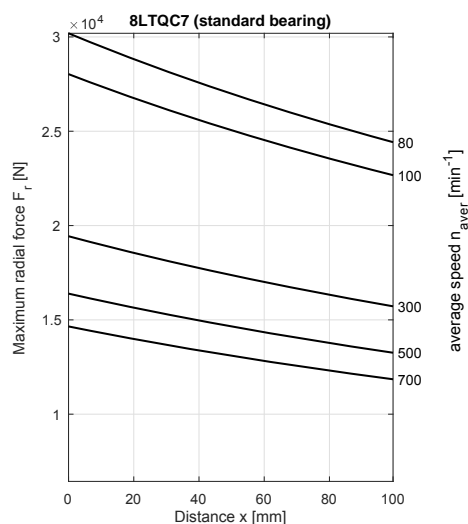
maximum allowed axial force: $F_{amax} = 2457 \text{ N}$



maximum allowed axial force: $F_{amax} = 2596 \text{ N}$

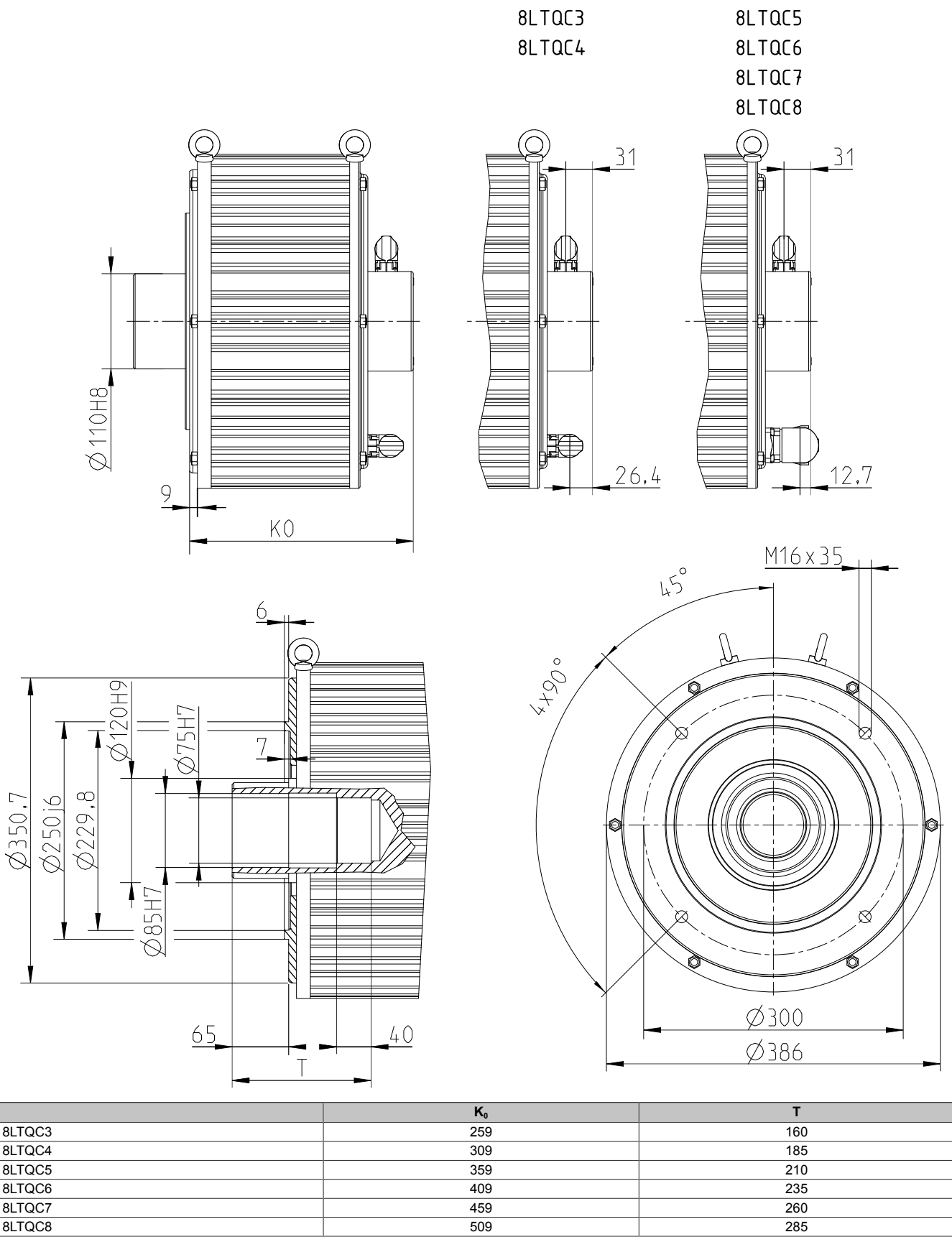


maximum allowed axial force: $F_{amax} = 2703 \text{ N}$

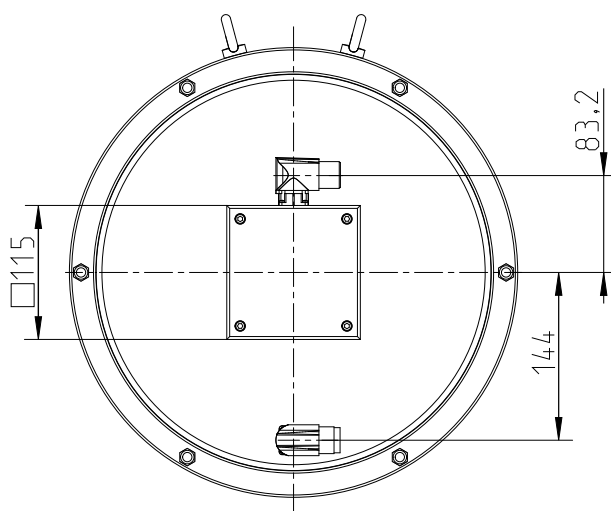


maximum allowed axial force: $F_{amax} = 2787 \text{ N}$

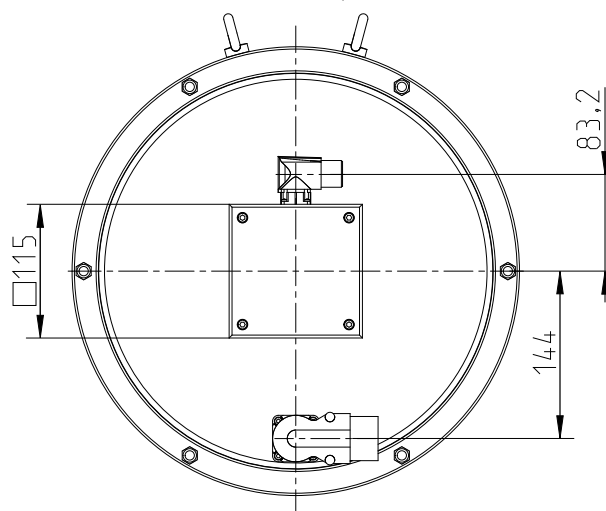
2.17.5 8LTQC - Dimensions



8LTQC3
8LTQC4



8LTQC5
8LTQC6
8LTQC7
8LTQC8



2.18 8LTS9 - Technical data

Model number	8LTS93. ee003ffgg-0	8LTS93. ee005ffgg-0	8LTS93. ee010ffgg-0	8LTS94. ee003ffgg-0	8LTS94. ee005ffgg-0	8LTS94. ee010ffgg-0
Motor						
Nominal speed n_N [rpm]	300	500	1000	300	500	1000
Number of pole pairs	12					
Nominal torque M_N [Nm]	81.6	76.5	66.3	161.5	153	130.9
Nominal power P_N [W]	2564	4006	6943	5074	8011	13708
Nominal current I_N [A]	4.86	7.62	13.92	9.71	15.5	26.99
Stall torque M_0 [Nm]	85			170		
Stall current I_0 [A]	5.1	8.5	17.8	10.2	17.2	35.1
Maximum torque M_{max} [Nm]	173			345		
Maximum current I_{max} [A]	18.17	30.37	64.12	33.99	57.27	116.55
Maximum speed n_{max} [rpm]	1200					
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87	4.85
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	288	1005.3	596.9	293.2
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63	0.4
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1	3.42
Electrical time constant t_{el} [ms]	7.6	7.28	7.51	9.28	9.17	8.38
Thermal time constant t_{therm} [min]	50			70		
Moment of inertia J [kgcm ²]	404			774		
Weight without brake m [kg]	32			51		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1090	1180	1320	1180		1640
ACOPOSmulti 8BVIxxxx...	0055	0110	0220	0110	0220	0440
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0					1.5

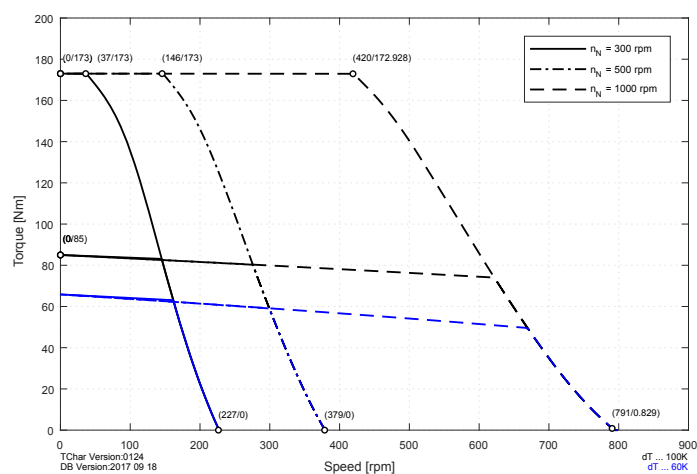
Model number	8LTS95. ee003ffgg-0	8LTS95. ee005ffgg-0	8LTS95. ee010ffgg-0	8LTS96. ee003ffgg-0	8LTS96. ee005ffgg-0	8LTS96. ee010ffgg-0
Motor						
Nominal speed n_N [rpm]	300	500	1000	300	500	1000
Number of pole pairs	12					
Nominal torque M_N [Nm]	241.4	229.5	197.2	319.6	306	260.1
Nominal power P_N [W]	7584	12017	20651	10041	16022	27238
Nominal current I_N [A]	14.37	23.25	39.95	19.02	30.46	52.69
Stall torque M_0 [Nm]	255			340		
Stall current I_0 [A]	15.2	25.8	51.7	20.2	33.8	68.9
Maximum torque M_{max} [Nm]	510			680		
Maximum current I_{max} [A]	48.85	83.17	166.16	65.15	108.9	221.55
Maximum speed n_{max} [rpm]	1200					
Torque constant K_T [Nm/A]	16.8	9.87	4.94	16.8	10.05	4.94
Voltage constant K_E [V/1000 rpm]	1015.8	596.9	298.4	1015.8	607.4	298.4
Stator resistance R_{2ph} [Ω]	2.82	0.96	0.24	1.97	0.72	0.17
Stator inductance L_{2ph} [mH]	27.5	9.41	2.42	20.86	7.4	1.76
Electrical time constant t_{el} [ms]	9.91	9.92	10.21	10.89	10.31	10.63
Thermal time constant t_{therm} [min]	90			110		
Moment of inertia J [kgcm ²]	1146			1519		
Weight without brake m [kg]	68			86		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1180	1320	1640	1320	1640	128M
ACOPOSmulti 8BVIxxxx...	0220	0330	0660	0330	0440	0880
Cross section for B&R motor cables [mm ²]	1.5					
Connector size	1.0		1.5	1.0	1.5	-

Technical data

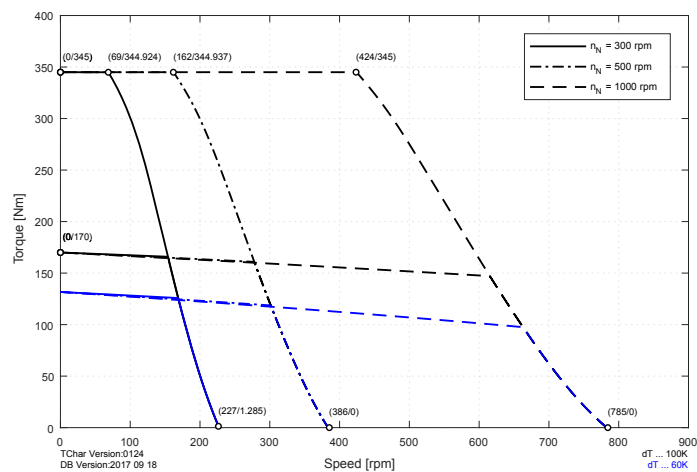
Model number	8LTS97.ee003ffgg-0	8LTS97.ee005ffgg-0	8LTS97.ee009ffgg-0
Motor			
Nominal speed n_N [rpm]	300	500	900
Number of pole pairs		12	
Nominal torque M_N [Nm]	382.5	360.4	320
Nominal power P_N [W]	12017	18871	30159
Nominal current I_N [A]	22.77	35.88	58.58
Stall torque M_0 [Nm]		408	
Stall current I_0 [A]	24.3	40.6	74.7
Maximum torque M_{max} [Nm]		816	
Maximum current I_{max} [A]	78.17	130.68	240.55
Maximum speed n_{max} [rpm]		1200	
Torque constant K_T [Nm/A]	16.8	10.05	5.46
Voltage constant K_E [V/1000 rpm]	1015.8	607.4	330.3
Stator resistance R_{2ph} [Ω]	1.76	0.66	0.18
Stator inductance L_{2ph} [mH]	18.09	6.63	1.85
Electrical time constant t_{el} [ms]	10.63	10	10.98
Thermal time constant t_{therm} [min]		130	
Moment of inertia J [kgcm ²]		1816	
Weight without brake m [kg]		100	
Holding brake			
Holding torque of brake M_{Br} [Nm]		0	
Mass of brake [kg]		0	
Moment of inertia of brake J_{Br} [kgcm ²]		0	
Recommendations			
ACOPOS 8Vxxx.xx...	1320	1640	128M
ACOPOSmulti 8BVlxxx...	0330	0660	0880
Cross section for B&R motor cables [mm ²]		1.5	
Connector size	1.0	1.5	-

2.18.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

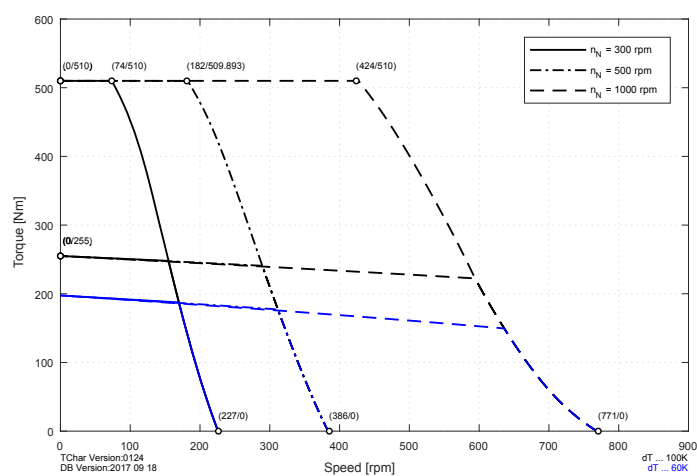
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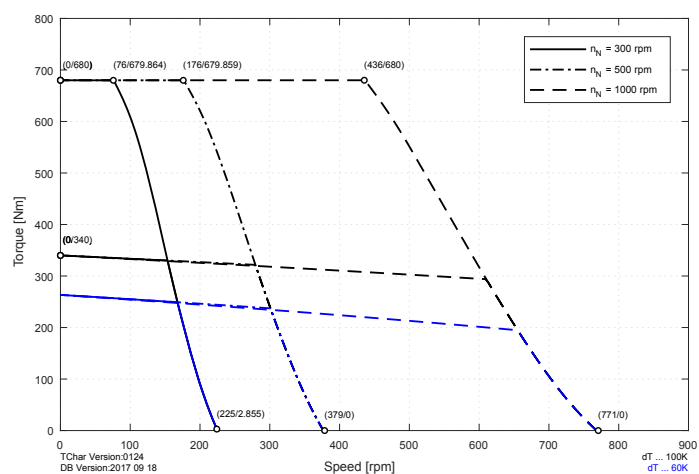
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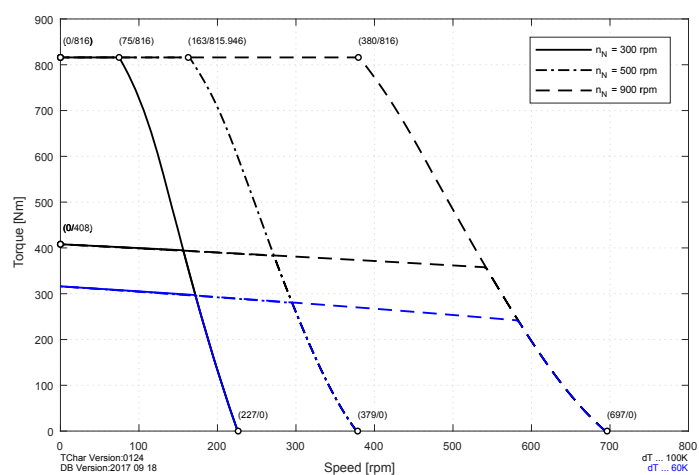
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8LTS96.eennnffgg-0

