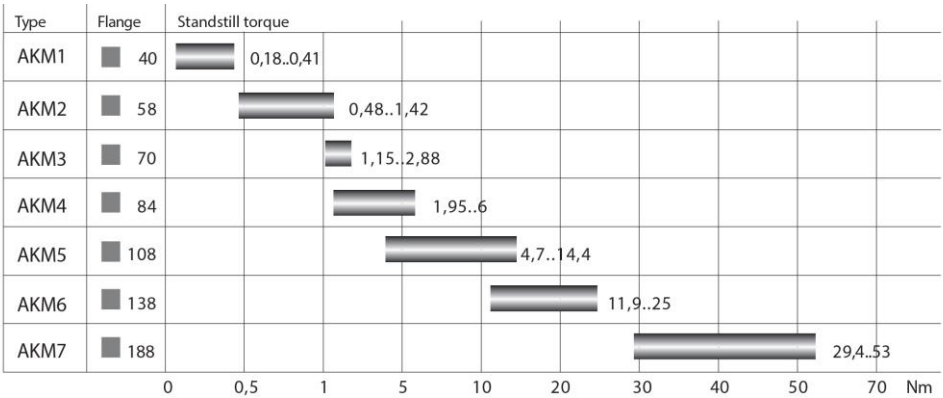
Servo Motors AKM

Select your motor:



Contents

Subject to technical changes that serve to improve the devices!

1 General

1.1 About this Handbook

This handbook describes the synchronous servomotors from the AKM series (standard configuration). The motors are operated in combination with the servo amplifiers. It is therefore important to note that the entire system documentation consists of:

The product handbook for the servo amplifier

Online help for the initial startup of the servo amplifier software

Accessories handbook

Technical description of the motor series (this handbook)

1.2 Target Group

This handbook addresses the following requirements for trained personnel:

Transport:	Only by personnel trained in handling components sensitive to electrostatic discharge
Mechanical installation:	By personnel with training in machine building technology only
Electrical installation:	By personnel trained in electrical technology only
Initial startup:	By personnel with extensive training in the areas of electrical / drive technology

Trained personnel must know and observe the following standards:
IEC 60364
IEC 60664
National accident prevention regulations

⚠ DANGER

While operating the motor, the danger of severe health or material damage or death. The operator must therefore ensure that the safety guidelines in this handbook are followed. The operator must ensure that all personnel working with the motor have read and understand the product handbook.

1.3 Symbols Used

⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.		
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.		
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or mode rate injury.		
NOTICE	Indicates situations which, if not avoided, could result in property damage		
INFO	This is not a safety symbol. This symbol indicates important notes.		
⇒	See chapter/page (cross reference)	●	Emphasis

1.4 Abbreviations

See chapter "Term Definitions"

2 Safety

2.1 Safety Guidelines

⚠ WARNING

- The manufacturer of the machine must generate a hazard analysis for the machine and take appropriate measures to ensure that unforeseen movements cannot cause injury or damage to any person or property.
- It is vital that you ensure that the motor housing is safely earthed to the PE (protective earth) busbar in the switch cabinet. Electrical safety is impossible without a low-resistance earth connection.
- Do not unplug any connectors during operation. This creates the danger of death, severe injury, or extensive material damage.
- Power connections may be live even when the motor is not rotating. Never disconnect the power connections of the motor while the equipment is energised. This can cause flashovers with resulting injuries to persons and damage to the contacts.

- After disconnecting the servo amplifier from the supply voltage, wait several minutes before touching any components which are normally live (e.g. contacts, screw connections) or opening any connections. The capacitors in the servo amplifier can still carry a dangerous voltage several minutes after switching off the supply voltages. To be quite safe, measure the DC-link voltage and wait until the voltage has fallen below 40V.

- The surfaces of the motors can be very hot in operation, according to their protection category. The surface temperature can exceed 100°C. Measure the temperature and wait until the motor has cooled down below 40°C before touching it.

- Remove any fitted key (if present) from the shaft before letting the motor run independently, to avoid the dangerous results of the key being thrown out by centrifugal forces.

- Built-in holding brakes do not ensure personnel safety! Hanging loads (vertical axes) require an additional, external mechanical brake to ensure personnel safety.

⚠ WARNING

- Only properly qualified personnel are permitted to perform such tasks as transport, assembly, setup and maintenance. Properly qualified personnel are persons who are familiar with the transport, assembly, installation, setup and operation of motors, and who have the appropriate qualifications for their jobs. The qualified personnel must know and observe the following standards and regulations:

  IEC 60364 or IEC 60664
  national regulations for safety / accident prevention

- Read the available documentation before assembly and setup. Incorrect handling of the motors can result in injury and damage to persons and machinery. Keep strictly to the technical data and the information on the connection requirements (nameplate and documentation).

2.2 Designated Use

- Synchronous servomotors from this series are designed especially as drives for handling devices, textile, tooling and packing machines as well as similar machines that have high dynamic requirements.

- The motors may **only** be operated under the environmental conditions defined in this document.

- The motors in this series are designed **exclusively** for the regulation of rotation speed and/or torque control by servo amplifiers.

- The motors are mounted as components in electrical assemblies or machines and may only be operated as integrated parts of the system.

- The thermal protection contact built into the motor winding must be evaluated and monitored.

- We guarantee the conformity of the servo system with the standards specified in the EG conformity declaration only when components (servo amplifiers, motors, conductors etc.) we have supplied are used.

2.3 Non Designated Use

- The use of the motors in the following environments is prohibited:
  - potentially explosive areas
  - environments with corrosive and/or electrically conductive acids, alkaline solutions, oils, vapours, dusts
  - directly on supply networks

- Commissioning the motor is prohibited if the machine in which it was installed
  - does not meet the requirements of the EC Machinery Directive
  - does not comply with the EMC Directive
  - does not comply with the Low Voltage Directive

- Built-in holding brakes without further equipment must not be used to ensure personnel safety.

3 Valid Standards

3.1 EG Conformity Declaration

We, SIGMATEK GmbH & Co. KG Sigmatekstrasse 1 5112 Lamprechtshausen Austria, hereby declare

that the conformity of the product line AKM motor series (types AKM 1, AKM 2, AKM 3, AKM 4, AKM 5, AKM 6, AKM 7) are with the following specifications:

EG-standard 2004/108/EG
Electromagnetic tolerance
Harmonized Norm EN61800-3 used

EG standard 2006/95/EG
Electrical equipment for use within specific voltage limits
Harmonized Norm EN61800-5-1 used

Issued by:

Management
Marianne Kusejko and Andreas Melkus

This declaration contains no assurance of the properties in the terms of the product liability law. The safety and protection methods in the operating instruction must be followed at all times.

The manufacturing company has prepared the following technical documentation for review:

- Standard operating manual
- Plans (for EU authorities only)
- Test protocols (for EU authorities only)
- Miscellaneous technical documentation (for EU authorities only)

UL Certification

UL (E515640)

4 Handling

4.1 Transport

- Transport Temperature: -25..+70°C, max. 20K/hour, FLUCTUATING
  Transport humidity: RELATIVE humidity 5% - 95%, UNCONDENSED
- By qualified personal and in the recyclable original packing from the manufacturer
- Avoid hard impacts, especially on the shaft extensions
- If the packaging is damaged, check the motor for visible damage, inform the transporter and if necessary, the manufacturer.

4.2 Packaging

- Cardboard packaging with Instapak ® foam.

Motor type	Card board	Max. stacking height	Motor type	Card board	Max. stacking height
AKM 1	X	10	AKM 5	X	5
AKM 2	X	10	AKM 6	X	1
AKM 3	X	6	AKM 7	X	1
AKM 4	X	6			

4.3 Storage

- Storage temperature –25 - +55 °C, max. 20K/hour fluctuating
- Humidity relative 5% to 95% uncondensed
- Store in the recyclable original packaging from the manufacturer only
- Max. stacking height: packaging table
- Shelf Life: Unlimited

4.4 Maintenance / Cleaning

- Maintenance and cleaning must be performed by qualified personnel only
- After 20,000 operating hours under normal conditions, the bearings should be replaced (by the manufacturer)
- Every 2500 operating hours or once a year, check the motor to see if the ball bearings make noise. If sound is heard from the ball bearings, the motor cannot be operated further; the bearings must be replaced (by the manufacturer).
- If the motor is opened, the guarantee is invalid.
- When cleaning the housing with isopropyl or similar, do not submerge or spray.

4.5 Repair

Repair of the motor must be done by the manufacturer. Opening the motor invalidates the warranty. Send the motor to:

SIGMATEK GmbH & CO KG
Sigmatekstraße 1
A-5112 Lamprechtshausen

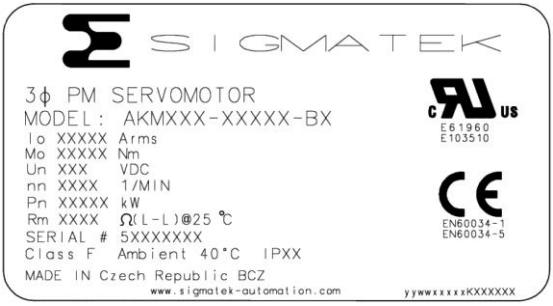
5 Product Identification

5.1 Delivery Contents

Received is a carton with Instapak® foam Included is:

- An AKM series motor
- The information slip with each motor (brief information)

5.2 Type Label



Legend:

MODEL	Type description
Io	Nominal current (A)
Mo	Standstill torque
Un	Intermediate circuit voltage (V DC)
nn	Nominal rotation speed at Rn (1/min)
Pn	Nominal power (kW)
Rm	Winding resistance at 25°C
SERIAL	Serial number
Ambient	Permissible ambient temperature

5.3 Type Code

AKM 4 4 J-AN C N GB B0

Flange size:

1	40 mm
2	58 mm
3	70 mm
4	84 mm
5	108 mm
6	138 mm
7	188 mm

Rotor length:

1
2
3
4
5

Winding type:

A ... Z	
S	special

Flange:

A	IEC
B	NEMA
C	alternative IEC standard
D	other standard
G	alternative IEC standard
H	alternative IEC standard
R	IEC with tolerance R

Shaft:

C	feather key groove
K	open feather key groove
N	smooth shaft
S	special

Shaft sealing:

B0	standard
B1	with shaft sealing
xx	special

Feedback unit:

DA	EnDat 2.1 (AKM2...7) ENC-1113/1313 (Single Turn opt.)
DB	EnDat 2.1 (AKM2...7) EQN-1125/1325 (Multi Turn opt.)
LA	EnDat 2.1 (AKM2...7) ECI-1118/1319 (Single Turn ind.)
LB	EnDat 2.1 (AKM2...7) EQI-1130/1331 (Multi Turn ind.)
GA	Hiperface SKS36 (Single Turn opt.)
GB	Hiperface (AKM2...7) SKM36 (Multi Turn opt.)
GD	Hiperface (AKM1) SEL34 (Multi Turn kap.)
R	resolver (Single Turn ind.)
S	special

Brake:

2	24 V holding brake
N	without brake
S	special

Connections:

B	angled connector, rotable (AKM2)
C	0.5 m shielded cable with IP65 connector, (AKM1/2) angled connector, rotable (AKM3...7)
Y	y-tec plug IP65 (AKM1)
S	special

Example Servo Motor AKM 4 4 J-AN C N GB B0:
Motortype AKM 44J, flange according to IEC standard, smooth shaft, rotable connectors, without brake, multiturn encoder SKM36

Detailed motor data can be found in the technical documentation.

6 Technical Description

6.1 Motor Construction

The synchronous servomotors of the AKM series are brushless rotary current motors for high-end servo applications. In combination with our digital servo amplifiers, AKM motors are especially suited for positioning tasks with industry robots, machine tools, transfer lines, etc. with high dynamic and stability requirements

The servomotors have permanent magnets in the rotor. The neodymium magnet material is a significant factor in the highly dynamic operation of these motors. The stator has a three-phase winding that is powered by the servo amplifier. The motor has no brushes; the commutation takes place in the servo amplifier electronically.

The windings temperature is monitored over temperature sensors in the stator windings and registered by the potential-free thermistor (PTC, $\leq 550\Omega$ / $\geq 1330\Omega$).

As a standard feedback unit, a resolver is built into the motor. The servo amplifier evaluates the resolver setting of the rotors and supplies the motor with sinusoidal currents. The alternative feedback systems available require a partial modification of the motor length and cannot be retrofitted.

The motor is available with or without stop brakes. Retrofitting the brakes is not possible.

The motors are lacquered with matt black and are not resistant to solvents (Tri, thinner or similar).

6.2 General Technical Data

Ambient temperature (by nominal data)

5...+40°C at an installation height of up to 1000m over NN

At ambient temperatures over 40°C and encapsulated installation of the Motor, it is important to consult our applications department.

Permissible humidity (according to nominal data)

95% relative humidity, uncondensed

Power reduction (current and torque)

1% ranging from 40°C to 50°C at up to 1000 meters above NN

At installation heights above 1000 meters over NN and at 40 °C

6%	at 2000 meters above NN
17%	at 3000 meters above NN
30%	at 4000 meters above NN
55%	at 5000 meters above NN

At installation heights above 1000 m over NN and a temperature reduction of 10k/ 1000m, there is not reduction in power.

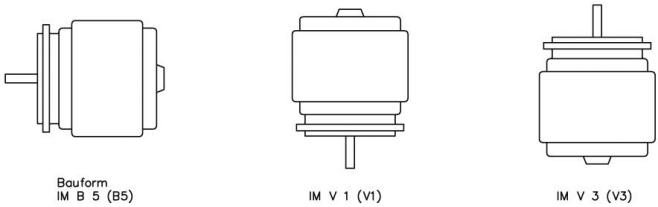
Ball bearings lifespan ≥ 20.000 operating hours

Technical Data ⇒ p. 31

6.3 Standard Equipment

6.3.1 Construction

The basic construction of the synchronous servomotors is the IM B5 configuration according to DIN EN 60034-7.



6.3.2 Shaft end A-side

The power is transmitted over the cylindrical shaft end A, fitting k6 (:h7) according to DIN 748 with threads but without a fitted key The life span of the bearings is 20,000 operating hours.

Radial Force

If driven by sprockets or a cam belt, a higher radial force is generated. The permissible rotation speed-dependent values on the shaft end can be seen in the chapter diagrams. The maximum allowed values are listed in the technical data. With the application of force in the center of the free shaft end, F_R can be larger than 10%

Axial Force

When mounting sprockets or pulleys on the shaft and operating angular gears, for example, axial forces are generated. The maximum allowed values are listed in the technical data.

Coupling

As an ideal clearance-free coupling element have double-conical collets possibly in conjunction with metal bellow couplings.

6.3.3 Flange

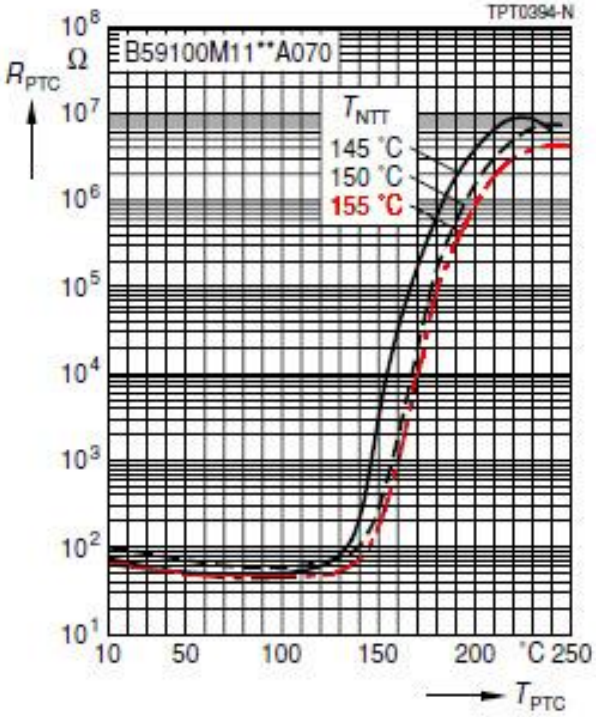
Flanged dimensions comply with the IEC standard, fitting j6 (: h7), precision complies with DIN 42955
Tolerance class: **N**

6.3.4 Protection Type

Standard Version AKM2 – AKM7 with connector options B, C without sealing ring IP54
Standard Version AKM1 – AKM7 with connector options B, C with sealing ring IP65

6.3.5 Protection

In the standard configuration, each motor is equipped with a potential-free PTC. The switch point is at 155 °C ± 5%. The PTC does **not** provide protection against short, very high overloading. The PTC is integrated in the monitoring system of the digital servo amplifier in conjunction with the use of our prefabricated resolver wiring.



6.3.6 Insulation Class

The motors comply with insulation class F according to IEC 85.

6.3.7 Vibration

The motors are designed according to DIN EN 60034-14, vibration A. This means that for a rotation speed from 600 – 3600 rpm and an axle height between 56 and 132 mm, the effective value for allowable vibration is 1,6 mm/s

Rotation speed [rpm]	Max. relative vibration [µm]	Max. Run-out [µm]
<= 1800	90	23
> 1800	65	16

6.3.8 Connection Technology

The Motors are equipped with angled connectors (straight connectors on the cable ends) for the power supply and resolver signals. The opposite connectors are not included in delivery. For the resolver and power lines, we offer prefabricated cables.

6.3.9 Stop Brake

The AKM2 – AKM7 motors are optionally available with a holding brake. A spring applied brake (24V DC) is integrated into the motors. When this brake is de-energized it blocks the rotor.

⚠ WARNING	**Personal safety in case of hanging loads (vertical axes) can be ensured only by using an additional, external, mechanical brake. If the brake is released then the rotor can be moved without a remanent torque.**
⚠ CAUTION	**The holding brakes are designed as standstill brakes and are not suited for repeated operational braking. In the case of frequent, operational braking, premature wear and failure of the holding brake is to be expected.**

The motor length increases when a holding brake is mounted.

The holding brake will be controlled directly by the servo amplifier (no personal safety!), the winding is suppressed in the servo amplifier — additional circuitry is not required (see instructions manual of the servo amplifier).

6.3.10 Number of Contacts

Motor	Number of contacts	Motor	Number of contacts	Motor	Number of contacts	Motor	Number of contacts
AKM 1	6	AKM 3	8	AKM 5	10	AKM 7	10
AKM 2	6	AKM 4	10	AKM 6	10		

6.4 Feedback Unit

Standard	Resolver	2-pin hollow shaft
Option	EnDat Encoder, Single-Turn	-: ECN 1113, -: ECN1313
Option	EnDat Encoder, Multi-Turn	-: EQN 1125, -: EQN1325
Option	Hiperface Encoder, Multi-Turn	-: SKM 36

The motor length depends on the integrated feedback unit. Retrofitting is not possible.

When using the encoder the maximum operating temperature of the feedback unit cannot exceed 110 °C.

6.5 Selection Criteria

The rotary current servomotors are designed for operation with the servo amplifiers from the DIAS Drive series. Both units form a closed rotation speed or torque regulation circuit.

The most important selection criteria are:

- Idling torque	$\mathbf{M_0}$	[Nm]
- Nominal rotation speed at nominal supply voltage	$\mathbf{n_n}$	[min^{-1}]
- Inertial torque from the motor and load	**J**	[$kgcm^2$]
- Effective torque (calculated)	$\mathbf{M_{rms}}$	[Nm]

When calculating the required motors and servo amplifiers, it is important to consider the static load **and** the dynamic load (acceleration/braking).

7 Mechanical Installation

7.1 Important Guidelines

INFO **Dimension drawings can be found in each documentation of the motor series.**

Only qualified personnel with machine assembly knowledge may mount the motor.

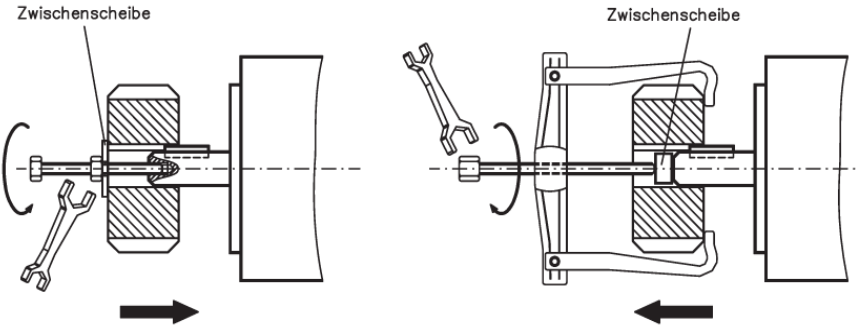
WARNING

- Protect the motor from improper use. Especially during transporting and handling, the components may not be bent and/or the isolation clearance changed.

- The mounting location must be free of conducting and aggressive material. For V3 mounting (shaft upwards), ensure that no fluids can enter the bearings. For encapsulation, our applications department should be consulted.

- Ensure that the ventilation and/or motor vent is unrestricted and note the allowable ambient and flange temperatures. At ambient temperatures over 40 °C, our applications department should be consulted.

- Servomotors are precision devices. The flange and shaft are especially vulnerable during storage and mounting. Avoid therefore brute force; precision requires sensitivity. To raise couplings, gear wheels or pulleys, the threading provided in the motor shaft must be used and the drive elements must be warmed as much as possible. Impacts or the application of force cause damage to bearings and the shaft.



- Whenever possible, use clearance-free friction-lock collets or couplings Ensure the coupling is mounted correctly. Incorrect setting leads to impermissible vibrations and damage to the ball bearings and coupling.

- When using cam belts it is important to ensure that the proper radial force is applied. High radial load on the shaft reduces the significantly lifespan of the motor.

- Avoid axial loading on the motor shaft as much as possible. An axial load significantly reduces the life span of the motor.

- Avoid mechanically over specified positioning of the motor shaft by rigid couplings and additional external positioning under all conditions.

- Note the number of motor and resolver contacts and set the correct number of contacts according to the servo amplifier used. The incorrect setting, especially with small motors, can cause damage.

- Check for compliance with the permissible radial and axial loads F_R and F_A. When using cam belt drives, the minimum permissible diameter of sprocket is calculated with the following equation:

$$d_{min} \geq \frac{M_0}{F_R} \times 2$$

8 Electrical installation

8.1 Safety Guidelines

Only qualified personnel with training in electrical technology may wire the motor.

DANGER

Motors must always be mounted and wired while voltage-free. This means the operating voltage of the device, to which the motor should be connected, cannot be applied. Ensure that the connection to the control cabinet is safe (lock, warning signs, etc.). The individual voltages are applied for the first time with the initial startup.

Never disconnect the motor while voltage is present. After shutdown, the capacitors can maintain dangerously high residual loads up to 5 minutes after the supply voltage has been removed. Measure the voltage at the intermediate circuit and wait until it has sank below 40 V. Control and power connections can have a voltage even when the motor is not turning.

WARNING The symbol for mass ⏚, found in all schematic plans, means that electric connection between the indicated device and the mounting panel in your control cabinet must be made over the largest possible surface. This connection should enable the dissipation of HF noise and should not be confused with the PE symbol (EN 60204 protection).

Follow the instruction in the schematic plans in the product handbook for the respective servo amplifier.

8.2 Electrical Installation Guide

Only qualified staff with knowledge of mechanical engineering are permitted to assemble the motor.

- Check the allocation of the servo amplifier and motor, and then compare the nominal voltage and current of the device. Connect the servo amplifier as shown in the connection diagram in the product handbook. The connection of the motor is shown starting from page 27.

- Ensure that the motor and servo amplifier are properly connected to earth. The applicable EMV shielding and earth connection can be found in the product handbook of the respective servo amplifier. The mounting panel and motor housing must be connected to earth.

- Power and control cables should be separated as much as possible (clearance > 20 cm). The electromagnetic stability of the system will then be improved. When using motor a power cable with integrated brake control wires. The shielding must be applied on both sides (see the product handbook for the servo amplifier).

- Wiring:

  - Separate power and control cables as much as possible
    - Connect the resolver or encoder
    - Connect motor lines, motor inductor close to servo amplifier
    - Connect shielding on both ends to the shielding terminals or EMV-plug
    - Connect motor-stop brakes
    - Apply shielding on both ends

WARNING

- All high-current lines must have a sufficient diameter in compliance with EN 60204. The recommended diameter can be found in the technical data.

- The shielding must cover a large area (low ohmic) of the metallic connector housing and/or EMV dissipating cable fittings.

8.3 Motor Connection with Prefabricated Cables

WARNING

- Lay the wiring according to the current rules and standards.
- For the power and feedback connection, use only our prefabricated shielded cables.
- Apply the shielding as shown in the diagrams in the product handbook of the server amplifier.
- Incorrect connected shielding lead directly to EMV noise.
- The maximum length is defined in the product handbook of the respective servo amplifier.

Requirements for the wire material

Capacity

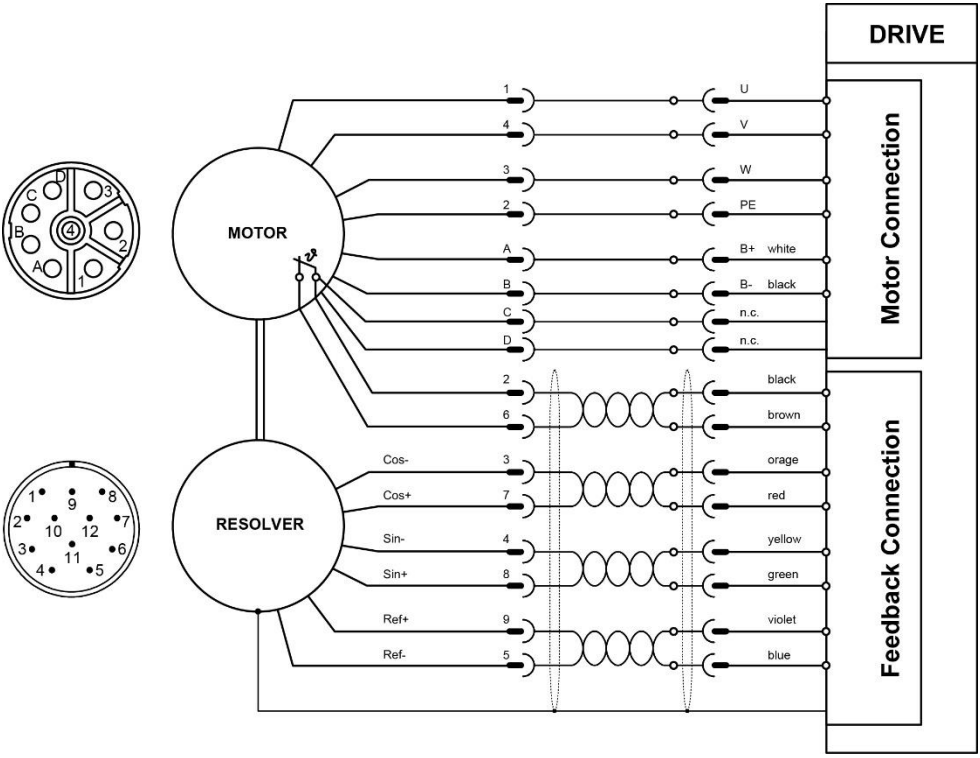
Motor lines:	smaller than 150 pF/m
Feedback lines:	smaller than 120 pF/m

Technical data and type codes for prefabricated feedback cables (Sensor and motor cables)

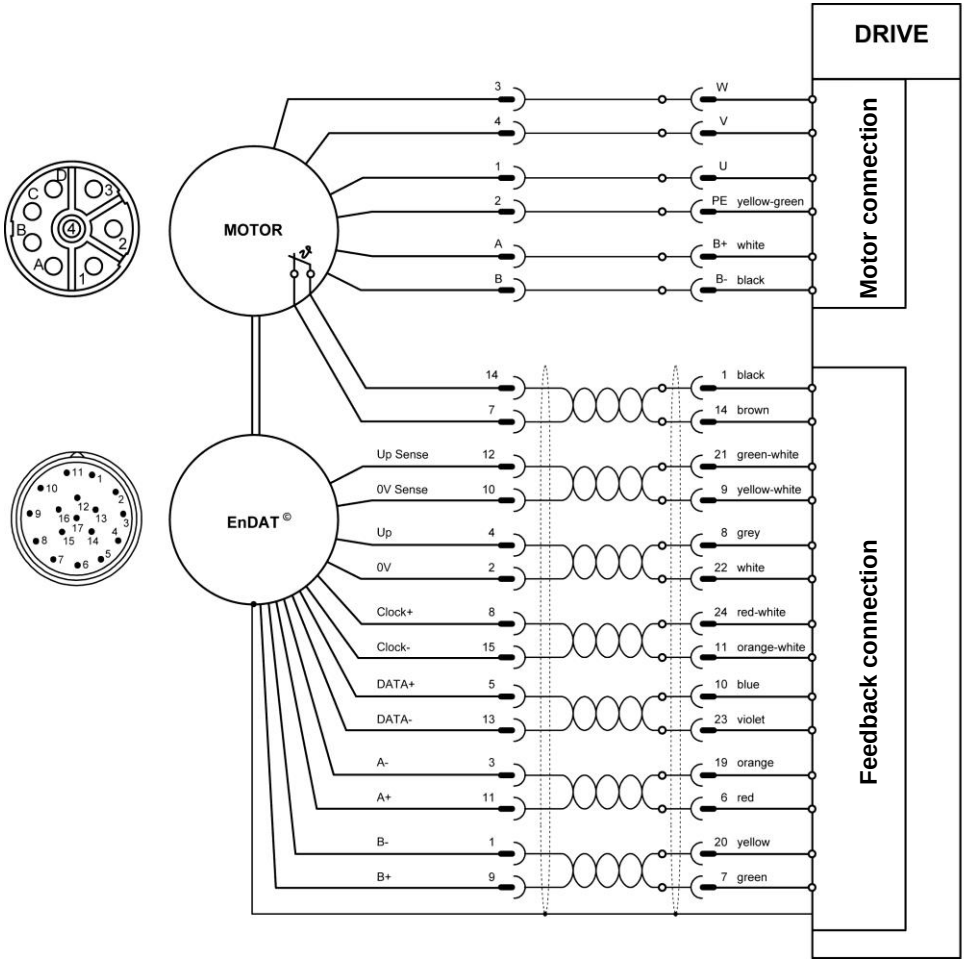
See page 241 ff.

8.4 Connection Diagrams

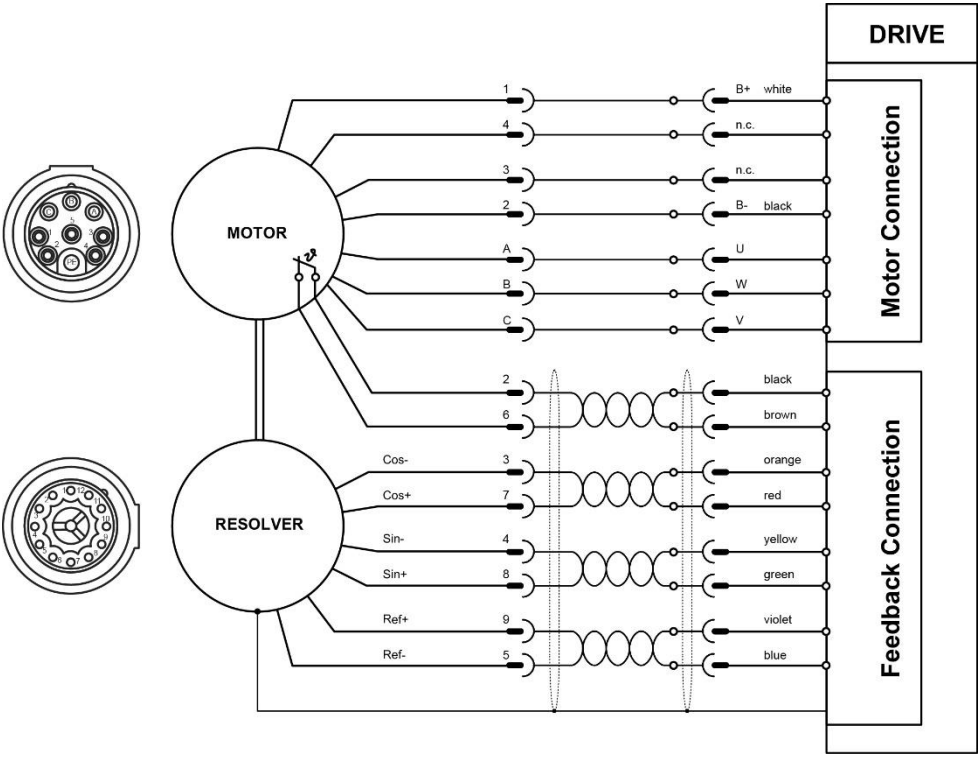
8.4.1 Connection Diagram for Motors with a Resolver M23 plug



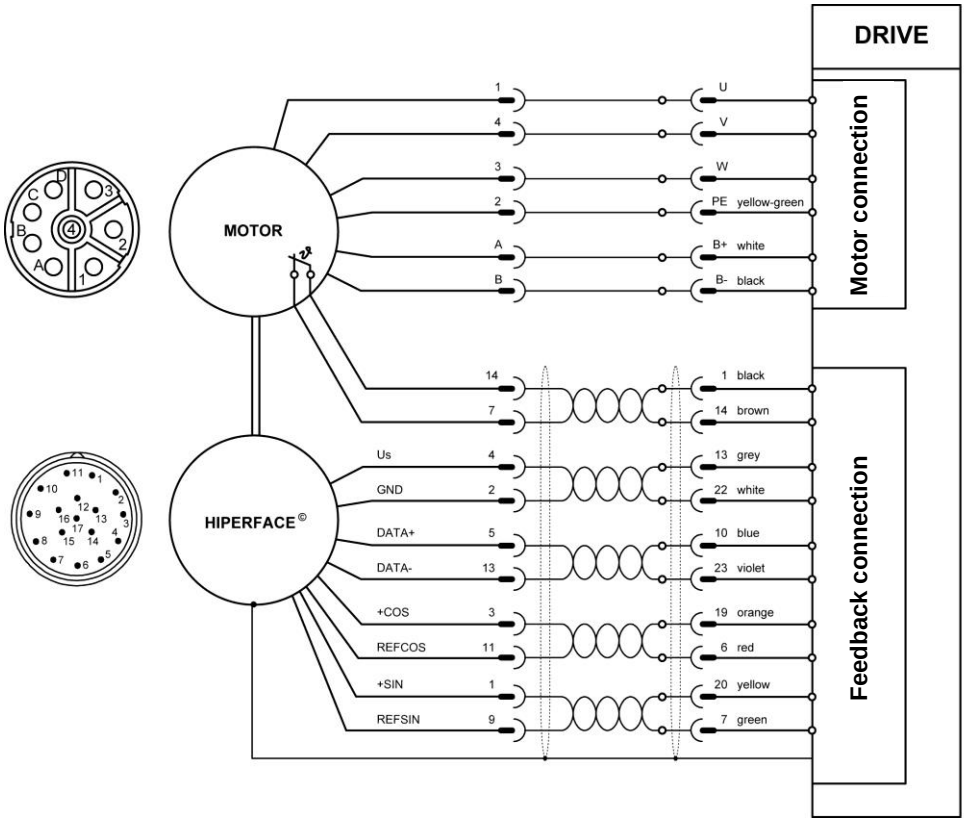
8.4.2 Connection Diagram for Motors with EnDAT



8.4.3 Connection Diagram for Motors with a Resolver Ytec Connector



8.4.4 Connection Diagram for Motors with HIPERFACE



9 Initial Startup

9.1 Important Guidelines

DANGER

- Only trained personnel with comprehensive knowledge in the areas of electro- and drive technology can perform the initial startup of the drive unit's servo amplifier/motor.
- Ensure that all voltage-carrying connectors are protected against external contact. Dangerously high voltages up to 900 V may be present.
- Never disconnect the motor while voltage is present. After shutdown, the capacitors can maintain dangerously high residual loads up to 5 minutes after the supply voltage has been removed.
- The surface temperature of the motor can exceed 100 °C. Measure the temperature and wait until the motor has cooled to 40 °C before touching it.
- Ensure that undesired movement of the drive cannot endanger machines or people.

9.2 Guidelines for the Initial Startup

The initial startup process will be described generically. Depending on the application of the device, a different process may be practically required.

- Check the mounting and alignment of the motor.
- Ensure that the drive elements (coupling, gears, pulleys) are secure and set correctly (check that radial and axial force are within tolerance).
- Check the wiring and connection on the motor and servo amplifier. Ensure that a proper earth connection is made.
- Check whether that the stop brakes, if available, function properly. (Apply 24 V, brakes must then air).
- Check whether the motor's rotor can be freely rotated (the brakes may first have to be aired). Listen for grinding sounds.
- Ensure that all contact prevention measures for moving and voltage carrying components were taken.

- Perform all system-specific and required tests.
- Now start the drive according to the respective startup instructions for the servo amplifier being used.
- For multi axial systems, start all servo amplifiers/motors in the drive unit.

9.3 Eliminating Interference

Depending on the facility conditions, noise can have several causes. Described below are the main causes of errors that affect the motor directly. Abnormalities that occur during regulation are mostly caused by incorrect parameter settings in servo amplifier. Review the documentation for the servo amplifier and the initial startup software.

In multi axial systems, additional unseen errors can exist.

Our applications department can help further with problems.

Error	Possible Causes:	Solutions
Motor does not spin	- Servo amplifier not released - Set value line interrupted - Motor phases interchanged - Brakes not released - Drive is mechanically blocked	- Apply ENABLE signal - Check set value line - Correct motor phases - Check brake control - Check Mechanical parts
Run away motor	- Motor phases inverted	- Correct motor phases
Motor vibrates	- Resolver line Shielding has been interrupted - Amplification too high	- Replace resolver wire - Use motor default values
Brake error message	- Short in the voltage supply for the stop brakes - Brakes defective	- Remove short - Exchange motor
Error message output stage error	- Motor line has a short-circuit/ground short- Motor has a short circuit or a ground short	- Exchange cable - Exchange motor
Resolver error message	- Resolver plug is connected incorrectly - Resolver cable is broken or crimped	- Check connector plug - Check cable
Motor temperature error message	- Motor thermo switch has activated - Resolver plug is loose or the Resolver cable is broken	- Wait until the motor has cooled then find the cause for over heating. - Check the connectors, possibly install a new resolver cable
The brakes don't engage	- Required stop torque too high - Brakes defective	- Check installation - Exchange motor

10 Technical Data

All data values for an ambient temperature of 40 °C and winding over temperature of 100K
The data can have a tolerance of +/- 10%

The reachability of the peak torque depends on the application for which the respective servo amplifier type is used. See the torque/speed characteristic line of the respective motor.