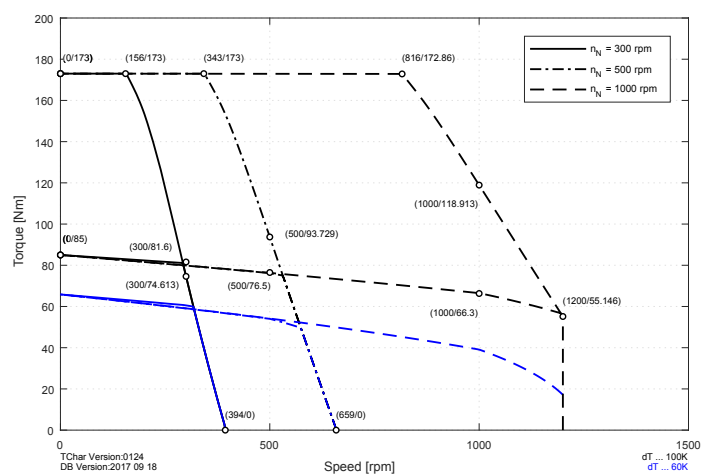


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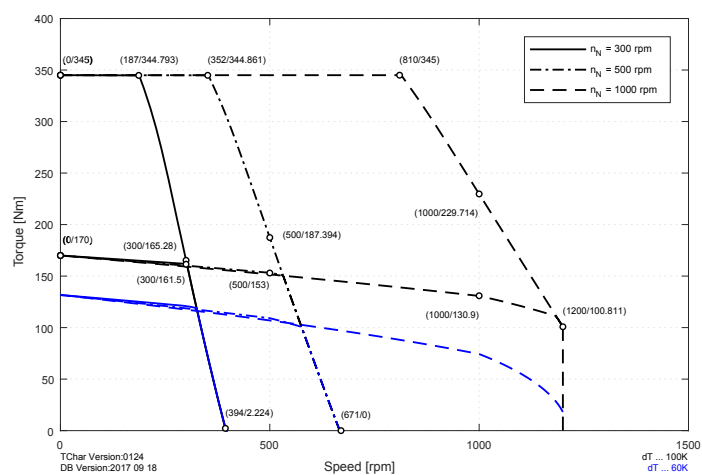


2.18.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

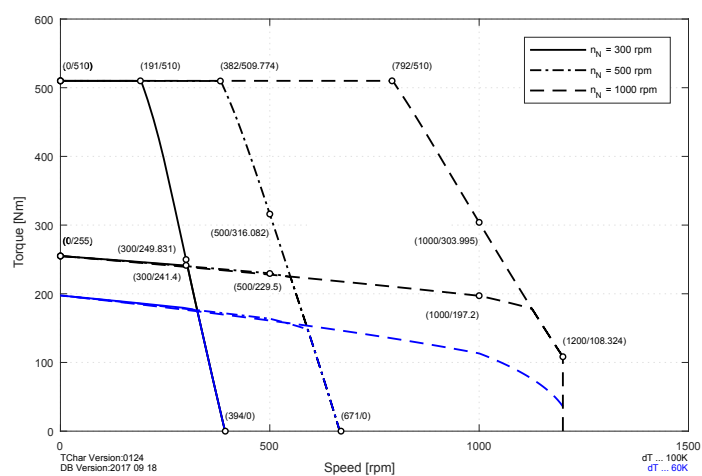
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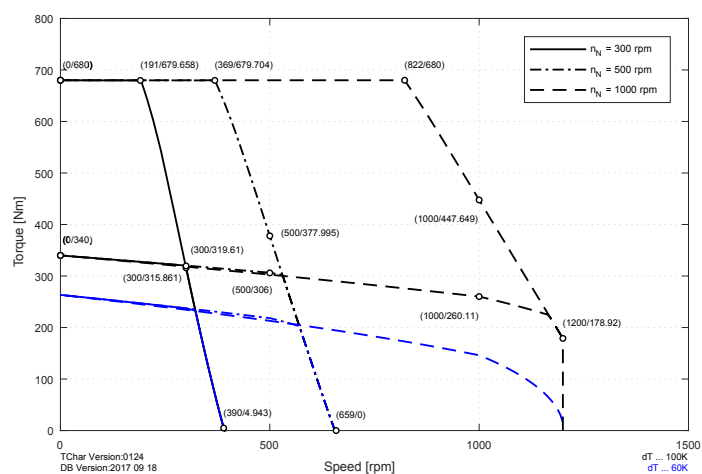
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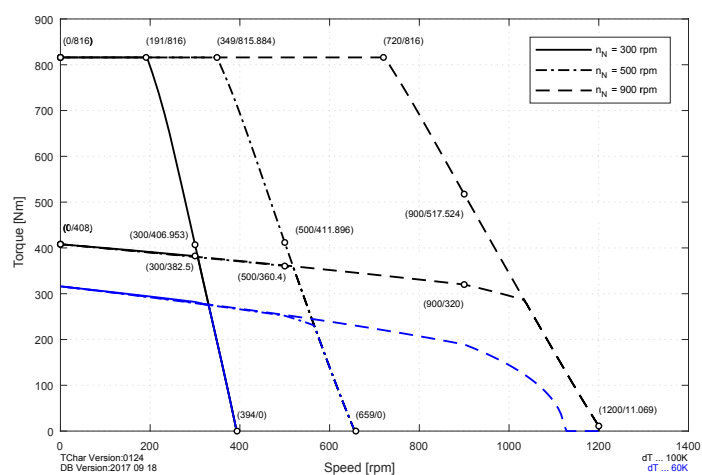
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8LTS96.eennnffgg-0

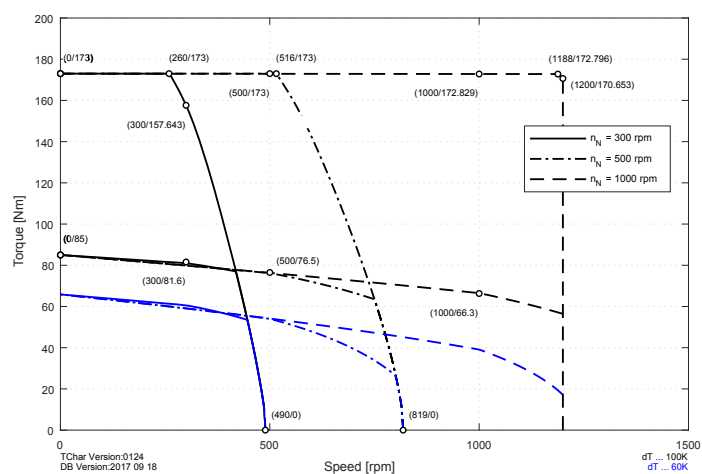


8LTS97.eennnffgg-0

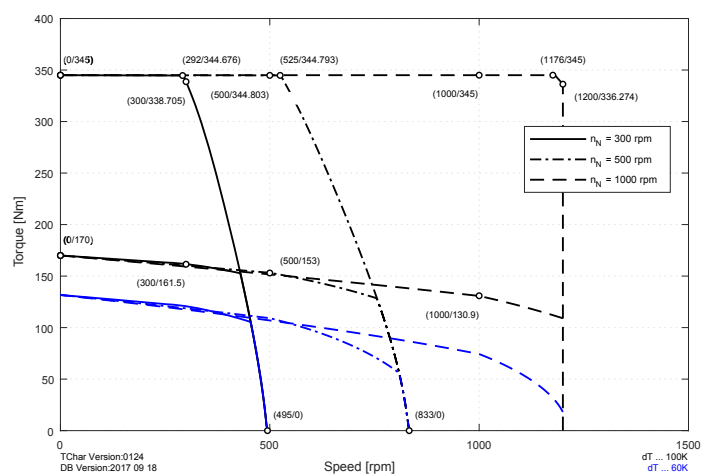


2.18.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

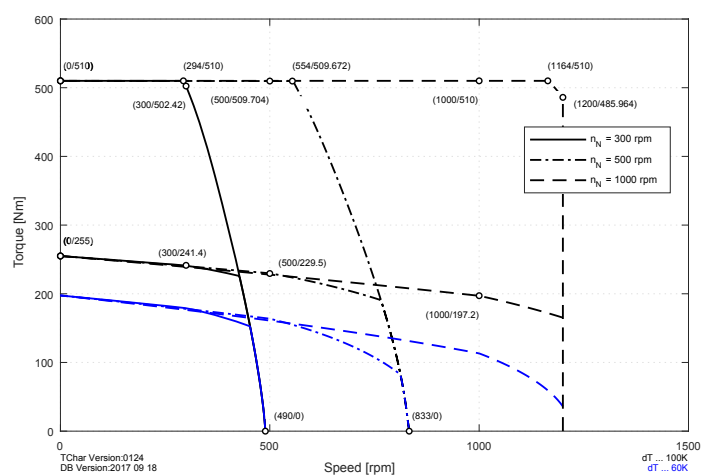
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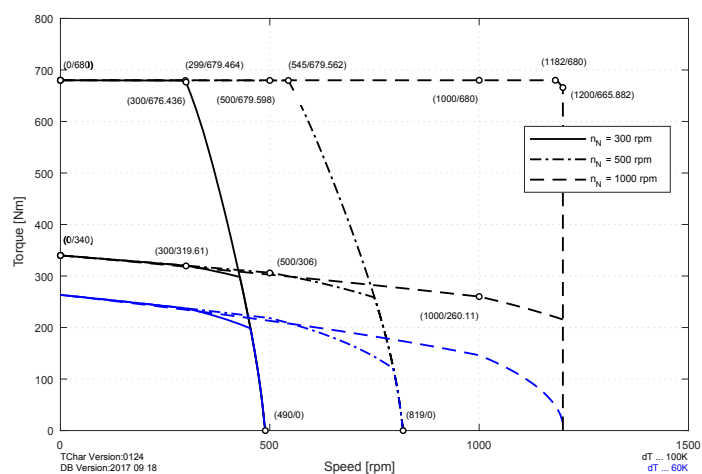
8LTS94.eennnffgg-0



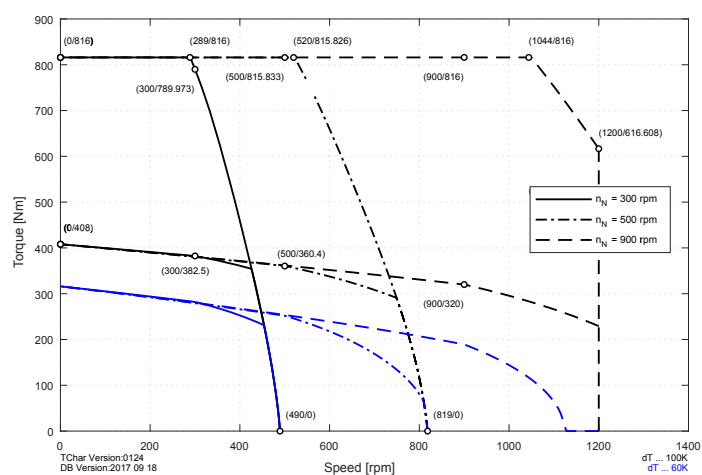
8LTS95.eennnffgg-0



8LTS96.eennnffgg-0

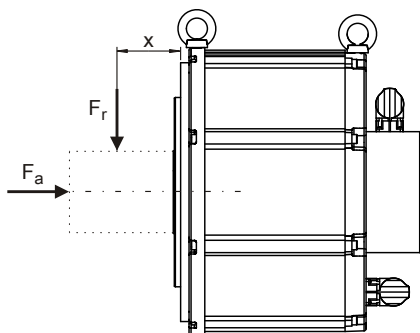


8LTS97.eennnffgg-0



2.18.4 8LTS9 - Permissible shaft load

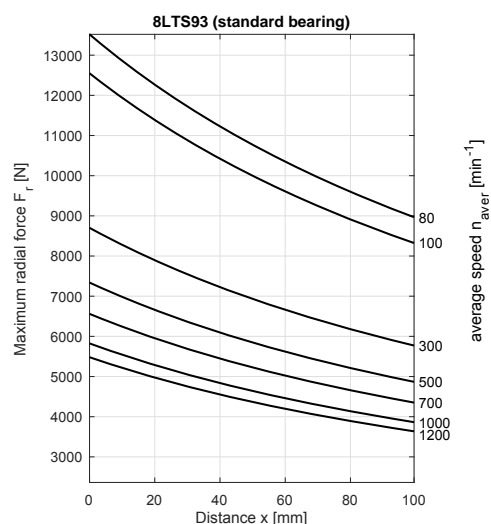
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



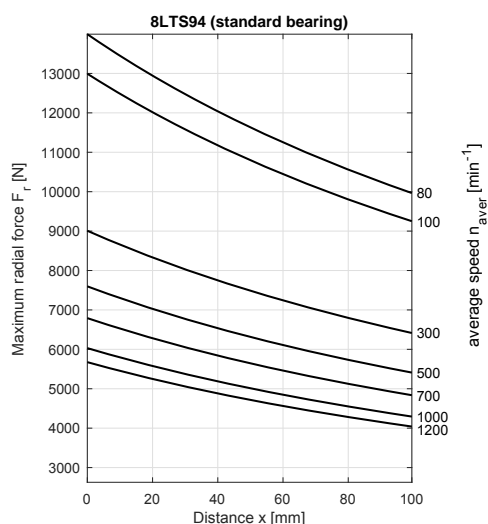
F_r ... Radial force

F_a ... Axial force

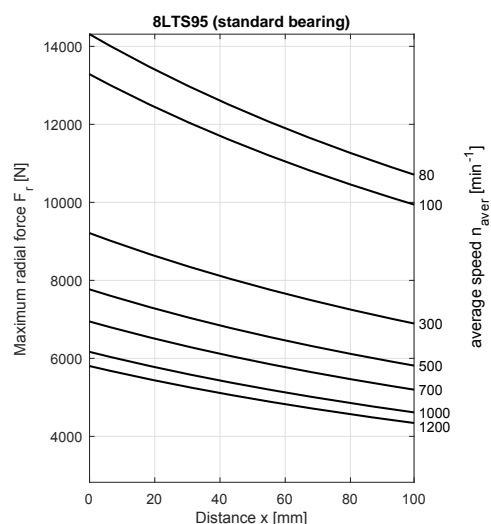
x ... Distance between the motor flange and the point where radial force F_r is applied.



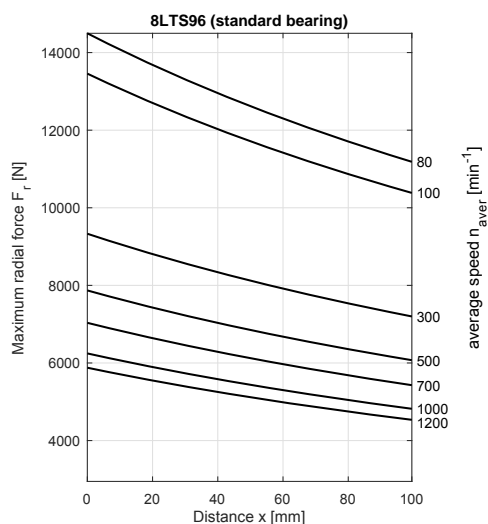
maximum allowed axial force: $F_{amax} = 1113 \text{ N}$