10.1 Term Definitions

Standstill Torque M_0 [Nm]
At rotations speeds of n<100 min^{-1} and nominal conditions, the idle torque can be delivered over an unlimited time

Nominal torque M_n [Nm]
The nominal torque is delivered when the motor draws nominal current at the nominal speed. During continuous operation (S1), the nominal torque can be delivered for an unlimited time at nominal speed.

Standstill Current I_{0rms} [A]
The idle current is the effective sinusoidal current value that the motor draws at n<100 min^{-1}, in order to deliver the idling torque.

Peak Current (Pulse Current) I_{0max} [A]
The peak current (effective sinusoidal value) is approximately four times the idle current. The peak current of the servo amplifier used must be smaller.

Torque Constant K_{Trms} [Nm/A]
The torque constant indicates how much torque the motor generates in Nm with a 1 A effective sinusoidal current. $M=I \times K_T$ (to a maximum of $I = 2 \times I_0$)

Voltage Constant K_{Erms} [mVmin]
The voltage constant indicates the effective sinusoidal value between the two terminals based on motor-induced EMK at 1000 rpm.

Rotor Inertial Torque J [kgcm²]
The constant J is a quantity for the motor's acceleration power. I_0 generates, for example, an acceleration time t_b of 0 to 3000 min^{-1}:

$$t_b\,[s] = \frac{3000 \times 2\pi}{M_0 \times 60s} \times \frac{m^2}{10^4 \times cm^2} \times J \qquad \text{mit } M_0 \text{ in Nm und J in kgcm}^2$$

Thermal Time Constant t_{th} [min]
The constant t_{th} determines the time it takes for a cold motor with a load of I_0 to reach the 0,63 x 100 Kelvin over temperature. With a peak current load, the warming time is significantly shorter.

Brake Reaction Time **Release delay time t_{BRH} [ms] / Application delay time t_{BRL} [ms] of the brakes**
This constant determines the reaction time of the brakes when operation with nominal voltage on the servo amplifier.

U_N
Nominal supply voltage

U_n
Intermediate circuit voltage.
$U_n = \sqrt{2} * U_N$

10.2 AKM Low Voltage

10.2.1 Technical Data

Data		Symbol [Unit]	AKM				
			11F	12E	21J	22H	31K
Electrical Data							
	Standstill torque (100 K)*	M_0 [Nm]**	0,18	0,31	0,43	0,88	1,25
	Standstill current	I_{0rms} [A]**	3,87	2,73	7,13	5,41	9,1
	Standstill torque (60 K)*	M_0 [Nm]**	0,14	0,25	0,34	0,70	1,00
	Max. nominal supply voltage	U_N [VAC]	75	160	75	160	160
U_n = 24V	Nominal rotation speed	n_n [rpm]	1000	—	1200	—	—
	Nominal torque*	M_n [Nm]	0,18	—	0,42	—	—
	Nominal power	P_n [kW]	0,02	—	0,05	—	—
	Nominal current	I_n [A]	3,95	—	6,93	—	—
U_n = 48V	Nominal rotation speed	n_n [rpm]	5000	1500	4500	1500	2000
	Nominal torque*	M_n [Nm]	0,17	0,30	0,39	0,85	1,23
	Nominal power	P_n [kW]	0,09	0,05	0,18	0,13	0,26
	Nominal current	I_n [A]	3,73	2,67	6,44	5,21	8,82
U_n = 75V	Nominal rotation speed	n_n [rpm]	8000	3000	8000	3000	3500
	Nominal torque*	M_n [Nm]	0,16	0,30	0,35	0,82	1,19
	Nominal power	P_n [kW]	0,13	0,10	0,29	0,26	0,43
	Nominal current	I_n [A]	3,51	2,67	5,78	5,02	8,53
U_n = 160V	Nominal rotation speed	n_n [rpm]	—	8000	—	8000	8000
	Nominal torque*	M_n [Nm]	—	0,27	—	0,70	0,76
	Nominal power	P_n [kW]	—	0,23	—	0,59	0,64
	Nominal current	I_n [A]	—	2,40	—	4,29	5,45
	Peak current	I_{0max} [A]	15,5	10,9	28,5	21,6	36,4
	Peak torque	M_{0max} [Nm]	0,59	1,05	1,38	2,80	4,12
	Torque constant	K_{Trms} [Nm/A]	0,0456	0,1125	0,0606	0,1632	0,1395
	Voltage constant	K_{Erms} [mVmin]	2,94	7,24	3,90	10,51	8,98
	Winding resistance Ph-Ph	R_{25} [Ω]	1,80	3,90	0,68	1,40	0,58
	Winding inductance Ph-Ph	L [mH]	1,04	2,68	0,76	2,57	1,02

Mechanical Data							
	Rotor inertial torque	J [kgcm²]	0,017	0,031	0,11	0,16	0,33
	Number of motor contacts		6	6	6	6	8
	Static drag torque	M_R [Nm]	0,0011	0,0021	0,002	0,005	0,014
	Thermal time constant	t_{TH} [min]	4	6	8	9	14
	Weight standard	G [kg]	0,35	0,49	0,82	1,10	1,55
	Radial force allowed on the shaft end at 8000 min^{-1}	F_R [N]	30		145		195
	Axial force allowed	F_A [N]	12		60		65

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:
For brake motor option: no continuous torque reduction.
For non-resolver feedback options: no continuous torque reduction.
For motors with non-resolver feedback and brake option: no continuous torque reduction.
For motors with optional shaft seal, reduce torque shown by 0.021 Nm and increase M_R by the same amount.

10.2.2 Cables and Connections

11F, 12E	see chapter 10.3.2 Cables and Connections
21J, 22H	see chapter 10.4.3 Cables and Connections
31K	see chapter 10.5.3 Cables and Connections

10.2.3 Maximum and Continuous Torque

Power supply 1x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier	
			MDD 111	MDD 121
AKM 11B	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,18 0,17 0,61	0,18 0,17 0,61	0,18 0,17 0,61
AKM 12C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,31 0,28 1,08	0,31 0,28 1,08	0,31 0,28 1,08
AKM 13C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,41 0,36 1,46	0,41 0,36 1,46	0,41 0,36 1,46

10.2.4 Dimensional Drawing (schematic diagram)

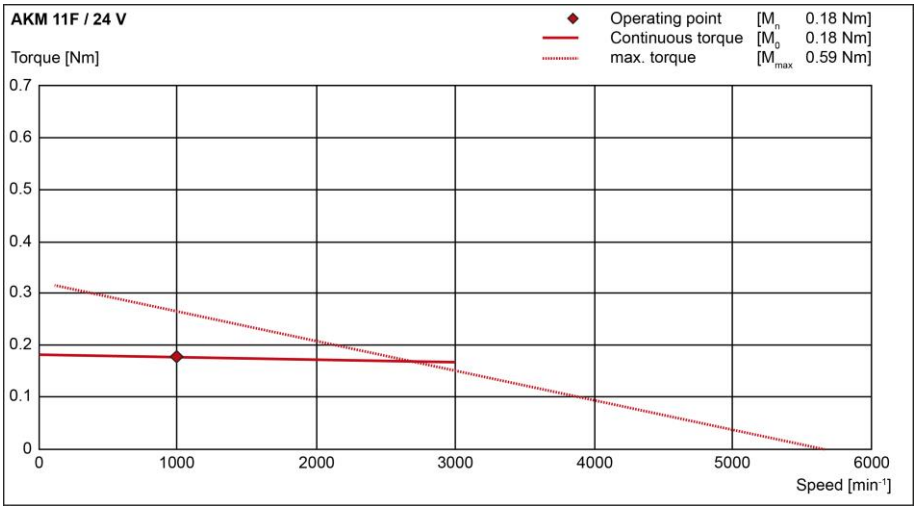
11F, 12E	see chapter 10.3.4 Dimensional Drawing
21J, 22H	see chapter 10.4.5 Dimensional Drawing
31K	see chapter 10.5.5 Dimensional Drawing

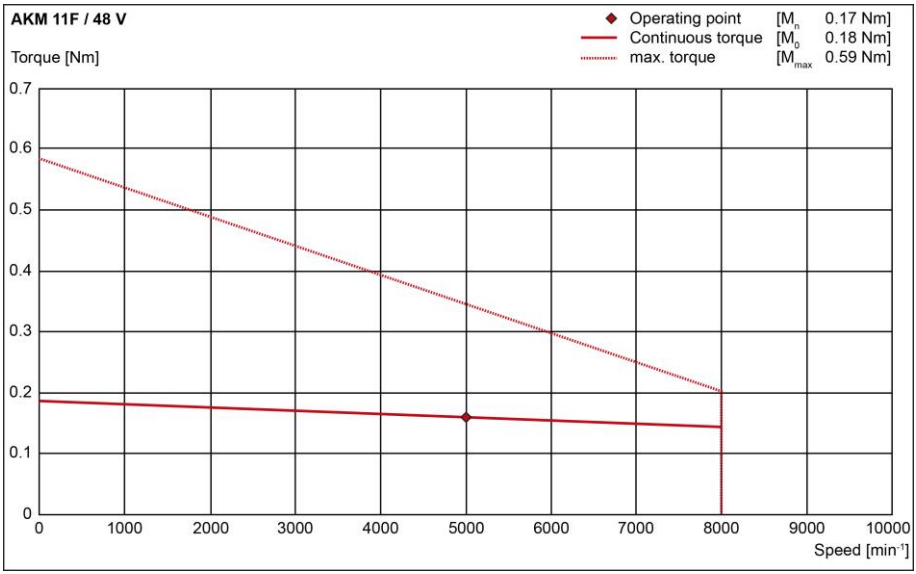
10.2.5 Radial Force on the Shaft End

11F, 12E	see chapter 10.3.5 Radial Force on the Shaft End
21J, 22H	see chapter 10.4.6 Radial Force on the Shaft End
31K	see chapter 10.5.6 Radial Force on the Shaft End

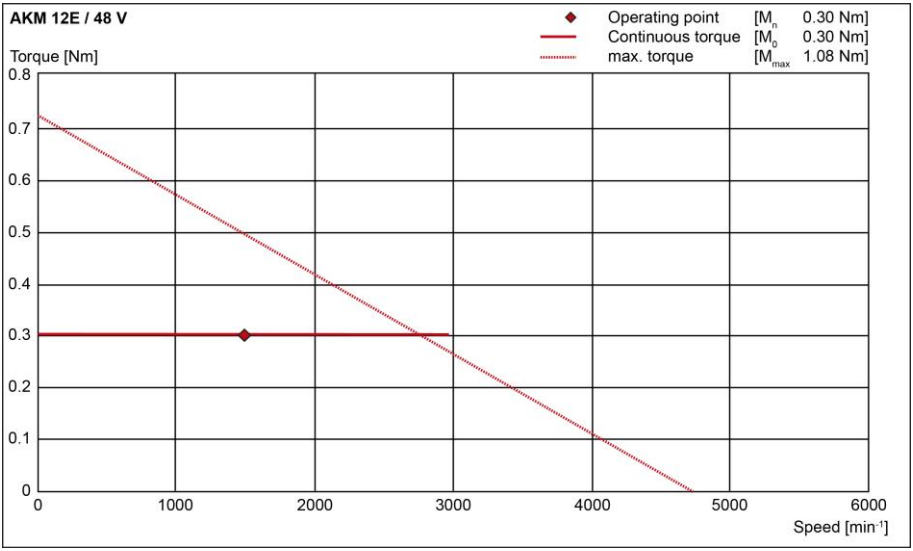
10.2.6 Motor Characteristics U_n 24/48 V

AKM 11F

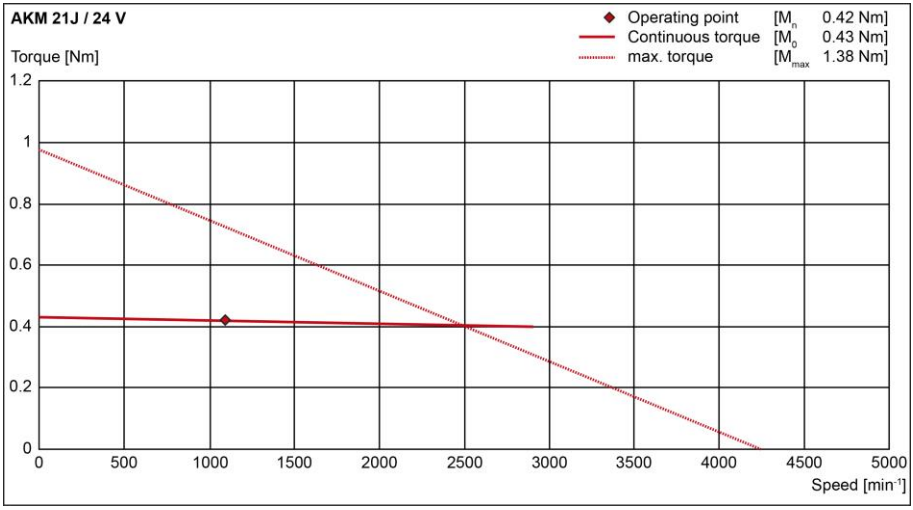


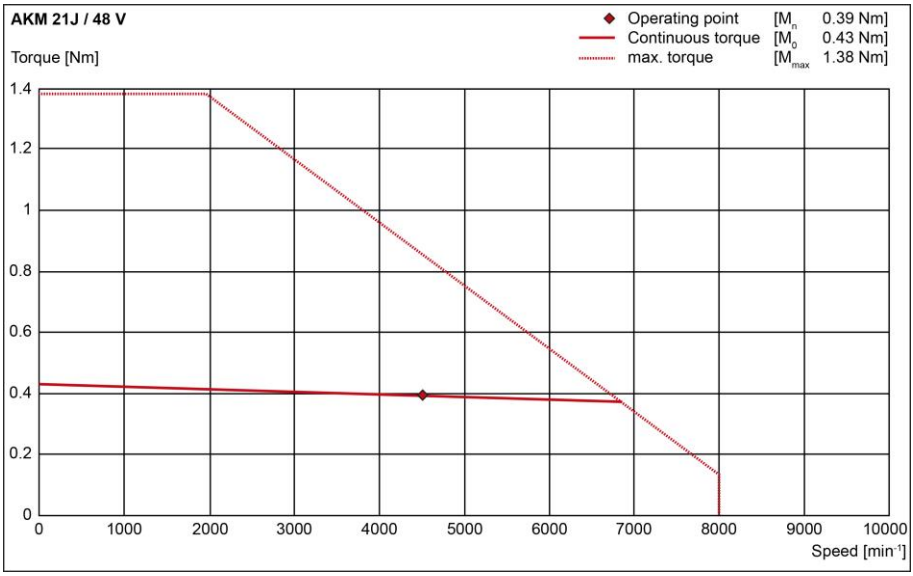


AKM 12E

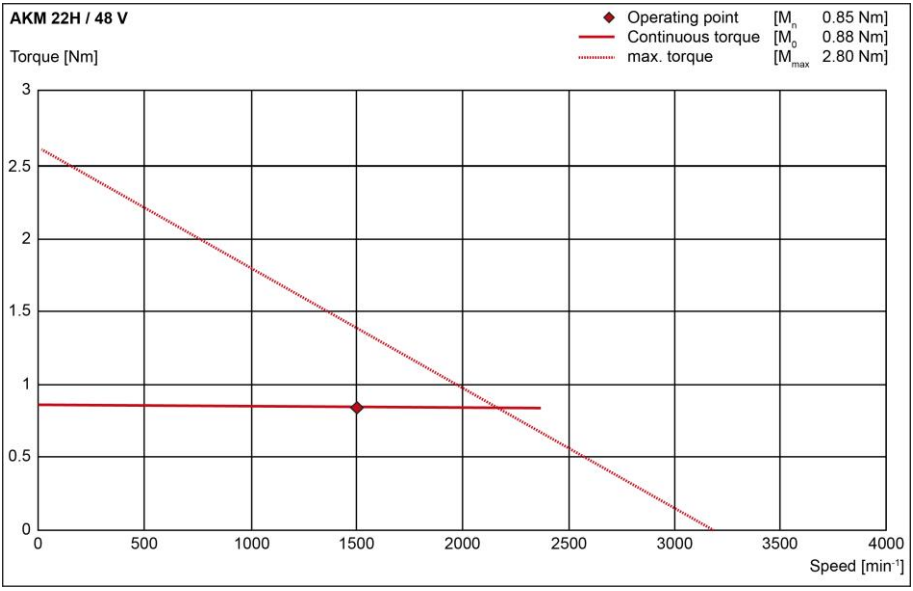

AKM 12E / 48 V
Operating point [M_n 0.30 Nm]
Continuous torque [M_0 0.30 Nm]
max. torque [M_max 1.08 Nm]
Torque [Nm]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

AKM 21J

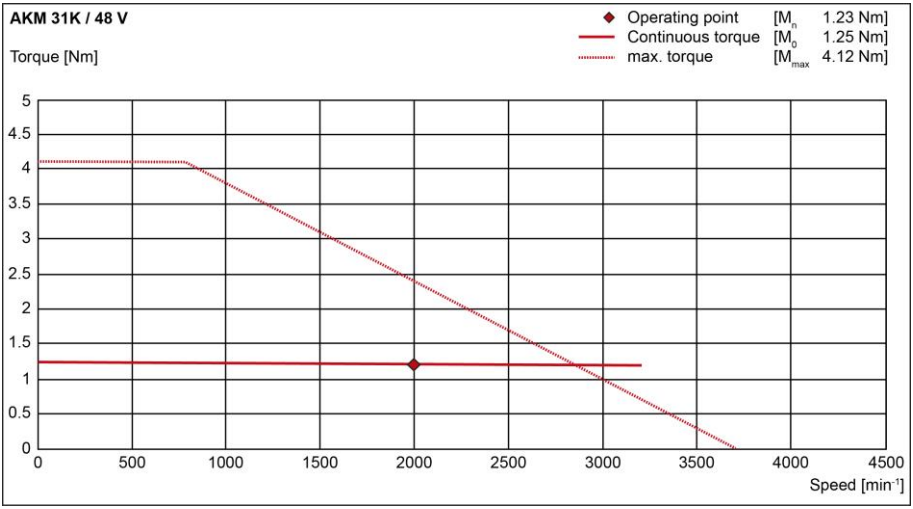

AKM 21J / 24 V
Operating point [M_n 0.42 Nm]
Continuous torque [M_0 0.43 Nm]
max. torque [M_{max} 1.38 Nm]
Torque [Nm]
1.2
1
0.8
0.6
0.4
0.2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min^{-1}]


AKM 21J / 48 V
Operating point [M_n 0.39 Nm]
Continuous torque [M_0 0.43 Nm]
max. torque [M_{max} 1.38 Nm]
Torque [Nm]
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Speed [min^{-1}]

AKM 22H



AKM 31K



10.3 AKM1

10.3.1 Technical Data

Data		Symbol [Unit]	AKM		
			11B	12C	13C
Electrical data					
	Standstill torque*	M_0 [Nm]**	0,18	0,31	0,41
	Standstill current	I_{0rms} [A]**	1,16	1,51	1,48
	Max. nominal supply voltage	U_N [VAC]	230VAC		
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	8000	8000	8000
	Nominal torque*	M_n [Nm]	0,17	0,28	0,36
	Nominal power	P_n [kW]	0,14	0,23	0,30
	Nominal current	I_n [A]	1,06	1,33	1,29
	Peak current	I_{0max} [A]	4,6	6	5,9
	Peak torque	M_{0max} [Nm]	0,61	1,08	1,46
	Torque constant	K_{Trms} [Nm/A]	0,16	0,21	0,28
	Voltage constant	K_{Erms} [mVmin]	10,2	13,3	17,9
	Winding resistance Ph-Ph	R_{25} [Ω]	18,2	12,4	13,5
	Winding inductance Ph-Ph	L [mH]	12,5	9,1	10,3
Mechanical Data					
	Rotor inertial torque	J [kgcm²]	0,017	0,031	0,045
	Number of motor contacts		6	6	6
	Static drag torque	M_R [Nm]	0,0011	0,0021	0,0031
	Thermal time constant	t_{TH} [min]	4	6	7
	Weight standard	G [kg]	0,35	0,49	0,63
	Radial force allowed on the shaft end at 8000 min^{-1}	F_R [N]	30		
	Axial force allowed	F_A [N]	12		

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:
For brake motor option: no continuous torque reduction.
For non-resolver feedback options: no continuous torque reduction.
For motors with non-resolver feedback and brake option: no continuous torque reduction.
For motors with optional shaft seal, reduce torque shown by 0.021 Nm and increase M_R by the same amount.

10.3.2 Cables and Connections

Data	AKM1
Power connection	4 + 4-pin, round, at end of cable 0,5m
Motor cable, shielded	4 x 1
Motor cable with control wires, shielded	4 x 1 + 2 x 0,5
Resolver connection	12-pin, round, at end of cable 0,5m
Motor cable, shielded	4 x 2 x 0,18mm²

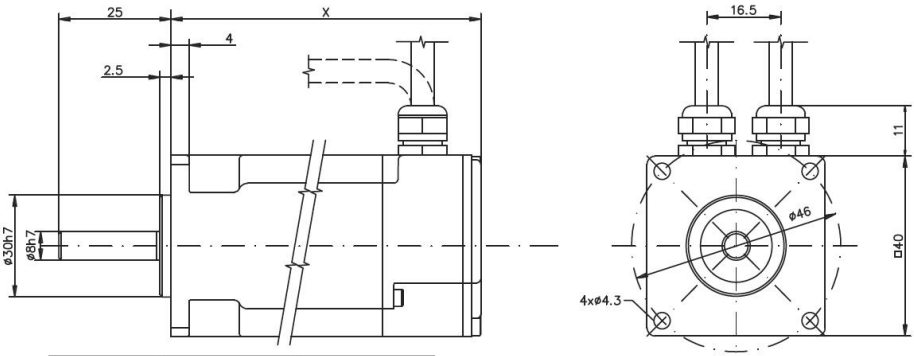
The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.3.3 Maximum and Continuous Torque

Power supply 1 x 230 V

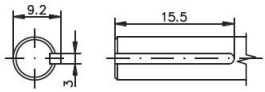
Motor type	Symbol [Unit]	Motor data	Servo amplifier	
			MDD 111	MDD 121
AKM 11B	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,18 0,17 0,61	0,18 0,17 0,61	0,18 0,17 0,61
AKM 12C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,31 0,28 1,08	0,31 0,28 1,08	0,31 0,28 1,08
AKM 13C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,41 0,36 1,46	0,41 0,36 1,46	0,41 0,36 1,46

10.3.4 Dimensional Drawing (schematic diagram)

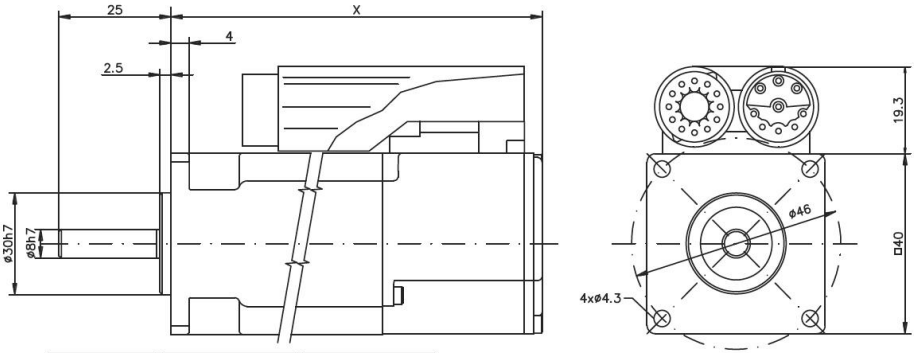


	Resolver		Encoder	
X (Cable)	No Brake	Brake	No Brake	Brake
AKM11	69.6	106.6	79	116
AKM12	88.6	125.6	98	135
AKM13	107.6	144.6	117	154

Option Keyway

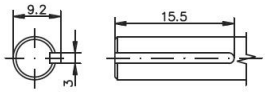


with mounted Y-TEC connectors

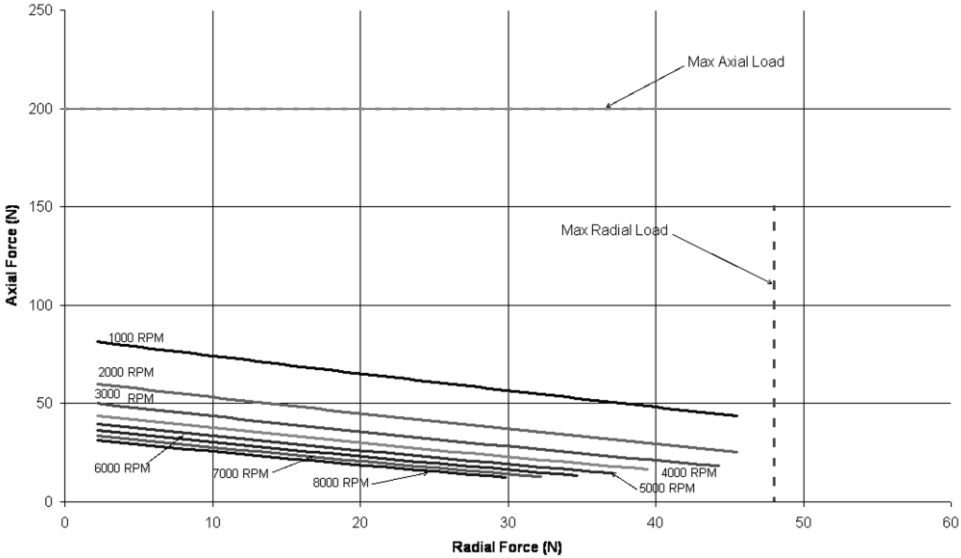


	Resolver		Encoder	
X (ytec)	No Brake	Brake	No Brake	Brake
AKM11	79	116	87.5	124.5
AKM12	98	135	107.5	144.5
AKM13	117	154	126.5	163.5

Option Keyway

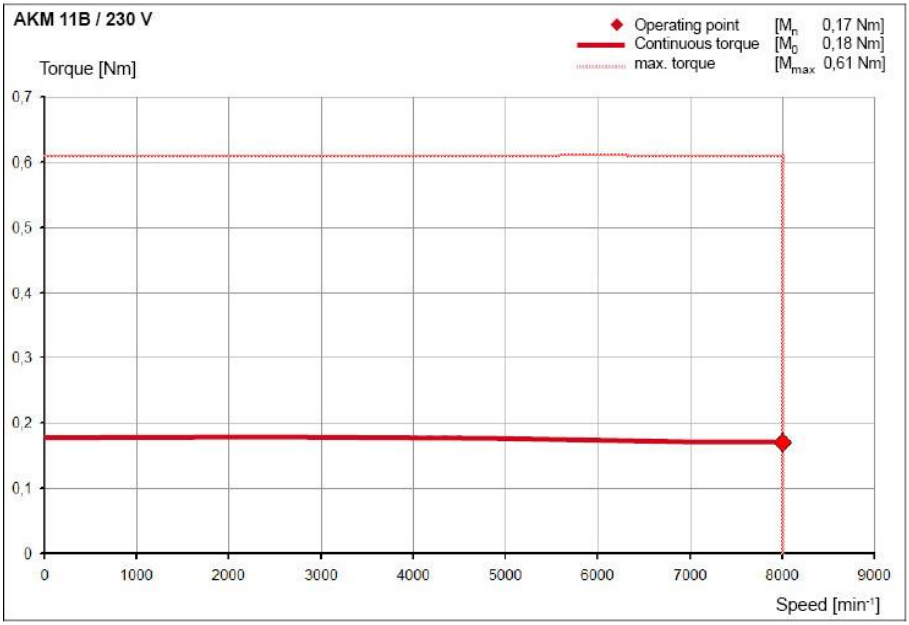


10.3.5 Radial Force on the Shaft End

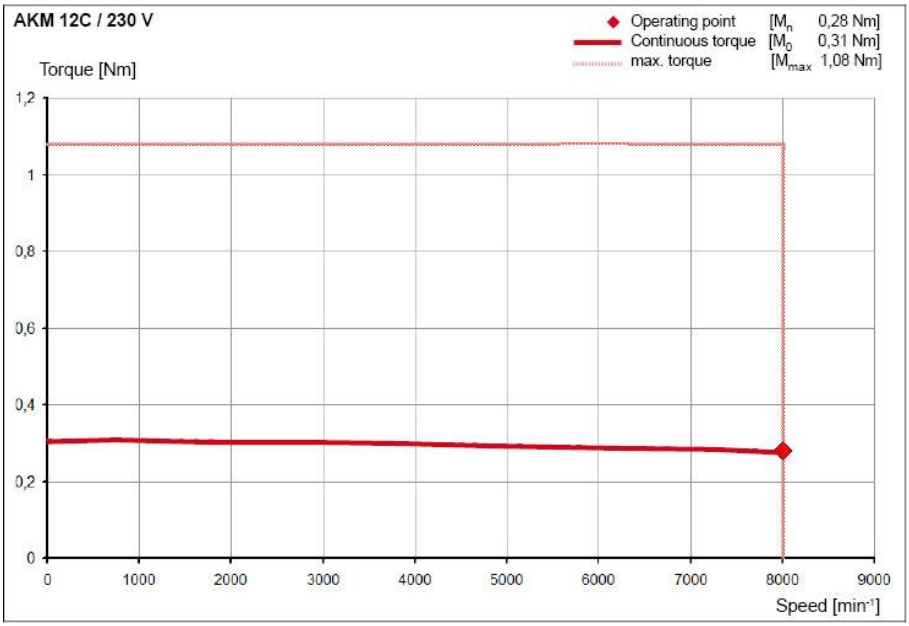


10.3.6 Motor Characteristics U_n 230 V

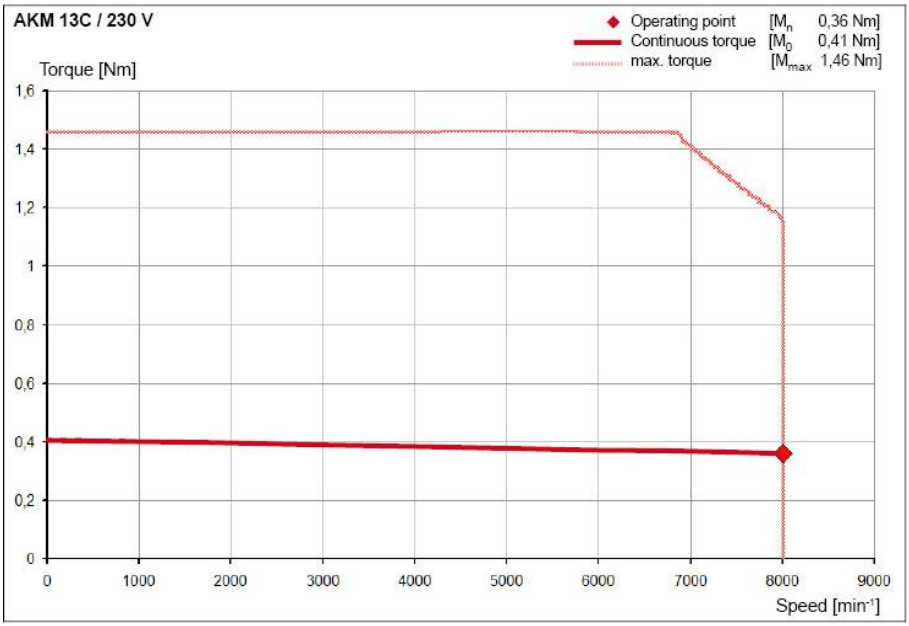
AKM 11B



AKM 12C


AKM 12C / 230 V
Operating point [Mn 0,28 Nm]
Continuous torque [M0 0,31 Nm]
max. torque [Mmax 1,08 Nm]
Torque [Nm]
1,2
1
0,8
0,6
0,4
0,2
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

AKM 13C


AKM 13C / 230 V
Operating point [Mn 0,36 Nm]
Continuous torque [M0 0,41 Nm]
max. torque [Mmax 1,46 Nm]
Torque [Nm]
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

10.4 AKM2

10.4.1 Technical Data

Data		Symbol [Unit]	AKM		
			21C	22C	22E
Electrical data					
	Standstill torque*	M_0 [Nm]**	0,45	0,84	0,87
	Standstill current	I_{0rms} [A]**	1,58	1,39	2,73
	Max. Nominal supply voltage	U_N [VAC]	480		
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	8000	3500	8000
	Nominal torque*	M_n [Nm]	0,39	0,78	0,70
	Nominal power	P_n [kW]	0,32	0,29	0,59
	Nominal current	I_n [A]	1,30	1,28	2,19
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	—	8000	—
	Nominal torque*	M_n [Nm]	—	0,68	—
	Nominal power	P_n [kW]	—	0,57	—
	Nominal current	I_n [A]	—	1,11	—
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	—	8000	—
	Nominal torque*	M_n [Nm]	—	0,68	—
	Nominal power	P_n [kW]	—	0,57	—
	Nominal current	I_n [A]	—	1,11	—
	Peak current	I_{0max} [A]	6,3	5,6	11
	Peak torque	M_{0max} [Nm]	1,47	2,73	2,76
	Torque constant	K_{Trms} [Nm/A]	0,30	0,61	0,32
	Voltage constant	K_{Erms} [mVmin]	19,5	39	20,4
	Winding resistance Ph-Ph	R_{25} [Ω]	13,0	20	5,22
	Winding inductance Ph-Ph	L [mH]	19	35,5	9,7

Mechanical Data			AKM 21	AKM 22
	Rotor inertial torque	J [kgcm²]	0,11	0,16
	Number of contacts		6	6
	Static drag torque	M_R [Nm]	0,002	0,005
	Thermal time constant	t_{TH} [min]	8	9
	Weight standard	G [kg]	0,82	1,1
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	145	
	Axial force allowed	F_A [N]	60	

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM21 = 0.00 Nm AKM22 = 0.01 Nm AKM23 = 0.02 Nm AKM24 = 0.05 Nm

For non-resolver feedback options: no continuous torque reduction.
Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM21 = 0.00 Nm AKM22 = 0.02 Nm AKM23 = 0.05 Nm AKM24 = 0.12 Nm

For motors with optional shaft seal, reduce torque shown by 0.047 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM					
			23C	23D	23F	24C	24D	24F
Electrical data								
	Standstill torque	M0 [Nm]**	1,13	1,16	1,18	1,38	1,41	1,42
	Standstill current	I0rms [A]**	1,41	2,19	4,31	1,42	2,21	3,89
	Max. Nominal supply voltage	UN [VAC]	480					
UN = 230V	Nominal rotation speed	nn [min-1]	2500	5000	8000	2000	4000	8000
	Nominal torque	Mn [Nm]	1,08	1,03	0,94	1,32	1,29	1,12
	Nominal power	Pn [kW]	0,28	0,54	0,79	0,28	0,54	0,94
	Nominal current	In [A]	1,35	1,98	3,48	1,36	2,05	3,11
UN = 400V	Nominal rotation speed	nn [min-1]	5500	8000	—	4500	8000	—
	Nominal torque*	Mn [Nm]	0,99	0,92	—	1,25	1,11	—
	Nominal power	Pn [kW]	0,57	0,77	—	0,59	0,93	—
	Nominal current	In [A]	1,24	1,77	—	1,29	1,76	—
UN = 480V	Nominal rotation speed	nn [min-1]	7000	8000	—	5500	8000	—
	Nominal torque*	Mn [Nm]	0,95	0,92	—	1,22	1,11	—
	Nominal power	Pn [kW]	0,70	0,77	—	0,70	0,93	—
	Nominal current	In [A]	1,19	1,77	—	1,26	1,76	—
	Peak current	I0max [A]	5,6	8,8	17,2	5,7	8,8	15,6
	Peak torque	M0max [Nm]	3,77	3,84	3,88	4,67	4,76	4,82
	Torque constant	KTrms [Nm/A]	0,80	0,52	0,27	0,97	0,63	0,36
	Voltage constant	KErms [mVmin]	51,8	33,8	17,6	62,4	40,8	23,4
	Winding resistance Ph-Ph	R25 [Ω]	21,2	8,77	2,34	20,4	9,02	2,77
	Winding inductance Ph-Ph	L [mH]	40,7	17,3	4,68	43,8	18,7	6,16

Mechanical Data			AKM 23	AKM 24
	Rotor inertial torque	J [kgcm²]	0,22	0,27
	Number of contacts		6	6
	Static drag torque	MR [Nm]	0,007	0,01
	Thermal time constant	tTH [min]	10	11
	Weight standard	G [kg]	1,38	1,66
	Radial force allowed on the shaft end at 8000 min-1	FR [N]	145	
	Axial force allowed	FA [N]	60	

*Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM21 = 0.00 Nm AKM22 = 0.01 Nm AKM23 = 0.02 Nm AKM24 = 0.05 Nm

For non-resolver feedback options: no continuous torque reduction.
Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM21 = 0.00 Nm AKM22 = 0.02 Nm AKM23 = 0.05 Nm AKM24 = 0.12 Nm

For motors with optional shaft seal, reduce torque shown by 0.047 Nm and increase M_R by the same amount.

10.4.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	M_{BR} [Nm]	1,42
Connection voltage	U_{BR} [VDC]	24 ± 10 %
Electrical power	P_{BR} [W]	8,4
Inertial torque	J_{BR} [kgcm²]	0,011
Release delay time	t_{BRH} [ms]	20
Application delay time	t_{BRL} [ms]	18
Brake weight	G_{BR} [kg]	0,27
Typical play	[°mech.]	0,46
Switching energy	E [mJ]	6,51

10.4.3 Cables and Connections

Data	AKM2
Power connection	4 + 4-pin, round, angled
Motor cable, shielded	4 x 1
Motor cable with control wires, shielded	4 x 1 x 2
Resolver connection	12-pin, round, angled
Motor cable, shielded	4 x 2 x 0,18 mm^2

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.4.4 Maximum and Continuous Torque

Power supply 1 x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier	
			MDD 111	MDD 121
AKM 21C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,45 0,39 1,47	0,45 0,39 1,47	0,45 0,39 1,47
AKM 22C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,84 0,78 2,73	0,84 0,78 2,73	0,84 0,78 2,73
AKM 22E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,87 0,70 2,76	0,87 0,70 2,76	0,87 0,70 2,34
AKM 23C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,13 1,08 3,77	1,13 1,08 3,77	1,13 1,08 3,77
AKM 23D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,16 1,03 3,84	1,16 1,03 3,84	1,16 1,03 3,83
AKM 23F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,18 0,94 3,88	1,18 0,94 3,42	0,79 0,94 2,21
AKM 24C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,38 1,32 4,67	1,38 1,32 4,67	1,38 1,32 4,67
AKM 24D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,41 1,29 4,76	1,41 1,29 4,76	1,41 1,29 4,75
AKM 24F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,42 1,12 4,82	1,42 1,12 4,58	1,06 1,12 2,96

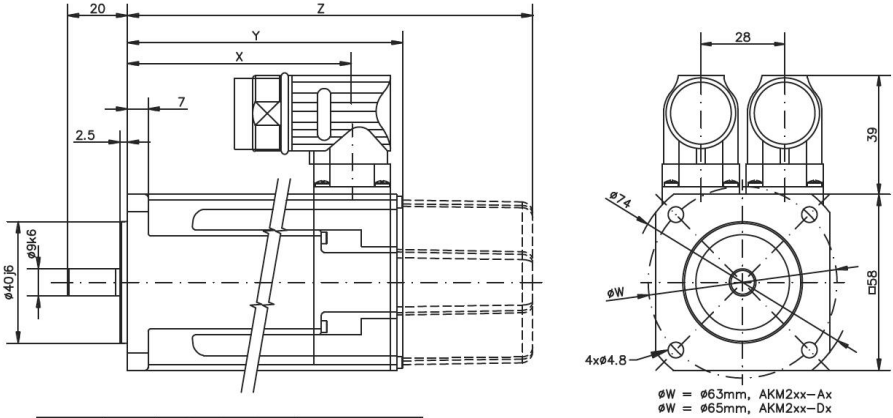
Power supply 3 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 21C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 22C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73
AKM 22E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 23C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77	1,13 0,99 3,77
AKM 23D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,16 0,92 3,84	1,16 0,92 3,84	1,01 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84
AKM 23F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 24C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67	1,38 1,25 4,67
AKM 24D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,41 1,11 4,76	1,41 1,11 4,75	1,23 1,11 3,39	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76
AKM 24F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

Power supply 3 x 480 V

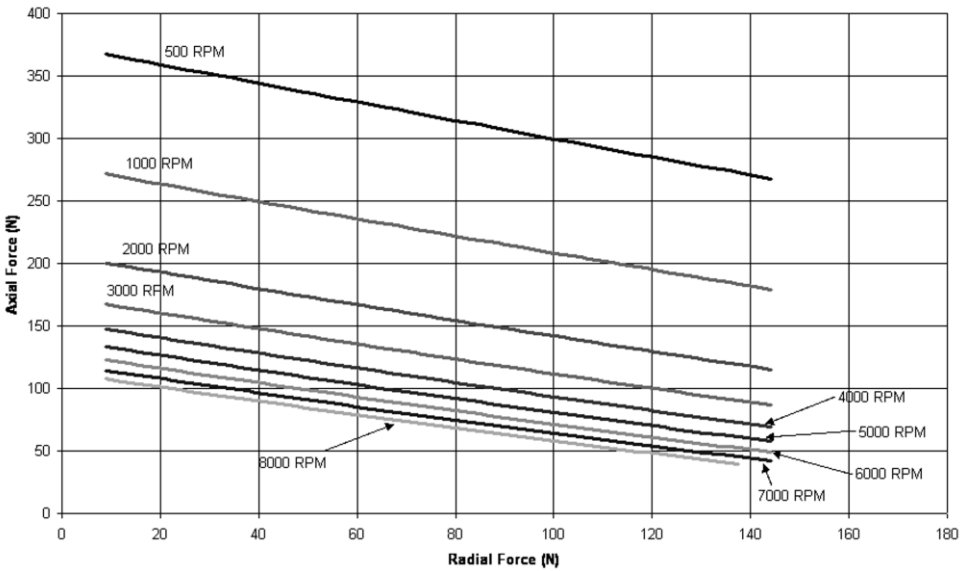
Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 21C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 22C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73	0,84 0,68 2,73
AKM 22E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 23C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77	1,13 0,95 3,77
AKM 23D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,16 0,92 3,84	1,16 0,92 3,83	1,01 0,92 2,76	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84	1,16 0,92 3,84
AKM 23F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 24C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67	1,38 1,22 4,67
AKM 24D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,41 1,11 4,76	1,41 1,11 4,75	1,23 1,11 3,39	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76	1,41 1,11 4,76
AKM 24F	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

10.4.5 Dimensional Drawing (schematic diagram)



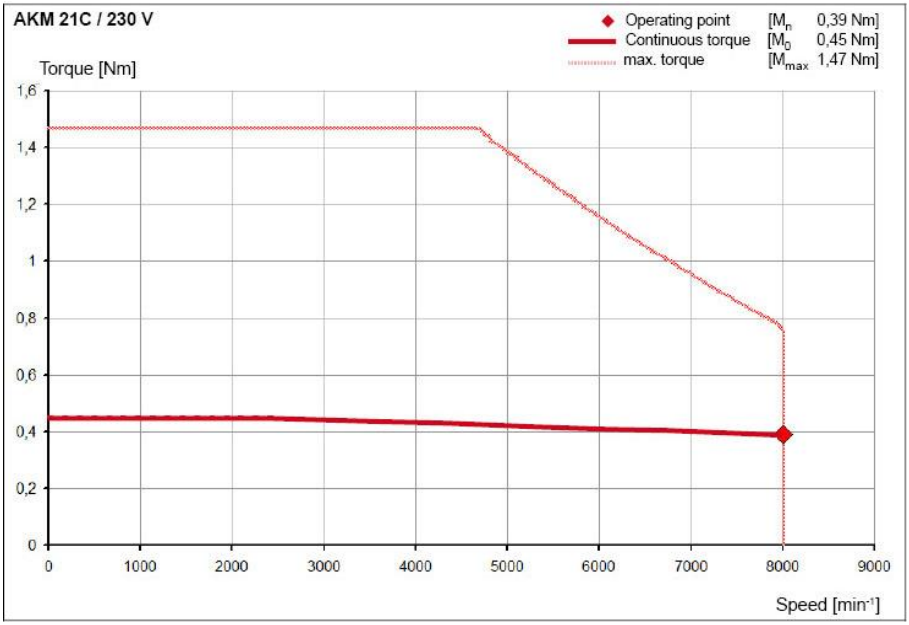
Model	X	Res/SFD/BiSS/EnDat		Hiperface	
		Y	Z (brake)	Y	Z (brake)
AKM21	76.1	95.4	129.5	113.4	147.1
AKM22	95.1	114.4	148.5	132.4	166.1
AKM23	114.1	133.4	167.5	151.4	185.1
AKM24	133.1	152.4	186.5	170.4	204.1

10.4.6 Radial Force on the Shaft End

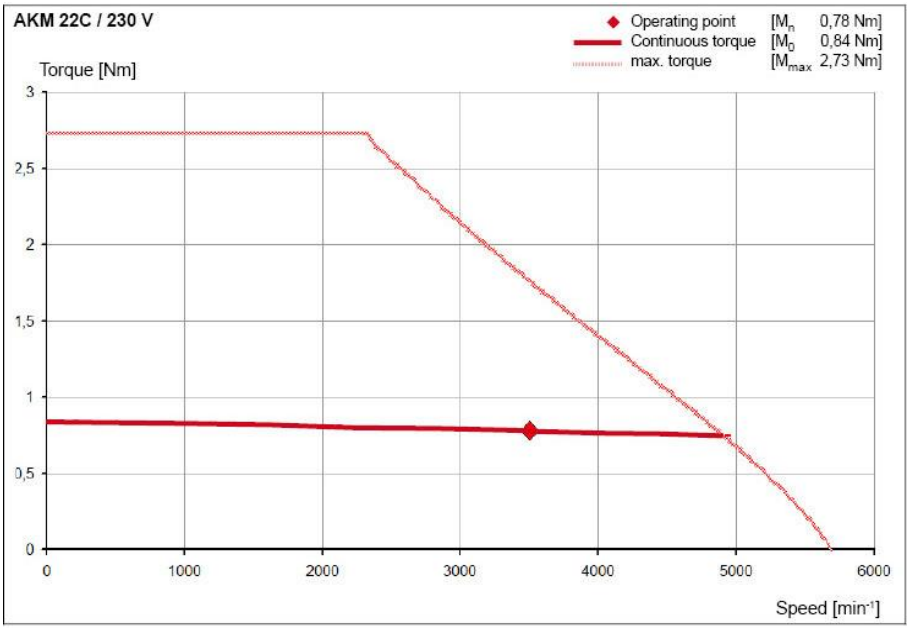


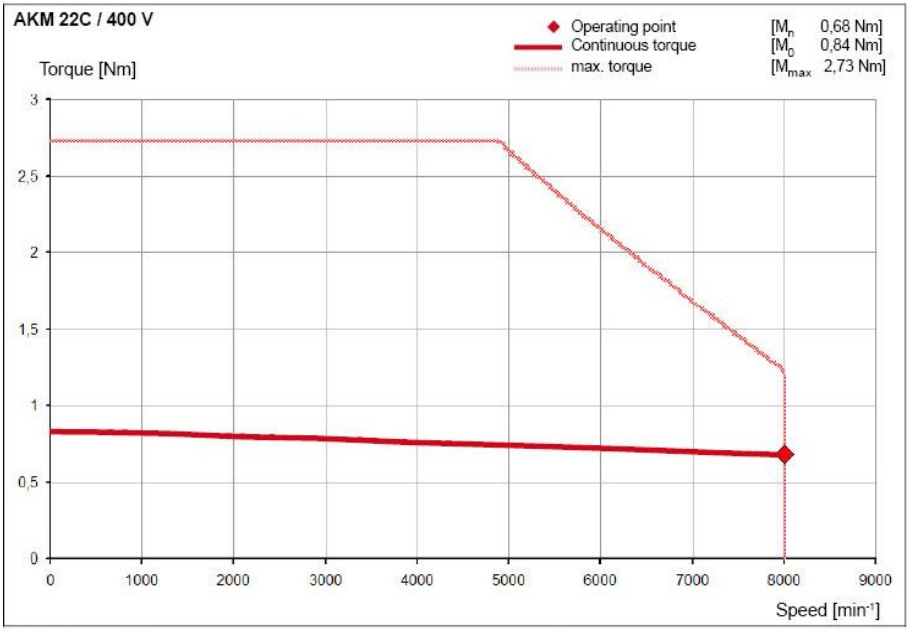
10.4.7 Motor Characteristics

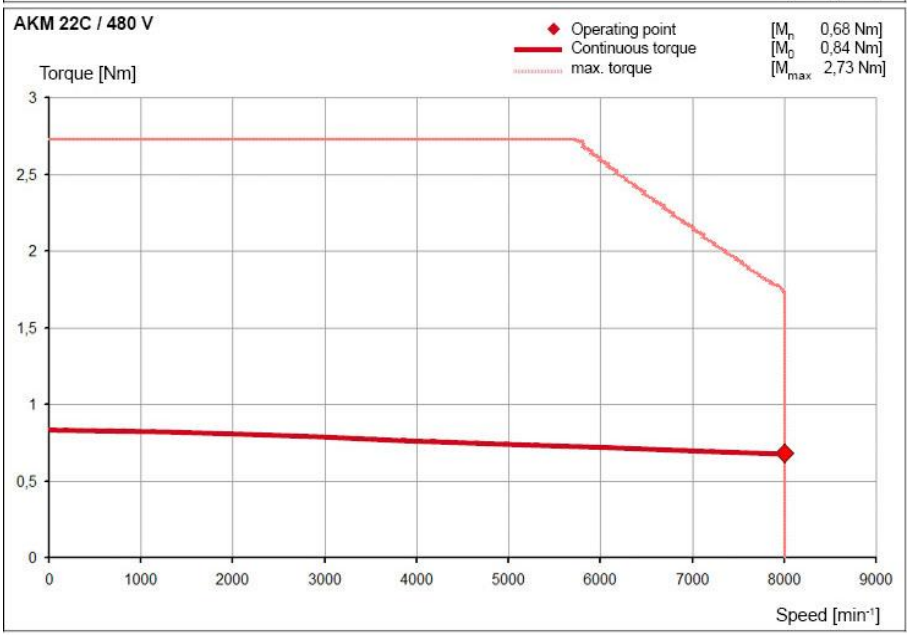
AKM 21C



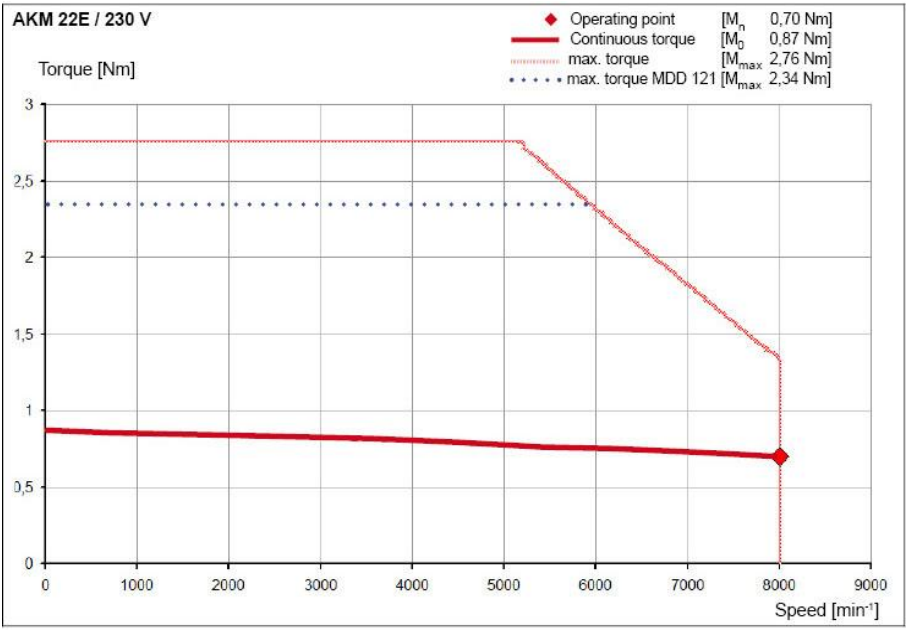
AKM 22C


AKM 22C / 230 V
Operating point [M_n 0,78 Nm]
Continuous torque [M_0 0,84 Nm]
max. torque [M_{max} 2,73 Nm]
Torque [Nm]
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
Speed [min⁻¹]

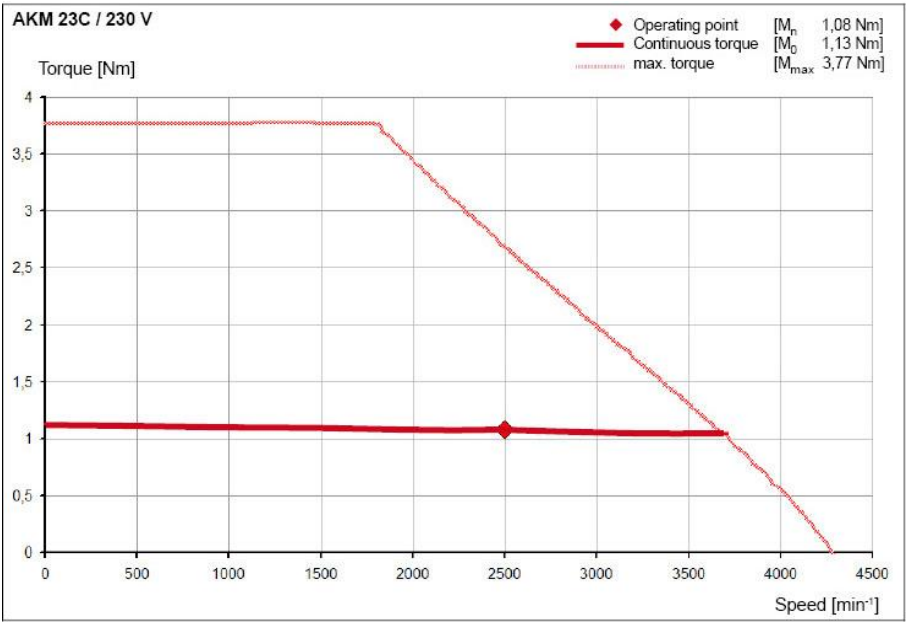

AKM 22C / 400 V
Operating point
Continuous torque
max. torque
[Mn 0,68 Nm]
[M0 0,84 Nm]
[Mmax 2,73 Nm]
Torque [Nm]
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

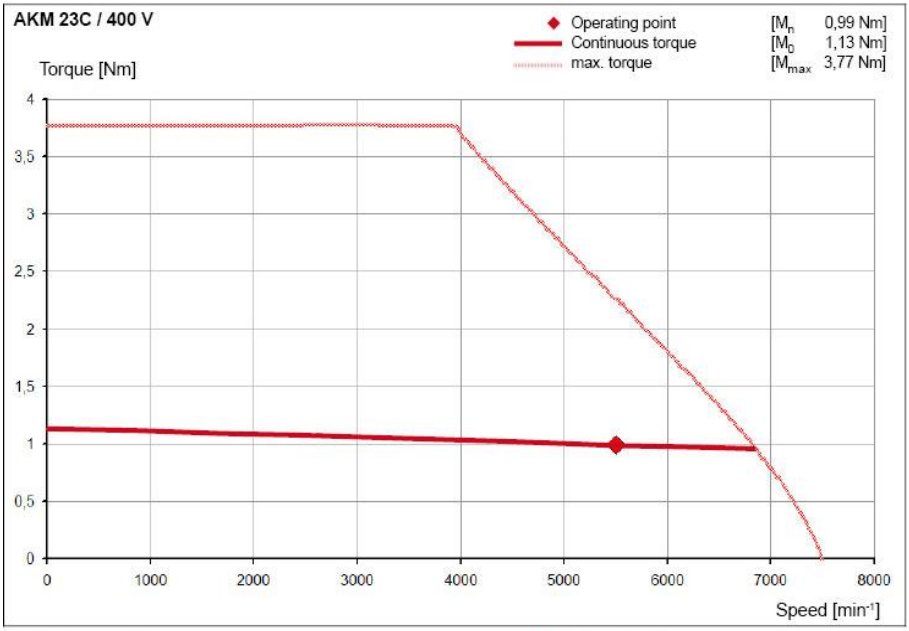

AKM 22C / 480 V
Operating point
Continuous torque
max. torque
[Mn 0,68 Nm]
[M0 0,84 Nm]
[Mmax 2,73 Nm]
Torque [Nm]
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

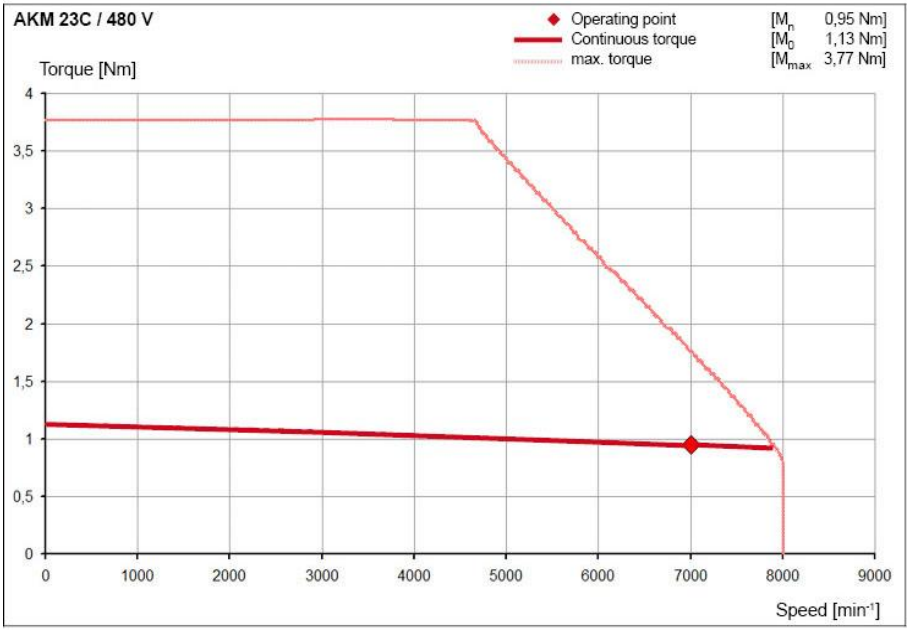
AKM 22E


AKM 22E / 230 V
Operating point [Mn 0,70 Nm]
Continuous torque [M0 0,87 Nm]
max. torque [Mmax 2,76 Nm]
max. torque MDD 121 [Mmax 2,34 Nm]
Torque [Nm]
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

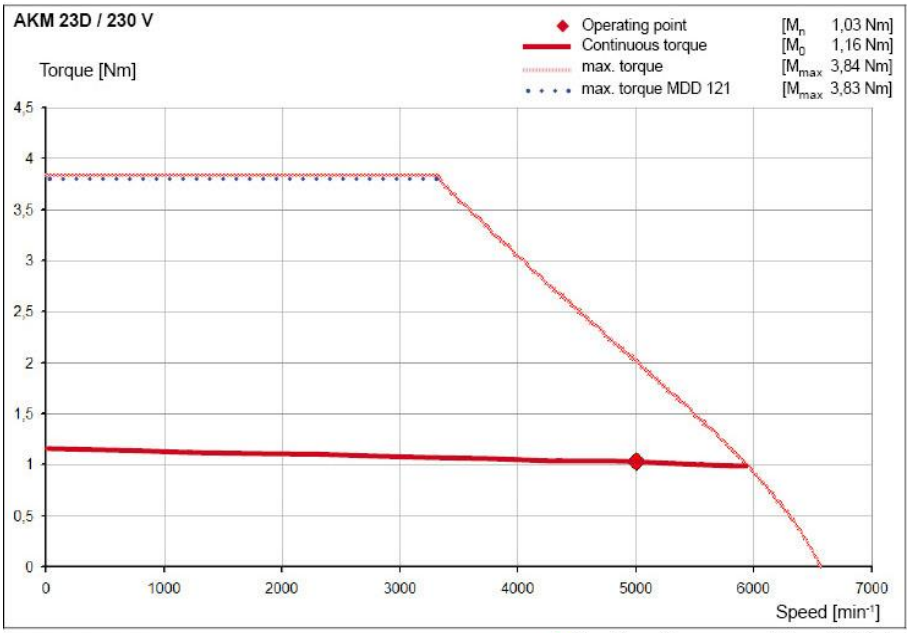
AKM 23C

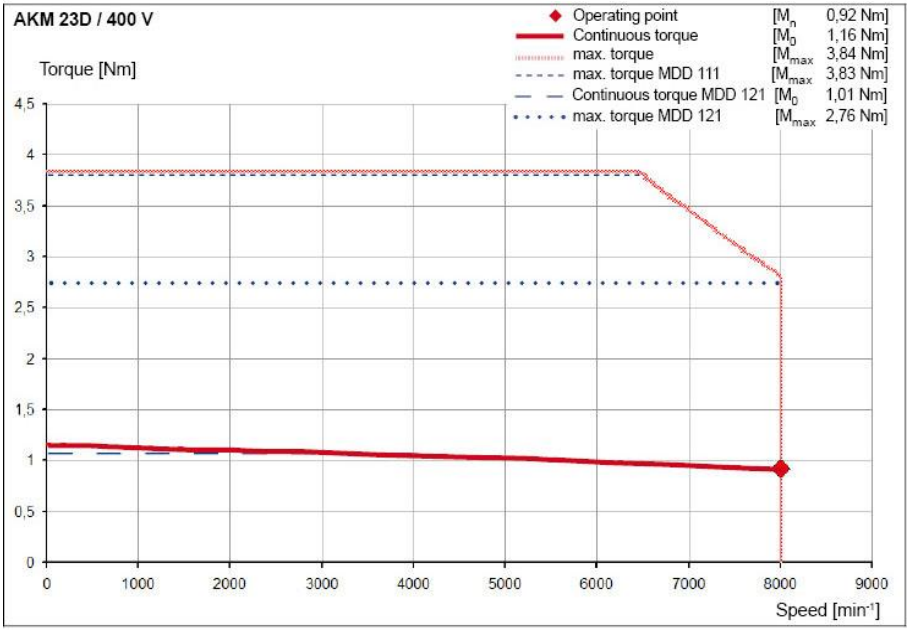

AKM 23C / 230 V
Operating point [Mn 1,08 Nm]
Continuous torque [M0 1,13 Nm]
max. torque [Mmax 3,77 Nm]
Torque [Nm]
4
3,5
3
2,5
2
1,5
1
0,5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

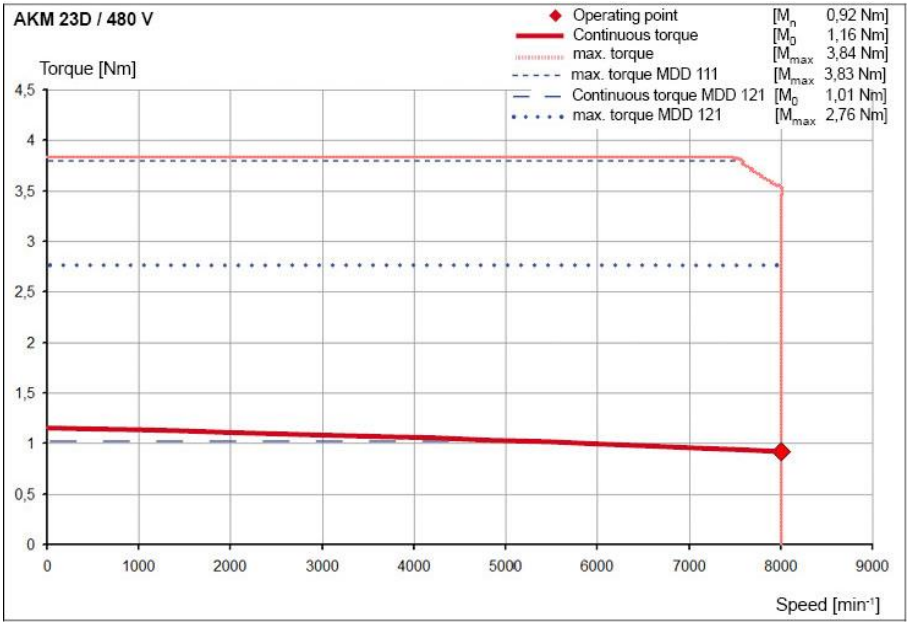

AKM 23C / 400 V
Operating point [M_n 0,99 Nm]
Continuous torque [M_0 1,13 Nm]
max. torque [M_{max} 3,77 Nm]
Torque [Nm]
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Speed [min⁻¹]


AKM 23C / 480 V
Operating point [M_n 0,95 Nm]
Continuous torque [M_0 1,13 Nm]
max. torque [M_{max} 3,77 Nm]
Torque [Nm]
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min⁻¹]

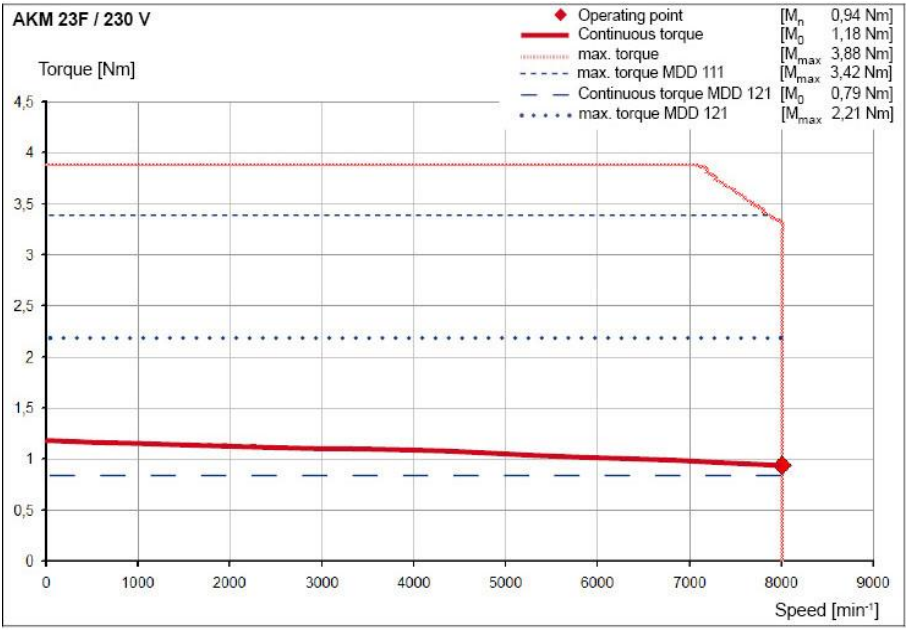
AKM 23D


AKM 23D / 230 V
Operating point [Mn 1,03 Nm]
Continuous torque [M0 1,16 Nm]
max. torque [Mmax 3,84 Nm]
max. torque MDD 121 [Mmax 3,83 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

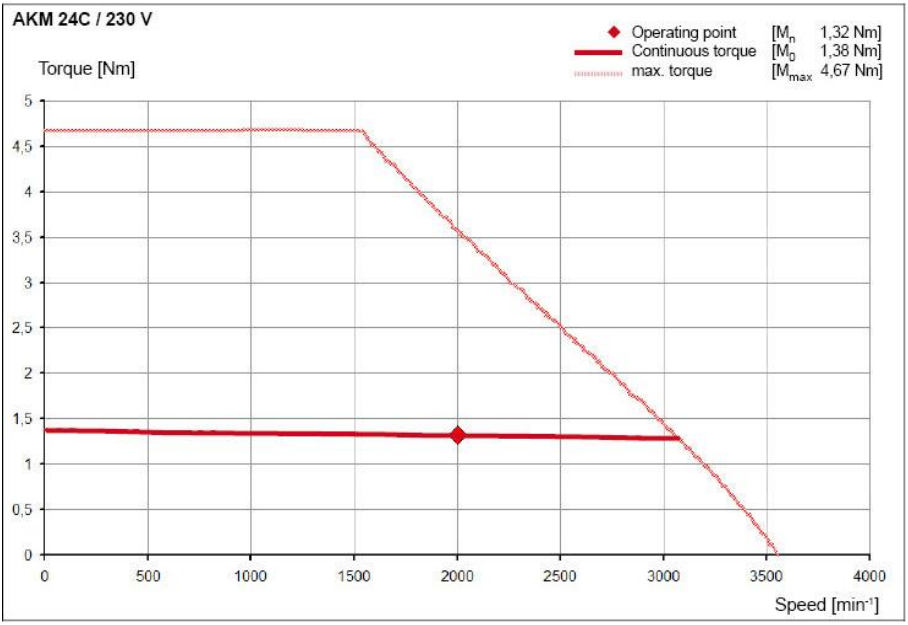

AKM 23D / 400 V
Operating point [Mn 0,92 Nm]
Continuous torque [M0 1,16 Nm]
max. torque [Mmax 3,84 Nm]
max. torque MDD 111 [Mmax 3,83 Nm]
Continuous torque MDD 121 [M0 1,01 Nm]
max. torque MDD 121 [Mmax 2,76 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

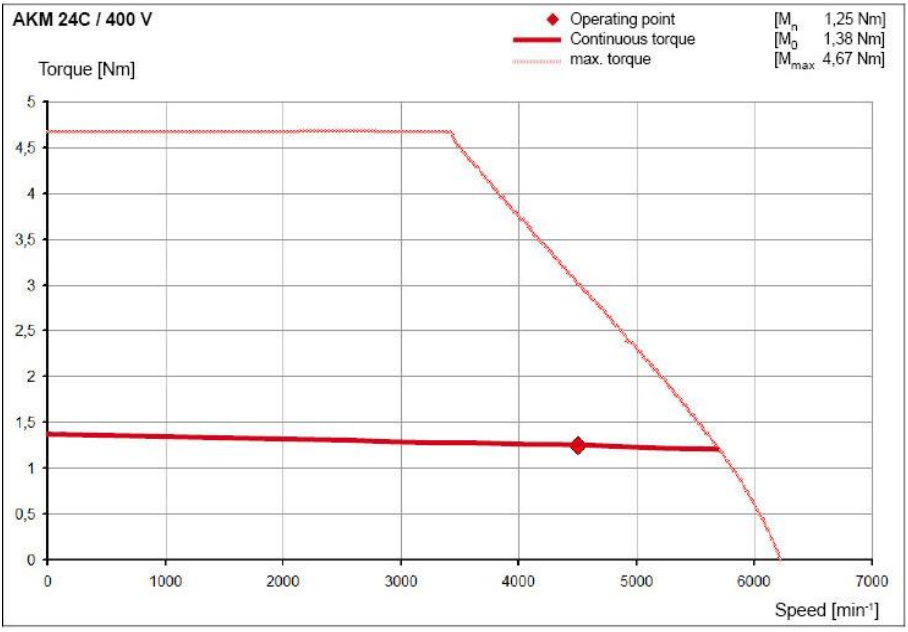

AKM 23D / 480 V
Operating point [Mn 0,92 Nm]
Continuous torque [M0 1,16 Nm]
max. torque [Mmax 3,84 Nm]
max. torque MDD 111 [Mmax 3,83 Nm]
Continuous torque MDD 121 [M0 1,01 Nm]
max. torque MDD 121 [Mmax 2,76 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

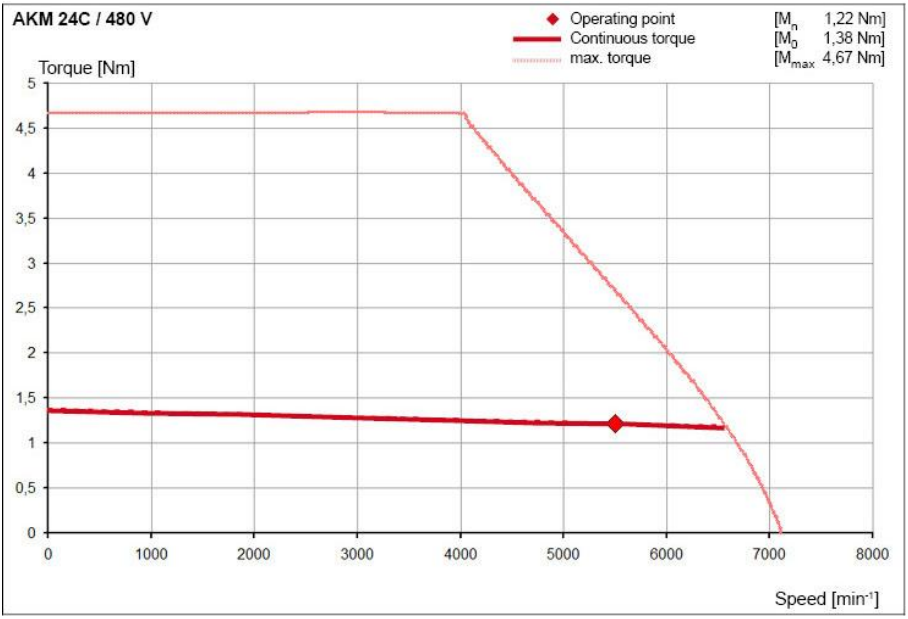
AKM 23F


AKM 23F / 230 V
Operating point [M_n 0,94 Nm]
Continuous torque [M_0 1,18 Nm]
max. torque [M_{max} 3,88 Nm]
max. torque MDD 111 [M_{max} 3,42 Nm]
Continuous torque MDD 121 [M_0 0,79 Nm]
max. torque MDD 121 [M_{max} 2,21 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min⁻¹]

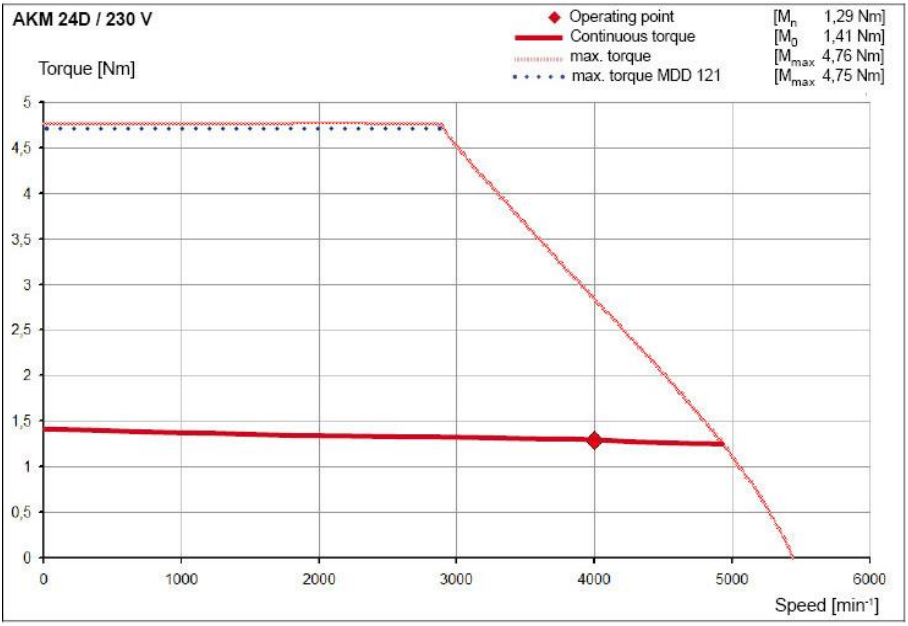
AKM 24C

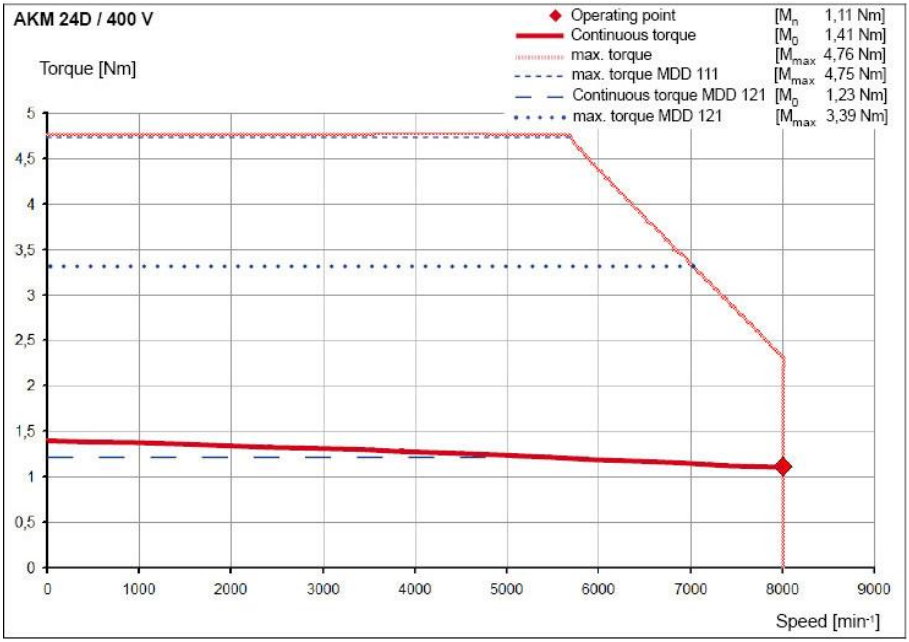

AKM 24C / 230 V
Operating point [M_n 1,32 Nm]
Continuous torque [M_0 1,38 Nm]
max. torque [M_{max} 4,67 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min⁻¹]