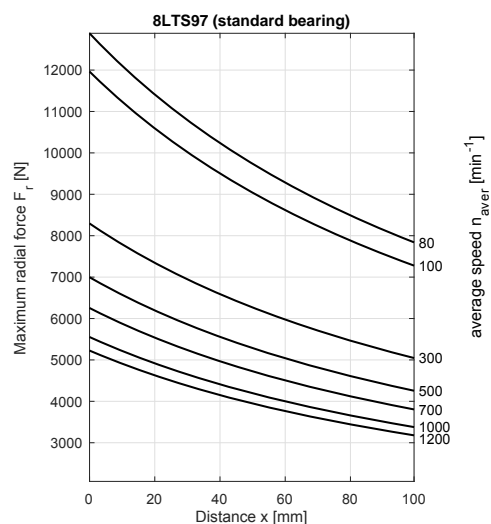
maximum allowed axial force: $F_{amax} = 1202 \text{ N}$



maximum allowed axial force: $F_{amax} = 1265 \text{ N}$

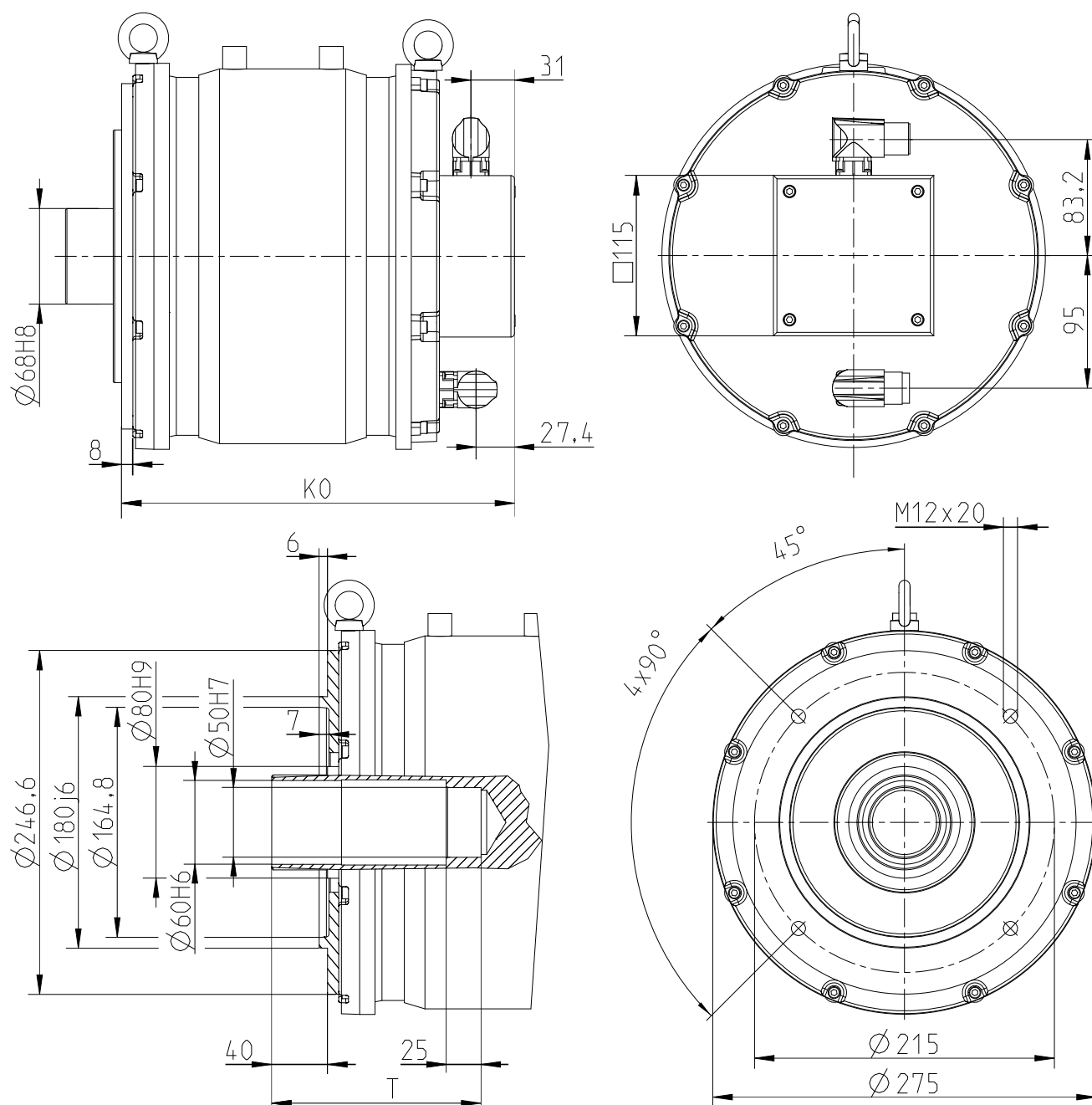


maximum allowed axial force: $F_{amax} = 1303 \text{ N}$



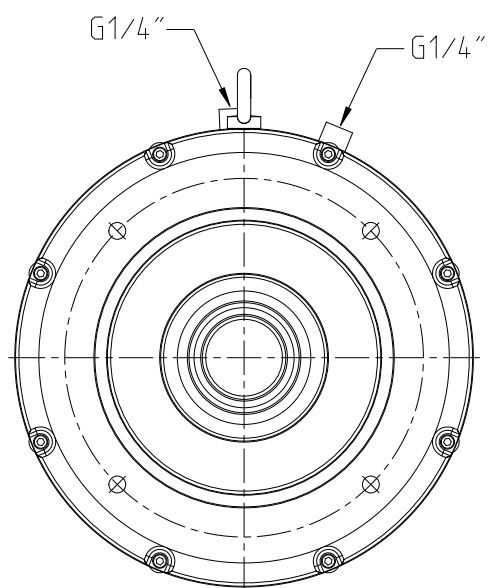
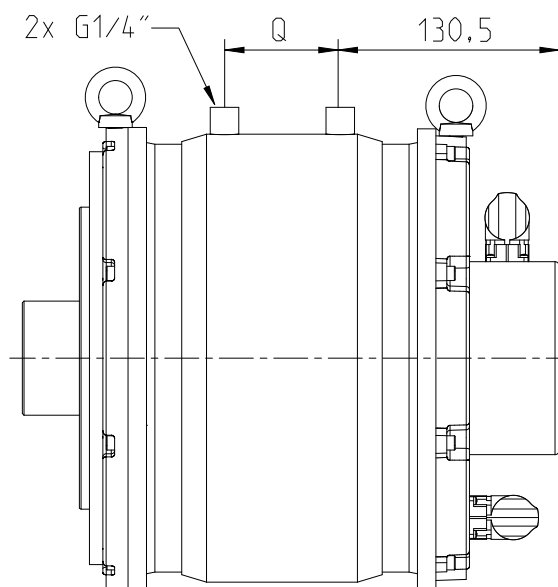
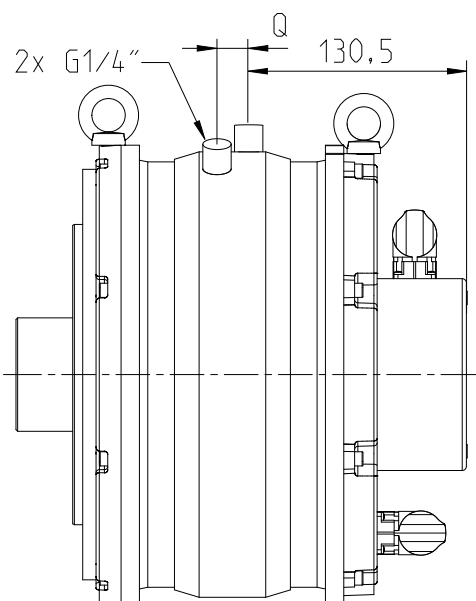
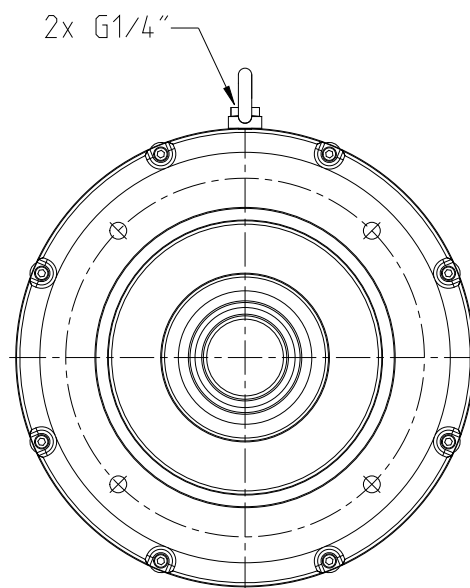
maximum allowed axial force: $F_{amax} = 1007 \text{ N}$

2.18.5 8LTS9 - Dimensions



	K_0	T
8LTS93	230	125
8LTS94	280	150
8LTS95	330	175
8LTS96	380	200
8LTS97	420	225

8LTS93


8LTS94
8LTS95
8LTS96
8LTS97


	Q
8LTS93	19
8LTS94	69
8LTS95	119
8LTS96	169
8LTS97	209

2.19 8LTSC - Technical data

Model number	8LTSC3. eeA08ffgg-0	8LTSC3. ee003ffgg-0	8LTSC3. ee005ffgg-0	8LTSC4. eeA08ffgg-0	8LTSC4. ee003ffgg-0	8LTSC4. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	80	300	500	80	300	500
Number of pole pairs	15					
Nominal torque M_N [Nm]	190	176	163	372	344	318
Nominal power P_N [W]	1592	5529	8535	3116	10807	16650
Nominal current I_N [A]	3.89	10.81	16.69	7.62	21.13	32.55
Stall torque M_0 [Nm]	196		383			
Stall current I_0 [A]	4	12	20.1	7.8	23.5	39.2
Maximum torque M_{max} [Nm]	345		703			
Maximum current I_{max} [A]	10.24	30.71	51.18	20.86	62.58	104.3
Maximum speed n_{max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	17.1	1.9	0.75	7.61	0.91	0.32
Stator inductance L_{2ph} [mH]	297.7	33.08	12.5	154	17.9	6.62
Electrical time constant t_{el} [ms]	17.41		16.58	20.24	19.76	20.88
Thermal time constant t_{therm} [min]	68		95.2			
Moment of inertia J [kgcm ²]	1700		3000			
Weight without brake m [kg]	66		93			
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1090	1180	1320	1090	1320	1640
ACOPOSmulti 8BVxxxx...	0055	0110	0330	0110	0330	0440
Cross section for B&R motor cables [mm ²]	1.5	4		1.5	4	10
Connector size	1.0					1.5

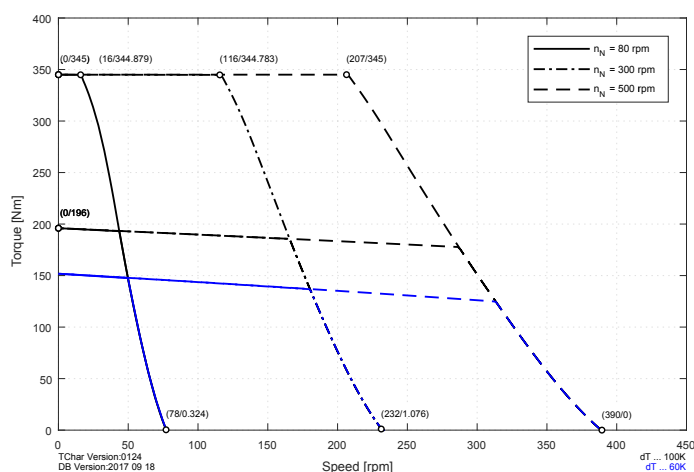
Model number	8LTSC5. eeA08ffgg-0	8LTSC5. ee003ffgg-0	8LTSC5. ee005ffgg-0	8LTSC6. eeA08ffgg-0	8LTSC6. ee003ffgg-0	8LTSC6. ee005ffgg-0
Motor						
Nominal speed n_N [rpm]	80	300	500	80	300	500
Number of pole pairs	15					
Nominal torque M_n [Nm]	540	498	461	695	643	596
Nominal power P_N [W]	4524	15645	24138	5822	20200	31206
Nominal current I_N [A]	11.06	30.59	47.19	14.23	39.49	61.01
Stall torque M_0 [Nm]	553			714		
Stall current I_0 [A]	11.3	34	56.6	14.6	43.9	73.1
Maximum torque M_{max} [Nm]	1054			1405		
Maximum current I_{max} [A]	31.27	93.82	156.37	41.69	125.07	208.44
Maximum speed n_{max} [rpm]	700					
Torque constant K_T [Nm/A]	48.84	16.28	9.77	48.84	16.28	9.77
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	590.6	2953.1	984.4	590.6
Stator resistance R_{2ph} [Ω]	4.31	0.53	0.21	3.4	0.38	0.13
Stator inductance L_{2ph} [mH]	99.2	11.4	4.35	77	8.66	3.1
Electrical time constant t_{el} [ms]	23.03	21.63	20.62	22.65	22.73	23.66
Thermal time constant t_{therm} [min]	122.4			149.6		
Moment of inertia J [kgcm ²]	4400			5800		
Weight without brake m [kg]	121			148		
Holding brake						
Holding torque of brake M_{Br} [Nm]	0					
Mass of brake [kg]	0					
Moment of inertia of brake J_{Br} [kgcm ²]	0					
Recommendations						
ACOPOS 8Vxxxx.xx...	1180	1640		1180	1640	128M
ACOPOSmulti 8BVIxxxx...	0110	0440	0660	0220	0660	0880
Cross section for B&R motor cables [mm ²]	4	10		4	10	0
Connector size	1.0	1.5		1.0	1.5	

Technical data

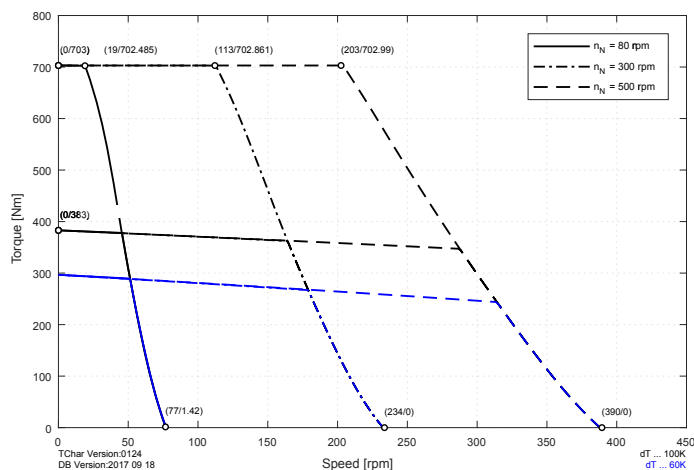
Model number	8LTSC7.00A08ffgg-0	8LTSC7.00003ffgg-0	8LTSC8.00A08ffgg-0	8LTSC8.00003ffgg-0
Motor				
Nominal speed n_N [rpm]	80	300	80	300
Number of pole pairs	15			
Nominal torque M_N [Nm]	845	780	993	918
Nominal power P_N [W]	7079	24504	8319	28840
Nominal current I_N [A]	17.3	47.91	20.33	56.38
Stall torque M_0 [Nm]	867		1020	
Stall current I_0 [A]	17.8	53.3	20.9	62.6
Maximum torque M_{max} [Nm]	1750		2108	
Maximum current I_{max} [A]	51.93	155.78	62.55	187.64
Maximum speed n_{max} [rpm]	700			
Torque constant K_T [Nm/A]	48.84	16.28	48.84	16.28
Voltage constant K_E [V/1000 rpm]	2953.1	984.4	2953.1	984.4
Stator resistance R_{2ph} [Ω]	2.66	0.32	2.29	0.25
Stator inductance L_{2ph} [mH]	62.3	7.07	52.9	5.86
Electrical time constant t_{el} [ms]	23.42	21.75	23.1	23.07
Thermal time constant t_{therm} [min]	177		204	
Moment of inertia J [kgcm ²]	7150		8500	
Weight without brake m [kg]	176		204	
Holding brake				
Holding torque of brake M_{Br} [Nm]	0			
Mass of brake [kg]	0			
Moment of inertia of brake J_{Br} [kgcm ²]	0			
Recommendations				
ACOPOS 8Vxxx.xx...	1320	1640	1320	128M
ACOPOSmulti 8BVlxxx...	0220	0660	0330	0880
Cross section for B&R motor cables [mm ²]	4	10	4	0
Connector size	1.0	1.5	1.0	-

2.19.1 Speed-Torque characteristic curves at 325 VDC DC bus voltage

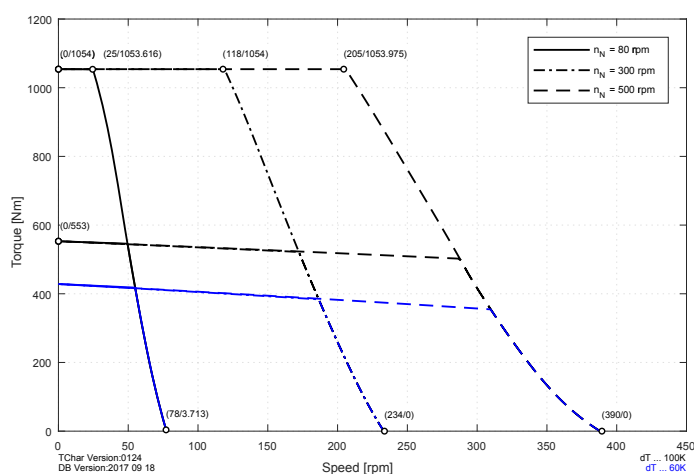
8LTSC3.eennnffgg-0



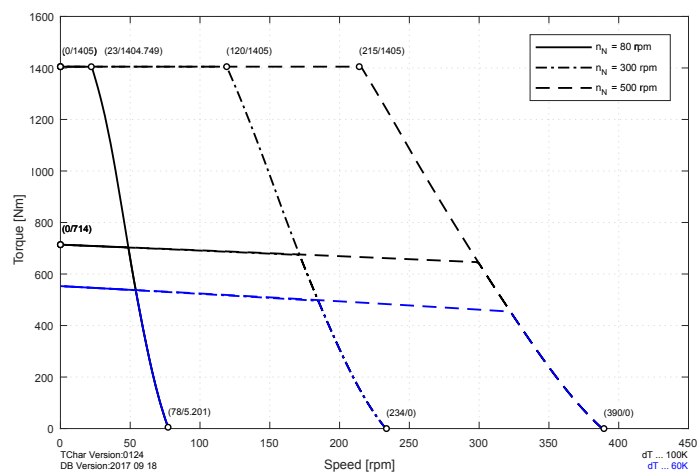
8LTSC4.eennnffgg-0



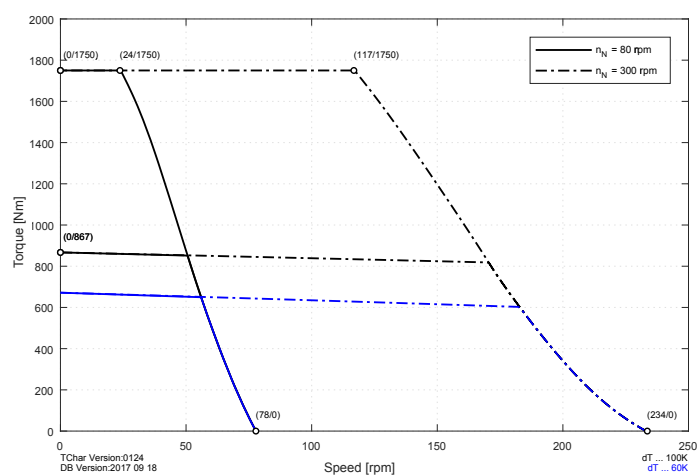
8LTSC5.eennnffgg-0



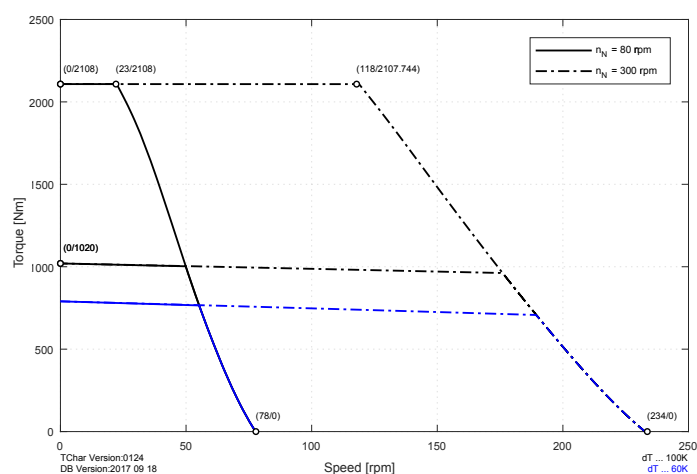
8LTSC6.eennnffgg-0



8LTSC7.eennnffgg-0

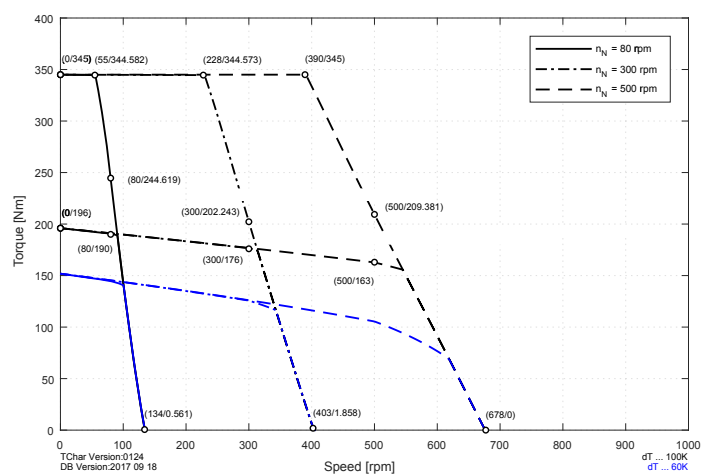


8LTSC8.eennnffgg-0

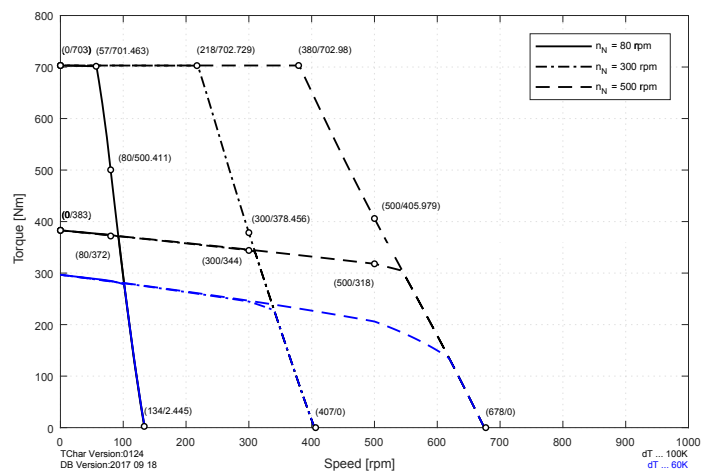


2.19.2 Speed-Torque characteristic curves at 560 VDC DC bus voltage

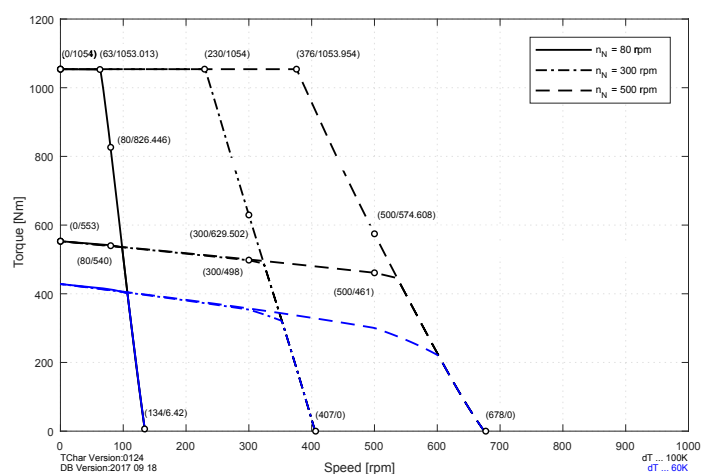
8LTSC3.eennnffgg-0



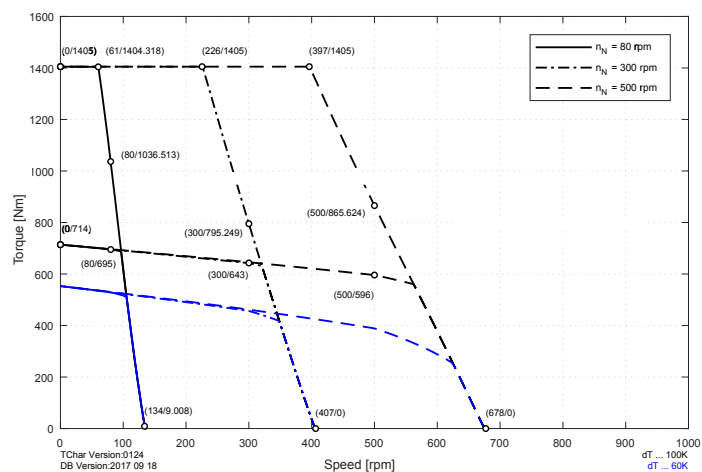
8LTSC4.eennnffgg-0



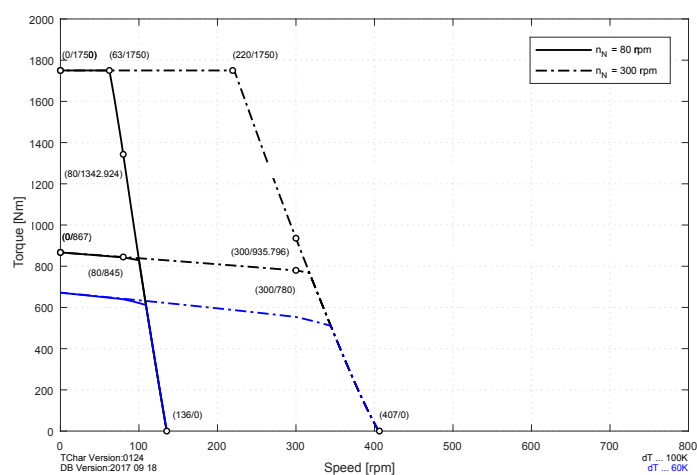
8LTSC5.eennnffgg-0



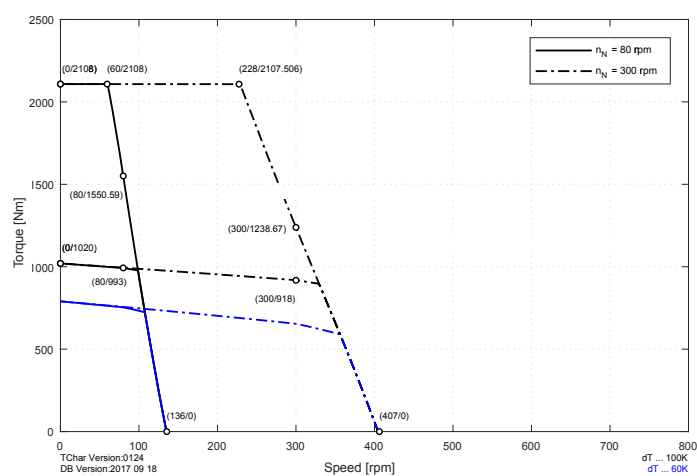
8LTSC6.eennnffgg-0



8LTSC7.eennnffgg-0

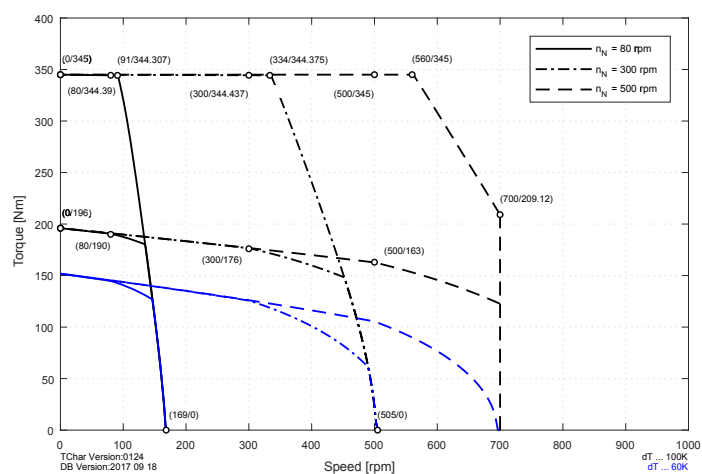


8LTSC8.eennnffgg-0

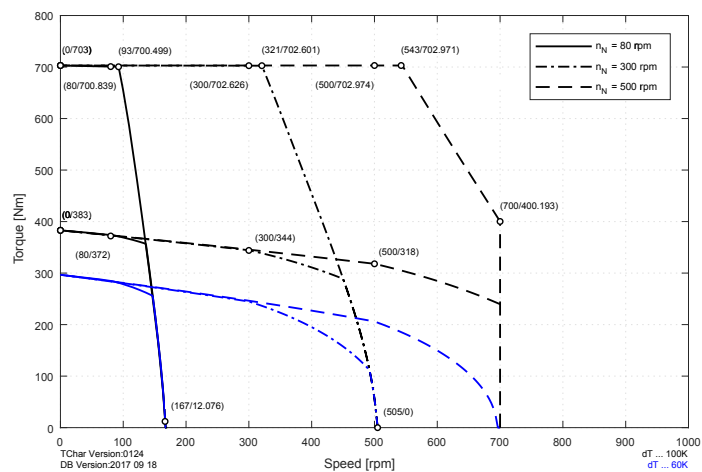


2.19.3 Speed-Torque characteristic curves at 750 VDC DC bus voltage

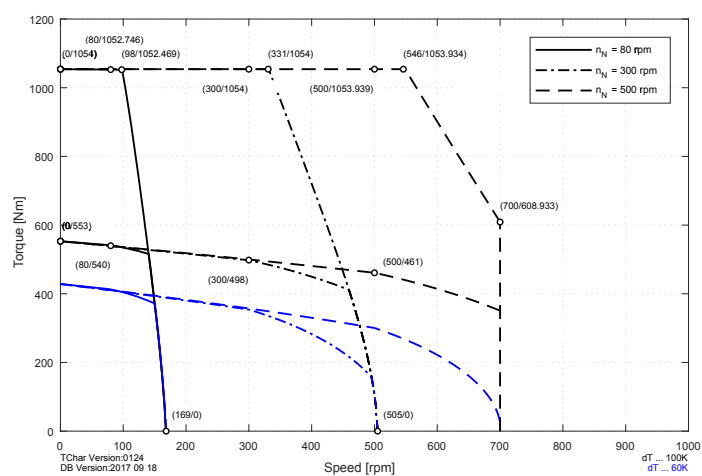
8LTSC3.eennnffgg-0



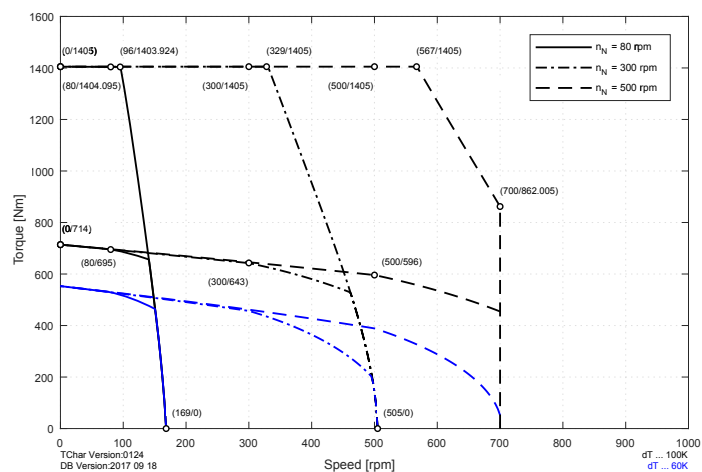
8LTSC4.eennnffgg-0



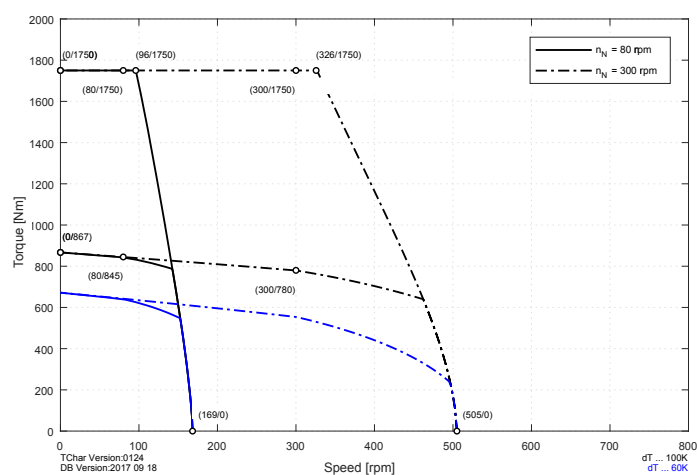
8LTSC5.eennnffgg-0



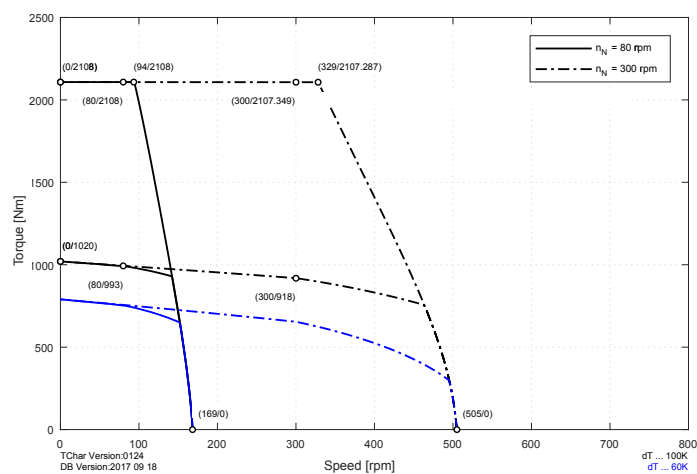
8LTSC6.eennnffgg-0



8LTSC7.eennnffgg-0

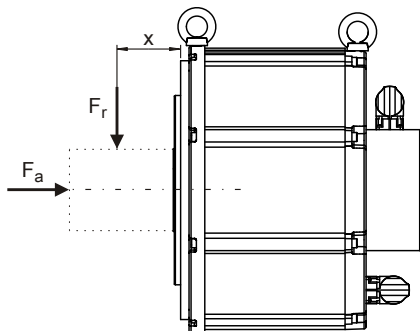


8LTSC8.eennnffgg-0



2.19.4 8LTSC - Permissible shaft load

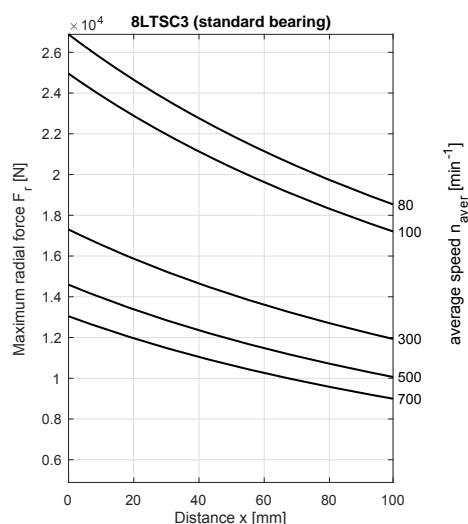
Note the information in section "Load capacity of the shaft end and bearing" on page of chapter "Installation conditions".



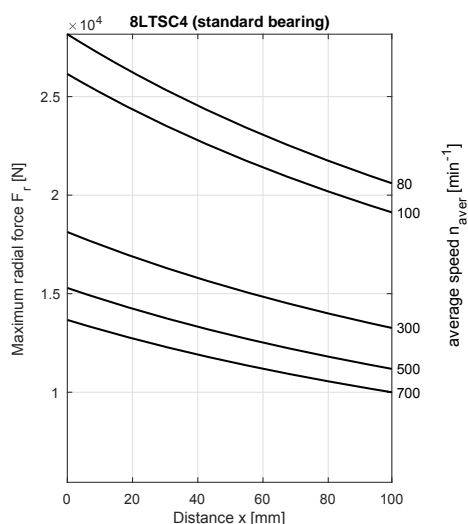
F_r ... Radial force

F_a ... Axial force

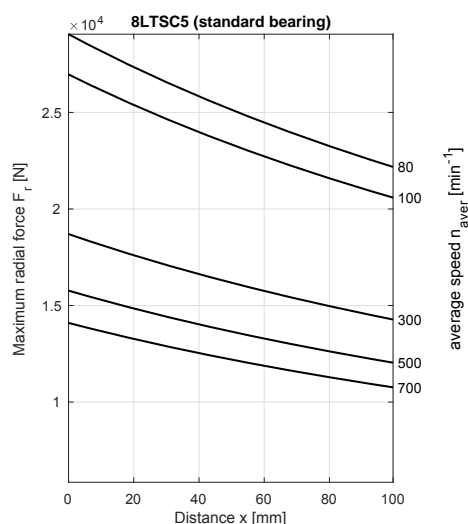
x ... Distance between the motor flange and the point where radial force F_r is applied.