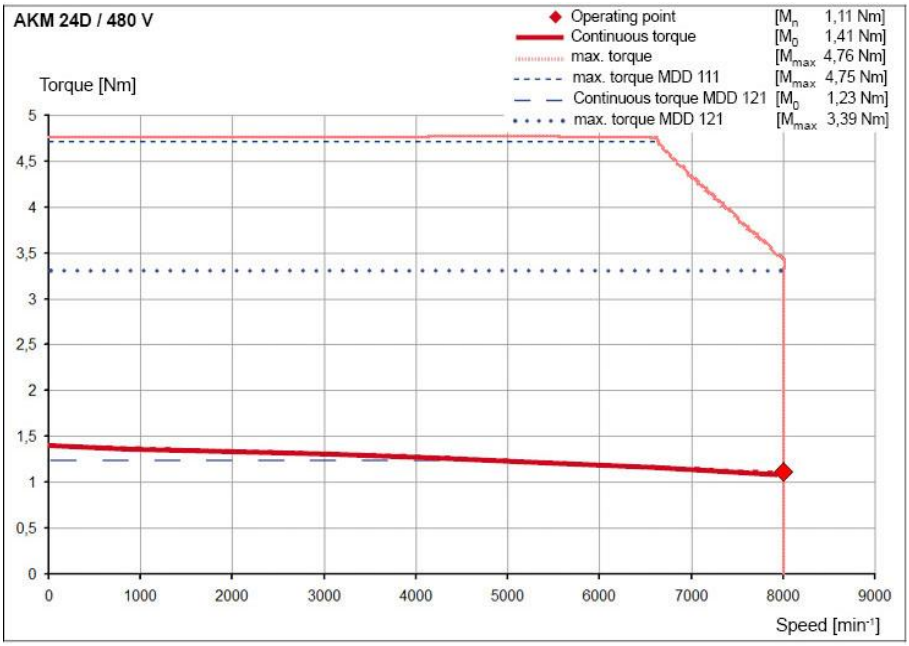

AKM 24C / 400 V
Operating point [M_n 1,25 Nm]
Continuous torque [M_0 1,38 Nm]
max. torque [M_{max} 4,67 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]


AKM 24C / 480 V
Operating point [Mn 1,22 Nm]
Continuous torque [M0 1,38 Nm]
max. torque [Mmax 4,67 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Speed [min-1]

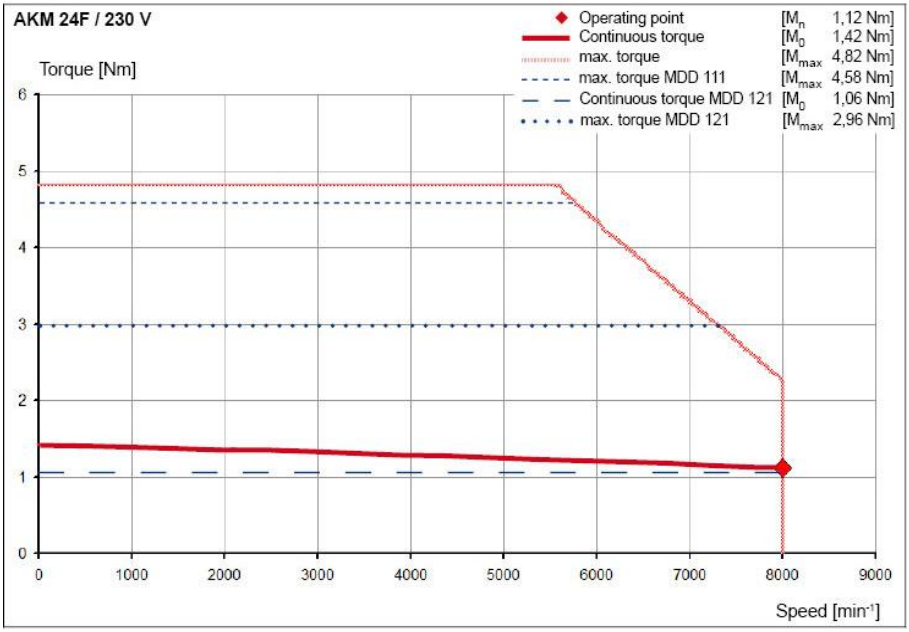
AKM 24D


AKM 24D / 230 V
Operating point [Mn 1,29 Nm]
Continuous torque [M0 1,41 Nm]
max. torque [Mmax 4,76 Nm]
max. torque MDD 121 [Mmax 4,75 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 24D / 400 V
Operating point [Mn 1,11 Nm]
Continuous torque [M0 1,41 Nm]
max. torque [Mmax 4,76 Nm]
max. torque MDD 111 [Mmax 4,75 Nm]
Continuous torque MDD 121 [M0 1,23 Nm]
max. torque MDD 121 [Mmax 3,39 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]


AKM 24D / 480 V
Operating point [Mn 1,11 Nm]
Continuous torque [M0 1,41 Nm]
max. torque [Mmax 4,76 Nm]
max. torque MDD 111 [Mmax 4,75 Nm]
Continuous torque MDD 121 [M0 1,23 Nm]
max. torque MDD 121 [Mmax 3,39 Nm]
Torque [Nm]
5
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

AKM 24F


AKM 24F / 230 V
Operating point [M_n 1,12 Nm]
Continuous torque [M_0 1,42 Nm]
max. torque [M_{max} 4,82 Nm]
max. torque MDD 111 [M_{max} 4,58 Nm]
Continuous torque MDD 121 [M_0 1,06 Nm]
max. torque MDD 121 [M_{max} 2,96 Nm]
Torque [Nm]
0
1
2
3
4
5
6
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min^{-1}]

10.5 AKM3

10.5.1 Technical Data

Data		Symbol [Unit]	AKM								
			31C	31E	32C	32D	32E	32H	33C	33E	33H
Electrical data											
	Standstill torque*	M_0 [Nm]**	1,15	1,20	2,00	2,04	2,04	2,10	2,71	2,79	2,88
	Standstill current	I_{0rms} [A]**	1,37	2,99	1,44	2,23	2,82	5,50	1,47	2,58	5,62
	Max. Nominal supply voltage	U_N [VAC]	480								
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	2500	6000	1500	2500	3500	7000	1000	2000	5500
	Nominal torque*	M_n [Nm]	1,12	0,95	1,95	1,93	1,87	1,45	2,64	2,62	2,27
	Nominal power	P_n [kW]	0,29	0,60	0,31	0,51	0,69	1,06	0,28	0,55	1,31
	Nominal current	I_n [A]	1,32	2,32	1,39	2,10	2,56	3,72	1,42	2,38	4,37
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	5000	—	3000	5500	7000	—	2000	4500	—
	Nominal torque*	M_n [Nm]	1,00	—	1,86	1,65	1,41	—	2,54	2,34	—
	Nominal power	P_n [kW]	0,52	—	0,58	0,95	1,03	—	0,53	1,10	—
	Nominal current	I_n [A]	1,18	—	1,33	1,79	1,93	—	1,37	2,13	—
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	6000	—	3500	6000	8000	—	2500	5000	—
	Nominal torque*	M_n [Nm]	0,91	—	1,83	1,58	1,22	—	2,50	2,27	—
	Nominal power	P_n [kW]	0,57	—	0,67	0,99	1,02	—	0,65	1,19	—
	Nominal current	I_n [A]	1,07	—	1,31	1,72	1,67	—	1,34	2,06	—
	Peak current	I_{0max} [A]	5,5	12	5,8	8,9	11,3	22	5,9	10,3	22,5
	Peak torque	M_{0max} [Nm]	3,88	4,0	6,92	7,1	7,11	7,26	9,76	9,96	10,22
	Torque constant	K_{Trms} [Nm/A]	0,85	0,41	1,40	0,92	0,73	0,39	1,86	1,10	0,52
	Voltage constant	K_{Erms} [mVmin]	54,5	26,1	89,8	59,0	47,1	24,8	120	70,6	33,4
	Winding resistance Ph-Ph	R_{25} [Ω]	21,4	4,74	23,8	10,3	6,3	1,69	26,6	9,01	1,96
	Winding inductance Ph-Ph	L [mH]	37,5	8,6	46,5	20,1	12,8	3,55	53,6	18,5	4,1

Mechanical Data			AKM 31	AKM 32	AKM 33
	Rotor inertial torque	J [kgcm²]	0,33	0,59	0,85
	Number of contacts		8	8	8
	Static drag torque	M_R [Nm]	0,014	0,02	0,026
	Thermal time constant	t_{TH} [min]	14	17	20
	Weight standard	G [kg]	1,55	2,23	2,9
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	195		
	Axial force allowed	F_A [N]	65		

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM31 = 0.00 Nm AKM32 = 0.05 Nm AKM33 = 0.1 Nm

For non-resolver feedback options: no continuous torque reduction.
Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM31 = 0.0 Nm AKM32 = 0.1 Nm AKM33 = 0.2 Nm

For motors with optional shaft seal, reduce torque shown by 0.047 Nm and increase M_R by the same amount.

10.5.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	M_{BR} [Nm]	2,5
Connection voltage	UBR [VDC]	24 ± 10 %
Electrical power	PBR [W]	10,1
Inertial torque	JBR [kgcm²]	0,011
Release delay time	tBRH [ms]	25
Application delay time	tBRL [ms]	10
Brake weight	GBR [kg]	0,35
Typical play	[°mech.]	0,46
Switching energy	E [mJ]	11,65

10.5.3 Cables and Connections

Data	AKM3
Power connection	4 + 4-pin, round, angled
Motor cable, shielded	4 x 1
Motor cable with control wires, shielded	4 x 1 + 2 x 0,5
Resolver connection	12-pin, round, angled
Motor cable, shielded	4 x 2 x 0,18 mm^2

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.5.4 Maximum and Continuous Torque

Power supply 1 x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier	
			MDD 111	MDD 121
AKM 31C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,15 1,12 3,88	1,15 1,12 3,88	1,15 1,12 3,88
AKM 31E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,20 0,95 4,00	1,20 0,95 4,00	1,15 0,95 3,10
AKM 32C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,00 1,95 6,92	2,00 1,95 6,92	2,00 1,95 6,92
AKM 32D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,04 1,93 7,01	2,04 1,93 7,01	2,04 1,93 6,98
AKM 32E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,04 1,87 7,11	2,04 1,87 7,11	2,04 1,87 5,74
AKM 32H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,10 1,45 7,26	2,10 1,45 5,12	1,12 1,45 3,22
AKM 33C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,71 2,64 9,76	2,71 2,64 9,76	2,71 2,64 9,76
AKM 33E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,79 2,62 9,96	2,79 2,62 9,96	2,79 2,62 8,66
AKM 33H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,88 2,27 10,22	2,88 2,27 7,01	1,51 2,27 4,37

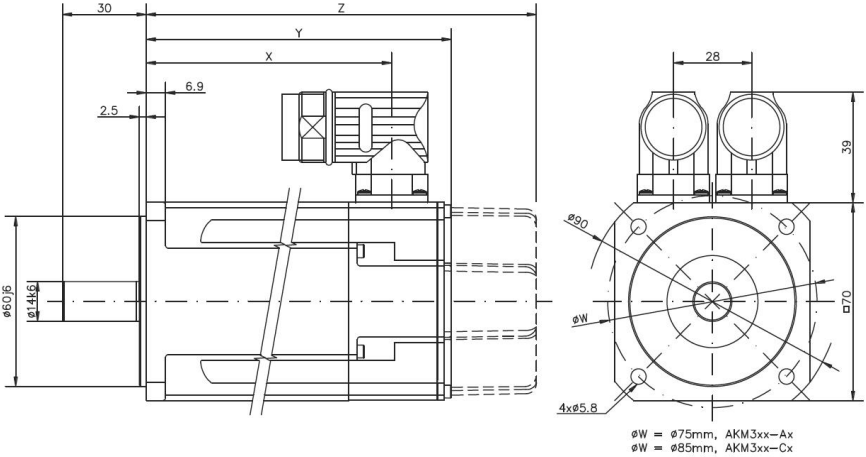
Power supply 3 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 31C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88	1,15 1,00 3,88
AKM 31E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 32C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92	2,00 1,86 6,92
AKM 32D	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,04 1,65 7,10	2,04 1,65 6,98	1,76 1,65 4,93	2,04 1,65 7,10	2,04 1,65 7,10	2,04 1,65 7,10	2,04 1,65 7,10	2,04 1,65 7,10	2,04 1,65 7,10
AKM 32H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,04 1,41 7,11	2,04 1,41 7,11	2,04 1,41 5,74	2,04 1,41 7,11	2,04 1,41 7,11	2,04 1,41 7,11	2,04 1,41 7,11	2,04 1,41 7,11	2,04 1,41 7,11
AKM 33C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 33E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76	2,71 2,54 9,76
AKM 33H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,79 2,34 9,96	2,79 2,34 8,66	2,11 2,34 6,01	2,79 2,34 9,96	2,79 2,34 9,96	2,79 2,34 9,96	2,79 2,34 9,96	2,79 2,34 9,96	2,79 2,34 9,96

Power supply 3 x 480 V

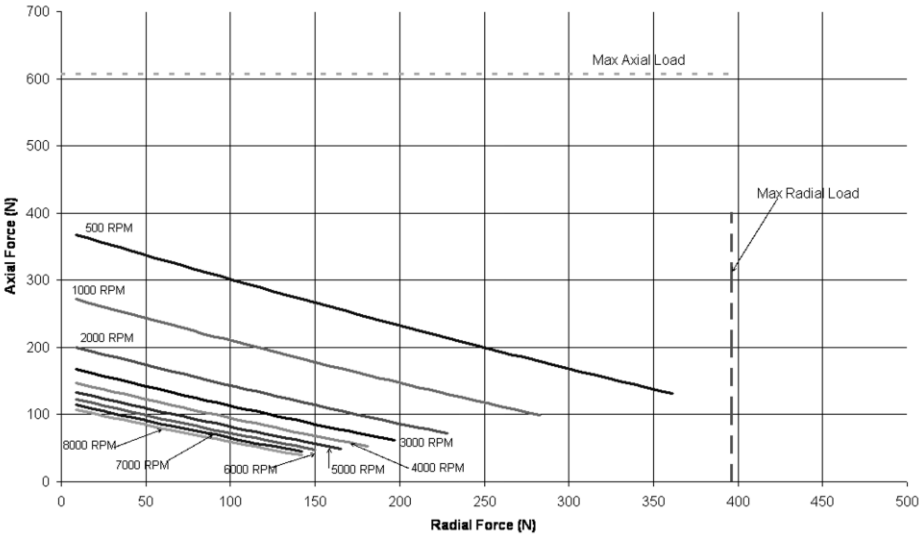
Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 31C	M_0 [Nm]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15
	M_n [Nm]	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
	M_{max} [Nm]	3,88	3,88	3,88	3,88	3,88	3,88	3,88	3,88	3,88
AKM 31E	M_0 [Nm]	-	-	-	-	-	-	-	-	-
	M_n [Nm]	-	-	-	-	-	-	-	-	-
	M_{max} [Nm]	-	-	-	-	-	-	-	-	-
AKM 32C	M_0 [Nm]	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	M_n [Nm]	1,83	1,83	1,83	1,83	1,83	1,83	1,83	1,83	1,83
	M_{max} [Nm]	6,92	6,92	6,92	6,92	6,92	6,92	6,92	6,92	6,92
AKM 32D	M_0 [Nm]	2,04	2,04	1,77	2,04	2,04	2,04	2,04	2,04	2,04
	M_n [Nm]	1,58	1,58	1,58	1,58	1,58	1,58	1,58	1,58	1,58
	M_{max} [Nm]	7,10	6,98	4,93	7,10	7,10	7,10	7,10	7,10	7,10
AKM 32H	M_0 [Nm]	2,04	2,04	1,41	2,04	2,04	2,04	2,04	2,04	2,04
	M_n [Nm]	1,22	1,22	1,22	1,22	1,22	1,22	1,22	1,22	1,22
	M_{max} [Nm]	7,11	5,84	4,04	7,11	7,11	7,11	7,11	7,11	7,11
AKM 33C	M_0 [Nm]	-	-	-	-	-	-	-	-	-
	M_n [Nm]	-	-	-	-	-	-	-	-	-
	M_{max} [Nm]	-	-	-	-	-	-	-	-	-
AKM 33E	M_0 [Nm]	2,71	2,71	2,71	2,71	2,71	2,71	2,71	2,71	2,71
	M_n [Nm]	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
	M_{max} [Nm]	9,76	9,76	9,69	9,76	9,76	9,76	9,76	9,76	9,76
AKM 33H	M_0 [Nm]	2,79	2,79	2,11	2,79	2,79	2,79	2,79	2,79	2,79
	M_n [Nm]	2,27	2,27	2,27	2,27	2,27	2,27	2,27	2,27	2,27
	M_{max} [Nm]	9,96	8,67	6,01	9,96	9,96	9,96	9,96	9,96	9,96

10.5.5 Dimensional Drawing (schematic diagram)



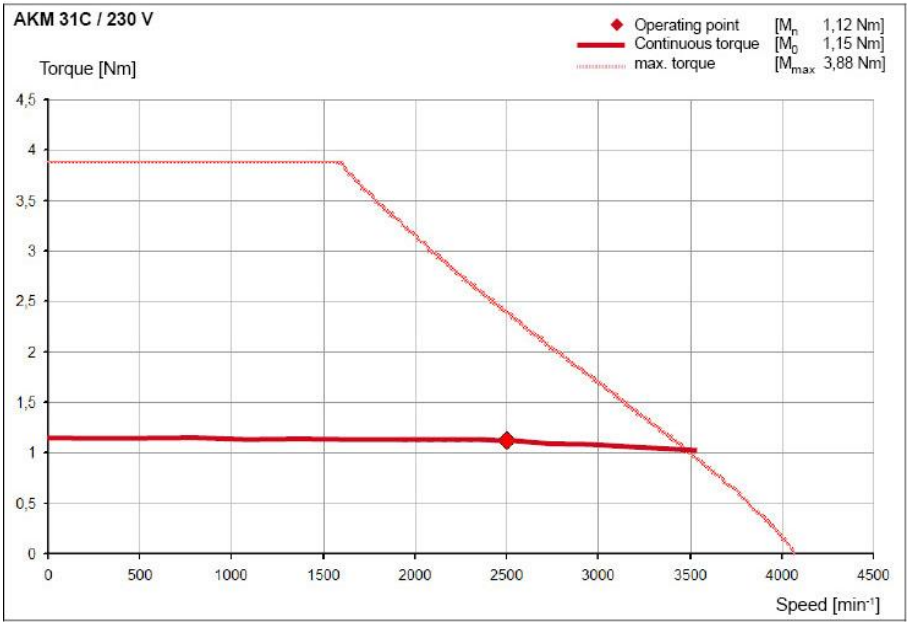
Model	X	Res/SFD/BISS/EnDat		Hiperface	
		Y	Z (brake)	Y1	Z (brake)
AKM31	87.9	109.8	141.3	125.3	159.3
AKM32	118.9	140.8	172.3	156.3	190.3
AKM33	149.9	171.8	203.3	187.3	221.3

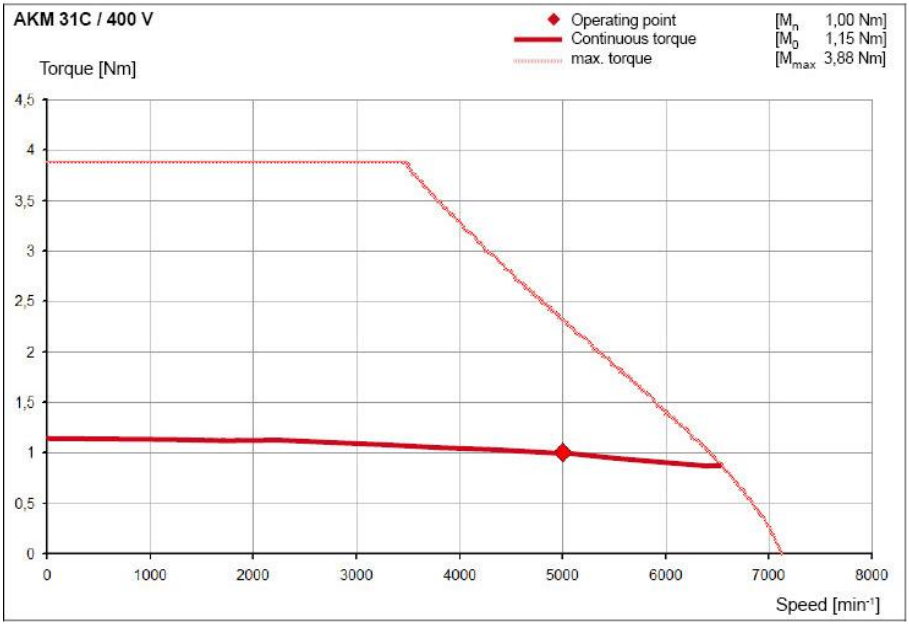
10.5.6 Radial Force on the Shaft End

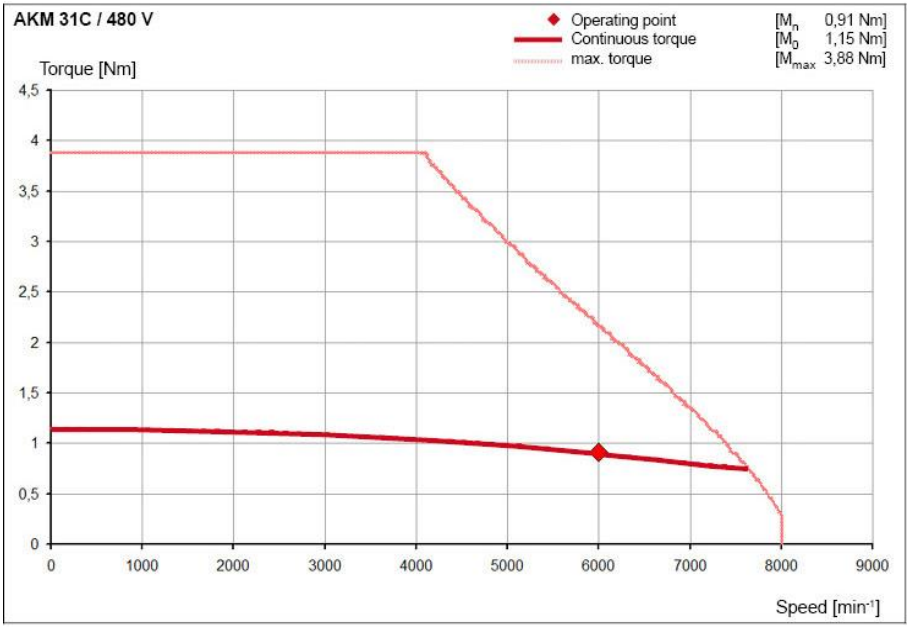


10.5.7 Motor Characteristics

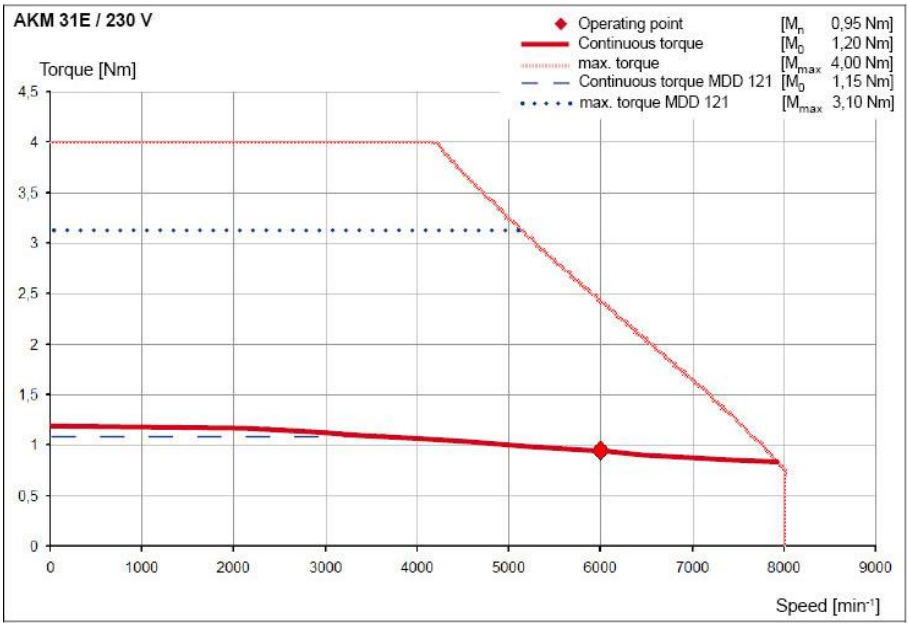
AKM 31C



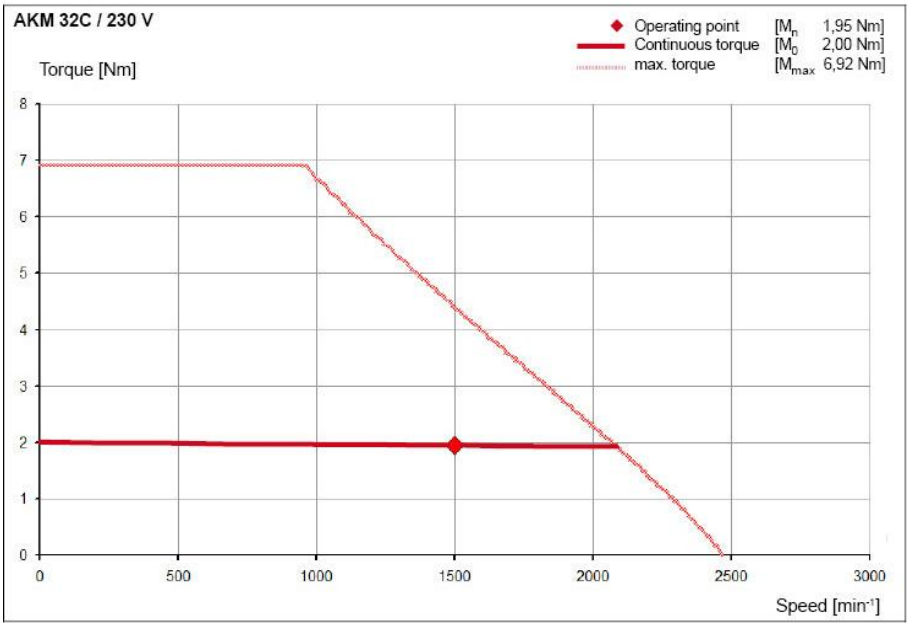

AKM 31C / 400 V
Operating point
Continuous torque
max. torque
[Mn 1,00 Nm]
[M0 1,15 Nm]
[Mmax 3,88 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Speed [min-1]

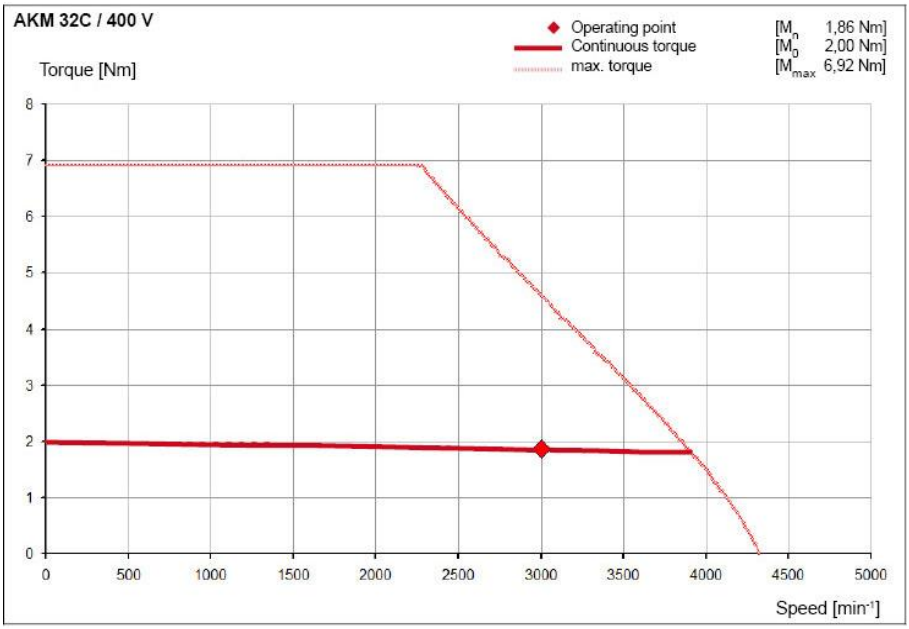

AKM 31C / 480 V
Operating point
Continuous torque
max. torque
[Mn 0,91 Nm]
[M0 1,15 Nm]
[Mmax 3,88 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

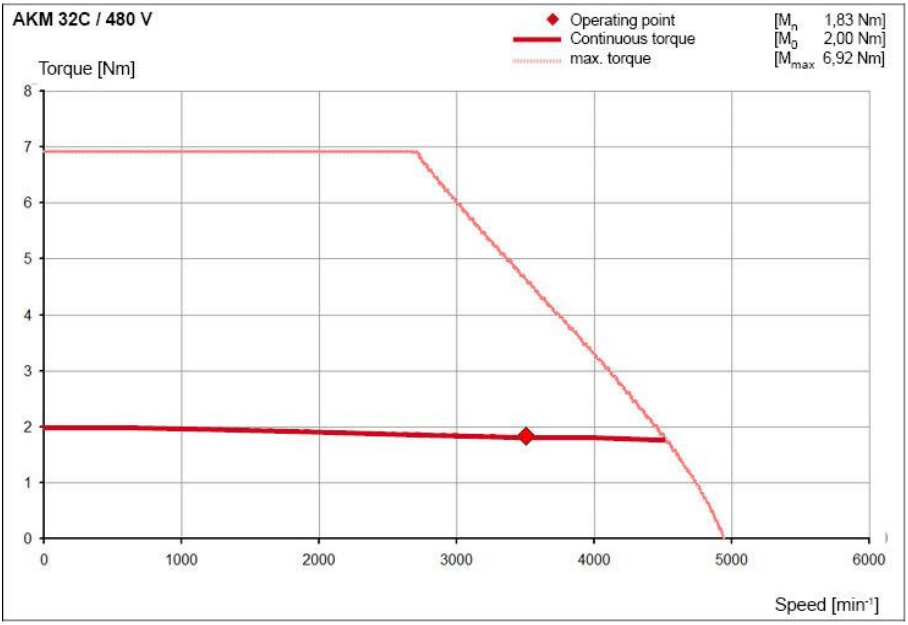
AKM 31E


AKM 31E / 230 V
Operating point [M_n 0,95 Nm]
Continuous torque [M_0 1,20 Nm]
max. torque [M_{max} 4,00 Nm]
Continuous torque MDD 121 [M_0 1,15 Nm]
max. torque MDD 121 [M_{max} 3,10 Nm]
Torque [Nm]
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

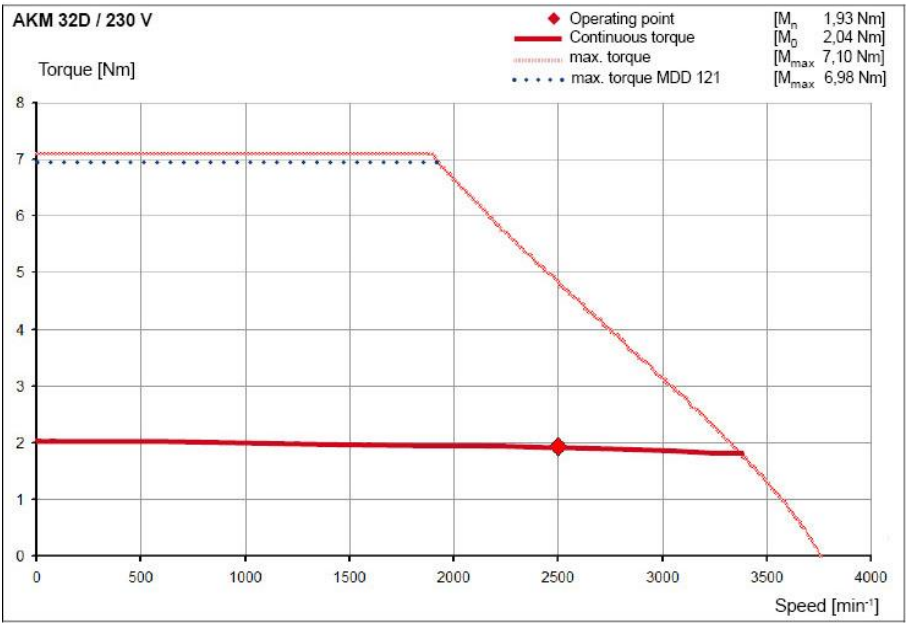
AKM 32C

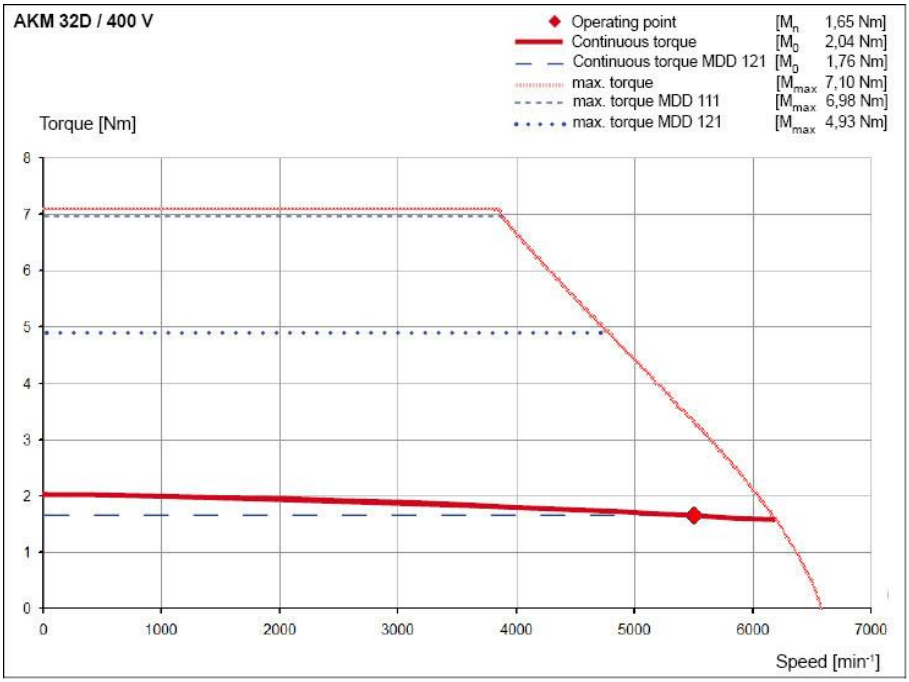

AKM 32C / 230 V
Operating point [M_n 1,95 Nm]
Continuous torque [M_0 2,00 Nm]
max. torque [M_{max} 6,92 Nm]
Torque [Nm]
8
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500
3000
Speed [min⁻¹]

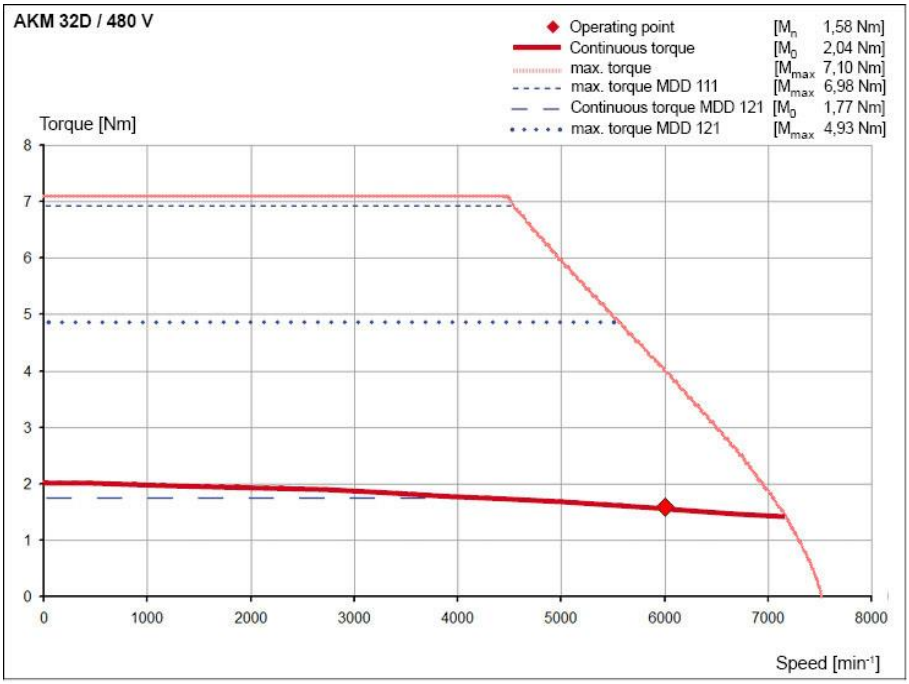

AKM 32C / 400 V
Operating point [M_n 1,86 Nm]
Continuous torque [M_0 2,00 Nm]
max. torque [M_{max} 6,92 Nm]
Torque [Nm]
8
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min⁻¹]