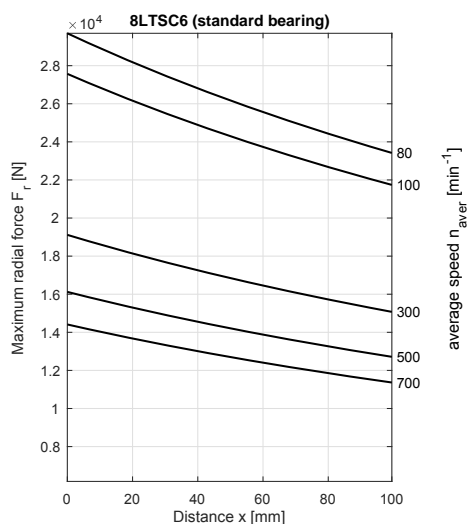
maximum allowed axial force: $F_{amax} = 2265 \text{ N}$



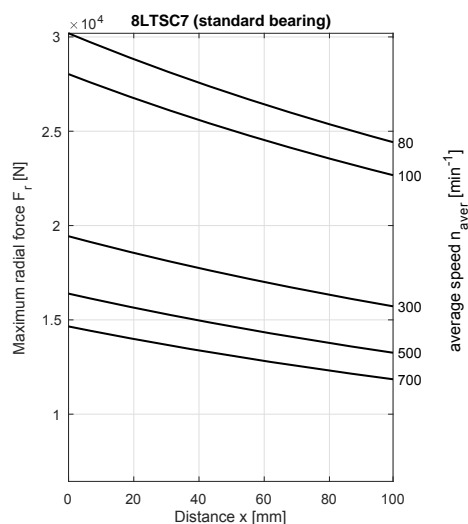
maximum allowed axial force: $F_{amax} = 2457 \text{ N}$



maximum allowed axial force: $F_{amax} = 2596 \text{ N}$

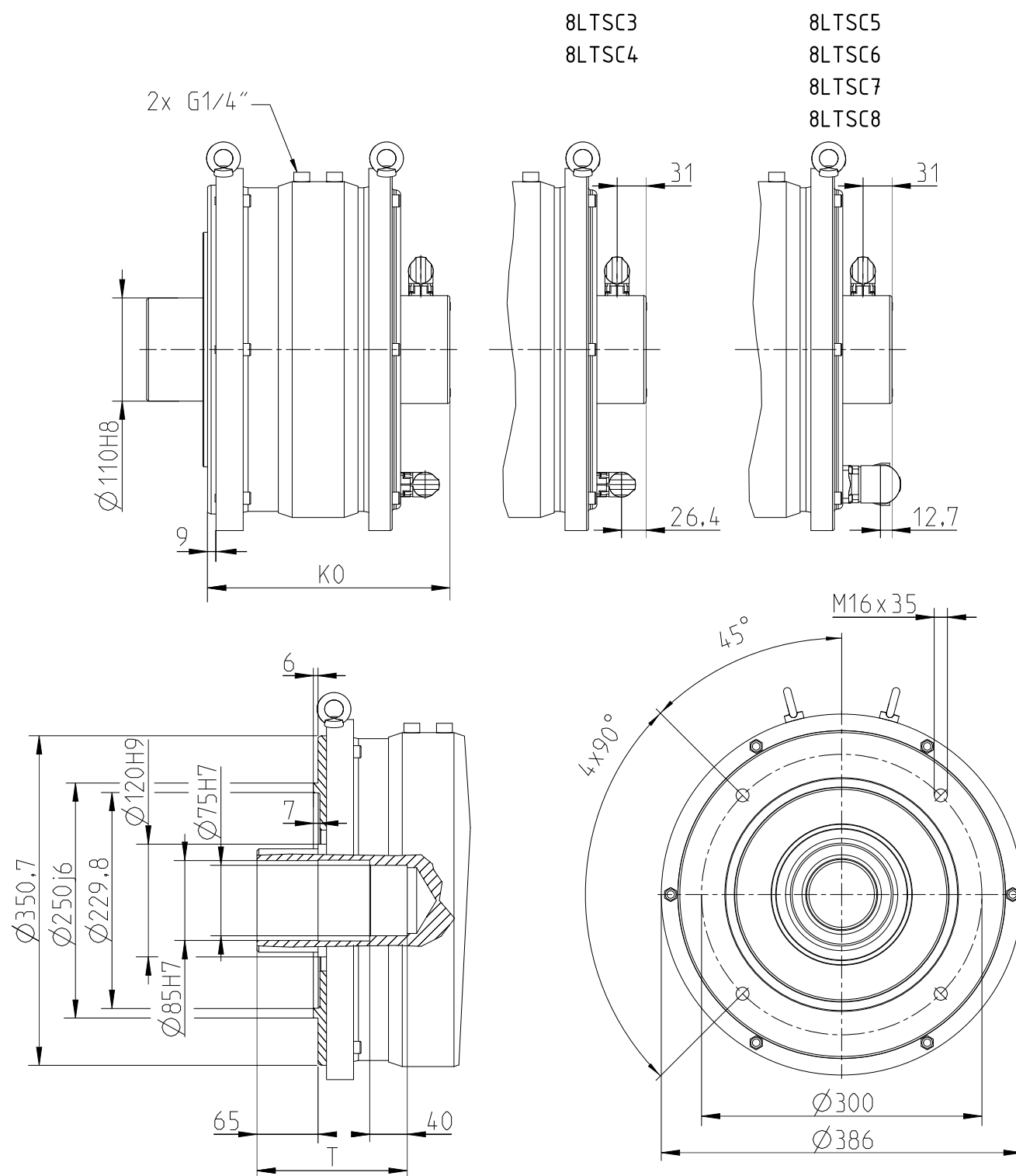


maximum allowed axial force: $F_{amax} = 2703 \text{ N}$



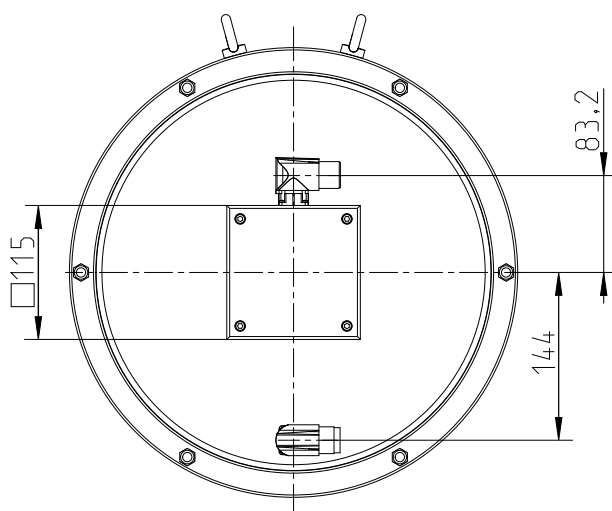
maximum allowed axial force: $F_{amax} = 2787 \text{ N}$

2.19.5 8LTSC - Dimensions

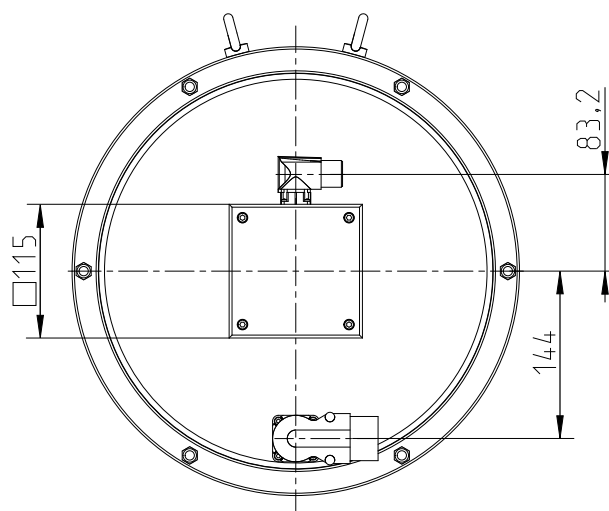


	K ₀	T
8LTSC3	259	160
8LTSC4	309	185
8LTSC5	359	210
8LTSC6	409	235
8LTSC7	459	260
8LTSC8	509	285

8LTSC3
8LTSC4



8LTSC5
8LTSC6
8LTSC7
8LTSC8



3 Transport and storage

During transport and storage, the product must be protected against undue stress (mechanical loads, temperature, moisture, corrosive atmospheres, etc.).

If necessary, also protect existing electrostatically sensitive components such as the encoders in motors against electrostatic discharge (ESD).

Never use attachment parts (cable connection, terminal boxes, fans, etc.) for securing during transport or as supporting surfaces.

Transport and storage conditions

- The room must be dry, dust-free and free of vibrations.
- The room must be well ventilated and free from drafts.
- The air in the room is not permitted to contain aggressive or hazardous gases.

Storage and transport conditions	8LTA / 8LTB / 8LTQ	8LTJ / 8LTK / 8LTS
Storage temperature	-20 to 60°C	
Relative humidity during storage	Max. 90%, non-condensing	
Transport temperature	-20 to 60°C	
Relative humidity during transport	Max. 90%, non-condensing	

Radial or axial forces on the shaft

Caution!

Damage to property due to excessive radial or axial forces on the shaft.

Excessive radial or axial forces on the shaft can damage the bearing and impair the effect of any holding brake present to such an extent that the braking effect is non-existent or reduced. Similarly, encoder errors or damage to the gearbox can occur as a result.

- Transport and store the product only in its original packaging and lying on the housing.
- Avoid pressure and impact on the shaft end and housing.
- Do not use the shaft for securing during transport.
- Transport and lift heavy output shaft components separately and not installed on the shaft end.

Transport

Check product deliveries immediately for transport damage and report any damage immediately to the carrier. In the event of damage, discontinue use where applicable.

Danger!

Danger of injury due to loads!

Suspended loads can lead to personal injury or death if they fall down. Heavy loads can tilt and trap people or severely injure them.

Failure to comply with instructions, guidelines and regulations or use of unsuitable or damaged tools and devices can result in serious injury and/or damage to property.

- Motors should only be lifted without any additional load from other products (e.g. gears, pulleys, couplings, etc.).
- If motors have eye bolts, only lift the motors using the eye bolts.
- Only use permitted lifting, transport and aids with sufficient lifting capacity.
- Never stand in the danger zone or under suspended loads.
- Secure the product against dropping and tilting.
- Wear safety shoes, protective clothing and a safety helmet.
- Comply with the national and local regulations.

Storage

Caution!

Damage caused by degraded material properties.

Storage for long periods of time or storage under improper conditions can cause certain materials to age prematurely, to have degraded properties and to become damaged. Damaged components can then result in further damage to property.

Recommendations to avoid damage during storage:

- Reduce the storage time to a minimum and do not exceed the maximum storage time of 2 years.
- Rotate the motor shaft a few turns at least every 6 months either by hand or at a low speed (max. 50 rpm). Bearing noise can occur during the run-in phase, which is perfectly normal and is not a sign of bearing damage.
- Apply a preservative coating to unprotected components such as the shaft end.
- Avoid contact corrosion.
- Use the original packaging.
- Use covers to protect against dust.
- Check the seals for damage when the item is issued or prior to use.

3.1 Eye bolts

If motors have eye bolts, only lift the motors using the eye bolts. The position of the eye bolts depends on the overall length of the motor.

Caution!

The eye bolts included in delivery are intended exclusively for lifting the motor without any additional components installed!

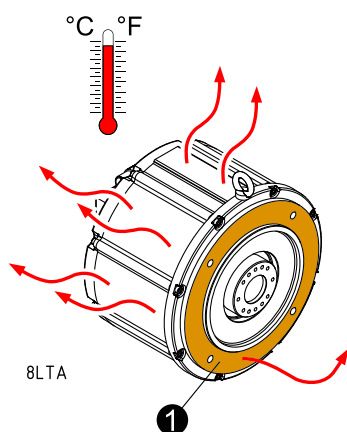
4 Installation conditions

Before every commissioning procedure, the motor must be checked by qualified personnel. The check must include the proper condition in terms of mounting and installation, the installation conditions and safe operation.

Operating conditions	8LTA / 8LTB / 8LTQ	8LTJ / 8LTK / 8LTS
Rating class, operating mode per EN 60034-1	S1 - Continuous operation	
Ambient temperature during operation	-15 to 40°C	
Relative humidity during operation	5 to 95%, non-condensing	
Reduction of nominal and stall current as well as nominal and stall torque at temperatures above 40°C	5% per 5°C	
Max. ambient temperature during operation	55°C ¹⁵⁾	
Reduction of nominal and stall current as well as nominal and stall torque at installation elevations starting at 1,000 m above sea level	5% per 1,000 m	
Maximum installation elevation	1,000 m ¹⁶⁾	
Max. flange temperature	65°C	
Degree of protection per EN 60034-5 (IP code): Degree of protection with optional oil seal (DIN 3760):	IP54 IP65	
Type of construction and mounting arrangement per EN 60034-7 (IM code)	Horizontal (IM3001) Vertical, motor suspended from the machine (IM 3011) ¹⁷⁾ Vertical, motor stands on the machine (IM3031)	Horizontal (IM 3001) ¹⁸⁾ Vertical, motor suspended from the machine (IM 3011) ¹⁹⁾²⁰⁾ Vertical, motor standing on the machine (IM 3031) ²¹⁾

4.1 Mounting type and cooling

Self-cooling motors (8LTA / 8LTB / 8LTQ)



Attach the motor with the **motor flange (1)**, which also serves as a **cooling surface**, directly onto the machine.

1. Mounting flange

Ensure unobstructed air circulation and cooling so that no heat accumulation can build up on the motor.

The following points must be observed:

- The opposite side of the mounting flange is not permitted to be thermally insulated. Heat from the motor must be allowed to dissipate sufficiently.
- Air circulation must not be impeded. There must be sufficient cooling air on the motor housing.
- Exceeding the specified maximum values for motor temperature is not permitted.

It is important to note the following:

- Power or heat from the motors is dissipated via the mounting flange and surface of the motor housing.
- The motor can heat up due to external heat sources.

¹⁵⁾ Continuous operation of torque motors from an ambient temperature 40°C to max. 55°C is possible, but this results in premature aging.

¹⁶⁾ Requirements that go beyond this must be arranged with B&R.

¹⁸⁾ Permissible water connection direction: Water inlet on top

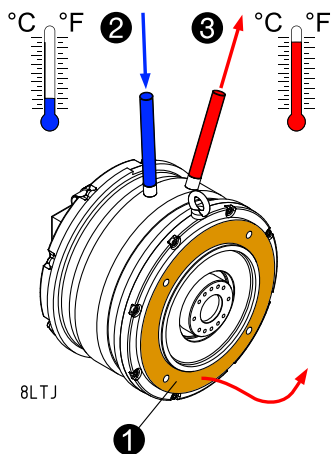
¹⁷⁾ With the IM 3011 type of construction and mounting arrangement (vertical, motor suspended from the machine), there is a risk of production fluids or oils penetrating the motor on the flange side. Motors or motor-gearbox combinations that should be used with this mounting arrangement must therefore have at least IP65 protection on the flange side.

¹⁹⁾ With the IM 3011 type of construction and mounting arrangement (vertical, motor suspended from the machine), there is a risk of production fluids or oils penetrating the motor on the flange side. Motors or motor-gearbox combinations that should be used with this mounting arrangement must therefore have at least IP65 protection on the flange side.

²⁰⁾ Permissible water connection direction: Water inlet on bottom

²¹⁾ Permissible water connection direction: Water inlet on bottom

Liquid-cooled motors (8LTJ / 8LTK / 8LTS)



Attach the motor with the **motor flange** (1), which also serves as a **cooling surface**, directly onto the machine.

1. Mounting flange
2. Coolant inlet
3. Coolant outlet

Ensure sufficient cooling so that no heat accumulation can build up on the motor.

Cooling takes place using water; the coolant absorbs the waste heat and transports it outwards. The reduction of the coolant temperature must be ensured by external measures.

The following points must be observed:

- The maximum permissible coolant inlet temperature is not permitted to be exceeded.
- A hot motor is not permitted to be cooled abruptly by supplying coolant with too great of a temperature difference. This could result in damage to the motor due to deformation of the motor housing.

It is important to note the following:

- To avoid condensation, the coolant temperature at the mounting flange must be maintained as specified in the general motor data.
- To avoid condensation, the coolant supply must be interrupted if the motor is not running for a longer period of time.
- To avoid frost damage, the coolant must be drained if the motor has not run for a long time and at an ambient temperature of less than 3°C.
- Consulting B&R is required before using antifreeze.

General

Caution!

Personal injury and damage to property due to failure or overheating of the drive.

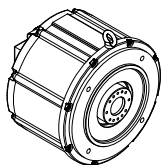
If the maximum permissible operating temperature is exceeded, a drive defect with consequential damage is very probable.

The cause of a defect could insufficient lubrication due to overheating, for example.

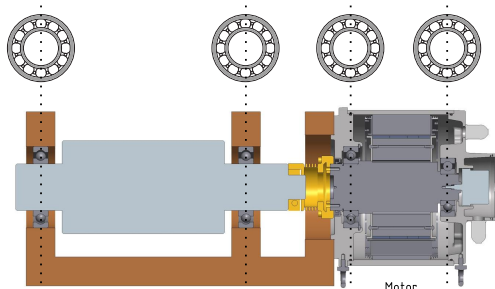
- **For safety reasons, switch off the machine if the maximum permissible temperature is exceeded.**
- **Ensure unobstructed air circulation and cooling so that no heat accumulation can build up in the drive or machine.**

4.1.1 Installation options

8LTA / 8LTJ - ISO output flange



There are two mounting options for motors with ISO output flange.



4x bearing with coupling

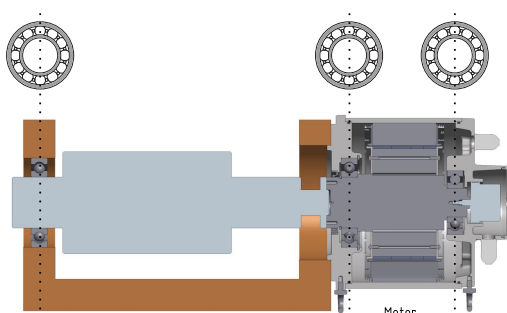
Standardized mechanical interface. Connecting the motor and machine shaft with a coupling.

Advantages:

Simple and cost-effective solution. Position and installation inaccuracies are compensated via coupling (radial, axial and angular). Good thermal connection of the motor.

Disadvantages:

Note the torque load of the coupling. Two-mass oscillator, inertia ratio is worse than with a direct motor. Limitation of control dynamics via mechanical resonant frequencies.



3x bearing (overdetermined)

The motor bearing takes over part of the shaft support. Design authority lies with the customer; B&R advises on mechanical integration.

Advantages:

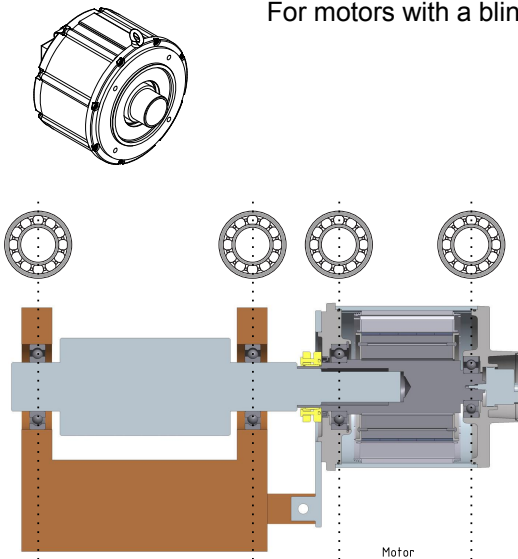
Fewer parts. Very stiff connection with motor and machine shaft. Very cost-effective. Good thermal connection of the motor.

Disadvantages:

Overdetermination on the shaft can result in an excess of maximum permissible bearing forces. You must take into account thermal expansion, mechanical tolerances and the accuracy of the mechanical products since this can result in an excess of maximum permissible bearing forces. Take into account and calculate the bearing service life. Alignment errors must be compensated for within the elastic range of the shaft (if necessary, perform an FMEA).

8LTQ / 8LTS - Shaft with blind hole

For motors with a blind hole, the machine shaft is clamped (e.g. with Ringspann products).



4x bearing

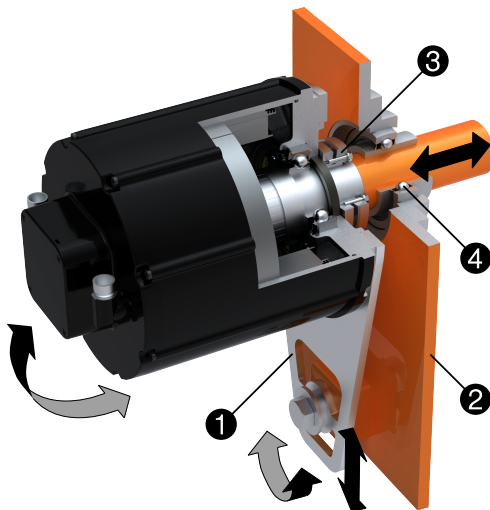
The motor is directly connected to the machine shaft.

Advantages:

Very stiff connection to the machine shaft. The torque bracket holds the motor and is connected to the machine frame.

Disadvantages:

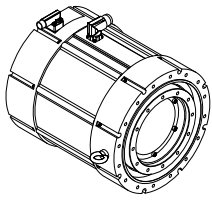
The motor weight must be supported by the machine shaft. High rigidity in the direction of rotation by means of a torque bracket is required. Adjustments in the axial and radial directions and alignment are required to avoid overloading the bearings. Poorer thermal connections result in power reduction. This must be taken into account during sizing.



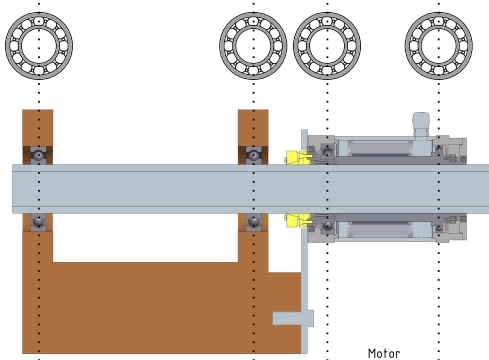
Torque bracket

- 1) Torque bracket
- 2) Machine bed
- 3) Clamping element
- 4) Machine bearing

8LTB / 8LTK - Hollow shaft



For motors with hollow shafts, the machine shaft is clamped (e.g. with Ringspann products) and the stator of the motor is connected to the machine using a torque bracket.



4x bearing

The motor is directly connected to the machine shaft.

Advantages:

Very stiff connection to the machine shaft. The torque bracket holds the motor and is connected to the machine frame.

Disadvantages:

The motor weight must be supported by the machine shaft. High rigidity in the direction of rotation by means of a torque bracket is required. Adjustments in the axial and radial directions and alignment are required to avoid overloading the bearings. Poorer thermal connections result in power reduction. This must be taken into account during sizing.

4.1.2 Load capacity of the shaft end and bearing

8LT direct drive motors are equipped with grooved ball bearings that are sealed on both sides and lubricated. Radial and axial forces (F_r , F_a) applied to the shaft end during operation and installation must be within the specifications listed below. Bearing elements are not permitted to be subjected to shocks or impacts! Incorrect handling will reduce the service life and result in damage to the bearings.

Radial force

The radial force F_r on the shaft end is a function of the loads during installation (e.g. belt tension on pulleys) and operation (e.g. load torque on the pinion). The maximum radial force F_r depends on the shaft end type, bearing type, average speed, the position where the radial force is applied and the desired service life of the bearings.

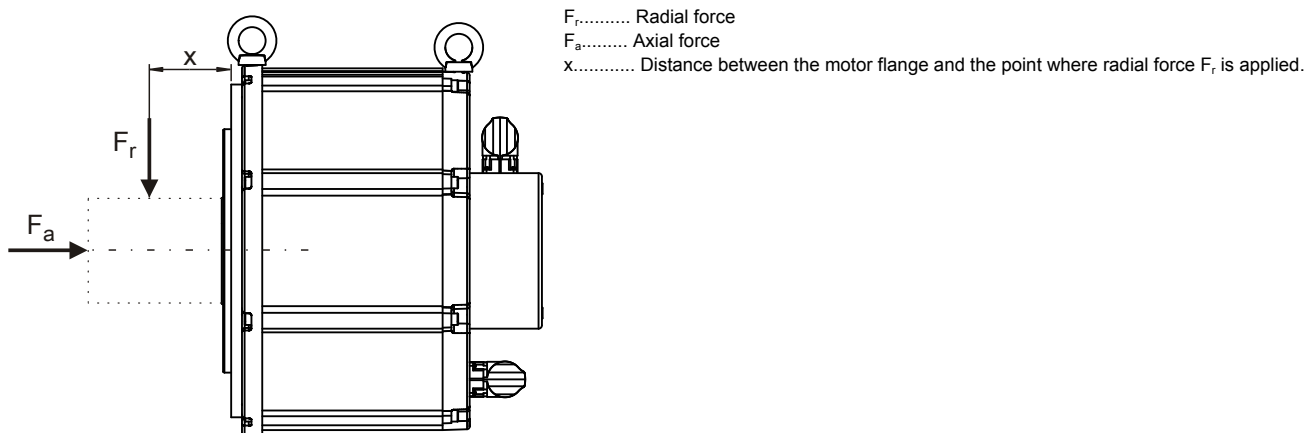
Axial force, shift in shaft position caused by axial force

The axial force F_a on the shaft end is a function of the loads during installation (e.g. stress caused by mounting) and operation (e.g. thrust caused by slanted tooth pinions). The maximum axial force F_a depends on the bearing type and the desired service life of the bearings. The fixed bearing is secured on the B-side flange with a retaining ring. The floating bearing on the B-side flange is preloaded with a spring in the direction of the A-side flange. Axial forces in the direction of the B-side flange can cause the spring bias to be overcome, which shifts the shaft by the amount of axial backlash in the bearing (approx. 0.1 - 0.2 mm). This shift can cause problems on motors with holding brakes or all motors with inductive encoder systems. As a result, no axial force in excess of the calculated values is permitted in the direction of the B-side flange when using these motors. (See "Determining permissible values for F_r and F_a ".)

Determining permissible values of F_r and F_a

For information about determining permissible values of F_r and F_a , see the diagrams in chapter [Technical data](#) (section "Maximum shaft load" for the respective motor).

The permissible values in the diagram are based on a mechanical bearing lifespan of 20,000 operating hours (calculation of bearing service life based on DIN ISO 281).



5 Installation and connection

5.1 Before installation

Read this user's manual completely before performing any work activities.

In addition, take into account the technical documentation for all other machine components as well as the finished machine.

5.2 Safety

Work on motors and their wiring is only permitted to be carried out by qualified personnel ²⁾ without voltage applied. The control cabinet must first be disconnected from the power supply and secured against being switched on again.

Only use appropriate equipment and tools. Protect yourself with safety equipment.

Warning!

Personal injury and damage to property due to unauthorized modifications!

As a result of unauthorized modifications to the product, the performance and limit values can be negatively affected and dangers can arise. Due to this, severe damage to property and injuries cannot be excluded.

Unauthorized modifications are therefore prohibited!

- **Do not carry out any unauthorized modifications or alterations to the product.**
- **If necessary, contact B&R.**

Caution!

The eye bolts included in delivery are intended exclusively for lifting the motor without any additional components installed!

5.2.1 General sources of danger

Tampering of protection or safety devices

Protective and/or safety devices protect you and other persons from dangerous voltage, rotating or moving elements and hot surfaces.

Danger!

Personal injury and damage to property due to tampering of protective equipment!

If protective or safety devices are removed or put out of operation, there is no longer any personal protection and serious personal injury and damage to property can occur.

- **Do not remove any safety devices.**
- **Do not put any safety devices out of operation.**
- **Always use all safety devices during short-term test and trial operations!**

Dangerous voltage

To operate the motors, dangerous voltage must be applied to certain parts.

²⁾ see "Qualified personnel" on page 9

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Danger due to electromagnetic fields

Electromagnetic fields are generated by the operation of electrical power engineering equipment such as transformers, drives and motors.

Danger!

Danger to health due to electromagnetic fields!

The functionality of a heart pacemaker can be impaired by electromagnetic fields to such an extent that the wearer experiences harm to his or her health, possibly with a fatal outcome.

- Observe relevant national health and safety regulations.
- Persons with pacemakers are not allowed to be in endangered areas.
- Warn staff by providing information, warnings and safety identification.
- Secure the danger zone by means of barriers.
- Reduce electromagnetic fields at their source (using shielding, for example).

Dangerous motion

By rotating and positioning motions of the motors, machine elements are moved or driven and loads conveyed.

After switching on the machine, movements of the motor shaft must always be expected! For this reason, higher-level protective measures must be put in place to ensure that personnel and machines are protected. This type of protection can be achieved, for example, by using stable mechanical protective equipment such as protective covers, protective fences, protective gates or photoelectric sensors.

In the immediate vicinity of the machine, provide sufficient and easily accessible emergency switching-off devices to stop the machine as quickly as possible in the event of an accident.

Danger!

Danger of injury due to rotating or moving elements and loads!

By rotating or moving elements, body parts can be drawn in or severed or subjected to impacts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Before working on the machine, secure it against unwanted movements. A holding brake is not suitable for this!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Motors can be started automatically via remote control! If appropriate, a corresponding warning symbol must be applied, and protective measures must be implemented to prevent entry into the high-risk area.

Danger!

Danger of injury due to loads!

Suspended loads can lead to personal injury or death if they fall down. Heavy loads can tilt and trap people or severely injure them.

Failure to comply with instructions, guidelines and regulations or use of unsuitable or damaged tools and devices can result in serious injury and/or damage to property.

- Motors should only be lifted without any additional load from other products (e.g. connection elements).
- Only use permitted lifting, transport and aids with sufficient lifting capacity.
- Never stand in the danger zone or under suspended loads.
- Secure the product against dropping and tilting.
- Wear safety shoes, protective clothing and a safety helmet.
- Comply with the national and local regulations.

Warning!

Danger of injury due to incorrect control or a defect.

Improper control of motors or a defect can result in injuries and unintended and hazardous movements of motors.

Such incorrect behavior can be triggered by:

- Incorrect installation or faults when handling components
- Improper or incomplete wiring
- Defective devices (servo drive, motor, position encoder, cables, brake)
- Incorrect control (e.g. caused by software error)

Risk due to hot surfaces

Due to the power dissipation from the motor and friction in the gearbox, these components as well as their environment can reach a temperature of more than 100°C.

The resulting heat is released to the environment via the housing and the flange.

Warning!

Risk of burns due to hot surfaces!

Touching hot surfaces (e.g. motor and gearbox housings, as well as connected components), can lead to very severe burns due to the very high temperature of these parts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Never touch the motor or gearbox housing as well as adjacent surfaces during nominal load operation.
- Be aware of hot surfaces also during standstill.
- Allow the motor and gearbox to cool down sufficiently before working on them; there remains the risk of burns for a long period of time after they are switched off.
- Always operate the motor or gearbox with all safety devices. Do this even during short testing and trial operations!

5.2.2 Noise emissions

Take into account the health of personnel in proximity to the machine.

Warning!

Hearing damage due to noise levels.

During operation, the motor can exceed the permissible workplace noise level and also cause hearing damage.

- Implement suitable noise reduction measures (e.g. housings, covers or other sound-insulating measures).
- Take into account applicable industrial safety regulations.

5.3 Shaft end and bearing

The motor shaft is supported on both sides with grease-lubricated grooved ball bearings. Protect the motor from damage due to excessive radial and axial forces!

Under all circumstances, avoid the following loads on the front shaft end or the rear motor housing cover:

- Excessive pressure
- Impacts
- Hammer blows

Warning!

Damage due to excessive axial forces!

The motor bearings can be damaged or the service life reduced by excessive axial forces (e.g. by impacting or pressing) on the shaft. Damage to the encoder or any installed options (holding brake, gearbox) is also possible.

- Do not hit the motor or output shaft with a hammer. The impact of a hammer certainly exceeds the permissible values.
- In addition, avoid impact and excessive pressure on the motor and output shaft.

Overdetermined bearing

Avoid an overdetermined bearing when attaching drive elements onto the output shaft! The necessarily occurring tolerances cause additional forces on the output shaft bearing. This can damage or significantly reduce the service life of the bearings!

Lifting and transporting

The weight of attachment elements (toothed gears, pulleys, couplings, etc.) can have a harmful effect on the bearing during lifting and transportation from the motor. Take into account these radial and axial loads during these operations!

Installing and removing attachment elements

Always install and remove the attachment elements (toothed gears, pulleys, couplings, etc.) at the shaft end without any axial load on the motor bearings and all other parts installed in the motor. For this, use suitable clamping sets, pressure sleeves, other clamping elements, retractors, etc. The centering hole on the face side of the shaft end can be used for this work.

Pay attention to balanced connection elements or corresponding assembly.

Secure the attachments against unintended loosening after installation and before operation.

5.4 Installing in the system

Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.

Inspection

Before installation, inspect the components to determine whether they are suitable and undamaged.

Warning!

Personal injury and damage to property due to damaged or unsuitable machine components!

Operating a machine with damaged or unsuitable components is a safety risk and can lead to failures. Severe damage to property and injuries cannot be excluded.

- **Never operate a machine with a damaged motor or gearbox or any other damaged component.**
- **Never install a damaged component in a machine.**
- **Do not use motors or gearboxes that have already been overloaded during operation.**
- **Before installation, ensure that the motor or gearbox is suitable for the machine.**
- **It is better not to carry out short-term test and trial operations with damaged or inappropriate machine components.**
- **Label damaged or non-operational components in a readily visible location and clearly.**

Cleaning

Clean anti-corrosive agents and dirt off the output shaft and flange of the motor as well as the opposite side of the shaft and flange on the machine.

Caution!

Damage to property caused by improper cleaning.

Contact with cleaning agents can damage oil seals, sealing lips and gaskets.