AKM 32C / 480 V
Operating point [Mn 1,83 Nm]
Continuous torque [M0 2,00 Nm]
max. torque [Mmax 6,92 Nm]
Torque [Nm]
8
7
6
5
4
3
2
1
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

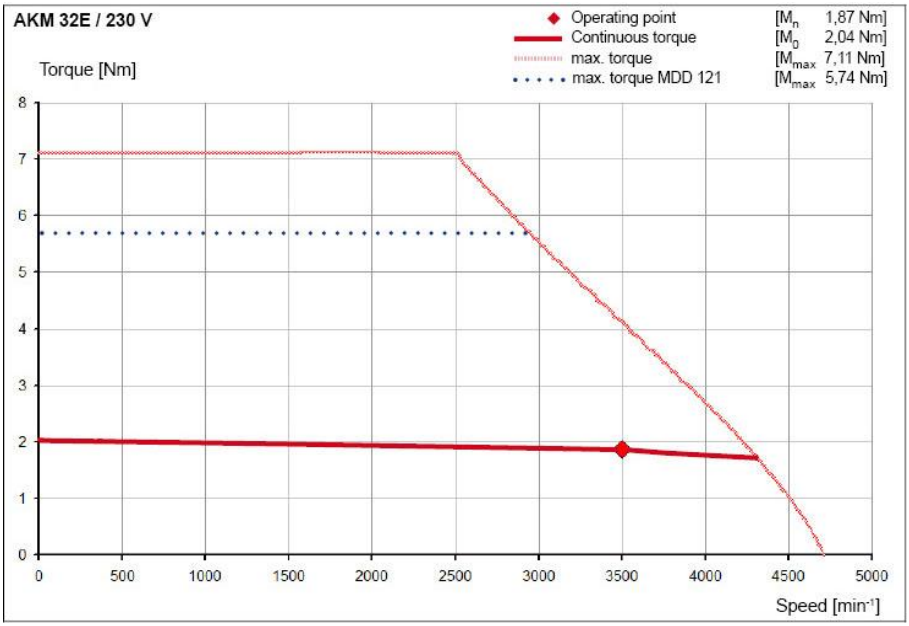
AKM 32D

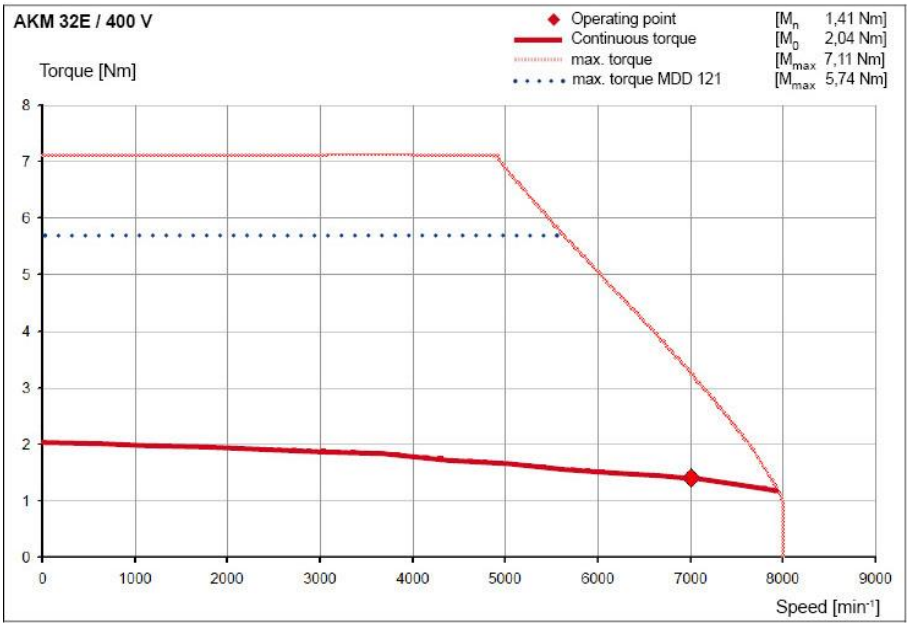

AKM 32D / 230 V
Operating point [Mn 1,93 Nm]
Continuous torque [M0 2,04 Nm]
max. torque [Mmax 7,10 Nm]
max. torque MDD 121 [Mmax 6,98 Nm]
Torque [Nm]
8
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

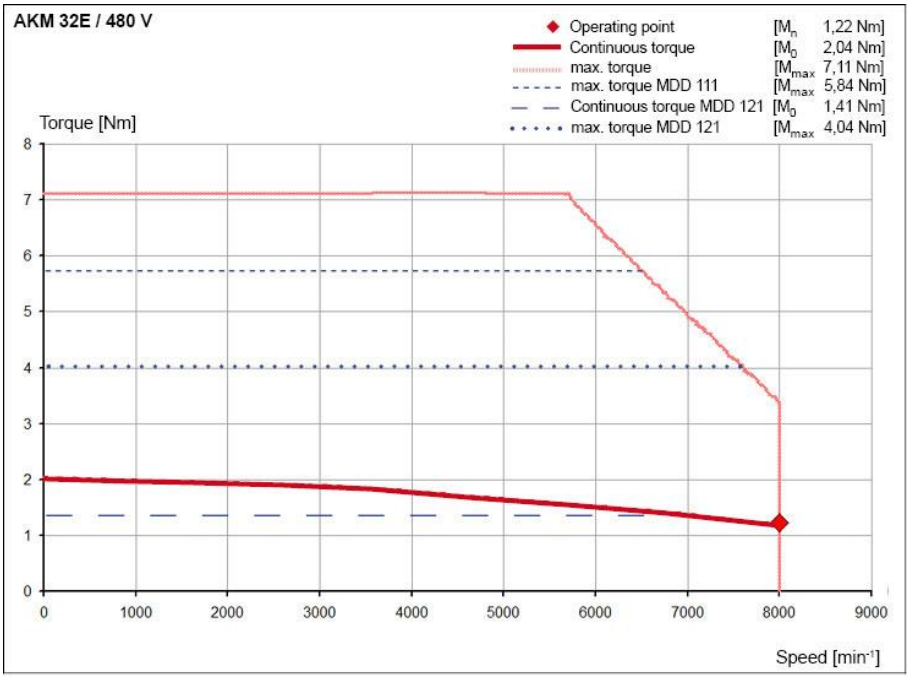

AKM 32D / 400 V
Operating point [Mn 1,65 Nm]
Continuous torque [M0 2,04 Nm]
Continuous torque MDD 121 [M0 1,76 Nm]
max. torque [Mmax 7,10 Nm]
max. torque MDD 111 [Mmax 6,98 Nm]
max. torque MDD 121 [Mmax 4,93 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]


AKM 32D / 480 V
Operating point [Mn 1,58 Nm]
Continuous torque [M0 2,04 Nm]
max. torque [Mmax 7,10 Nm]
max. torque MDD 111 [Mmax 6,98 Nm]
Continuous torque MDD 121 [M0 1,77 Nm]
max. torque MDD 121 [Mmax 4,93 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
1000
2000
3000
4000
5000
6000
7000
8000
Speed [min-1]

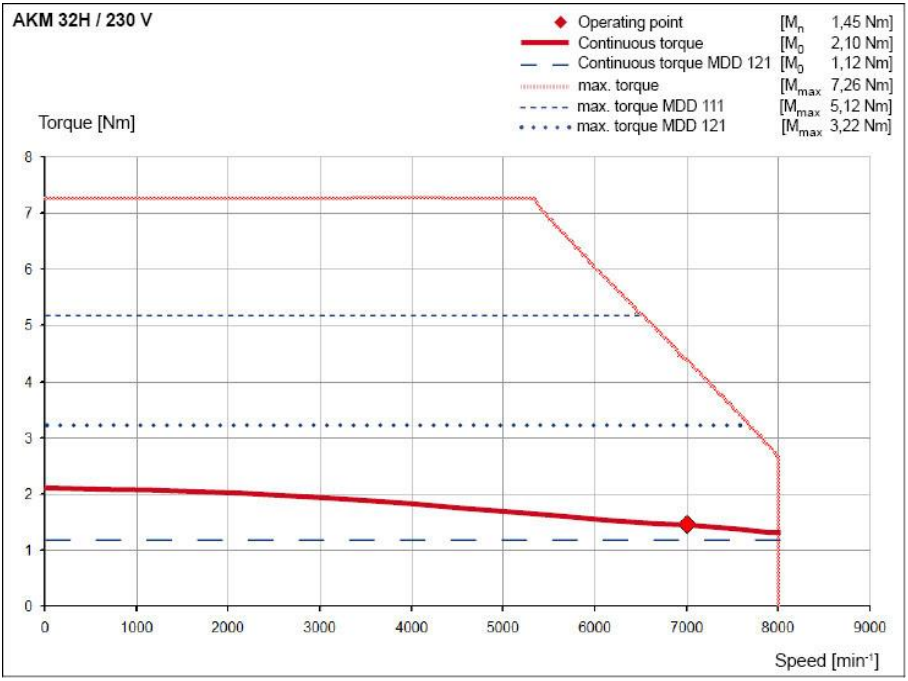
AKM 32E


AKM 32E / 230 V
Operating point [M_n 1,87 Nm]
Continuous torque [M_0 2,04 Nm]
max. torque [M_{max} 7,11 Nm]
max. torque MDD 121 [M_{max} 5,74 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min⁻¹]

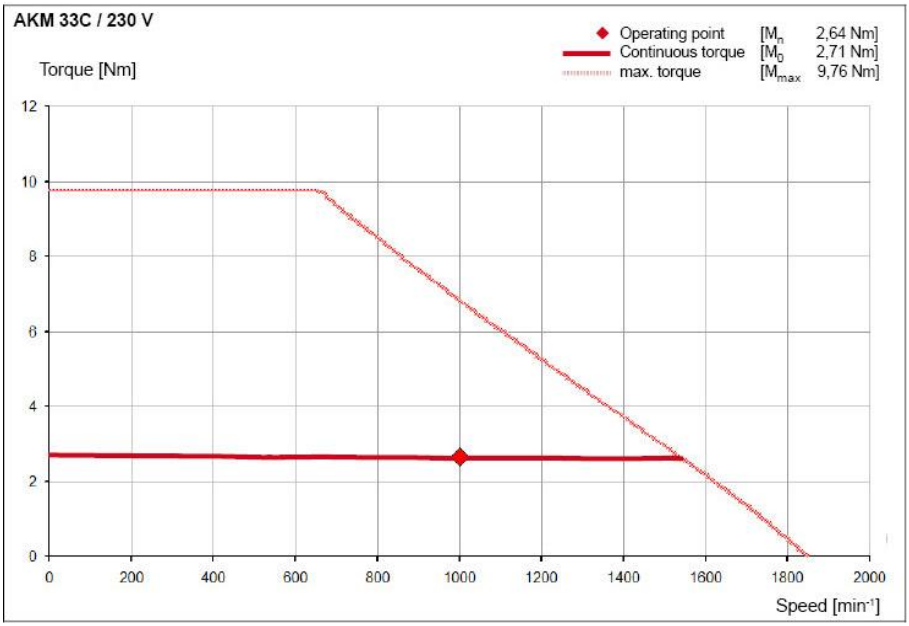

AKM 32E / 400 V
Operating point [M_n 1,41 Nm]
Continuous torque [M_0 2,04 Nm]
max. torque [M_{max} 7,11 Nm]
max. torque MDD 121 [M_{max} 5,74 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min⁻¹]

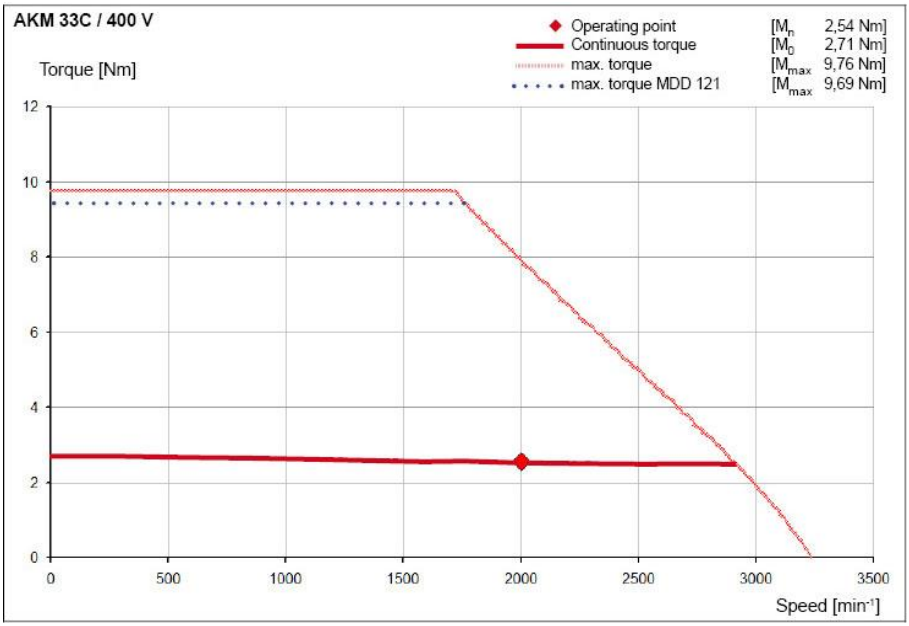

AKM 32E / 480 V
Operating point [Mn 1,22 Nm]
Continuous torque [M0 2,04 Nm]
max. torque [Mmax 7,11 Nm]
max. torque MDD 111 [Mmax 5,84 Nm]
Continuous torque MDD 121 [M0 1,41 Nm]
max. torque MDD 121 [Mmax 4,04 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min-1]

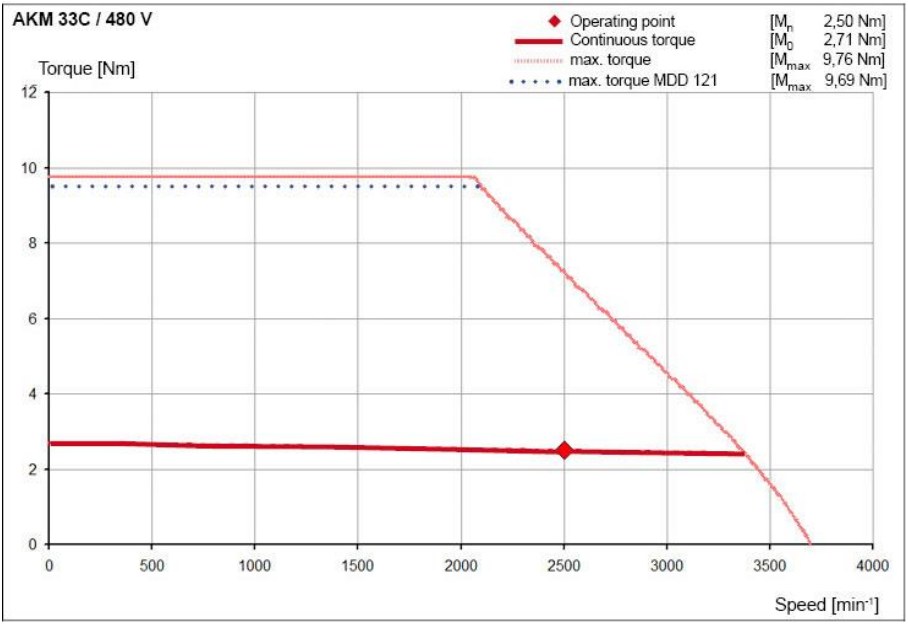
AKM 32H


AKM 32H / 230 V
Operating point [M_n 1,45 Nm]
Continuous torque [M_0 2,10 Nm]
Continuous torque MDD 121 [M_0 1,12 Nm]
max. torque [M_{max} 7,26 Nm]
max. torque MDD 111 [M_{max} 5,12 Nm]
max. torque MDD 121 [M_{max} 3,22 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
8
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Speed [min⁻¹]

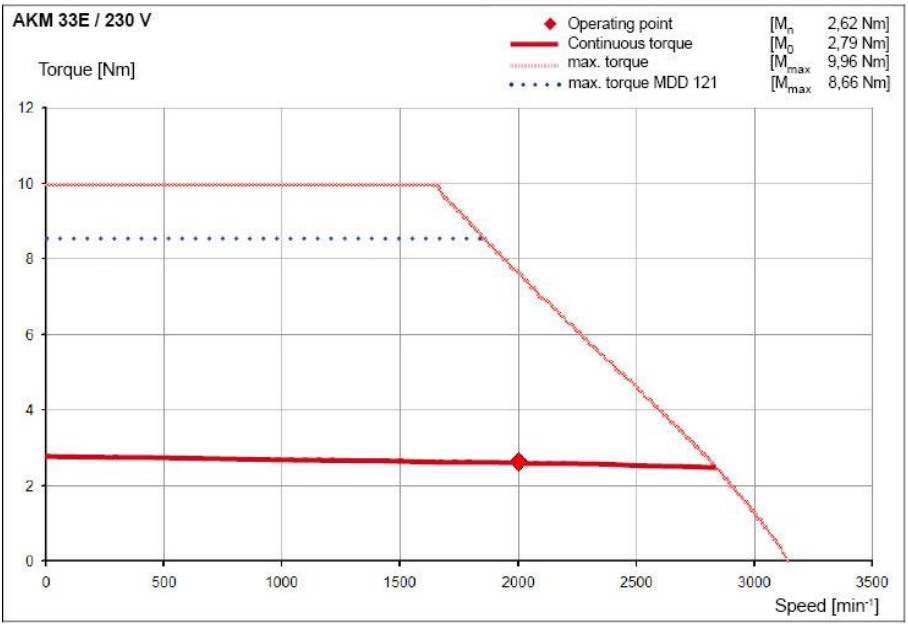
AKM 33C

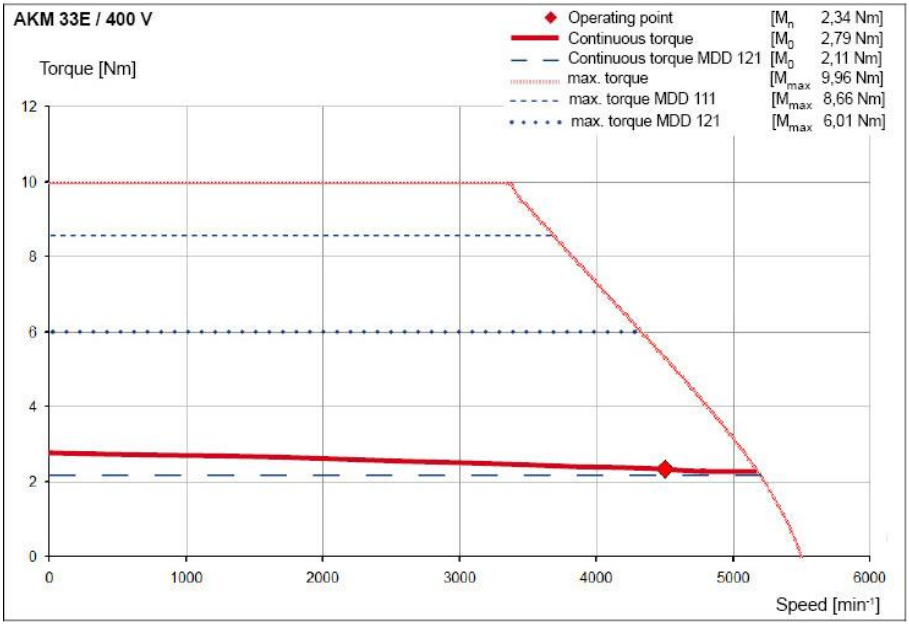

AKM 33C / 230 V
Operating point [M_n 2,64 Nm]
Continuous torque [M_0 2,71 Nm]
max. torque [M_{max} 9,76 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Speed [min⁻¹]

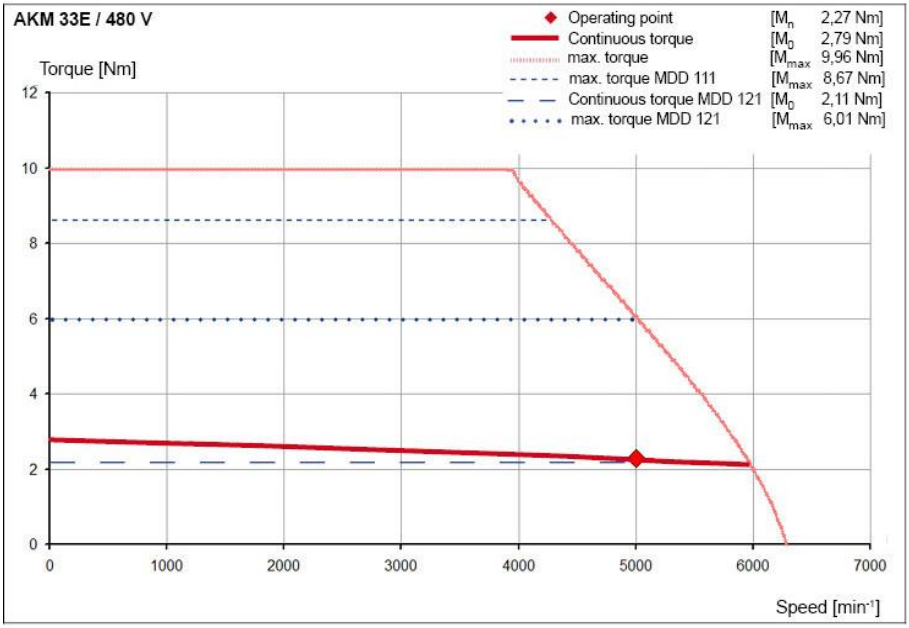

AKM 33C / 400 V
Operating point [M_n 2,54 Nm]
Continuous torque [M_0 2,71 Nm]
max. torque [M_{max} 9,76 Nm]
max. torque MDD 121 [M_{max} 9,69 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min⁻¹]


AKM 33C / 480 V
Operating point [Mn 2,50 Nm]
Continuous torque [M0 2,71 Nm]
max. torque [Mmax 9,76 Nm]
max. torque MDD 121 [Mmax 9,69 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

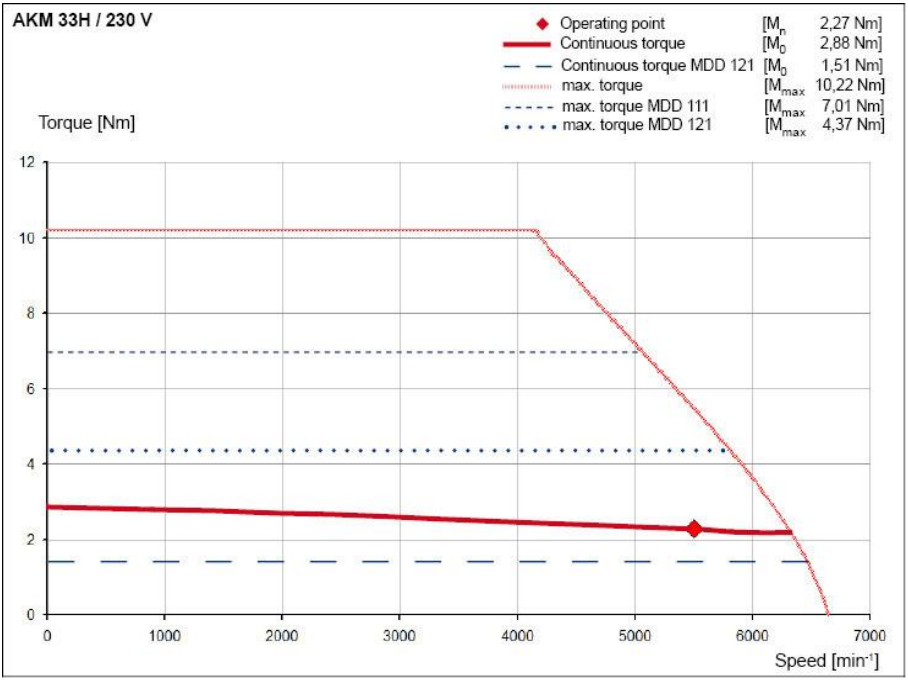
AKM 33E


AKM 33E / 230 V
Operating point [Mn 2,62 Nm]
Continuous torque [M0 2,79 Nm]
max. torque [Mmax 9,96 Nm]
max. torque MDD 121 [Mmax 8,66 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]


AKM 33E / 400 V
Operating point [Mn 2,34 Nm]
Continuous torque [M0 2,79 Nm]
Continuous torque MDD 121 [M0 2,11 Nm]
max. torque [Mmax 9,96 Nm]
max. torque MDD 111 [Mmax 8,66 Nm]
max. torque MDD 121 [Mmax 6,01 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 33E / 480 V
Operating point [Mn 2,27 Nm]
Continuous torque [M0 2,79 Nm]
max. torque [Mmax 9,96 Nm]
max. torque MDD 111 [Mmax 8,67 Nm]
Continuous torque MDD 121 [M0 2,11 Nm]
max. torque MDD 121 [Mmax 6,01 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

AKM 33H


AKM 33H / 230 V
Operating point [M_n 2,27 Nm]
Continuous torque [M_0 2,88 Nm]
Continuous torque MDD 121 [M_0 1,51 Nm]
max. torque [M_max 10,22 Nm]
max. torque MDD 111 [M_max 7,01 Nm]
max. torque MDD 121 [M_max 4,37 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]

10.6 AKM4

10.6.1 Technical Data

Data		Symbol [Unit]	AKM					
			41C	41E	41H			
Electrical data								
	Standstill torque*	M_0 [Nm]**	1,95	2,02	2,06			
	Standstill current	I_{0rms} [A]**	1,46	2,85	5,60			
	Max. Nominal supply voltage	U_N [VAC]	480					
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	1200	3000	6000			
	Nominal torque*	M_n [Nm]	1,88	1,82	1,62			
	Nominal power	P_n [kW]	0,24	0,57	1,02			
	Nominal current	I_n [A]	1,40	2,56	4,38			
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	3000	6000	—			
	Nominal torque*	M_n [Nm]	1,77	1,58	—			
	Nominal power	P_n [kW]	0,56	0,99	—			
	Nominal current	I_n [A]	1,32	2,23	—			
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	3500	6000	—			
	Nominal torque*	M_n [Nm]	1,74	1,58	—			
	Nominal power	P_n [kW]	0,64	0,99	—			
	Nominal current	I_n [A]	1,30	2,23	—			
	Peak current	I_{0max} [A]	5,8	11,4	22,4			
	Peak torque	M_{0max} [Nm]	6,12	6,28	6,36			
	Torque constant	K_{Trms} [Nm/A]	1,34	0,71	0,37			
	Voltage constant	K_{Erms} [mVmin]	86,3	45,6	23,7			
	Winding resistance Ph-Ph	R_{25} [Ω]	21,3	6,02	1,56			
	Winding inductance Ph-Ph	L [mH]	66,1	18,4	5,0			

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	0,81
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,014
	Thermal time constant	t_{TH} [min]	13
	Weight standard	G [kg]	2,44
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:

Brake motor option reduces continuous torque ratings by 0.12Nm:
Non-resolver feedback options reduce continuous torque ratings by:

AKM41 = 0.1 Nm AKM42 = 0.1 Nm AKM43 = 0.2 Nm AKM44 = 0.3 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM41 = 0.22 Nm AKM42 = 0.36 Nm AKM43 = 0.55 Nm AKM44 = 0.76 Nm

For motors with optional shaft seal, reduce torque shown by 0.071 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM					
			42C	42E	42G	42J		
Electrical data								
	Standstill torque*	M_0 [Nm]**	3,35	3,42	3,53	3,56		
	Standstill current	I_{0rms} [A]**	1,40	2,74	4,80	8,40		
	Max. Nominal supply voltage	U_N [VAC]	480					
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	—	1800	3500	6000		
	Nominal torque*	M_n [Nm]	—	3,12	2,90	2,38		
	Nominal power	P_n [kW]	—	0,59	1,06	1,50		
	Nominal current	I_n [A]	—	2,48	3,92	5,53		
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	1500	3500	6000	—		
	Nominal torque*	M_n [Nm]	3,10	2,81	2,35	—		
	Nominal power	P_n [kW]	0,49	1,03	1,48	—		
	Nominal current	I_n [A]	1,29	2,23	3,18	—		
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	2000	4000	6000	—		
	Nominal torque*	M_n [Nm]	3,02	2,72	2,35	—		
	Nominal power	P_n [kW]	0,63	1,14	1,48	—		
	Nominal current	I_n [A]	1,26	2,16	3,18	—		
	Peak current	I_{0max} [A]	5,6	11	19,2	33,6		
	Peak torque	M_{0max} [Nm]	11,3	11,3	11,5	11,6		
	Torque constant	K_{Trms} [Nm/A]	2,40	1,26	0,74	0,43		
	Voltage constant	K_{Erms} [mVmin]	154	80,9	47,5	27,5		
	Winding resistance Ph-Ph	R_{25} [Ω]	27,5	7,78	2,51	0,80		
	Winding inductance Ph-Ph	L [mH]	97,4	26,8	9,2	3,1		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	1,5
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,026
	Thermal time constant	t_{TH} [min]	17
	Weight standard	G [kg]	3,39
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:

Brake motor option reduces continuous torque ratings by 0.12Nm:
Non-resolver feedback options reduce continuous torque ratings by:

AKM41 = 0.1 Nm AKM42 = 0.1 Nm AKM43 = 0.2 Nm AKM44 = 0.3 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM41 = 0.22 Nm AKM42 = 0.36 Nm AKM43 = 0.55 Nm AKM44 = 0.76 Nm

For motors with optional shaft seal, reduce torque shown by 0.071 Nm and increase M_R by the same amount.

Data		Symbol [Unit]		AKM				
			43E	43G	43K	44E	44G	44J
	Electrical data							
	Standstill torque*	M_0 [Nm]**	4,70	4,80	4,90	5,76	5,88	6,00
	Standstill current	I_{0rms} [A]**	2,76	4,87	9,60	2,90	5,00	8,80
	Max. Nominal supply voltage	U_N [VAC]		480				
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	1500	2500	6000	1200	2000	4000
	Nominal torque*	M_n [Nm]	4,24	4,00	2,62	5,22	4,90	3,84
	Nominal power	P_n [kW]	0,67	1,05	1,65	0,66	1,03	1,61
	Nominal current	I_n [A]	2,47	4,04	5,04	2,55	4,12	5,57
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	2500	5000	—	2000	4000	6000
	Nominal torque*	M_n [Nm]	3,92	3,01	—	4,80	3,76	2,75
	Nominal power	P_n [kW]	1,03	1,58	—	1,01	1,57	1,73
	Nominal current	I_n [A]	2,28	3,04	—	2,35	3,16	3,99
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	3000	6000	—	2500	5000	6000
	Nominal torque*	M_n [Nm]	3,76	2,57	—	4,56	3,19	2,75
	Nominal power	P_n [kW]	1,18	1,61	—	1,19	1,67	1,73
	Nominal current	I_n [A]	2,19	2,60	—	2,24	2,68	3,99
	Peak current	I_{0max} [A]	11	19,5	38,4	11,4	20	35,2
	Peak torque	M_{0max} [Nm]	15,9	16,1	16,4	19,9	20,3	20,4
	Torque constant	K_{Trms} [Nm/A]	1,72	0,99	0,52	2,04	1,19	0,69
	Voltage constant	K_{Erms} [mVmin]	111	63,9	33,2	132	76,6	44,2
	Winding resistance Ph-Ph	R_{25} [Ω]	8,61	2,61	0,74	8,08	2,80	0,94
	Winding inductance Ph-Ph	L [mH]	32,6	10,8	2,9	33,9	11,5	3,8

Mechanical Data			AKM 43	AKM 44
	Rotor inertial torque	J [kgcm²]	2,1	2,7
	Number of contacts		10	10
	Static drag torque	M_R [Nm]	0,038	0,05
	Thermal time constant	t_{TH} [min]	20	24
	Weight standard	G [kg]	4,35	5,3
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	450	
	Axial force allowed	F_A [N]	180	

* Measuring flange Aluminum 254mm * 254mm * 6,35mm
** Derating:
Brake motor option reduces continuous torque ratings by 0.12Nm:
Non-resolver feedback options reduce continuous torque ratings by:

AKM41 = 0.1 Nm AKM42 = 0.1 Nm AKM43 = 0.2 Nm AKM44 = 0.3 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM41 = 0.22 Nm AKM42 = 0.36 Nm AKM43 = 0.55 Nm AKM44 = 0.76 Nm

For motors with optional shaft seal, reduce torque shown by 0.071 Nm and increase M_R by the same amount.