- **Only use suitable and material-friendly cleaning agents.**
- **Ensure that oil seals, sealing lips and gaskets do not come into contact with cleaning agents.**

Installation with the mounting flange

Attach the motor with the mounting flange, which also serves as a cooling surface, directly to the machine.

For this, the motor must be screwed to the machine via the flange.

Apply tightening torque in accordance with the standard when tightening the screws and use a screw locking mechanism.

5.4.1 Fasteners and tightening torques

Notice!

All specifications regarding mounting and tightening torques is without guarantee. Mounting must be carried out taking into account the material of the mounting material and the mounting flange on the opposite side.

Motors with ISO output flange (8LTA / 8LTJ)

Mounting flange

Motor	Screw (ISO 4762)	Flat washer (UNI 6592)	Tightening torques for bolts 8.8 ($\mu=0.14$) [Nm]
8LTA9 / 8LTJ9	M 12	13x20	70
8LTAC / 8LTJ9	M 16	17x88	145

Motor shaft

Screw	Tightening torques for bolts 12.9 ($\mu=0.14$) [Nm]
M 8	43
M 10	84
M12	145

- For screw locking, select large clamping length l_k , preferably $l_k / d > 5$.
- Mounting surfaces must be free of oil and grease.

Motors with hollow shaft (8LTB / 8LTK)

Mounting flange

Motor	Screw (ISO 4762)	Flat washer (UNI 6592)	Tightening torques for bolts 8.8 ($\mu=0.14$) [Nm]
8LTB9 / 8LTK9	M 8	8.4x14	23

Hollow shaft

B&R recommends products from the company Ringspann.

Motors with shaft with blind hole (8LTQ / 8LTS)

Mounting flange

Motor	Screw (ISO 4762)	Flat washer (UNI 6592)	Tightening torques for bolts 8.8 ($\mu=0.14$) [Nm]
8LTQ9 / 8LTS9	M 12	13x20	70
8LTQC / 8LTS9	M 16	17x88	145

Shaft with blind hole

B&R recommends products from the company Ringspann.

5.5 Connecting and disconnecting the motor

Observe the following safety guidelines and instructions when connecting and disconnecting the motor:

The protective ground conductor must be connected via the power connection or motor connector.

Danger!

Personal injury and damage to property due to missing ground potential!

If there is no proper ground potential on the motor housing or servo drive, fault currents can lead to serious personal injury and damage to property.

- Properly (also during short-term test and trial operation!) connect the motor housing and the servo drive to the ground potential (PE rail).

Danger!

Personal injury and damage to property due to direct mains connection!

Connecting the motor directly to the mains results in severe personal injury and damage to property.

- Only operate the motor with B&R drive systems.

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Warning!

Risk of burns due to hot surfaces!

Touching hot surfaces (e.g. motor and gearbox housings, as well as connected components), can lead to very severe burns due to the very high temperature of these parts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Never touch the motor or gearbox housing as well as adjacent surfaces during nominal load operation.
- Be aware of hot surfaces also during standstill.
- Allow the motor and gearbox to cool down sufficiently before working on them; there remains the risk of burns for a long period of time after they are switched off.
- Always operate the motor or gearbox with all safety devices. Do this even during short testing and trial operations!

5.5.1 Cables and connectors

Information:

To find the technical data and order data for the cables, see the current user's manual for the B&R drive system being used.

They are available in the Downloads section of the B&R website (www.br-automation.com).

5.5.1.1 Cables from other manufacturers

Caution!

Damage caused by voltage rise!

Cables from other manufacturers can have a negative effect on voltage rise on the winding. The winding can become damaged as a result of voltage rise.

- If non-B&R cables are used, you must provide documented evidence of conformity with voltage class A per EN 60034-25.
- If this evidence has not been provided, there is no claim to warranty due to winding damage that can be attributed to a rise in voltage on the winding.

5.5.1.2 Connectors from other manufacturers

Advice:

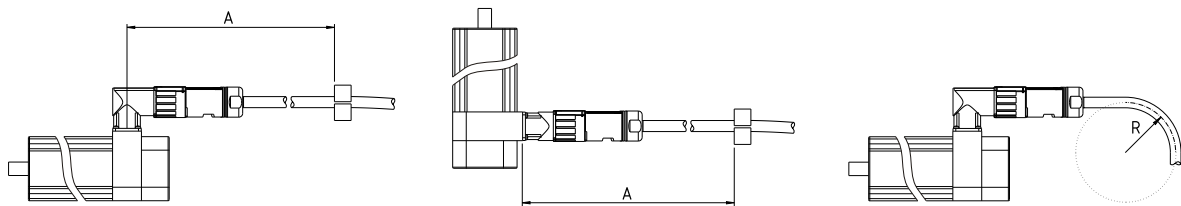
Disturbances caused by electrical or electromagnetic effects!

When using connectors from other manufacturers, EMC faults cannot be excluded.

- Use B&R connectors to ensure compliance with the EMC limit values of the connection.
- Ensure proper assembly and that cable shields are connected correctly.

5.5.1.3 Cable clamp and bend radius

To ensure that cables and connectors are not exposed to harmful loads, the cable clamp (**A**) and minimum bend radius (**R**) must be observed during installation.



Cable clamp (A)

- A = Max. 300 mm along longitudinal axis of connector
- The connection must be free of force and torque.
- Movement relative to the connector is not permitted!
- Tensile stress on cables and connectors is not permitted!

Bend radius (R)

- For the minimum radius values, see the current technical data sheet for the cable.

5.5.2 Order of connection

When connecting or disconnecting the servo motor, the following safety guidelines and orders must be observed.

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Danger!

After switching off the servo drive, wait for the DC bus to discharge for at least five minutes. To avoid a hazard, the current voltage on the DC bus must be measured between -DC1 and +DC1 and less than 42 VDC before starting work with a suitable measuring instrument. An unlit operating LED does not indicate that the device is de-energized!

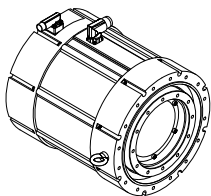
Caution!

The temperature sensor on the motor is sensitive to electrostatic discharge (ESD). For this reason, the attachment cables on the drive system side (ACOPOS) must first be completely assembled and connected. Only then are the connectors permitted to be connected to the motor in the order described.

Separate connections for motor and encoder

Connecting

1. Disconnect the machine from the power system and secure it against being switched on again.
2. Connect the cable to the drive system (ACOPOS).
3. Connect the power connector to the motor.
4. Connect the encoder connector to the motor.



Disconnecting

1. Disconnect the machine from the power system and secure it against being switched on again.
2. Disconnect the encoder connector from the motor.
3. Disconnect the power connector from the motor.
4. Disconnect the cable from the drive system (ACOPOS).

5.5.3 Connecting connectors properly

The power and encoder connectors are available in different variants.

Caution!

Damage due to improper connector installation!

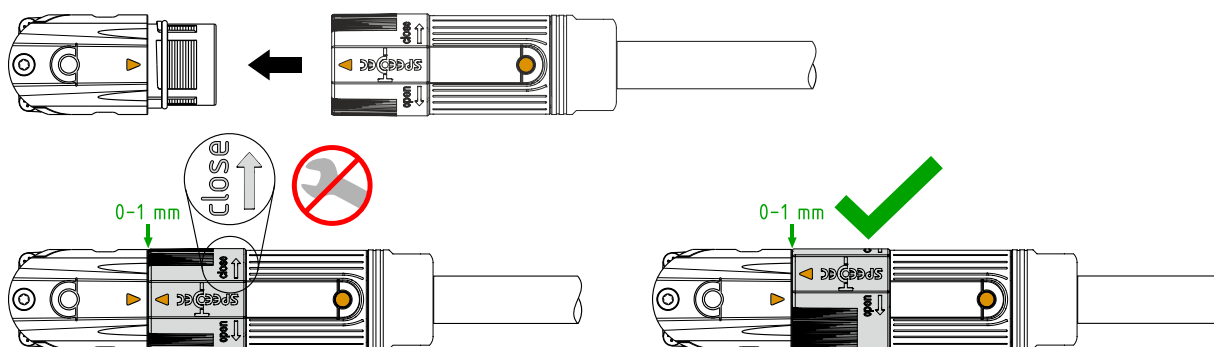
Incorrectly attached connectors can lead to malfunctions and damage to the motor and encoder!

- Always attach the connectors without excessive force or the use of tools.
- Make sure that the connectors are fully attached and locked if necessary.

5.5.3.1 speedtec system

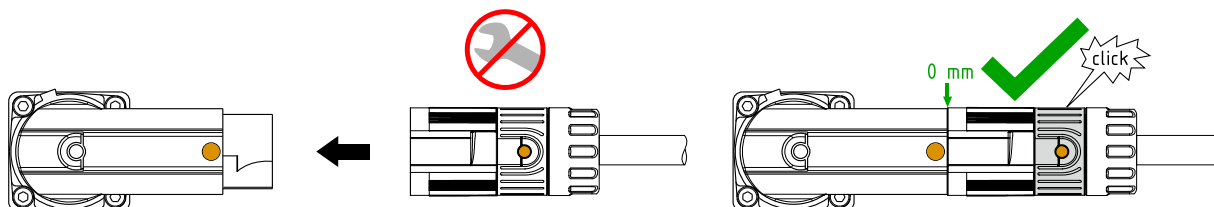
The speedtec system has a tool-free quick-release fastener. During installation, make sure that the connectors are tightly connected and locked.

In addition to the quick-release fastener, the speedtec connector also has internal threads, making it compatible with built-in connectors that use a screw connection.



5.5.3.2 springtec system

The self-locking springtec system twists the first ring when attached and returns it to the middle position after it has been locked.

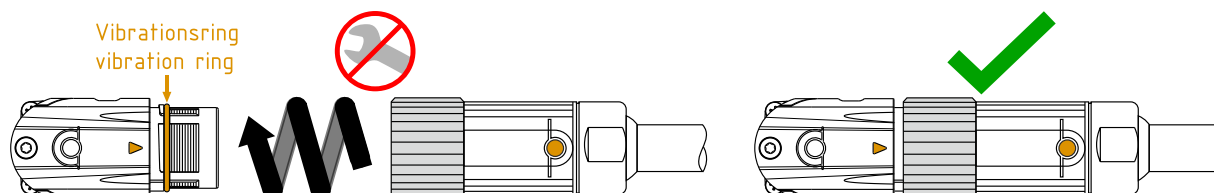


5.5.3.3 Screw terminal

The screw terminal does not require a tool. During installation, make sure that the connector is screwed on straight.

If strong vibrations ($>4-6$ g) are expected during operation, the screw connection must be secured with a **vibration ring**. This prevents the screw connection from coming loose (does not function as a seal).

The vibration ring can be pushed onto the power/signal connector on the motor without requiring a tool. The vibration ring is only permitted to be pushed into the first mounting groove (immediately after the fine thread).



Vibration ring order data

Model number: 8PX000.00-1
Model number: 8PX001.00-1

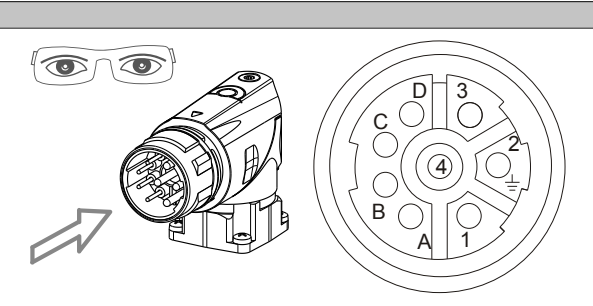
50-piece vibration ring size 1 for speedtec
10-piece vibration ring size 1.5 for speedtec

5.5.4 Connection type

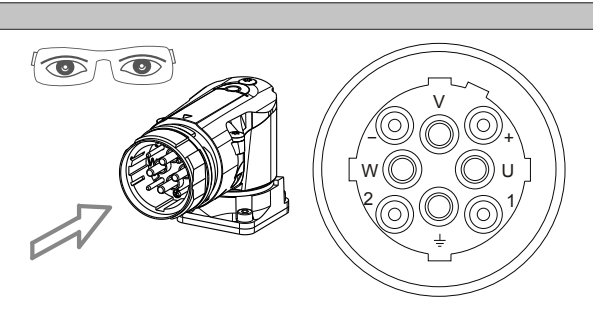
5.5.4.1 Power connection

5.5.4.1.1 Pinout power connection.

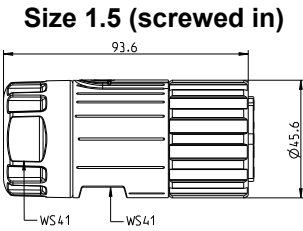
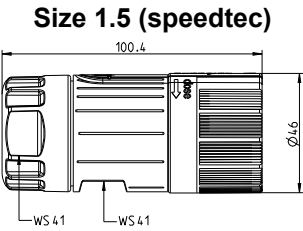
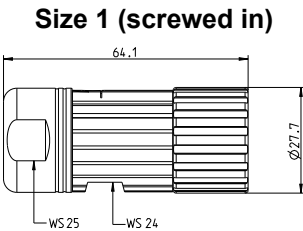
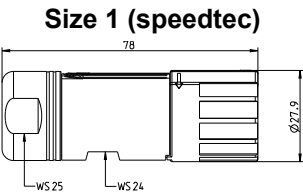
Built-in connector, size 1

	Pin	Description	Function
	1	U	Motor connection U
	4	V	Motor connection V
	3	W	Motor connection W
	2	PE	Grounding
	A	T+	Temperature +
	B	T-	Temperature -
	C	B+	Brake +
	D	B-	Brake -

Built-in connector, size 1.5

	Pin	Description	Function
	U	U	Motor connection U
	V	V	Motor connection V
	W	W	Motor connection W
	Ground symbol	PE	Grounding
	1	T+	Temperature +
	2	T-	Temperature -
	+	B+	Brake +
	-	B-	Brake -

5.5.4.1.2 Power connector dimensions



5.5.4.2 Encoder connection

5.5.4.2.1 Resolver pinout

	Pin	Color (LTN)	Description
	1	---	---
	2	---	---
	3	Blue	S4
	4	Red	S1
	5	Black/White	R2
	6	---	---
	7	Yellow	S2
	8	Black	S3
	9	Red/White	R1
	10	---	---
	11	---	---
	12	---	---

5.5.4.2.2 EnDat connection - Pinout

EnDat 2.1

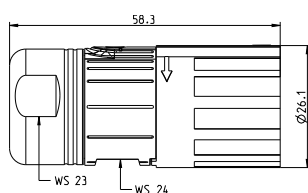
	Pin	Color	Description	Function
	1	Blue	Sense +5 V	Sense output +5 V
	2	---	---	---
	3	---	---	---
	4	White	Sense COM	Sense output 0 V
	5	---	---	---
	6	---	---	---
	7	Brown/Green	+5 V output / 0.25 A	Encoder power supply +5 V
	8	Violet	T	Clock input
	9	Yellow	T\	Clock input inverted
	10	White/Green	COM (1, 3-9, 11, 13-15)	0 V encoder power supply
	11	---	---	---
	12	Blue/Black	B	Channel B
	13	Red/Black	B\	Channel B inverted
	14	Gray	D	Data output
	15	Green/Black	A	Channel A
	16	Yellow/Black	A\	Channel A inverted
	17	Pink	D\	Data inverted

EnDat 2.2

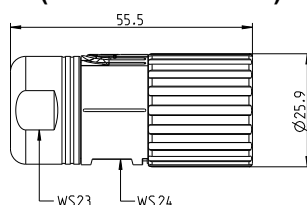
	Pin	Color	Description	Function
	1	Brown/Green	+5 V output / 0.25 A	Encoder power supply +5 V
	2	Gray	D	Data output
	3	Pink	D\	Data output inverted
	4	Purple	T	Clock input
	5	Yellow	T\	Clock input inverted
	6	White	Sense COM	Sense 0 V
	7	White/Green	COM (1, 3-9, 11, 13-15)	Sense +5 V
	8	---	---	---
	9	---	---	---
	10	---	---	---
	11	---	---	---
	12	Blue	Sense +5 V	Battery +5 V

5.5.4.2.3 Encoder connector dimensions

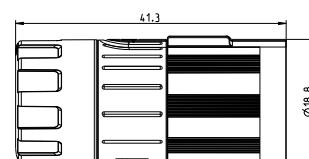
EnDat 2.1 / Resolver (speedtec)



EnDat 2.1 / Resolver (screw connection)



EnDat 2.2 (springtec)



6 Commissioning and operation

6.1 Before commissioning and operation

Read this user's manual completely before starting any commissioning activities or operation.

In addition, take into account the technical documentation for all other machine components (e.g. the B&R drive system) as well as the finished machine.

6.2 Safety

Commissioning is only permitted to be carried out by qualified personnel²⁾.

Only use appropriate equipment and tools. Protect yourself with safety equipment.

Caution!

Severe personal injury and damage to property due to failure of the servo drive!

If the servo drive fails, an uncontrolled motor can cause damage.

Electronic devices are generally not failsafe!

- **Ensure that the motor is brought into a safe state if the servo drive fails.**

6.2.1 General sources of danger

Tampering of protection or safety devices

Protective and/or safety devices protect you and other persons from dangerous voltage, rotating or moving elements and hot surfaces.

Danger!

Personal injury and damage to property due to tampering of protective equipment!

If protective or safety devices are removed or put out of operation, there is no longer any personal protection and serious personal injury and damage to property can occur.

- **Do not remove any safety devices.**
- **Do not put any safety devices out of operation.**
- **Always use all safety devices during short-term test and trial operations!**

Dangerous voltage

To operate the motors, dangerous voltage must be applied to certain parts.

²⁾ see "Qualified personnel" on page 9

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Danger due to electromagnetic fields

Electromagnetic fields are generated by the operation of electrical power engineering equipment such as transformers, drives and motors.

Danger!

Danger to health due to electromagnetic fields!

The functionality of a heart pacemaker can be impaired by electromagnetic fields to such an extent that the wearer experiences harm to his or her health, possibly with a fatal outcome.

- Observe relevant national health and safety regulations.
- Persons with pacemakers are not allowed to be in endangered areas.
- Warn staff by providing information, warnings and safety identification.
- Secure the danger zone by means of barriers.
- Reduce electromagnetic fields at their source (using shielding, for example).

Dangerous motion

By rotating and positioning motions of the motors, machine elements are moved or driven and loads conveyed.

After switching on the machine, movements of the motor shaft must always be expected! For this reason, higher-level protective measures must be put in place to ensure that personnel and machines are protected. This type of protection can be achieved, for example, by using stable mechanical protective equipment such as protective covers, protective fences, protective gates or photoelectric sensors.

In the immediate vicinity of the machine, provide sufficient and easily accessible emergency switching-off devices to stop the machine as quickly as possible in the event of an accident.

Danger!

Danger of injury due to rotating or moving elements and loads!

By rotating or moving elements, body parts can be drawn in or severed or subjected to impacts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Before working on the machine, secure it against unwanted movements. A holding brake is not suitable for this!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Motors can be started automatically via remote control! If appropriate, a corresponding warning symbol must be applied, and protective measures must be implemented to prevent entry into the high-risk area.

Danger!

Danger of injury due to loads!

Suspended loads can lead to personal injury or death if they fall down. Heavy loads can tilt and trap people or severely injure them.

Failure to comply with instructions, guidelines and regulations or use of unsuitable or damaged tools and devices can result in serious injury and/or damage to property.

- Motors should only be lifted without any additional load from other products (e.g. connection elements).
- Only use permitted lifting, transport and aids with sufficient lifting capacity.
- Never stand in the danger zone or under suspended loads.
- Secure the product against dropping and tilting.
- Wear safety shoes, protective clothing and a safety helmet.
- Comply with the national and local regulations.

Warning!

Danger of injury due to incorrect control or a defect.

Improper control of motors or a defect can result in injuries and unintended and hazardous movements of motors.

Such incorrect behavior can be triggered by:

- Incorrect installation or faults when handling components
- Improper or incomplete wiring
- Defective devices (servo drive, motor, position encoder, cables, brake)
- Incorrect control (e.g. caused by software error)

Risk due to hot surfaces

Due to the power dissipation from the motor and friction in the gearbox, these components as well as their environment can reach a temperature of more than 100°C.

The resulting heat is released to the environment via the housing and the flange.

Warning!

Risk of burns due to hot surfaces!

Touching hot surfaces (e.g. motor and gearbox housings, as well as connected components), can lead to very severe burns due to the very high temperature of these parts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Never touch the motor or gearbox housing as well as adjacent surfaces during nominal load operation.
- Be aware of hot surfaces also during standstill.
- Allow the motor and gearbox to cool down sufficiently before working on them; there remains the risk of burns for a long period of time after they are switched off.
- Always operate the motor or gearbox with all safety devices. Do this even during short testing and trial operations!

6.2.2 Freely rotating motors

With freely rotating motors, measures must be taken to prevent the key (if present) from being ejected. Measures must be taken to prevent mounting screws or other mounting elements from being ejected or removed prior to operation. A shaft protection sleeve for transport and storage is not appropriate protection and must also be removed.

Warning!

Personal injury and damage to property due to ejected elements!

With freely rotating motors, ejected elements can cause personal injury and damage to property.

- The following safety precautions also apply during short testing and trial operations!
- Secure the keys.
- Secure or remove mounting screws or other mounting elements.
- A shaft protection sleeve for transport and storage must also be removed.

6.3 Verification

6.3.1 To verify before commissioning

The following must be ensured before commissioning:

- The drive is not permitted to be damaged.
- The motor must be properly aligned and secured and is not permitted to be within the danger zone of other equipment.
- The screw connections must be tightened correctly.
- Any unused connection threads on the flanged end shield must be sealed.
- All components attached to the output shaft must be secured against unintentional release.
- Motors that have a keyed shaft end are not permitted to be operated without a key. The resulting imbalance can result in motor damage.
- For freely rotating motors, keys must be secured against ejection and mounting screws; other mounting elements must be secured or removed.
- All the necessary protective equipment (mechanical, thermal, electrical) must be installed.
- All motor connections must be properly made.
- The protective ground conductor must be installed properly and verified.
- The wires are not permitted to touch the motor surface.
- The drive must be free (release brake).
- The emergency switch-off functions must be checked.
- If a fan is present, it must be properly connected and functional.
- If a liquid cooling system is present, it must be properly connected, functional and leak-proof.

Warning!

Personal injury and damage to property due to damaged or unsuitable machine components!

Operating a machine with damaged or unsuitable components is a safety risk and can lead to failures. Severe damage to property and injuries cannot be excluded.

- **Never operate a machine with a damaged motor or gearbox or any other damaged component.**
- **Never install a damaged component in a machine.**
- **Do not use motors or gearboxes that have already been overloaded during operation.**
- **Before installation, ensure that the motor or gearbox is suitable for the machine.**
- **It is better not to carry out short-term test and trial operations with damaged or inappropriate machine components.**
- **Label damaged or non-operational components in a readily visible location and clearly.**

6.3.2 To verify during commissioning

The following must be ensured during commissioning:

- The functionality of all the motor's components and assemblies (protective equipment, encoder, brake, cooling, gearbox, etc.) must have been verified.
- The operating conditions (see chapter "Installation conditions") must be observed.
- A holding brake, if present, must be released when the motor is rotating.
- If a liquid cooling system is present, it must be functional and leak-proof.
- All electrical attachments and connections must be properly designed and secured.
- All protective measures must have been implemented in order to prevent contact with voltage-carrying components, hot surfaces and rotating or moving parts and assemblies. Also check whether these protective measures are working properly.
- All output elements must be installed and set up in accordance with the manufacturer's specifications.
- The max. permissible speed n_{\max} of the motor must be limited and is not permitted to be exceeded. The maximum permissible speed n_q is the maximum speed that is permissible for short-time duty.

6.3.3 During operation

During operation, be aware of the following signs that can indicate a malfunction:

- Unusual noises
- Unusual vibrations
- Unusual odors
- Smoke generation
- Unusual temperature development
- Increased power consumption
- Lubricant outlet
- The monitoring or safety device responds

If possible, switch off the machine as soon as possible in order to avoid damage or accidents. Always ensure the safety of other persons as well as your own safety during shutdowns and causal investigation!

In the case of shutdowns, please inform the responsible qualified personnel immediately.

6.4 Faults during operation

In the following table, you can find possible causes of error broken down by malfunction as well as information about how to fix them.

Fault	Possible cause	Fix
Motor will not start	Controller enable missing	Activate controller enable
	Controller error, encoder error	Read error listing on inverter/controller, correct error Check the connector to ensure it is connected correctly (see chapter "Installation and connection", section "Ensure proper connections")
	Power supply not present	Check connection and power supply Check the connector to ensure it is connected correctly (see chapter "Installation and connection", section "Ensure proper connections")
	Rotating field	Check phase sequence, replace connection line if necessary
	Brake will not release (optional equipment may be available)	Check triggering, connections and power supply
Runs noisily	Brake defective (optional equipment may be available)	If necessary, contact B&R.
	Insufficient shielding in connection lines	Check shielding connection and grounding
Vibrations	Controller parameters too high	Optimize controller parameters
	Coupling element or machine not properly balanced	Adjust balance
	Power transmission system misaligned	Realign power transmission system
Noise during operation	Mounting screws loose	Check and tighten screw connections
	Foreign bodies in the motor	If necessary, contact B&R.
	Bearing damage	If necessary, contact B&R.
The motor becomes too warm - the temperature monitoring responds	Power transmission system overloaded	Check motor load and compare with data on nameplate
	Insufficient heat dissipation	Ensure sufficient heat dissipation.
	Brake will not release sufficiently - Grinding brake (optional equipment may be available)	If necessary, contact B&R.
Current consumption too high - motor torque too low	Rest angle is incorrect	Check rest angle and adjust as needed

If necessary, contact B&R.

For this, the following information should be provided:

- Order description and serial number (see nameplate)
- Type and extent of fault
- Circumstances under which the fault occurred
- Application data (cycle of torque, speed and forces over time, ambient conditions)

7 Inspection and maintenance

Various operating conditions (e.g. operating mode, temperature, speed, load, mounting orientation), can have a significant impact on the service life of lubricants, seals and bearings.

Depending on the pollution degree, clean regularly on site to ensure heat is being dissipated properly, for example.

The following tasks are the responsibility of the operator:

- A maintenance plan and the documentation of inspections and maintenance work is created.
- Motors and cooling air-supplying construction are checked for dirt, moisture and leaks.
- Motors and cooling air-supplying construction are cleaned.
- Checking cables and connectors for damage.
- All safety devices are tested for safe operation.

7.1 Safety

Work on motors and their wiring is only permitted to be carried out by qualified personnel ²⁾ without voltage applied. The control cabinet must first be disconnected from the power supply and secured against being switched on again.

Only use appropriate equipment and tools. Protect yourself with safety equipment.

Warning!

Personal injury and damage to property due to unauthorized modifications!

As a result of unauthorized modifications to the product, the performance and limit values can be negatively affected and dangers can arise. Due to this, severe damage to property and injuries cannot be excluded.

Unauthorized modifications are therefore prohibited!

- Do not carry out any unauthorized modifications or alterations to the product.
- If necessary, contact B&R.

7.1.1 General sources of danger

Tampering of protection or safety devices

Protective and/or safety devices protect you and other persons from dangerous voltage, rotating or moving elements and hot surfaces.

Danger!

Personal injury and damage to property due to tampering of protective equipment!

If protective or safety devices are removed or put out of operation, there is no longer any personal protection and serious personal injury and damage to property can occur.

- Do not remove any safety devices.
- Do not put any safety devices out of operation.
- Always use all safety devices during short-term test and trial operations!

Dangerous voltage

To operate the motors, dangerous voltage must be applied to certain parts.

²⁾ see "Qualified personnel" on page 9

Danger!

Risk of injury due to electric shock!

If live parts are touched, there is immediate danger of fatal electric shock.

If connections are connected or disconnected in the incorrect order or when the power is switched on, electric arcs can occur and persons and contacts can be damaged.

Even if the motor is not rotating or is running as a generator driven externally, the control and power connections can still carry voltage!

- Never touch connections when the power is switched on.
- Never disconnect or connect electrical connections to the motor and servo drive when the power is switched on!
- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Before working on motors, gearboxes or servo drives or in the danger zone of your machine, disconnect them completely from the power system and secure them against being switched on again by other persons or automatic systems.
- Note the discharge time of any existing DC bus.
- Only connect measuring instruments when the power is switched off!

Danger due to electromagnetic fields

Electromagnetic fields are generated by the operation of electrical power engineering equipment such as transformers, drives and motors.

Danger!

Danger to health due to electromagnetic fields!

The functionality of a heart pacemaker can be impaired by electromagnetic fields to such an extent that the wearer experiences harm to his or her health, possibly with a fatal outcome.

- Observe relevant national health and safety regulations.
- Persons with pacemakers are not allowed to be in endangered areas.
- Warn staff by providing information, warnings and safety identification.
- Secure the danger zone by means of barriers.
- Reduce electromagnetic fields at their source (using shielding, for example).

Dangerous motion

By rotating and positioning motions of the motors, machine elements are moved or driven and loads conveyed.

After switching on the machine, movements of the motor shaft must always be expected! For this reason, higher-level protective measures must be put in place to ensure that personnel and machines are protected. This type of protection can be achieved, for example, by using stable mechanical protective equipment such as protective covers, protective fences, protective gates or photoelectric sensors.

In the immediate vicinity of the machine, provide sufficient and easily accessible emergency switching-off devices to stop the machine as quickly as possible in the event of an accident.

Danger!

Danger of injury due to rotating or moving elements and loads!

By rotating or moving elements, body parts can be drawn in or severed or subjected to impacts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Before working on the machine, secure it against unwanted movements. A holding brake is not suitable for this!
- Keep all covers and control cabinet doors closed during operation and as long as the machine is not disconnected from the power system.
- Always operate the motor with all safety equipment. Do this even during short testing and trial operations!
- Motors can be started automatically via remote control! If appropriate, a corresponding warning symbol must be applied, and protective measures must be implemented to prevent entry into the high-risk area.

Danger!

Danger of injury due to loads!

Suspended loads can lead to personal injury or death if they fall down. Heavy loads can tilt and trap people or severely injure them.

Failure to comply with instructions, guidelines and regulations or use of unsuitable or damaged tools and devices can result in serious injury and/or damage to property.

- Motors should only be lifted without any additional load from other products (e.g. connection elements).
- Only use permitted lifting, transport and aids with sufficient lifting capacity.
- Never stand in the danger zone or under suspended loads.
- Secure the product against dropping and tilting.
- Wear safety shoes, protective clothing and a safety helmet.
- Comply with the national and local regulations.

Warning!

Danger of injury due to incorrect control or a defect.

Improper control of motors or a defect can result in injuries and unintended and hazardous movements of motors.

Such incorrect behavior can be triggered by:

- Incorrect installation or faults when handling components
- Improper or incomplete wiring
- Defective devices (servo drive, motor, position encoder, cables, brake)
- Incorrect control (e.g. caused by software error)

Risk due to hot surfaces

Due to the power dissipation from the motor and friction in the gearbox, these components as well as their environment can reach a temperature of more than 100°C.

The resulting heat is released to the environment via the housing and the flange.

Warning!

Risk of burns due to hot surfaces!

Touching hot surfaces (e.g. motor and gearbox housings, as well as connected components), can lead to very severe burns due to the very high temperature of these parts.

- Do not stay in the danger zone during operation and secure it against access by unauthorized persons.
- Never touch the motor or gearbox housing as well as adjacent surfaces during nominal load operation.
- Be aware of hot surfaces also during standstill.
- Allow the motor and gearbox to cool down sufficiently before working on them; there remains the risk of burns for a long period of time after they are switched off.
- Always operate the motor or gearbox with all safety devices. Do this even during short testing and trial operations!

7.2 Motor bearing

Motor bearing

In the case of trouble-free operation, we recommend changing the motor bearing after approx. 20,000 operating hours as a general maintenance guideline (calculated bearing mission time L_{h10} : 20,000 operating hours).

7.3 Oil seal

Motors can optionally be equipped with an oil seal (form A per DIN 3760). The motors thus satisfy the requirements for IP65 protection per EN 60034-5.

Advice:

Gearbox mounting is not permitted as a result, however, since maintenance of the oil seal is impeded by the gearbox.

- Ensure sufficient lubrication of the oil seal throughout the entire service life of the motor.

7.4 Cleaning

Clean the motors regularly to ensure good heat dissipation.

Information:

- During cleaning work, hold the drive cable/connector in place.
- Remove fibers and foreign matter from the motor housing by hand without damaging the motor surface or shaft end.
- Use a cloth moistened with water to remove dust and dirt from the motor housing (excluding the shaft end).

Caution!

- Cleaning is only permitted to be carried out by qualified personnel.
- Before starting cleaning work, make sure that the motor is switched off, disconnected from power, stopped and cooled down.
- Compressed air tools, high-pressure cleaners, wire brushes, scrapers, etc. are not suitable for cleaning the motor and cables.

8 Disposal

Separation of materials

To ensure that devices can be recycled in an environmentally friendly manner, it is necessary to separate out the different materials. Disposal must be carried out in accordance with applicable legal regulations.

Component	Disposal	Note
Motors	Electronic recycling	A magnetized rotor is not permitted to be transported or delivered outside the stator under any circumstances!
Gearbox (without oil)	Metal waste	
Waste oil (gearbox)	Special waste	
Coolant	Special waste	For liquid-cooled motors only. Consists of water / oil with additives.
Modules, cables	Electronic recycling	
Batteries	Special waste	Danger of fire: Do not store batteries together with conductive materials during disposal.
Cardboard/Paper packaging	Paper/Cardboard recycling	

8.1 Safety

8.1.1 Protective equipment

Always wear suitable safety clothing and equipment for your personal protection.

8.1.2 Rotor with rare earth magnets

In B&R motors, rotors are installed with rare earth magnets with high magnetic energy densities.

Warning!

Personal injury and damage to property due to rare earth magnets!

The motors are not permitted to be disassembled into individual parts.

A magnetized rotor is not permitted to be transported or delivered outside the stator under any circumstances!

- Due to the surrounding magnetic fields, the functionality of a pacemaker can be impaired in such a way that it can lead to bodily harm or even death of the carrier.
- The surrounding magnetic fields can affect or destroy electronic and mechanical measuring instruments.
- The strong magnetic attractive force can lead to uncontrolled movements of the magnet or the attraction of other objects. Personal injury due to impacts or trapping is possible. If magnets are splintered during collision, personal injury cannot be ruled out.
- In potentially explosive atmospheres, a spark generated by magnets can lead to serious explosions and cause personal injury and damage to property.

Publishing information

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