10.6.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	MBR [Nm]	6
Connection voltage	UBR [VDC]	24 ± 10 %
Electrical power	PBR [W]	12,8
Inertial torque	JBR [kgcm²]	0,068
Release delay time	tBRH [ms]	35
Application delay time	tBRL [ms]	15
Brake weight	GBR [kg]	0,63
Typical play	[°mech.]	0,37
Switching energy	E [mJ]	19,17

10.6.3 Cables and Connections

Data	AKM4
Power connection	4 + 4-pin, round, angled
Motor cable, shielded	4 x 1,5
Motor cable with control wires, shielded	4 x 1.5 + 2 x 0.5
Resolver connection	12-pin, round, angled
Motor cable, shielded	4 x 2 x 0,18 mm²

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.6.4 Maximum and Continuous Torque

Power supply 1 x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier	
			MDD 111	MDD 121
AKM 41C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,95 1,88 6,12	1,95 1,88 6,12	1,95 1,88 6,12
AKM 41E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,02 1,82 6,28	2,02 1,82 6,28	2,02 1,82 5,20
AKM 41H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,06 1,62 6,36	2,06 1,62 4,63	1,07 1,62 2,99
AKM 42C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -
AKM 42E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,42 3,12 11,3	3,42 3,12 13	3,42 3,12 9,47
AKM 42G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,53 2,90 11,5	3,53 2,90 9,31	2,14 2,90 6,00
AKM 42J	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,56 2,38 11,6	2,46 2,38 11,6	1,25 2,38 11,6
AKM 43E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 4,24 15,9	4,70 4,24 15,9	4,70 4,24 13,2
AKM 43G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,80 4,00 16,1	4,80 4,00 12,8	2,88 4,00 8,16
AKM 43K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,90 2,62 16,4	2,98 2,62 16,4	1,51 2,62 16,4
AKM 44E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,76 5,22 19,9	5,76 5,22 19,9	5,76 5,22 15,9
AKM 44G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,88 4,90 20,3	5,88 4,90 15,6	3,45 4,90 9,85
AKM 44J	M_0 [Nm] M_n [Nm] M_{max} [Nm]	6,00 3,84 20,4	- - -	- - -

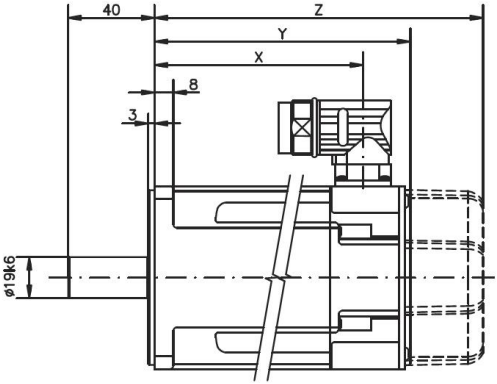
Power supply 3 x 400 V

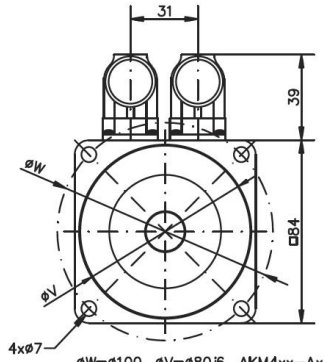
Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 41C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12	1,95 1,77 6,12
AKM 41E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,02 1,58 6,28	2,02 1,58 5,20	1,36 1,58 3,73	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28
AKM 41H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 42C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3	3,35 3,10 11,3
AKM 42E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,42 2,81 11,3	3,42 2,81 9,47	2,41 2,81 6,70	3,42 2,81 11,3	3,42 2,81 11,3	3,42 2,81 11,3	3,42 2,81 11,3	3,42 2,81 11,3	3,42 2,81 11,3
AKM 42G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,53 2,35 11,5	2,82 2,35 6,00	1,44 2,35 4,14	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5
AKM 43E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 3,92 15,9	4,70 3,92 13,2	3,30 3,92 9,27	4,70 3,92 15,9	4,70 3,92 15,9	4,70 3,92 15,9	4,70 3,92 15,9	4,70 3,92 15,9	4,70 3,92 15,9
AKM 43G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,80 3,01 16,1	3,80 3,01 8,16	1,94 3,01 5,60	4,80 3,01 16,1	4,80 3,01 16,1	4,80 3,01 16,1	4,80 3,01 16,1	4,80 3,01 16,1	4,80 3,01 16,1
AKM 44E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,76 4,80 19,9	5,76 4,80 15,9	3,93 4,80 11,2	5,76 4,80 19,9	5,76 4,80 19,9	5,76 4,80 19,9	5,76 4,80 19,9	5,76 4,80 19,9	5,76 4,80 19,9
AKM 44G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,88 3,76 20,3	4,56 3,76 9,85	2,32 3,76 6,73	5,88 3,76 19,9	5,88 3,76 19,9	5,88 3,76 20,3	5,88 3,76 19,9	5,88 3,76 20,3	5,88 3,76 20,3
AKM 44J	M_0 [Nm] M_n [Nm] M_{max} [Nm]	6,00 2,75 20,4	2,68 2,75 5,89	1,35 2,75 3,98	6,00 2,75 12,4	6,00 2,75 12,4	6,00 2,75 17,7	6,00 2,75 12,4	6,00 2,75 17,7	6,00 2,75 20,4

Power supply 3 x 480 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 41C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12	1,95 1,74 6,12
AKM 41E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	2,02 1,58 6,28	2,02 1,58 5,20	1,36 1,58 3,73	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28	2,02 1,58 6,28
AKM 41H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 42C	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,35 3,02 11,3	3,35 3,02 12,8	3,35 3,02 11,3	3,35 3,02 11,3	3,35 3,02 11,3	3,35 3,02 11,3	3,35 3,02 11,3	3,35 3,02 11,3	3,35 3,02 11,3
AKM 42E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,42 2,72 11,3	3,42 2,72 9,47	2,41 2,72 6,70	3,42 2,72 11,3	3,42 2,72 11,3	3,42 2,72 11,3	3,42 2,72 11,3	3,42 2,72 11,3	3,42 2,72 11,3
AKM 42G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	3,53 2,35 11,5	2,82 2,35 6,0	1,44 2,35 4,14	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5	3,53 2,35 11,5
AKM 43E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 3,76 15,9	4,70 3,76 13,2	3,30 3,76 9,27	4,70 3,76 15,9	4,70 3,76 15,9	4,70 3,76 15,9	4,70 3,76 15,9	4,70 3,76 15,9	4,70 3,76 15,9
AKM 43G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,80 2,57 16,1	3,80 2,57 8,16	1,93 2,57 5,60	4,80 2,57 16,1	4,80 2,57 16,1	4,80 2,57 16,1	4,80 2,57 16,1	4,80 2,57 16,1	4,80 2,57 16,1
AKM 44E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,76 4,56 19,9	5,76 4,56 16,0	3,93 4,56 11,1	5,76 4,56 19,9	5,76 4,56 19,9	5,76 4,56 19,9	5,76 4,56 19,9	5,76 4,56 19,9	5,76 4,56 19,9
AKM 44G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	5,88 3,19 20,3	4,56 3,19 9,85	2,32 3,19 6,73	5,88 3,19 19,9	5,88 3,19 19,9	5,88 3,19 20,3	5,88 3,19 19,9	5,88 3,19 20,3	5,88 3,19 20,3
AKM 44J	M_0 [Nm] M_n [Nm] M_{max} [Nm]	6,00 2,75 20,4	2,68 2,75 5,90	1,35 2,75 3,98	6,00 2,75 12,4	6,00 2,75 12,4	6,00 2,75 17,7	6,00 2,75 12,4	6,00 2,75 17,7	6,00 2,75 20,4

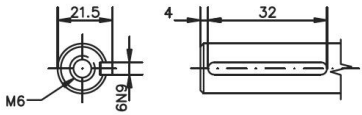
10.6.5 Dimensional Drawing (schematic diagram)





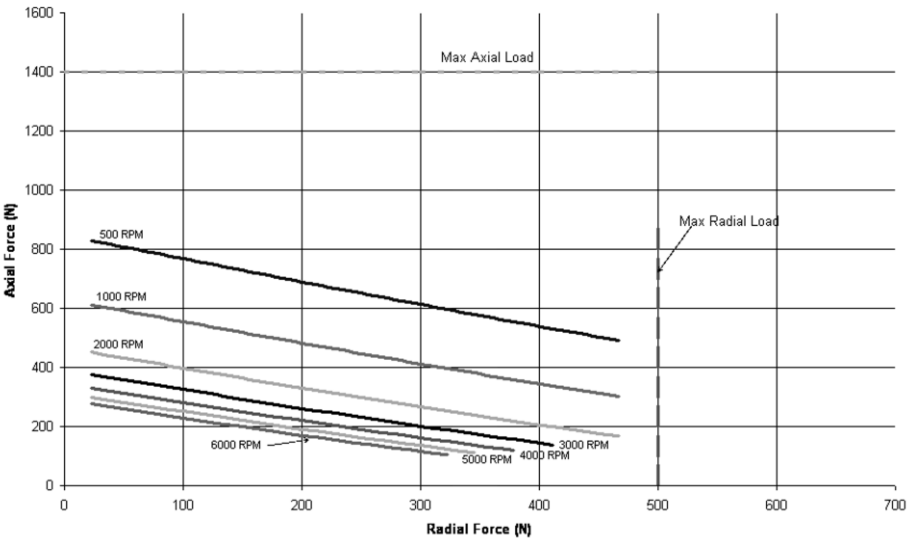
øW=ø100, øV=ø80j6, AKM4xx–Ax
øW=ø90, øV=ø60j6, AKM4xx–Cx

Option Keyway



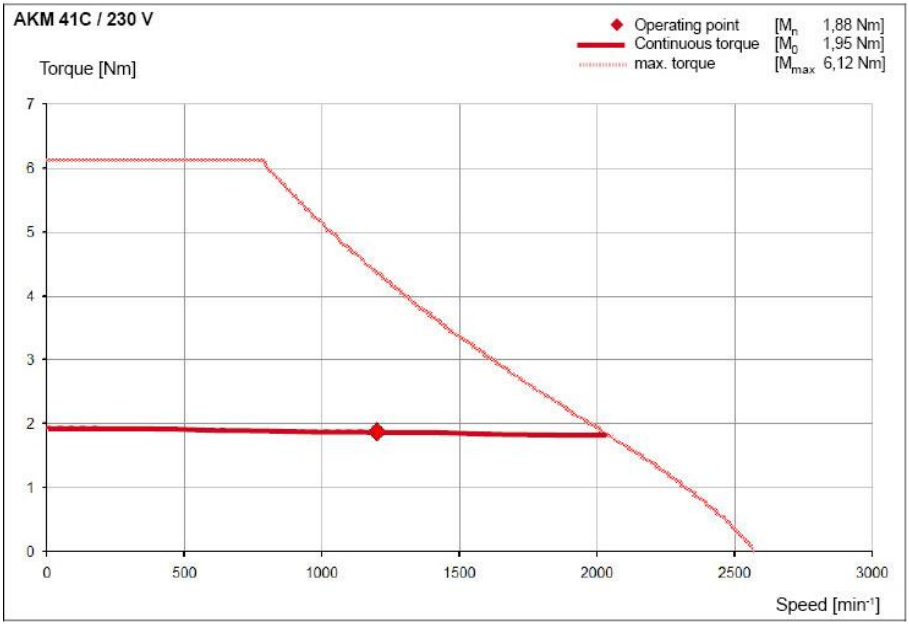
Model	X	Res/SFD/BiSS/ExN		Exl/Hiperface	
		Y	Z (brake)	Y	Z (brake)
AKM41	96.4	118.8	152.3	136.8	170.3
AKM42	125.5	147.8	181.3	165.8	199.3
AKM43	154.4	176.8	210.3	194.8	228.3
AKM44	183.4	205.8	239.3	223.8	257.3

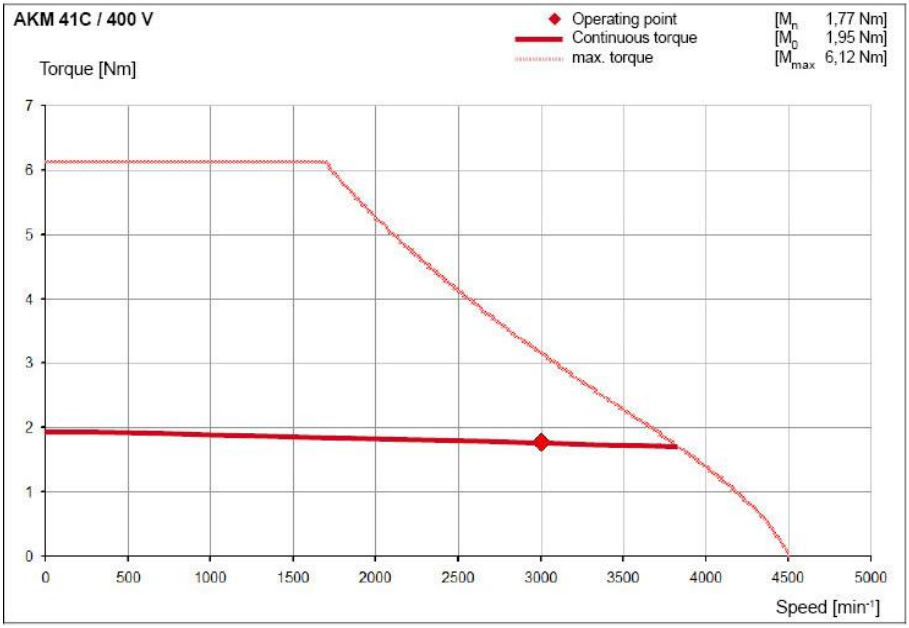
10.6.6 Radial Force on the Shaft End

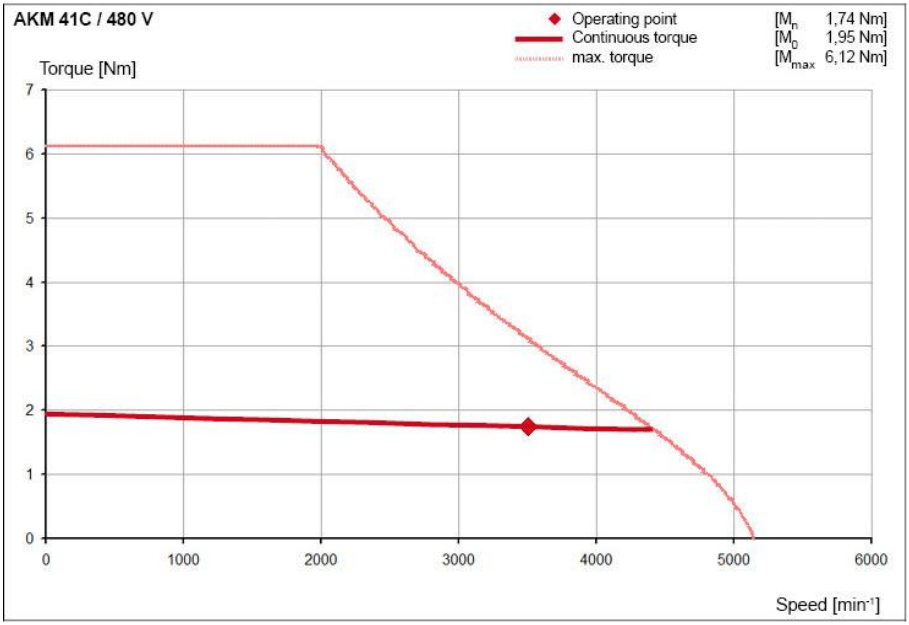


10.6.7 Motor Characteristics

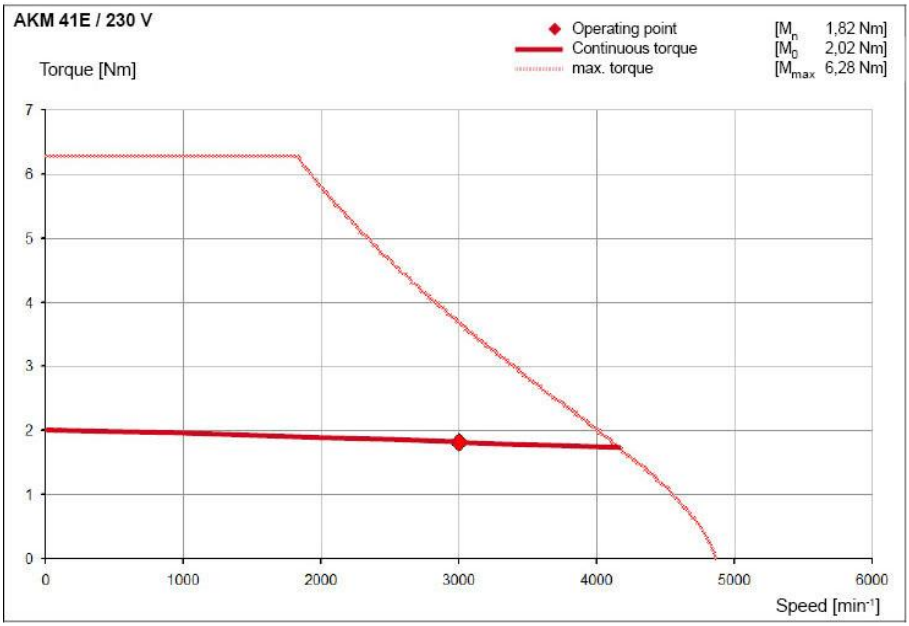
AKM 41C

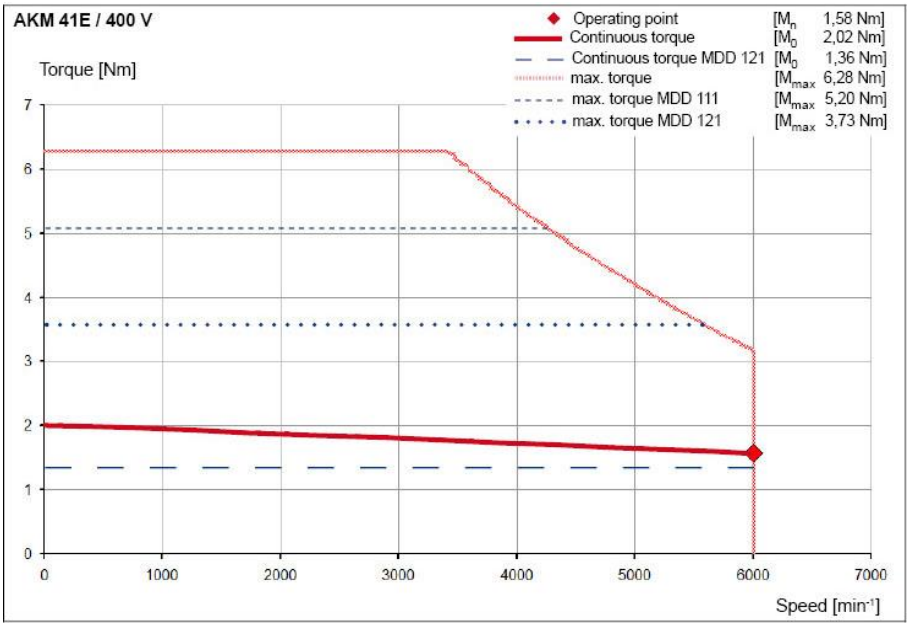


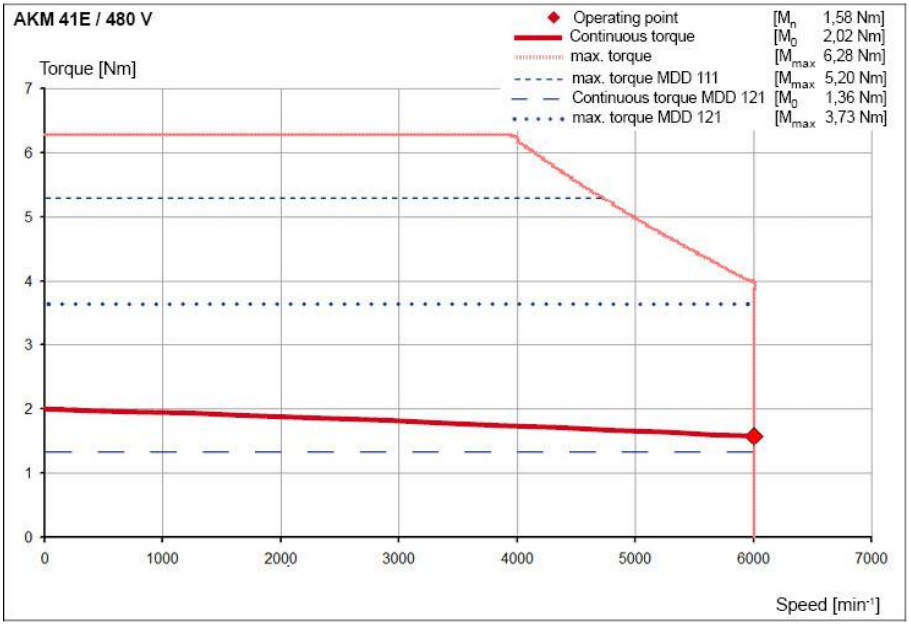

AKM 41C / 400 V
Operating point [Mn 1,77 Nm]
Continuous torque [M0 1,95 Nm]
max. torque [Mmax 6,12 Nm]
Torque [Nm]
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]


AKM 41C / 480 V
Operating point [Mn 1,74 Nm]
Continuous torque [M0 1,95 Nm]
max. torque [Mmax 6,12 Nm]
Torque [Nm]
7
6
5
4
3
2
1
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

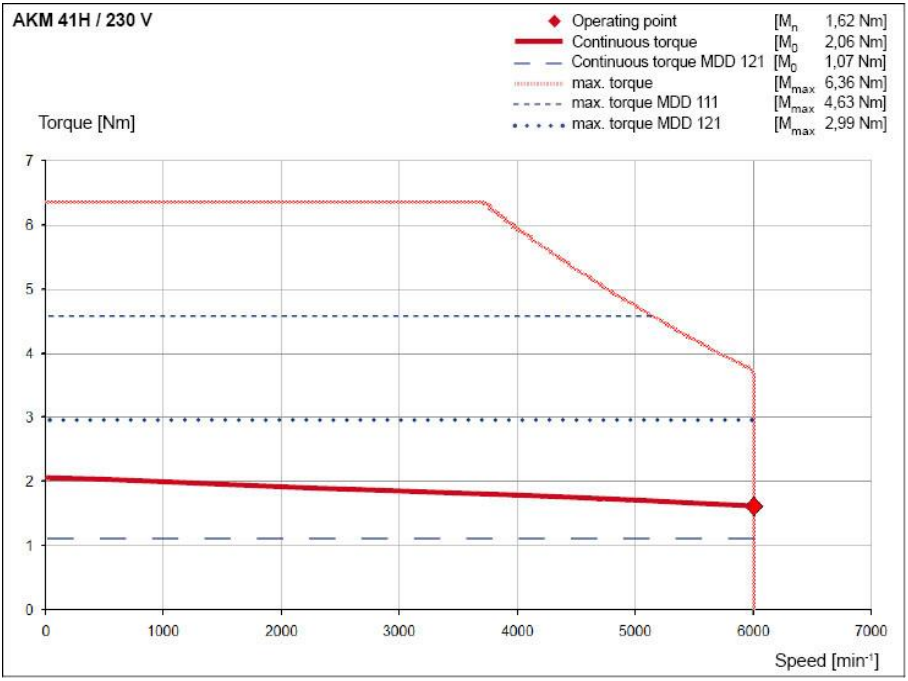
AKM 41E


AKM 41E / 230 V
Operating point [M_n 1,82 Nm]
Continuous torque [M_0 2,02 Nm]
max. torque [M_{max} 6,28 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
0
1000
2000
3000
4000
5000
6000
Speed [min⁻¹]

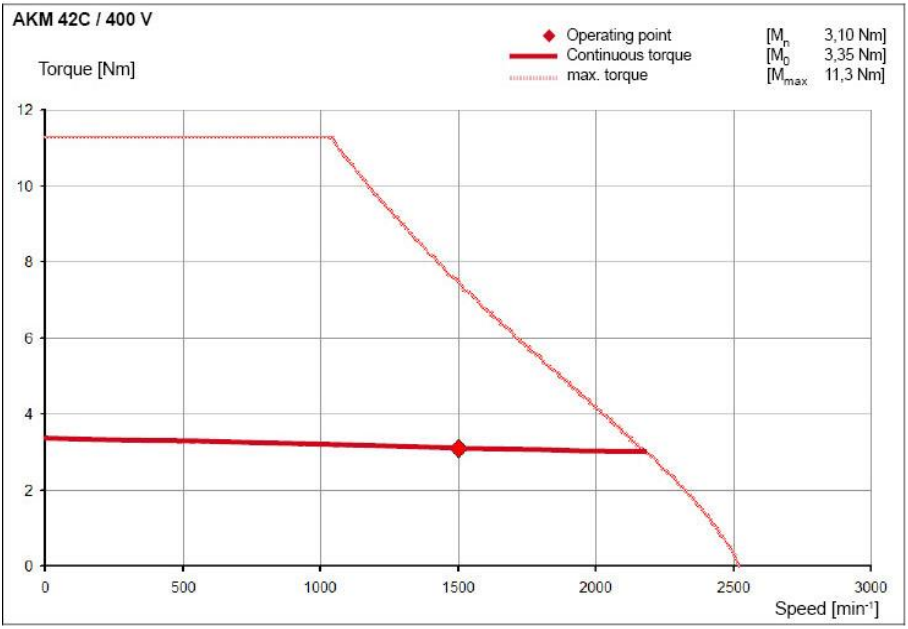

AKM 41E / 400 V
Operating point [M_n 1,58 Nm]
Continuous torque [M_0 2,02 Nm]
Continuous torque MDD 121 [M_0 1,36 Nm]
max. torque [M_{max} 6,28 Nm]
max. torque MDD 111 [M_{max} 5,20 Nm]
max. torque MDD 121 [M_{max} 3,73 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]

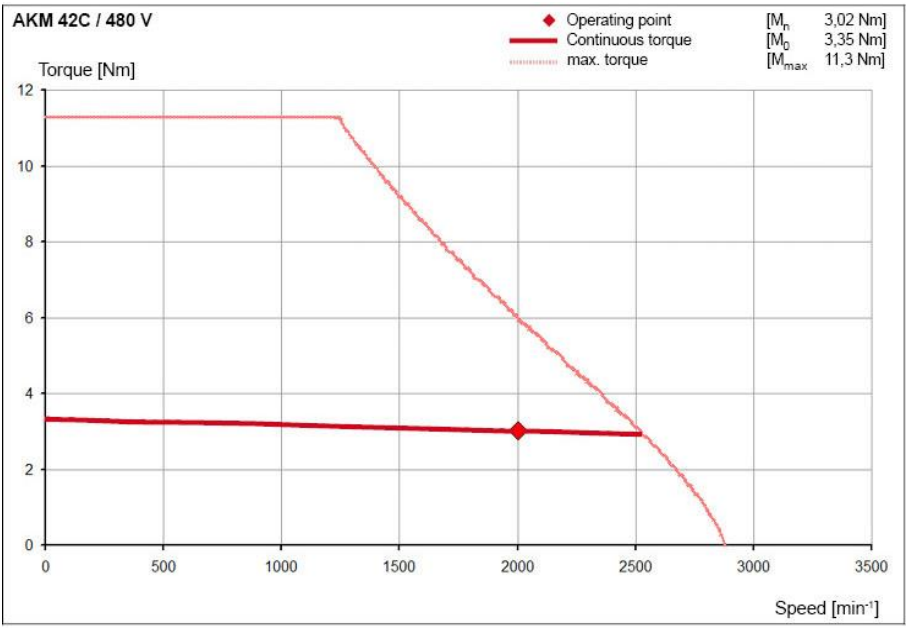

AKM 41E / 480 V
Operating point [Mn 1,58 Nm]
Continuous torque [M0 2,02 Nm]
max. torque [Mmax 6,28 Nm]
max. torque MDD 111 [Mmax 5,20 Nm]
Continuous torque MDD 121 [M0 1,36 Nm]
max. torque MDD 121 [Mmax 3,73 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

AKM 41H

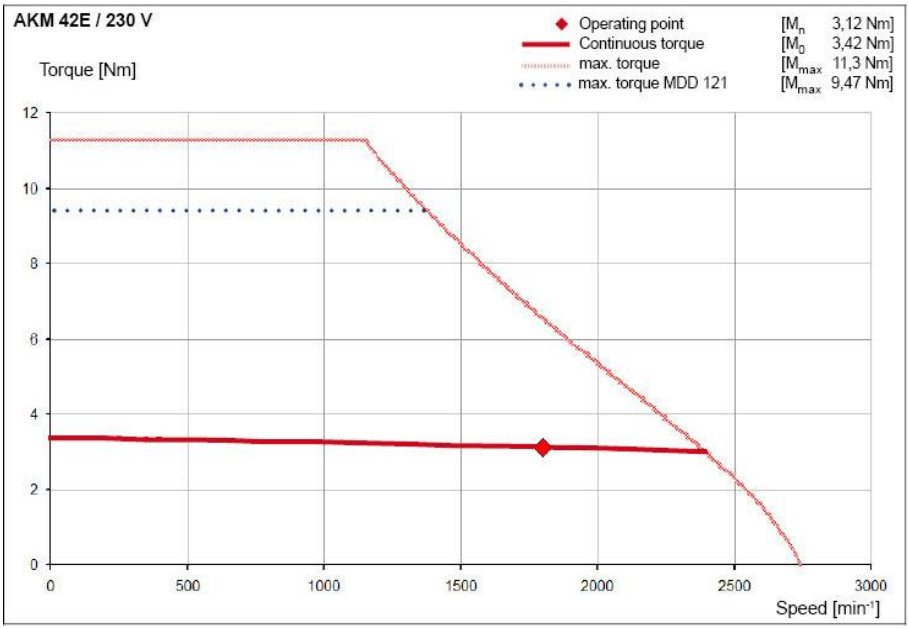

AKM 41H / 230 V
Operating point [M_n 1,62 Nm]
Continuous torque [M_0 2,06 Nm]
Continuous torque MDD 121 [M_0 1,07 Nm]
max. torque [M_{max} 6,36 Nm]
max. torque MDD 111 [M_{max} 4,63 Nm]
max. torque MDD 121 [M_{max} 2,99 Nm]
Torque [Nm]
0
1
2
3
4
5
6
7
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]

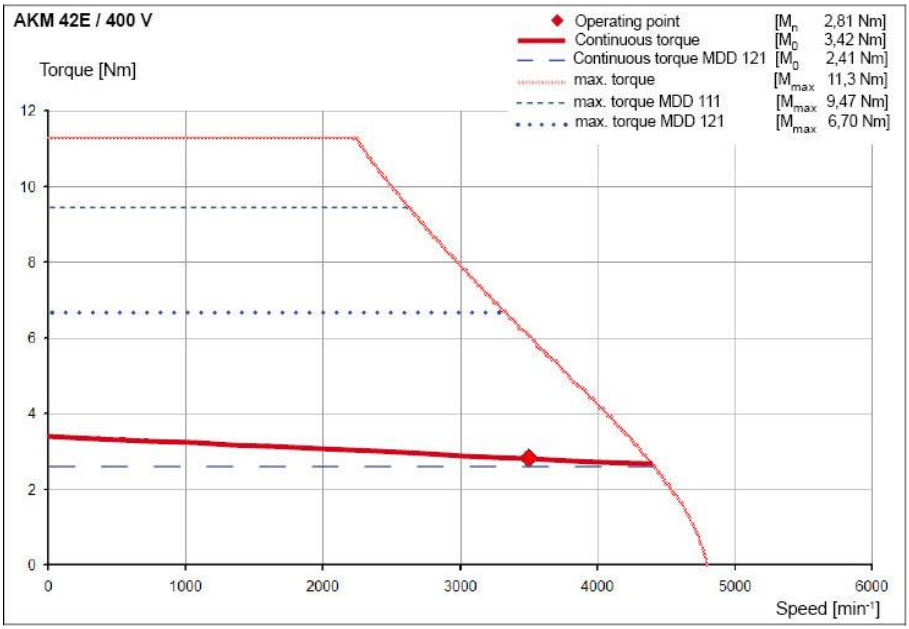
AKM 42C

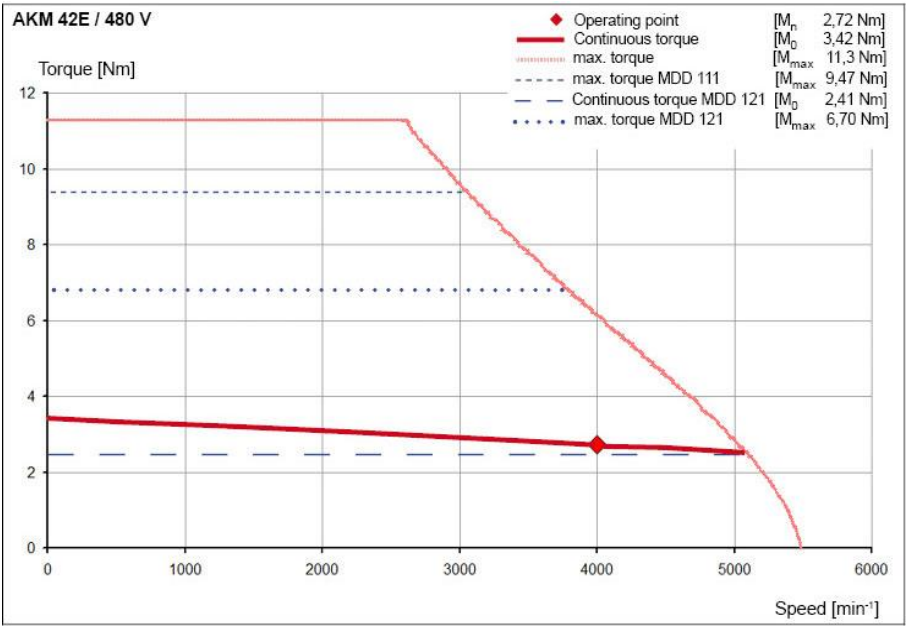

AKM 42C / 400 V
Operating point [M_n 3,10 Nm]
Continuous torque [M_0 3,35 Nm]
max. torque [M_{max} 11,3 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
Speed [min⁻¹]


AKM 42C / 480 V
Operating point [M_n 3,02 Nm]
Continuous torque [M_0 3,35 Nm]
max. torque [M_{max} 11,3 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min⁻¹]

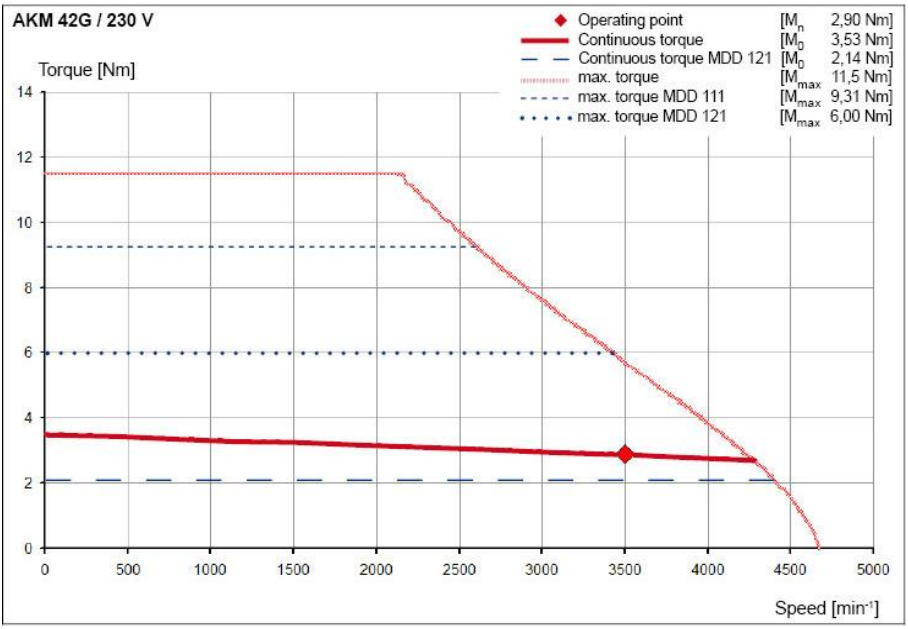
AKM 42E

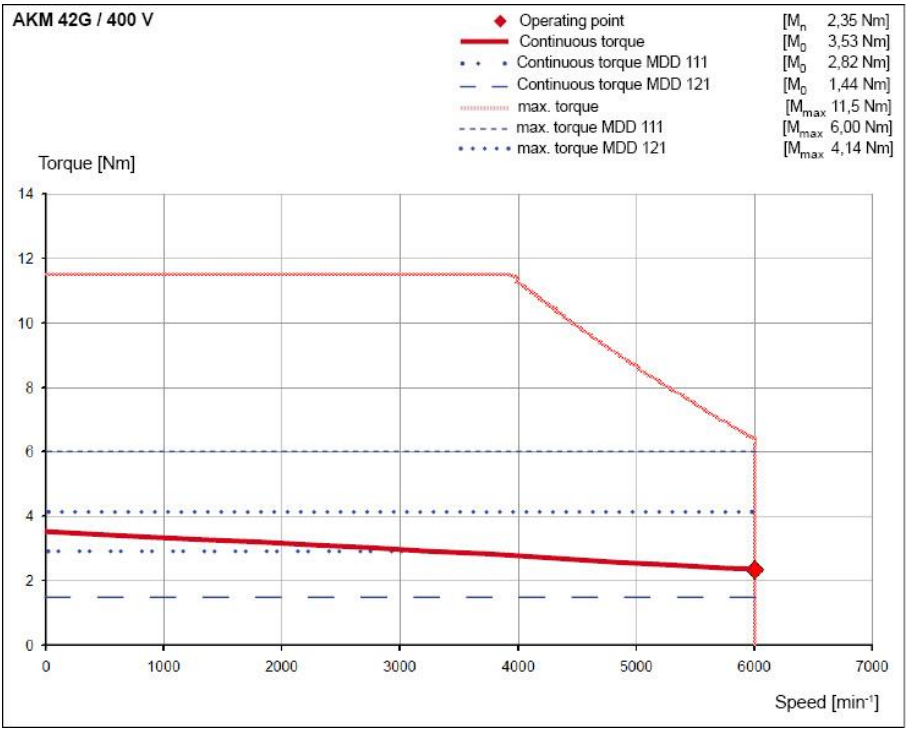

AKM 42E / 230 V
Torque [Nm]
Operating point [Mn 3,12 Nm]
Continuous torque [M0 3,42 Nm]
max. torque [Mmax 11,3 Nm]
max. torque MDD 121 [Mmax 9,47 Nm]
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

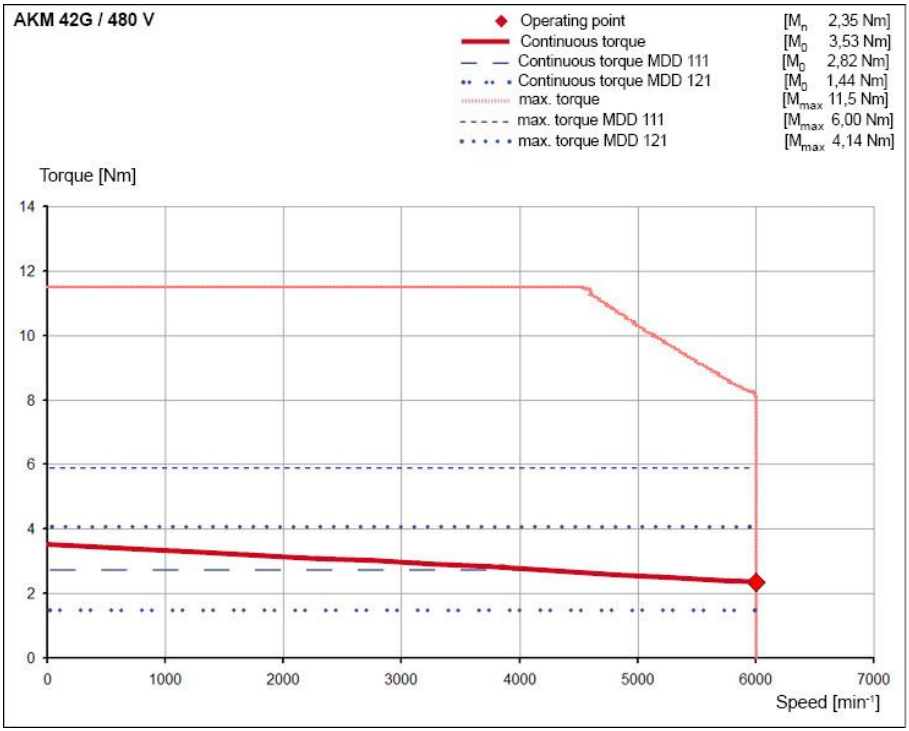

AKM 42E / 400 V
Torque [Nm]
Operating point [Mn 2,81 Nm]
Continuous torque [M0 3,42 Nm]
Continuous torque MDD 121 [M0 2,41 Nm]
max. torque [Mmax 11,3 Nm]
max. torque MDD 111 [Mmax 9,47 Nm]
max. torque MDD 121 [Mmax 6,70 Nm]
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 42E / 480 V
Operating point [Mn 2,72 Nm]
Continuous torque [M0 3,42 Nm]
max. torque [Mmax 11,3 Nm]
max. torque MDD 111 [Mmax 9,47 Nm]
Continuous torque MDD 121 [M0 2,41 Nm]
max. torque MDD 121 [Mmax 6,70 Nm]
Torque [Nm]
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

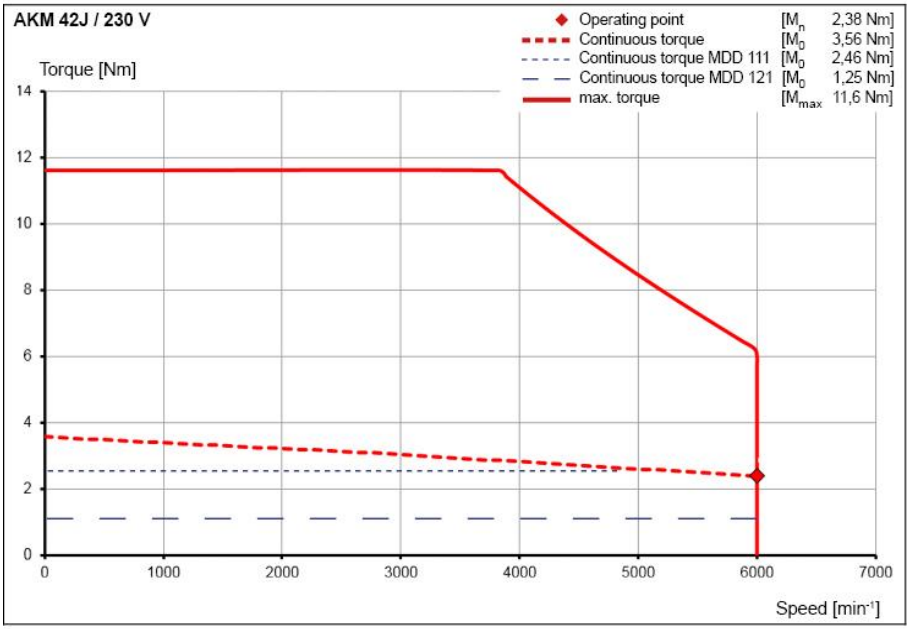
AKM 42G


AKM 42G / 230 V
Operating point [Mn 2,90 Nm]
Continuous torque [M0 3,53 Nm]
Continuous torque MDD 121 [M0 2,14 Nm]
max. torque [Mmax 11,5 Nm]
max. torque MDD 111 [Mmax 9,31 Nm]
max. torque MDD 121 [Mmax 6,00 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]

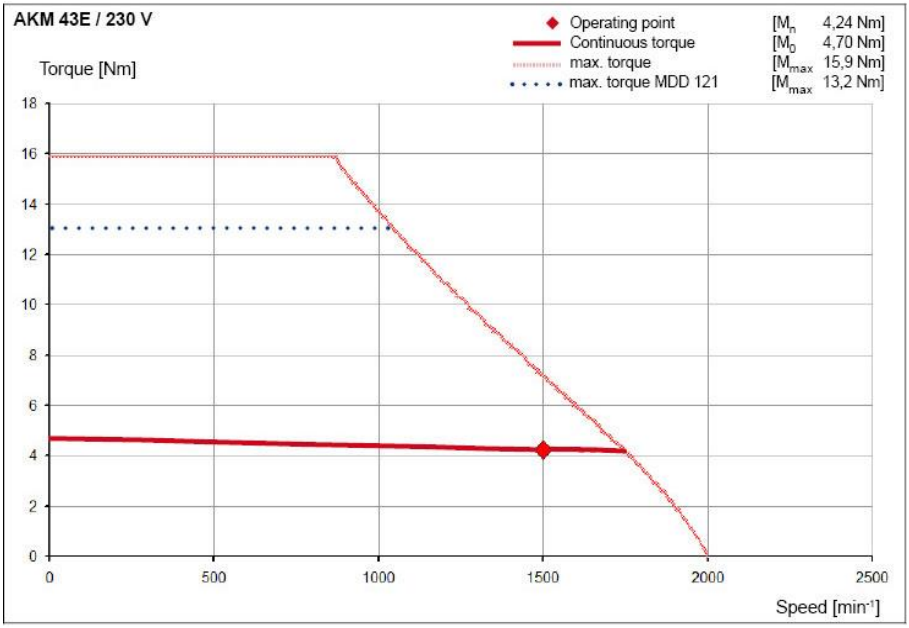

AKM 42G / 400 V
Operating point [M_n 2,35 Nm]
Continuous torque [M_0 3,53 Nm]
Continuous torque MDD 111 [M_0 2,82 Nm]
Continuous torque MDD 121 [M_0 1,44 Nm]
max. torque [M_{max} 11,5 Nm]
max. torque MDD 111 [M_{max} 6,00 Nm]
max. torque MDD 121 [M_{max} 4,14 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]

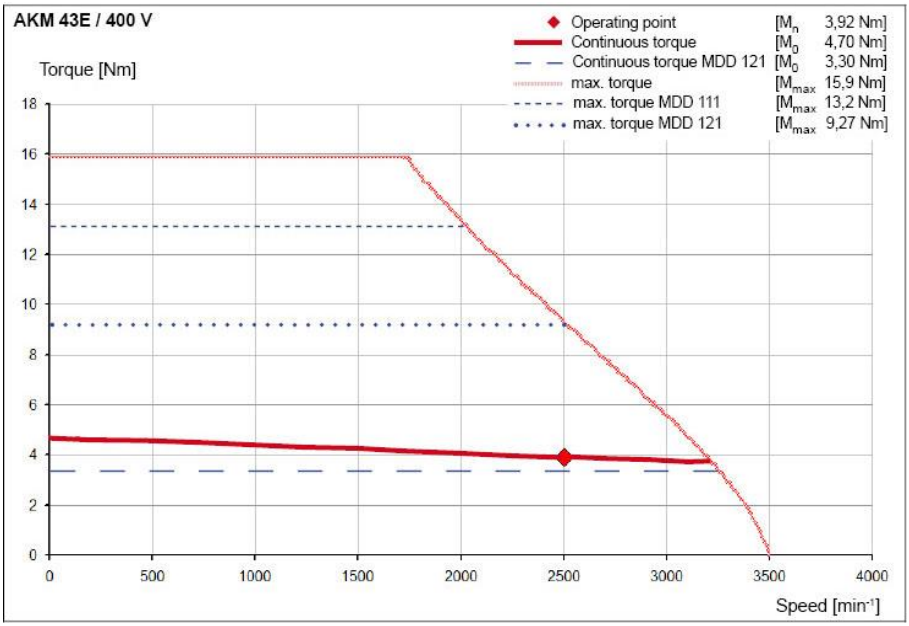

AKM 42G / 480 V
Operating point [Mn 2,35 Nm]
Continuous torque [M0 3,53 Nm]
Continuous torque MDD 111 [M0 2,82 Nm]
Continuous torque MDD 121 [M0 1,44 Nm]
max. torque [Mmax 11,5 Nm]
max. torque MDD 111 [Mmax 6,00 Nm]
max. torque MDD 121 [Mmax 4,14 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

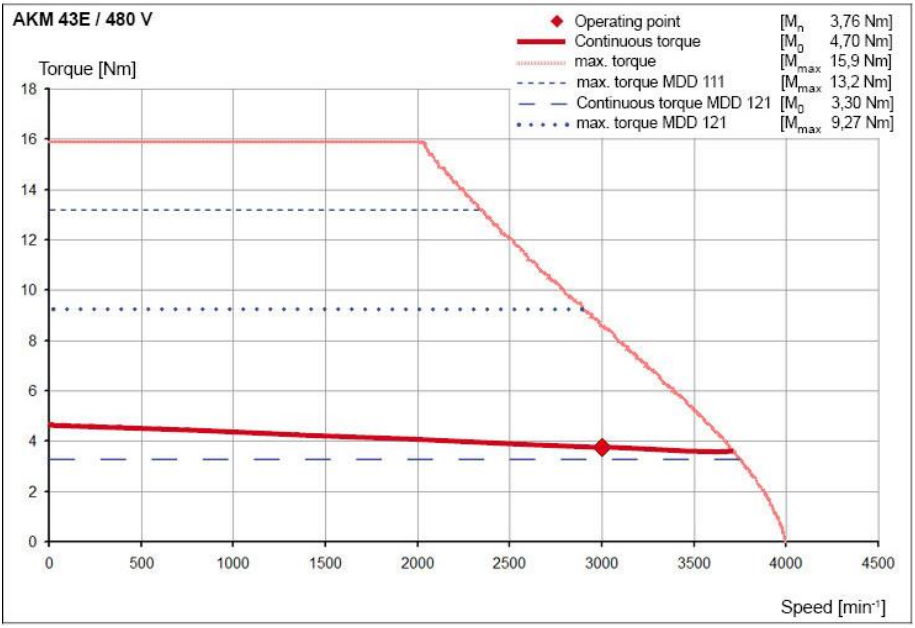
AKM 42J


AKM 42J / 230 V
Operating point [Mn 2,38 Nm]
Continuous torque [M0 3,56 Nm]
Continuous torque MDD 111 [M0 2,46 Nm]
Continuous torque MDD 121 [M0 1,25 Nm]
max. torque [Mmax 11,6 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

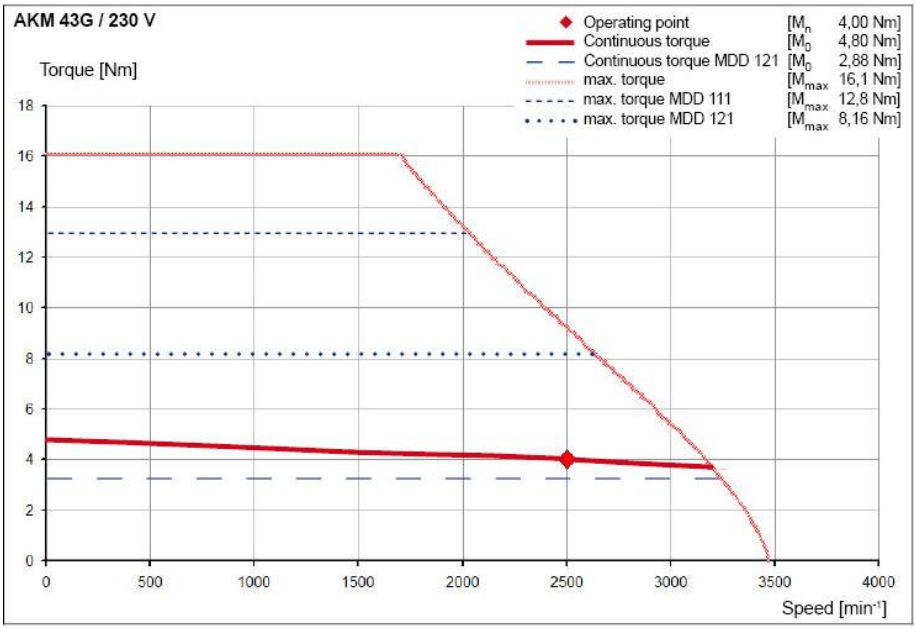
AKM 43E

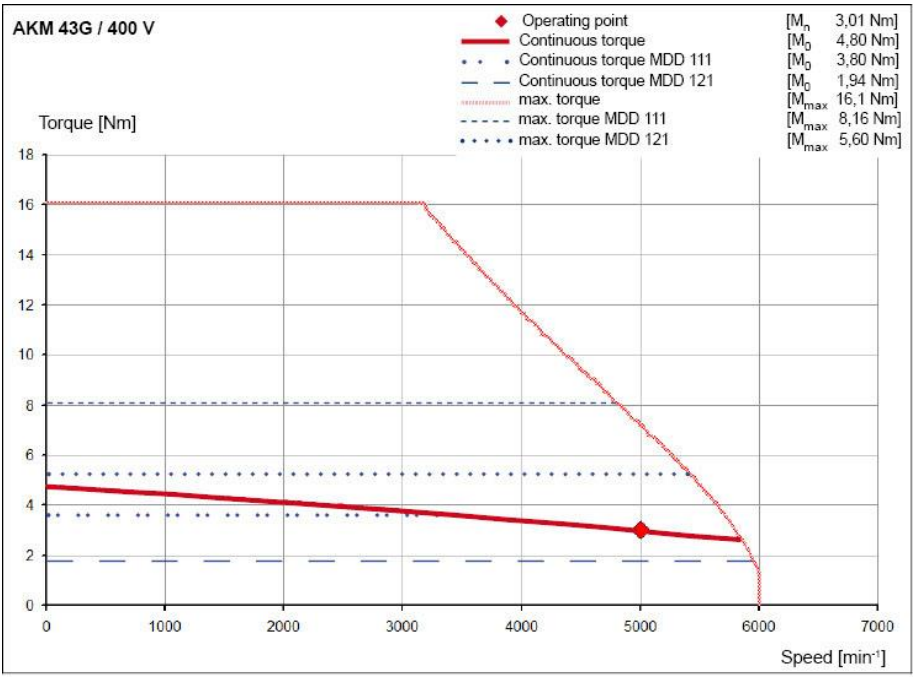

AKM 43E / 230 V
Operating point [M_n 4,24 Nm]
Continuous torque [M_0 4,70 Nm]
max. torque [M_{max} 15,9 Nm]
max. torque MDD 121 [M_{max} 13,2 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
Speed [min⁻¹]

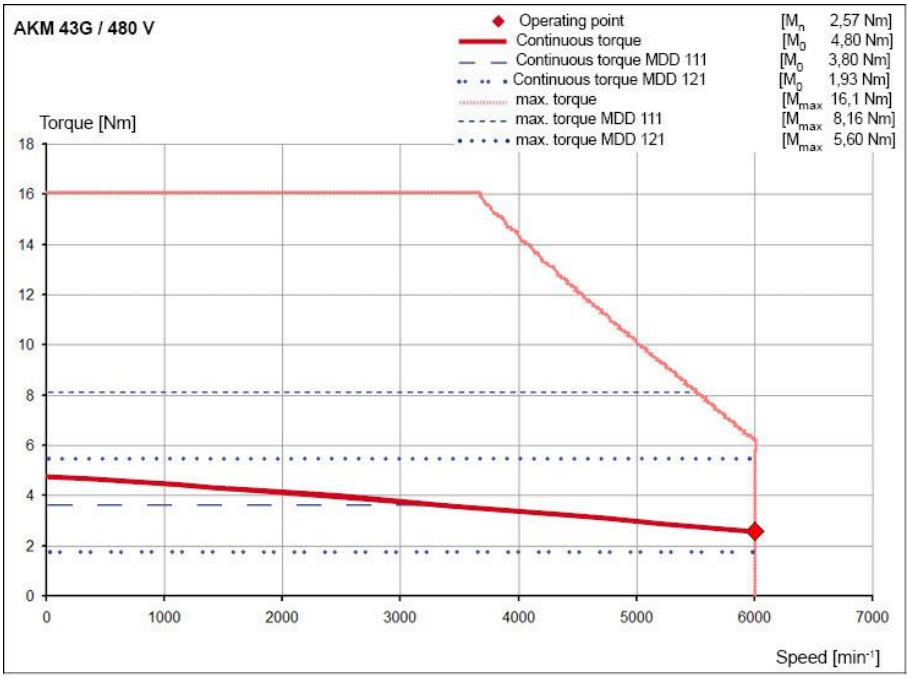

AKM 43E / 400 V
Operating point [M_n 3,92 Nm]
Continuous torque [M_0 4,70 Nm]
Continuous torque MDD 121 [M_0 3,30 Nm]
max. torque [M_{max} 15,9 Nm]
max. torque MDD 111 [M_{max} 13,2 Nm]
max. torque MDD 121 [M_{max} 9,27 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min⁻¹]


AKM 43E / 480 V
Operating point [Mn 3,76 Nm]
Continuous torque [M0 4,70 Nm]
max. torque [Mmax 15,9 Nm]
max. torque MDD 111 [Mmax 13,2 Nm]
Continuous torque MDD 121 [M0 3,30 Nm]
max. torque MDD 121 [Mmax 9,27 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

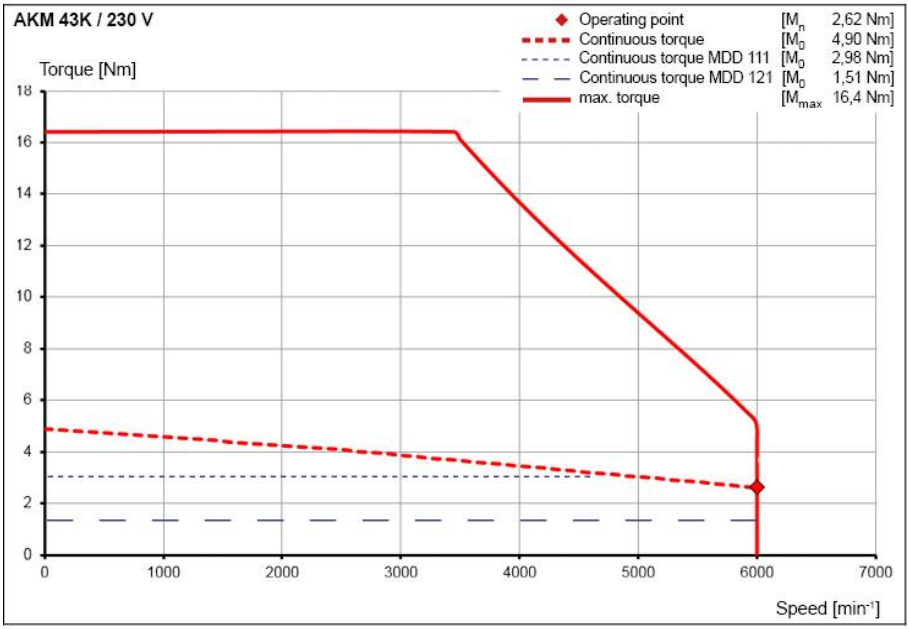
AKM 43G


AKM 43G / 230 V
Torque [Nm]
Operating point [Mn 4,00 Nm]
Continuous torque [M0 4,80 Nm]
Continuous torque MDD 121 [M0 2,88 Nm]
max. torque [Mmax 16,1 Nm]
max. torque MDD 111 [Mmax 12,8 Nm]
max. torque MDD 121 [Mmax 8,16 Nm]
18
16
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

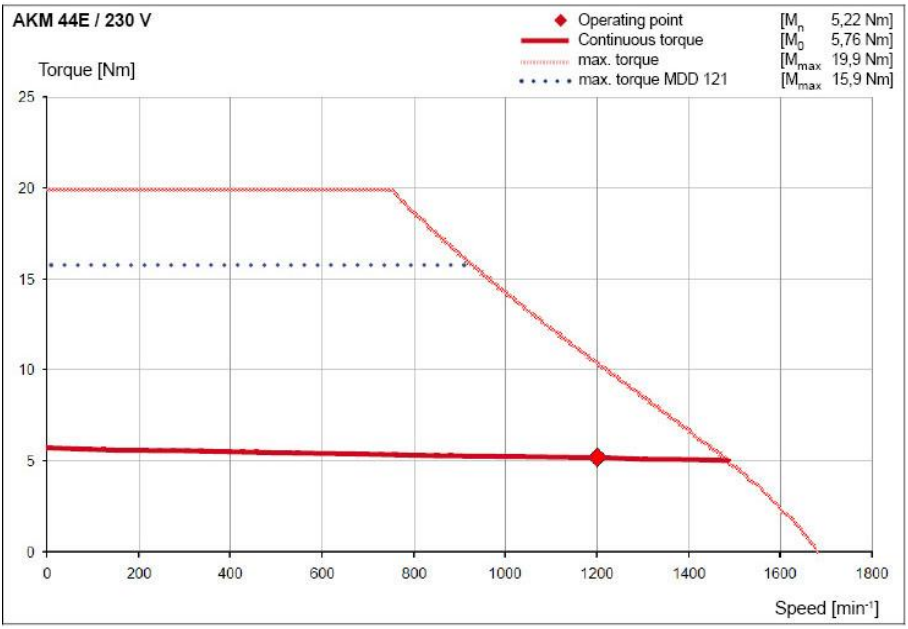

AKM 43G / 400 V
Operating point [Mn 3,01 Nm]
Continuous torque [M0 4,80 Nm]
Continuous torque MDD 111 [M0 3,80 Nm]
Continuous torque MDD 121 [M0 1,94 Nm]
max. torque [Mmax 16,1 Nm]
max. torque MDD 111 [Mmax 8,16 Nm]
max. torque MDD 121 [Mmax 5,60 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

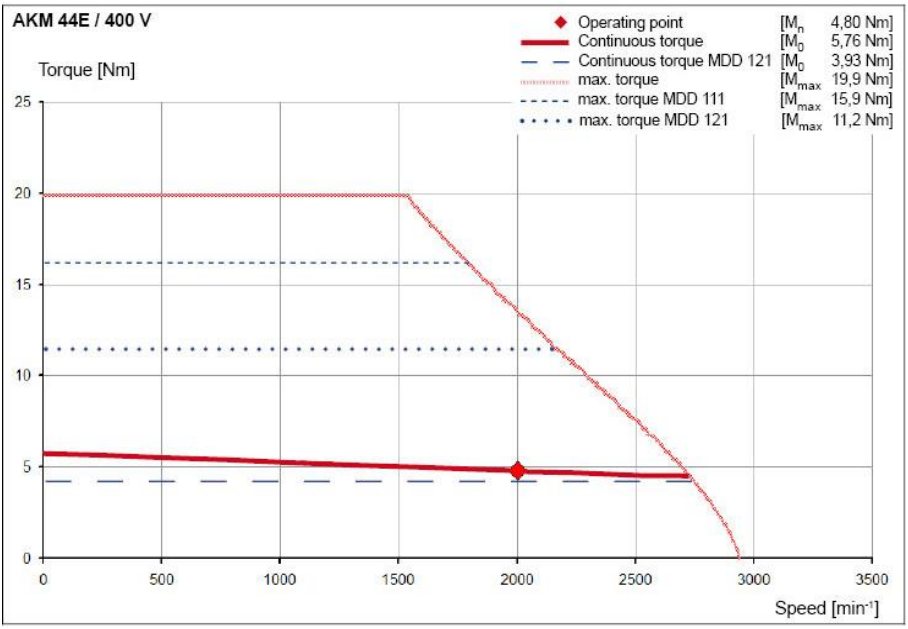

AKM 43G / 480 V
Operating point [Mn 2,57 Nm]
Continuous torque [M0 4,80 Nm]
Continuous torque MDD 111 [M0 3,80 Nm]
Continuous torque MDD 121 [M0 1,93 Nm]
max. torque [Mmax 16,1 Nm]
max. torque MDD 111 [Mmax 8,16 Nm]
max. torque MDD 121 [Mmax 5,60 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

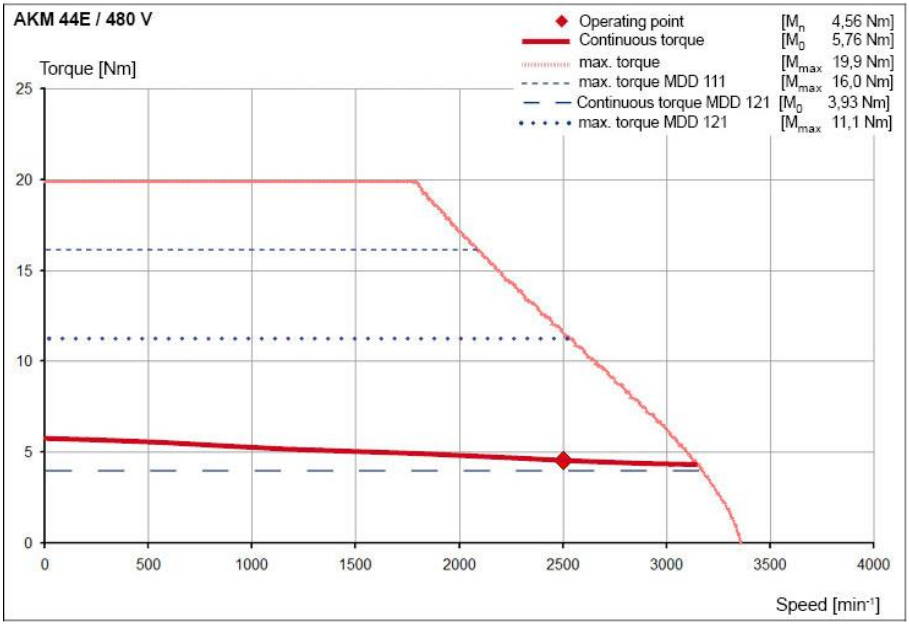
AKM 43K


AKM 43K / 230 V
Operating point [Mn 2,62 Nm]
Continuous torque [M0 4,90 Nm]
Continuous torque MDD 111 [M0 2,98 Nm]
Continuous torque MDD 121 [M0 1,51 Nm]
max. torque [Mmax 16,4 Nm]
Torque [Nm]
18
16
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

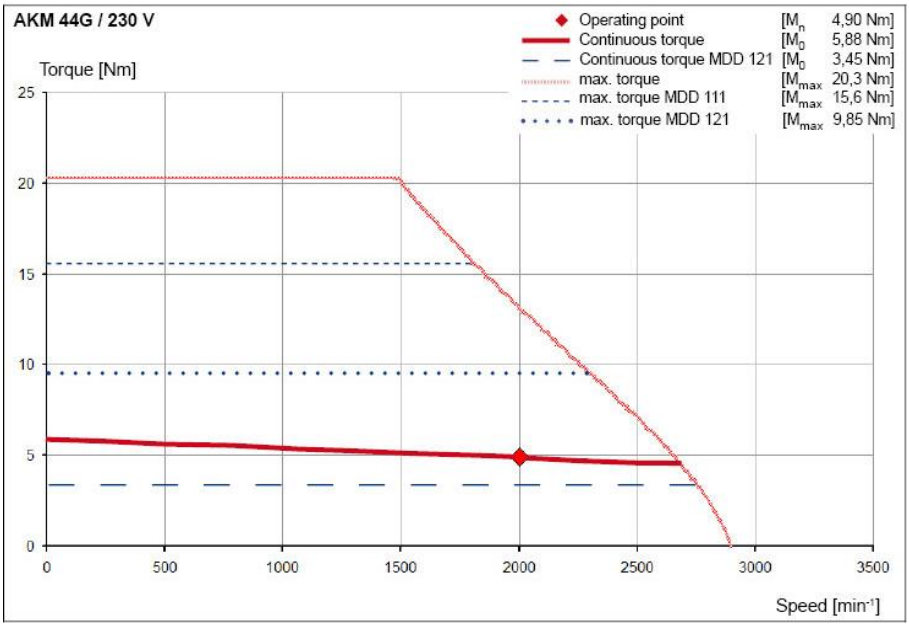
AKM 44E

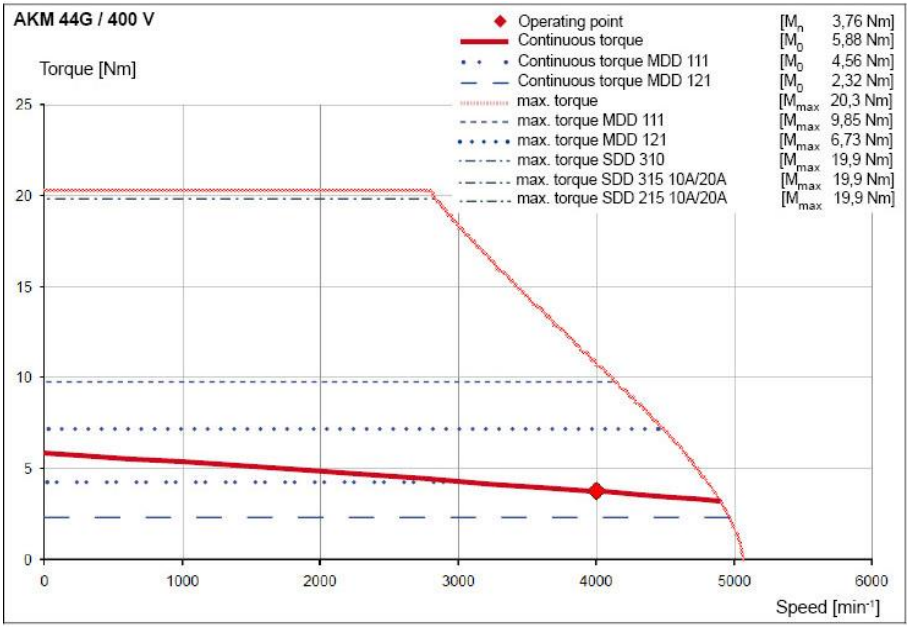

AKM 44E / 230 V
Operating point [M_n 5,22 Nm]
Continuous torque [M_0 5,76 Nm]
max. torque [M_{max} 19,9 Nm]
max. torque MDD 121 [M_{max} 15,9 Nm]
Torque [Nm]
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
Speed [min⁻¹]

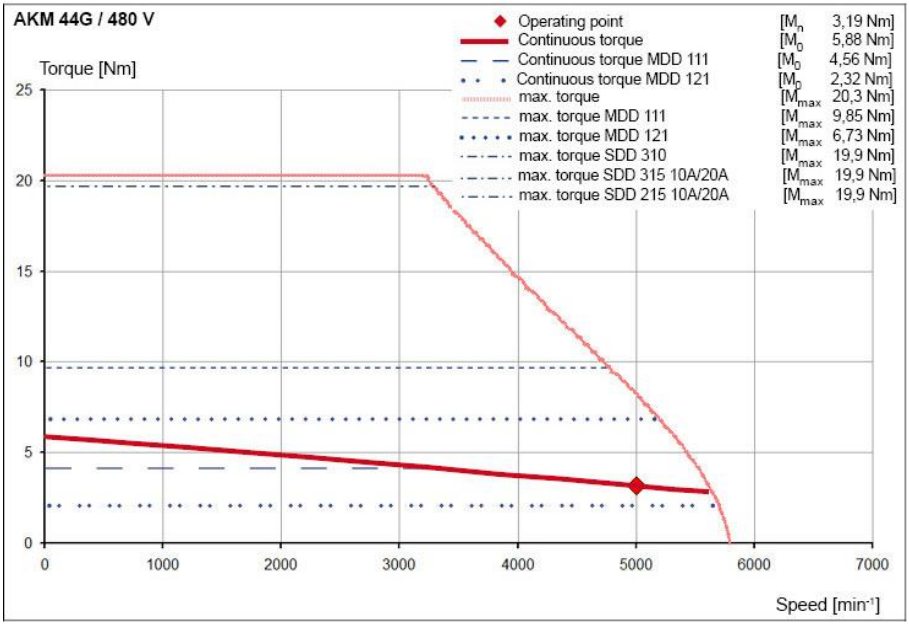

AKM 44E / 400 V
Operating point [M_n 4,80 Nm]
Continuous torque [M_0 5,76 Nm]
Continuous torque MDD 121 [M_0 3,93 Nm]
max. torque [M_{max} 19,9 Nm]
max. torque MDD 111 [M_{max} 15,9 Nm]
max. torque MDD 121 [M_{max} 11,2 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min⁻¹]


AKM 44E / 480 V
Operating point [Mn 4,56 Nm]
Continuous torque [M0 5,76 Nm]
max. torque [Mmax 19,9 Nm]
max. torque MDD 111 [Mmax 16,0 Nm]
Continuous torque MDD 121 [M0 3,93 Nm]
max. torque MDD 121 [Mmax 11,1 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

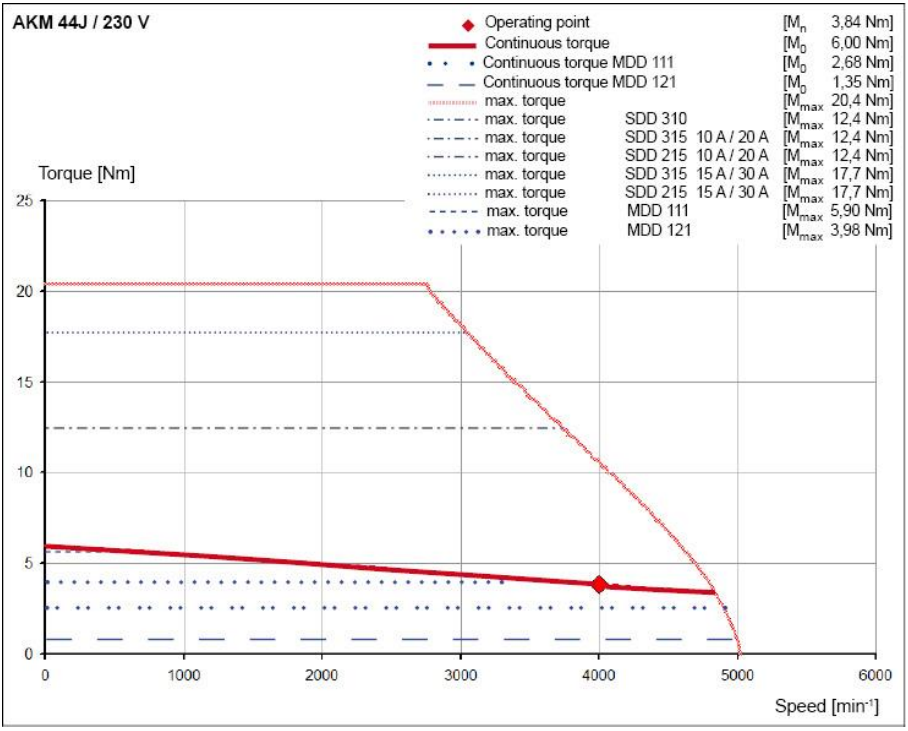
AKM 44G

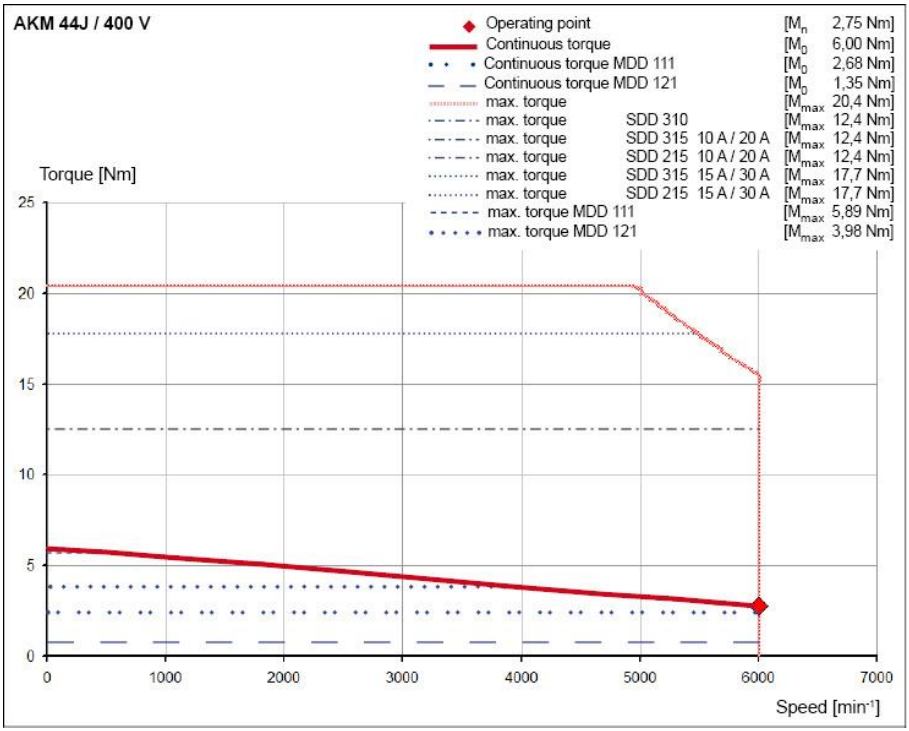

AKM 44G / 230 V
Operating point [Mn 4,90 Nm]
Continuous torque [M0 5,88 Nm]
Continuous torque MDD 121 [M0 3,45 Nm]
max. torque [Mmax 20,3 Nm]
max. torque MDD 111 [Mmax 15,6 Nm]
max. torque MDD 121 [Mmax 9,85 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

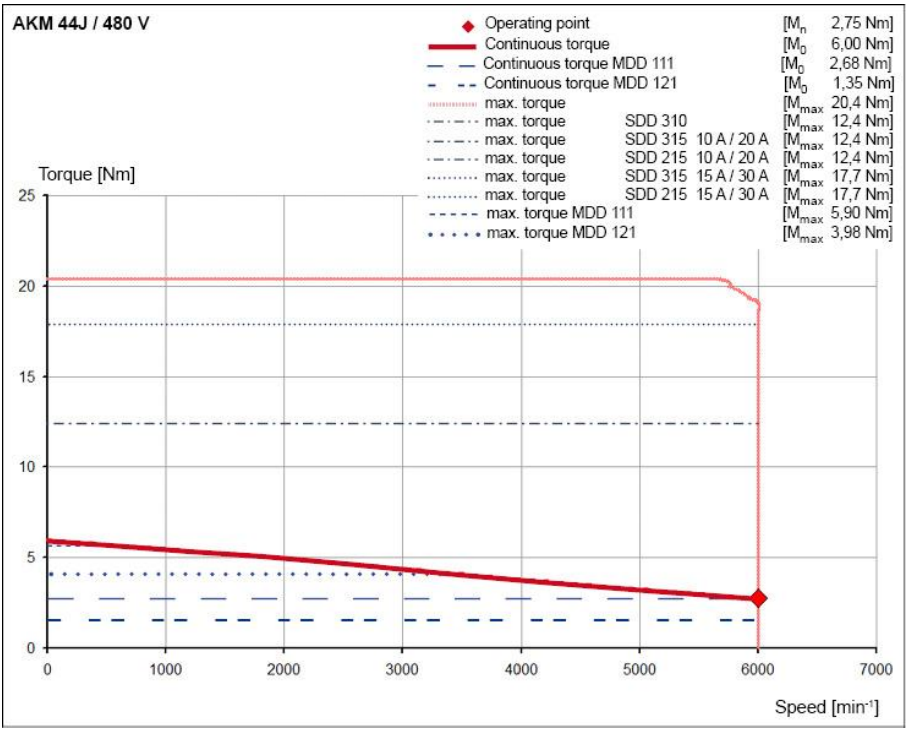

AKM 44G / 400 V
Torque [Nm]
Operating point [M_n 3,76 Nm]
Continuous torque [M_0 5,88 Nm]
Continuous torque MDD 111 [M_0 4,56 Nm]
Continuous torque MDD 121 [M_0 2,32 Nm]
max. torque [M_max 20,3 Nm]
max. torque MDD 111 [M_max 9,85 Nm]
max. torque MDD 121 [M_max 6,73 Nm]
max. torque SDD 310 [M_max 19,9 Nm]
max. torque SDD 315 10A/20A [M_max 19,9 Nm]
max. torque SDD 215 10A/20A [M_max 19,9 Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 44G / 480 V
Torque [Nm]
Operating point [M_n 3,19 Nm]
Continuous torque [M_0 5,88 Nm]
Continuous torque MDD 111 [M_0 4,56 Nm]
Continuous torque MDD 121 [M_0 2,32 Nm]
max. torque [M_max 20,3 Nm]
max. torque MDD 111 [M_max 9,85 Nm]
max. torque MDD 121 [M_max 6,73 Nm]
max. torque SDD 310 [M_max 19,9 Nm]
max. torque SDD 315 10A/20A [M_max 19,9 Nm]
max. torque SDD 215 10A/20A [M_max 19,9 Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

AKM 44J


AKM 44J / 230 V
Operating point [M_n 3,84 Nm]
Continuous torque [M_0 6,00 Nm]
Continuous torque MDD 111 [M_0 2,68 Nm]
Continuous torque MDD 121 [M_0 1,35 Nm]
max. torque [M_{max} 20,4 Nm]
max. torque SDD 310 [M_{max} 12,4 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 12,4 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 12,4 Nm]
max. torque SDD 315 15 A / 30 A [M_{max} 17,7 Nm]
max. torque SDD 215 15 A / 30 A [M_{max} 17,7 Nm]
max. torque MDD 111 [M_{max} 5,90 Nm]
max. torque MDD 121 [M_{max} 3,98 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min⁻¹]


AKM 44J / 400 V
Operating point [Mn 2,75 Nm]
Continuous torque [M0 6,00 Nm]
Continuous torque MDD 111 [M0 2,68 Nm]
Continuous torque MDD 121 [M0 1,35 Nm]
max. torque [Mmax 20,4 Nm]
max. torque SDD 310 [Mmax 12,4 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 12,4 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 12,4 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 17,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 17,7 Nm]
max. torque MDD 111 [Mmax 5,89 Nm]
max. torque MDD 121 [Mmax 3,98 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]


AKM 44J / 480 V
Operating point [Mn 2,75 Nm]
Continuous torque [M0 6,00 Nm]
Continuous torque MDD 111 [M0 2,68 Nm]
Continuous torque MDD 121 [M0 1,35 Nm]
max. torque [Mmax 20,4 Nm]
max. torque SDD 310 [Mmax 12,4 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 12,4 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 12,4 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 17,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 17,7 Nm]
max. torque MDD 111 [Mmax 5,90 Nm]
max. torque MDD 121 [Mmax 3,98 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

10.7 AKM5

10.7.1 Technical Data

Data		Symbol [Unit]	AKM							
			51E	51G	51H	51K				
Electrical data										
	Standstill torque*	M_0 [Nm]**	4,70	4,75	4,79	4,90				
	Standstill current	I_{0rms} [A]**	2,75	4,84	6	9,4				
	Max. Nominal supply voltage	U_N [VAC]	480							
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	1200	2500	3000	5500				
	Nominal torque*	M_n [Nm]	4,41	4,03	3,87	2,35				
	Nominal power	P_n [kW]	0,55	1,05	1,22	1,35				
	Nominal current	I_n [A]	2,56	4,06	4,84	4,52				
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	2500	5000	6000	—				
	Nominal torque*	M_n [Nm]	3,98	2,62	1,95	—				
	Nominal power	P_n [kW]	1,04	1,37	1,23	—				
	Nominal current	I_n [A]	2,31	2,65	2,44	—				
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	3000	6000	6000	—				
	Nominal torque*	M_n [Nm]	3,80	1,94	1,95	—				
	Nominal power	P_n [kW]	1,19	1,22	1,23	—				
	Nominal current	I_n [A]	2,21	1,96	2,44	—				
	Peak current	I_{0max} [A]	8,2	14,5	18	28,2				
	Peak torque	M_{0max} [Nm]	11,6	11,7	11,7	11,9				
	Torque constant	K_{Trms} [Nm/A]	1,72	0,99	0,8	0,52				
	Voltage constant	K_{Erms} [mVmin]	110	63,6	51,3	33,5				
	Winding resistance Ph-Ph	R_{25} [Ω]	8,98	2,87	1,97	0,75				
	Winding inductance Ph-Ph	L [mH]	36,6	12,1	7,9	3,40				

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	3,4
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,022
	Thermal time constant	t_{TH} [min]	20
	Weight standard	G [kg]	4,2
	Radial force allowed on the shaft end at 3000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 305mm * 305mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.26 Nm AKM53 = 0.35 Nm AKM54 = 0.43 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.34 Nm AKM53 = 0.58 Nm AKM54 = 0.86 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM51 = 0.39 Nm AKM52 = 0.76 Nm AKM53 = 1.13 Nm AKM54 = 1.55 Nm

For motors with optional shaft seal, reduce torque shown by 0.13 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM							
			52E	52G	52H	52K	52M	52L		
Electrical data										
	Standstill torque*	M_0 [Nm]**	8,34	8,43	8,48	8,60	8,60	8,67		
	Standstill current	I_{0rms} [A]**	2,99	4,72	5,9	9,3	13,1	11,6		
	Max. Nominal supply voltage	U_N [VAC]	480							
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	—	1500	1800	3000	4500	3500		
	Nominal torque*	M_n [Nm]	—	7,69	7,53	6,80	5,20	6,40		
	Nominal power	P_n [kW]	—	1,21	1,42	2,14	2,45	2,35		
	Nominal current	I_n [A]	—	4,30	5,22	7,31	7,88	8,53		
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	1500	2500	3500	5500	—	6000		
	Nominal torque*	M_n [Nm]	7,61	7,06	6,26	3,90	—	3,27		
	Nominal power	P_n [kW]	1,20	1,85	2,3	2,25	—	2,06		
	Nominal current	I_n [A]	2,73	3,94	4,35	4,19	—	4,36		
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	2000	3000	4000	6000	—	—		
	Nominal torque*	M_n [Nm]	7,28	6,66	5,77	3,25	—	—		
	Nominal power	P_n [kW]	1,52	2,09	2,42	2,04	—	—		
	Nominal current	I_n [A]	2,61	3,72	4,01	3,49	—	—		
	Peak current	I_{0max} [A]	9	14,2	17,7	27,9	39,4	58		
	Peak torque	M_{0max} [Nm]	21,3	21,5	21,6	21,9	21,9	21,9		
	Torque constant	K_{Trms} [Nm/A]	2,79	1,79	1,44	0,93	0,66	0,75		
	Voltage constant	K_{Erms} [mVmin]	179	115	92,7	60,1	42,4	48,3		
	Winding resistance Ph-Ph	R_{25} [Ω]	8,96	3,70	2,35	0,96	0,49	0,61		
	Winding inductance Ph-Ph	L [mH]	44,7	18,5	11,9	5,00	2,50	3,24		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	6,2
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,04
	Thermal time constant	t_{TH} [min]	24
	Weight standard	G [kg]	5,8
	Radial force allowed on the shaft end at 3000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 305mm * 305mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.26 Nm AKM53 = 0.35 Nm AKM54 = 0.43 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.34 Nm AKM53 = 0.58 Nm AKM54 = 0.86 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM51 = 0.39 Nm AKM52 = 0.76 Nm AKM53 = 1.13 Nm AKM54 = 1.55 Nm

For motors with optional shaft seal, reduce torque shown by 0.13 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM						
			53G	53H	53K	53M	53P		
Electrical data									
	Standstill torque*	M_0 [Nm]**	11,4	11,5	11,6	11,4	11,4		
	Standstill current	I_{0rms} [A]**	4,77	6,6	9,4	13,4	19,1		
	Max. Nominal supply voltage	U_N [VAC]	480						
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	1000	—	2000	—	—		
	Nominal torque*	M_n [Nm]	10,7	—	10,1	—	—		
	Nominal power	P_n [kW]	1,12	—	2,12	—	—		
	Nominal current	I_n [A]	4,48	—	8,15	—	—		
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	2000	3000	4000	3000	5000		
	Nominal torque*	M_n [Nm]	9,85	8,83	7,65	8,72	5,88		
	Nominal power	P_n [kW]	2,06	2,77	3,20	2,74	3,08		
	Nominal current	I_n [A]	4,12	5,05	6,17	10,26	9,80		
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	2400	3500	4500	—	—		
	Nominal torque*	M_n [Nm]	9,50	8,23	6,85	—	—		
	Nominal power	P_n [kW]	2,39	3,02	3,23	—	—		
	Nominal current	I_n [A]	3,97	4,70	5,52	—	—		
	Peak current	I_{0max} [A]	14,3	19,8	28,2	40,2	57,4		
	Peak torque	M_{0max} [Nm]	29,7	30,0	30,3	29,7	29,8		
	Torque constant	K_{Trms} [Nm/A]	2,39	1,75	1,24	0,85	0,60		
	Voltage constant	K_{Erms} [mVmin]	154	112	79,8	54,7	38,4		
	Winding resistance Ph-Ph	R_{25} [Ω]	3,97	2,1	1,06	0,51	0,28		
	Winding inductance Ph-Ph	L [mH]	21,3	11,4	5,70	2,70	1,30		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	9,1
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,058
	Thermal time constant	t_{TH} [min]	28
	Weight standard	G [kg]	7,4
	Radial force allowed on the shaft end at 3000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 305mm * 305mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.26 Nm AKM53 = 0.35 Nm AKM54 = 0.43 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.34 Nm AKM53 = 0.58 Nm AKM54 = 0.86 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM51 = 0.39 Nm AKM52 = 0.76 Nm AKM53 = 1.13 Nm AKM54 = 1.55 Nm

For motors with optional shaft seal, reduce torque shown by 0.13 Nm and increase M_R by the same amount.

	Data	Symbol [Unit]	AKM						
			54G	54H	54K	54L	54N		
Electrical data									
	Standstill torque*	M_0 [Nm]**	14,3	14,2	14,4	14,1	14,1		
	Standstill current	I_{0rms} [A]**	5,0	5,5	9,7	12,5	17,8		
	Max. Nominal supply voltage	U_N [VAC]	480						
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	—	—	1800	2500	3500		
	Nominal torque*	M_n [Nm]	—	—	12,7	11,5	9,85		
	Nominal power	P_n [kW]	—	—	2,39	3,00	3,61		
	Nominal current	I_n [A]	—	—	8,47	10,18	12,31		
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	1500	1500	3500	4500	—		
	Nominal torque*	M_n [Nm]	12,9	12,6	10,1	8,13	—		
	Nominal power	P_n [kW]	2,03	2,38	3,68	3,83	—		
	Nominal current	I_n [A]	4,48	4,9	6,67	7,19	—		
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	2000	2000	4000	—	—		
	Nominal torque*	M_n [Nm]	12,3	12,2	9,25	—	—		
	Nominal power	P_n [kW]	2,57	2,56	3,87	—	—		
	Nominal current	I_n [A]	4,27	4,75	6,17	—	—		
	Peak current	I_{0max} [A]	15	16,5	29,2	37,5	53,4		
	Peak torque	M_{0max} [Nm]	38	37,5	38,4	37,5	37,6		
	Torque constant	K_{Trms} [Nm/A]	2,88	2,57	1,50	1,13	0,80		
	Voltage constant	K_{Erms} [mVmin]	185	166	96,6	72,9	51,3		
	Winding resistance Ph-Ph	R_{25} [Ω]	4,08	3,2	1,08	0,65	0,33		
	Winding inductance Ph-Ph	L [mH]	22,9	18,3	6,20	3,50	1,80		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	12
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,077
	Thermal time constant	t_{TH} [min]	31
	Weight standard	G [kg]	9
	Radial force allowed on the shaft end at 3000 min-1	F_R [N]	450
	Axial force allowed	F_A [N]	180

* Measuring flange Aluminum 305mm * 305mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.26 Nm AKM53 = 0.35 Nm AKM54 = 0.43 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM51 = 0.15 Nm AKM52 = 0.34 Nm AKM53 = 0.58 Nm AKM54 = 0.86 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM51 = 0.39 Nm AKM52 = 0.76 Nm AKM53 = 1.13 Nm AKM54 = 1.55 Nm

For motors with optional shaft seal, reduce torque shown by 0.13 Nm and increase M_R by the same amount.

10.7.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	MBR [Nm]	14,5
Connection voltage	UBR [VDC]	24 ± 10 %
Electrical power	PBR [W]	19,5
Inertial torque	JBR [kgcm²]	0,173
Release delay time	tBRH [ms]	80
Application delay time	tBRL [ms]	15
Brake weight	GBR [kg]	1,1
Typical play	[°mech.]	0,31
Switching energy	E [mJ]	36,82

AKM5 can only be used with brake and MDD100, if MDD1x1-2 is used.

10.7.3 Cables and Connections

Data	AKM5	
Power connection	4 + 4-pin, round, angled	
Motor cable, shielded	4 x 1,5	4 x 2,5
Motor cable with control wires, shielded	4 x 1.5 + 2 x 0.5	4 x 2,5 + 2 x 0,5
Resolver connection	12-pin, round, angled	
Motor cable, shielded	4 x 2 x 0,18 mm²	

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.7.4 Maximum and Continuous Torque

Power supply 1 x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 51E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 4,41 11,6	4,70 4,41 11,6	4,70 4,41 11,6	4,70 4,41 11,6	4,70 4,41 11,6	4,70 4,41 11,6	4,70 4,41 11,6
AKM 51G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,75 4,03 11,7	4,75 4,03 11,7	4,75 4,03 11,7	4,75 4,03 11,7	4,75 4,03 11,7	4,75 4,03 11,7	4,75 4,03 11,7
AKM 51H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,79 3,87 11,7	4,79 3,87 11,7	4,79 3,87 11,7	4,79 3,87 11,7	4,79 3,87 11,7	4,79 3,87 11,7	4,79 3,87 11,7
AKM 51K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,90 2,35 11,9	4,90 2,35 11,9	4,90 2,35 11,9	4,90 2,35 11,9	4,90 2,35 11,9	4,90 2,35 11,9	4,90 2,35 11,9
AKM 52E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 52G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,43 7,69 21,5	8,43 7,69 21,5	8,43 7,69 21,5	8,43 7,69 21,5	8,43 7,69 21,5	8,43 7,69 21,5	8,43 7,69 21,5
AKM 52H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,48 7,53 21,6	8,48 7,53 21,6	8,48 7,53 21,6	8,48 7,53 21,6	8,48 7,53 21,6	8,48 7,53 21,6	8,48 7,53 21,6
AKM 52K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,60 6,80 21,9	8,60 6,80 16,1	8,60 6,80 16,1	8,60 6,80 21,9	8,60 6,80 16,1	8,60 6,80 21,9	8,60 6,80 21,9
AKM 52M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,60 5,20 21,9	6,30 5,20 12,1	6,30 5,20 12,1	8,60 5,20 17,4	6,30 5,20 12,1	8,60 5,20 17,4	8,60 5,20 21,9
AKM 52L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,67 6,40 21,9	7,08 6,40 13,4	7,08 6,40 13,4	8,67 6,40 18,9	7,08 6,40 13,4	8,67 6,40 18,9	8,67 6,40 21,9
AKM 53G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,4 10,7 29,7	11,4 10,7 29,7	11,4 10,7 29,7	11,4 10,7 29,7	11,4 10,7 29,7	11,4 10,7 29,7	11,4 10,7 29,7
AKM 53H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -

AKM 53K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,6 10,1 30,3	11,6 10,1 21,9	11,6 10,1 21,9	11,6 10,1 30,3	11,6 10,1 21,9	11,6 10,1 30,3	11,6 10,1 30,3
AKM 53M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,4 8,72 29,7	8,23 8,72 15,9	8,23 8,72 15,9	11,4 8,72 23	8,23 8,72 15,9	11,4 8,72 23	11,4 8,72 29,7
AKM 53P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,4 5,88 29,8	5,83 5,88 11,4	5,83 5,88 11,4	8,65 5,88 16,7	5,83 5,88 11,4	8,65 5,88 16,7	11,4 5,88 21,7
AKM 54G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 54H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	- - -	- - -	- - -	- - -	- - -	- - -	- - -
AKM 54K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,4 12,7 38,4	14,4 12,7 26,8	14,4 12,7 26,8	14,4 12,7 38	14,4 12,7 26,8	14,4 12,7 38	14,4 12,7 38,4
AKM 54L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,1 11,5 37,5	10,9 11,5 20,9	10,9 11,5 20,9	14,1 11,5 30	10,9 11,5 20,9	14,1 11,5 30	14,1 11,5 37,5
AKM 54N	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,1 9,85 37,6	7,76 9,85 15,1	7,76 9,85 15,1	11,5 9,85 22,3	7,76 9,85 15,1	11,5 9,85 22,3	14,1 9,85 29,0

Power supply 1 x 400 V

Motor type	**Symbol [Unit]**	**Motor data**	**Servo amplifier**					
			SDD 310	**SDD 315** 10A/20A	15A/30A	**SDD 215** 10A/20A	15A/30A	**SDD 120**
AKM 51E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 3,98 11,6	4,70 3,98 11,6	4,70 3,98 11,6	4,70 3,98 11,6	4,70 3,98 11,6	4,70 3,98 11,6	4,70 3,98 11,6
AKM 51G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,75 2,62 11,7	4,75 2,62 11,7	4,75 2,62 11,7	4,75 2,62 11,7	4,75 2,62 11,7	4,75 2,62 11,7	4,75 2,62 11,7
AKM 51H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7
AKM 52E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,34 7,61 21,3	8,34 7,61 21,3	8,34 7,61 21,3	8,34 7,61 21,3	8,34 7,61 21,3	8,34 7,61 21,3	8,34 7,61 21,3

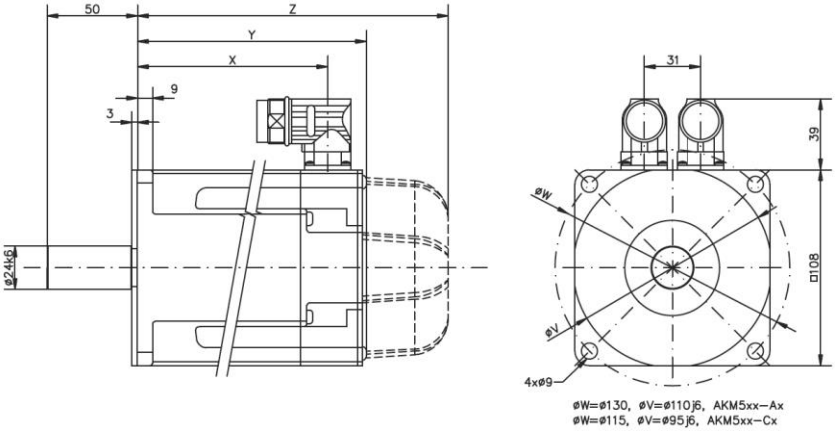
AKM 52G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,43 7,06 21,5	8,43 7,06 21,5	8,43 7,06 21,5	8,43 7,06 21,5	8,43 7,06 21,5	8,43 7,06 21,5	8,43 7,06 21,5
AKM 52H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,48 6,26 21,6	8,48 6,26 21,6	8,48 6,26 21,6	8,48 6,26 21,6	8,48 6,26 21,6	8,48 6,26 21,6	8,48 6,26 21,6
AKM 52K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,60 3,90 21,9	8,60 3,90 16,1	8,60 3,90 16,1	8,60 3,90 21,9	8,60 3,90 16,1	8,60 3,90 21,9	8,60 3,90 21,9
AKM 52L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,67 3,27 21,9	7,10 3,27 13,4	7,10 3,27 13,4	8,67 3,27 18,9	7,10 3,27 13,4	8,67 3,27 18,9	8,67 3,27 21,9
AKM 53G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,4 9,85 29,7	11,4 9,85 29,7	11,4 9,85 29,7	11,4 9,85 29,7	11,4 9,85 29,7	11,4 9,85 29,7	11,4 9,85 29,7
AKM 53H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,5 8,83 30,0	11,5 8,83 29,3	11,5 8,83 29,3	11,5 8,83 30,0	11,5 8,83 29,3	11,5 8,83 30,0	11,5 8,83 30,0
AKM 53K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,6 7,65 30,3	11,6 7,65 21,9	11,6 7,65 21,9	11,6 7,65 30,3	11,6 7,65 21,9	11,6 7,65 30,3	11,6 7,65 30,3
AKM 54G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,3 12,9 38	14,3 12,9 38	14,3 12,9 38	14,3 12,9 38	14,3 12,9 38	14,3 12,9 38	14,3 12,9 38
AKM 54H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,2 12,6 37,5	14,2 12,6 37,5	14,2 12,6 37,5	14,2 12,6 37,5	14,2 12,6 37,5	14,2 12,6 37,5	14,2 12,6 37,5
AKM 54K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,4 10,1 38,4	14,4 10,1 26,8	14,4 10,1 26,8	14,4 10,1 38	14,4 10,1 26,8	14,4 10,1 38	14,4 10,1 38,4
AKM 54L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,1 8,13 37,5	10,9 8,13 20,9	10,9 8,13 20,9	14,1 8,13 30	10,9 8,13 20,9	14,1 8,13 30	14,1 8,13 37,5

Power supply 1 x 480 V

Motor type	**Symbol [Unit]**	**Motor data**	**Servo amplifier**					
			SDD 310	**SDD 315** 10A/20A	15A/30A	**SDD 215** 10A/20A	15A/30A	**SDD 120**
AKM 51E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6
AKM 51G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,75 1,94 11,7	4,75 1,94 11,7	4,75 1,94 11,7	4,75 1,94 11,7	4,75 1,94 11,7	4,75 1,94 11,7	4,75 1,94 11,7

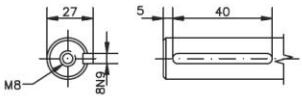
AKM 51H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7	4,79 1,95 11,7
AKM 52E	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,34 7,28 21,3	8,34 7,28 21,3	8,34 7,28 21,3	8,34 7,28 21,3	8,34 7,28 21,3	8,34 7,28 21,3	8,34 7,28 21,3
AKM 52G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,43 6,66 21,5	8,43 6,66 21,5	8,43 6,66 21,5	8,43 6,66 21,5	8,43 6,66 21,5	8,43 6,66 21,5	8,43 6,66 21,5
AKM 52H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,48 5,77 21,6	8,48 5,77 21,6	8,48 5,77 21,6	8,48 5,77 21,6	8,48 5,77 21,6	8,48 5,77 21,6	8,48 5,77 21,6
AKM 52K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	8,60 3,25 21,9	8,60 3,25 16,1	8,60 3,25 16,1	8,60 3,25 21,9	8,60 3,25 16,1	8,60 3,25 21,9	8,60 3,25 21,9
AKM 53G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,4 9,50 29,7	11,4 9,50 29,7	11,4 9,50 29,7	11,4 9,50 29,7	11,4 9,50 29,7	11,4 9,50 29,7	11,4 9,50 29,7
AKM 53H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,5 8,23 30,0	11,5 8,23 29,3	11,5 8,23 29,3	11,5 8,23 30,0	11,5 8,23 29,3	11,5 8,23 30,0	11,5 8,23 30,0
AKM 53K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,6 6,85 30,3	11,6 6,85 21,9	11,6 6,85 21,9	11,6 6,85 30,3	11,6 6,85 21,9	11,6 6,85 30,3	11,6 6,85 30,3
AKM 54G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,3 12,3 38,0	14,3 12,3 38,0	14,3 12,3 38,0	14,3 12,3 38,0	14,3 12,3 38,0	14,3 12,3 38,0	14,3 12,3 38,0
AKM 54H	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,2 12,2 37,5	14,2 12,2 37,5	14,2 12,2 37,5	14,2 12,2 37,5	14,2 12,2 37,5	14,2 12,2 37,5	14,2 12,2 37,5
AKM 54K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	14,4 9,25 38,4	14,4 9,25 26,8	14,4 9,25 26,8	14,4 9,25 38,0	14,4 9,25 26,8	14,4 9,25 38,0	14,4 9,25 38,4

10.7.5 Dimensional Drawing (schematic diagram)

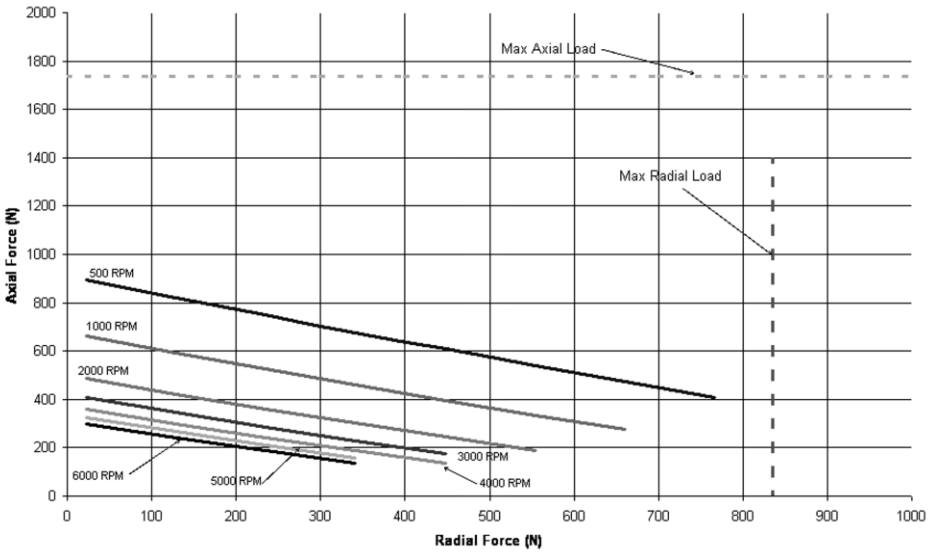


Model	X	Resolver/Comcoder		Encoder	
		Y	Z (brake)	Y	Z (brake)
AKM51	105.3	127.5	172.5	146.0	189.0
AKM52	136.3	158.5	203.5	177.0	220.0
AKM53	167.3	189.5	234.5	208.0	251.0
AKM54	198.3	220.5	265.5	239.0	282.0

Option Keyway

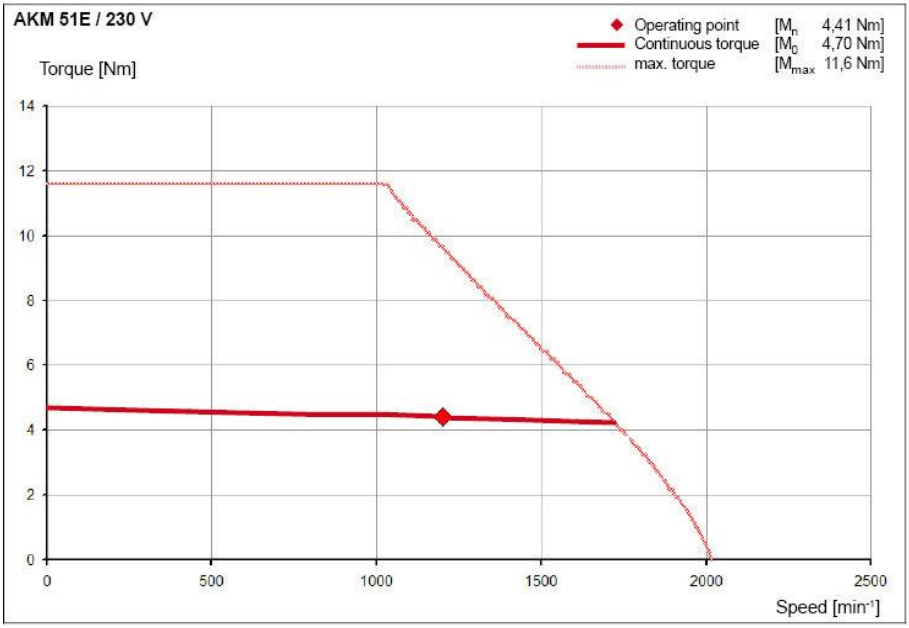


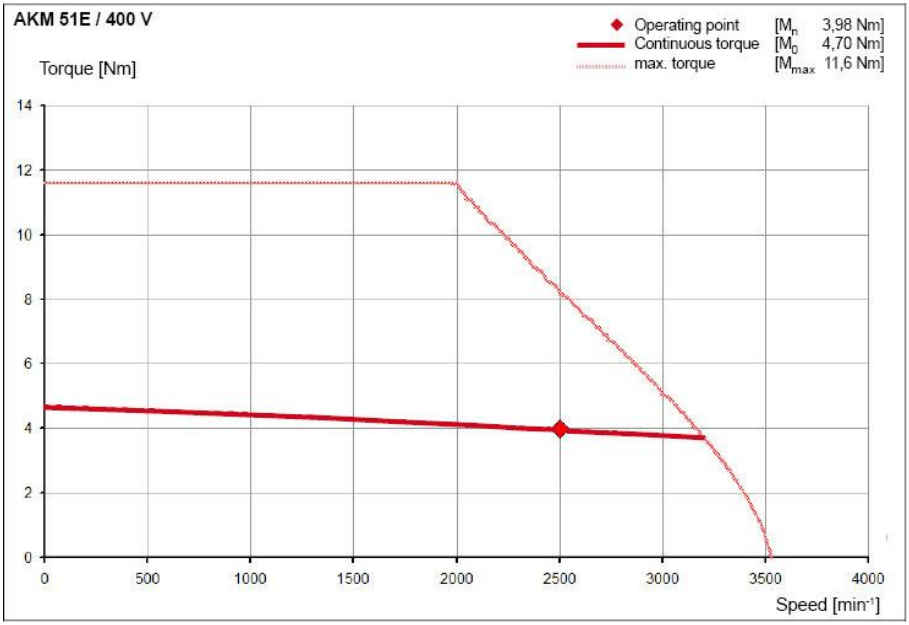
10.7.6 Radial Force on the Shaft End

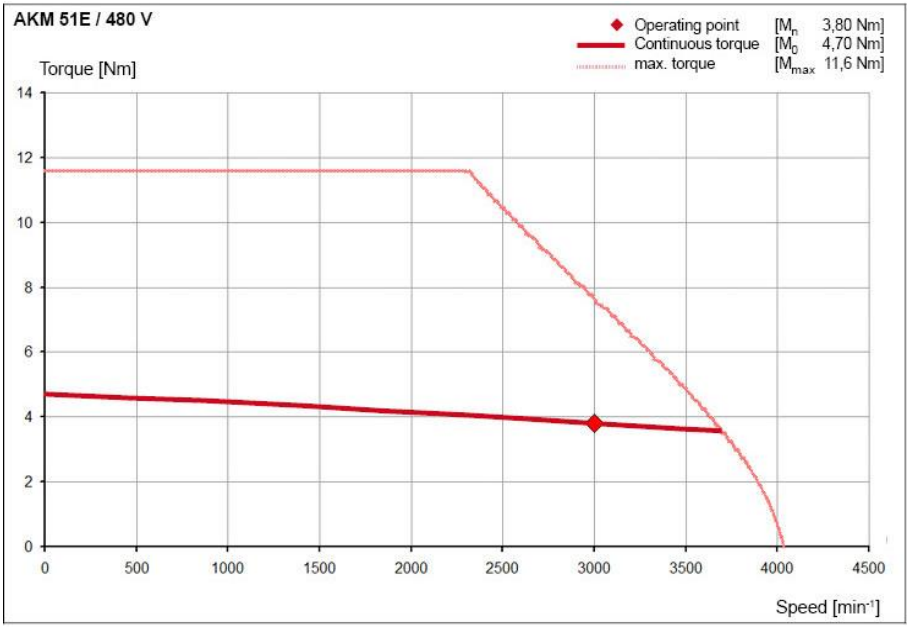


10.7.7 Motor Characteristics

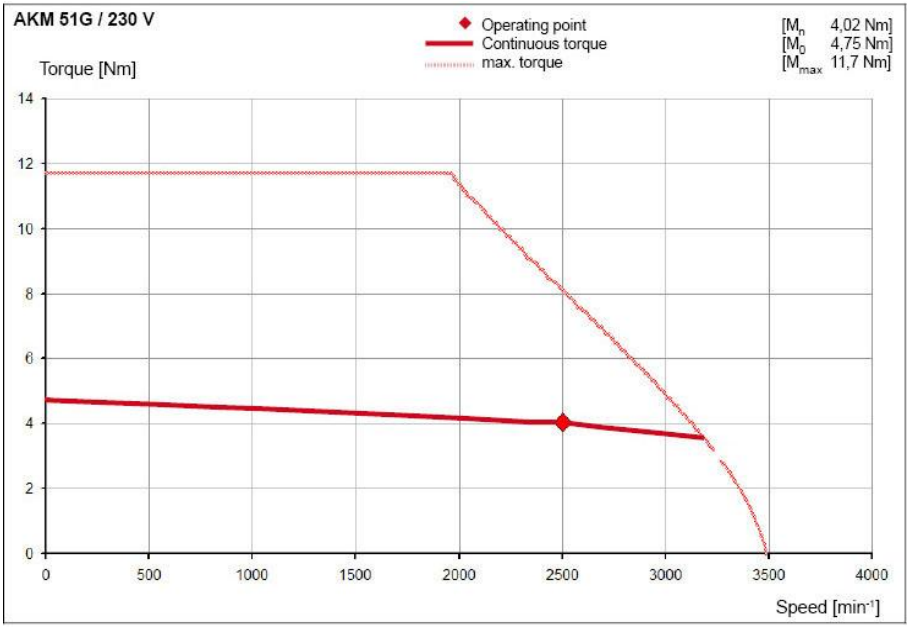
AKM 51E

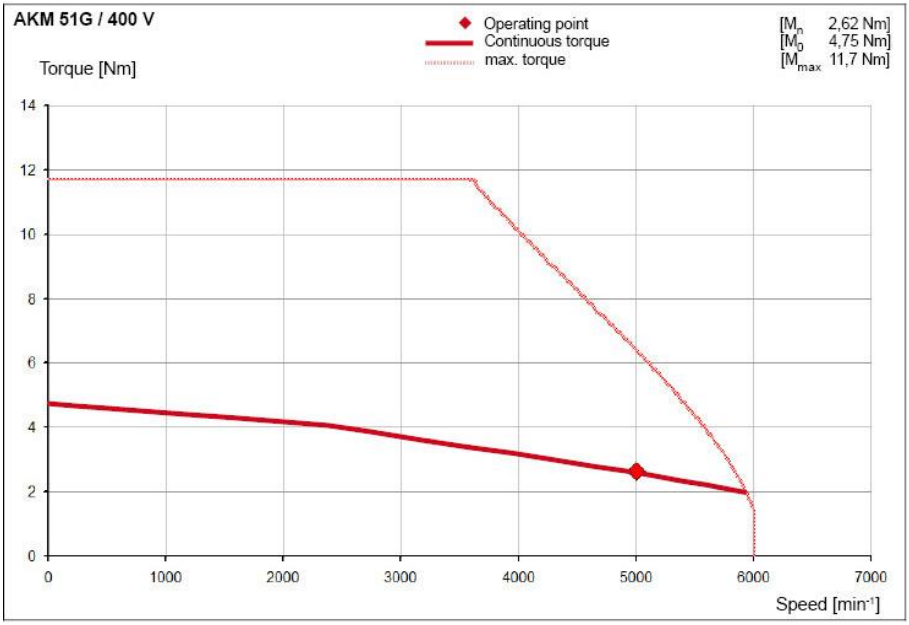


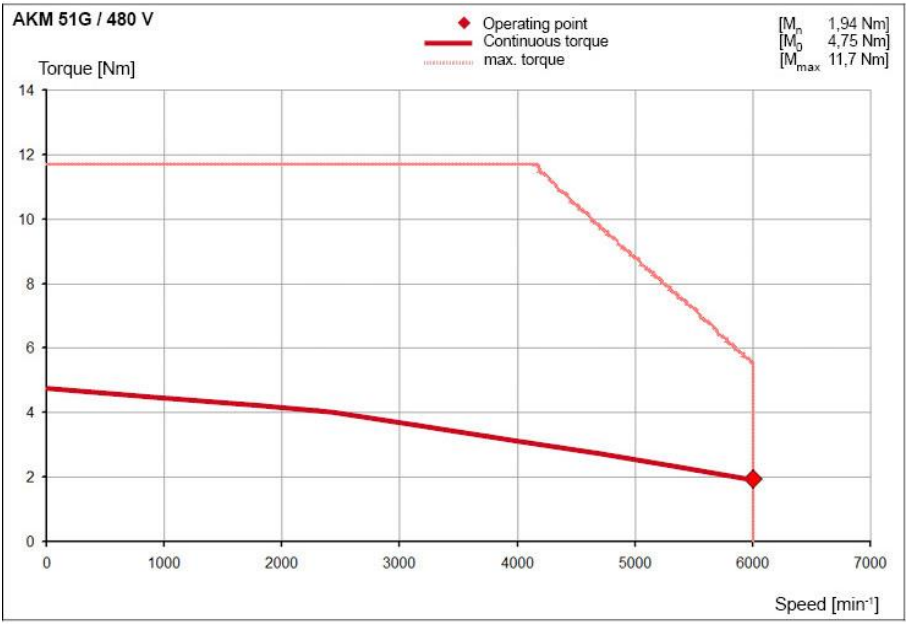

AKM 51E / 400 V
Operating point [Mn 3,98 Nm]
Continuous torque [M0 4,70 Nm]
max. torque [Mmax 11,6 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]


AKM 51E / 480 V
Operating point [Mn 3,80 Nm]
Continuous torque [M0 4,70 Nm]
max. torque [Mmax 11,6 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

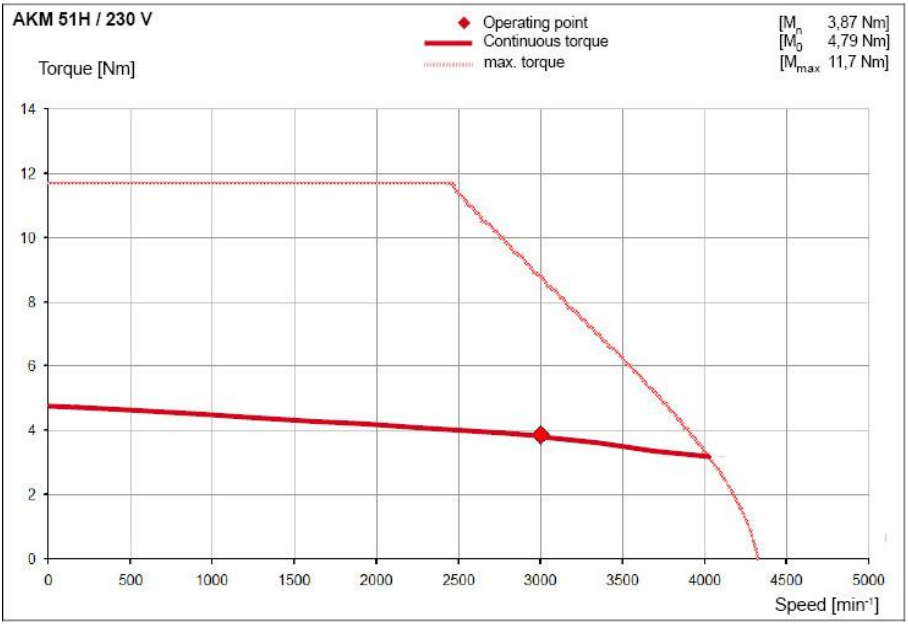
AKM 51G

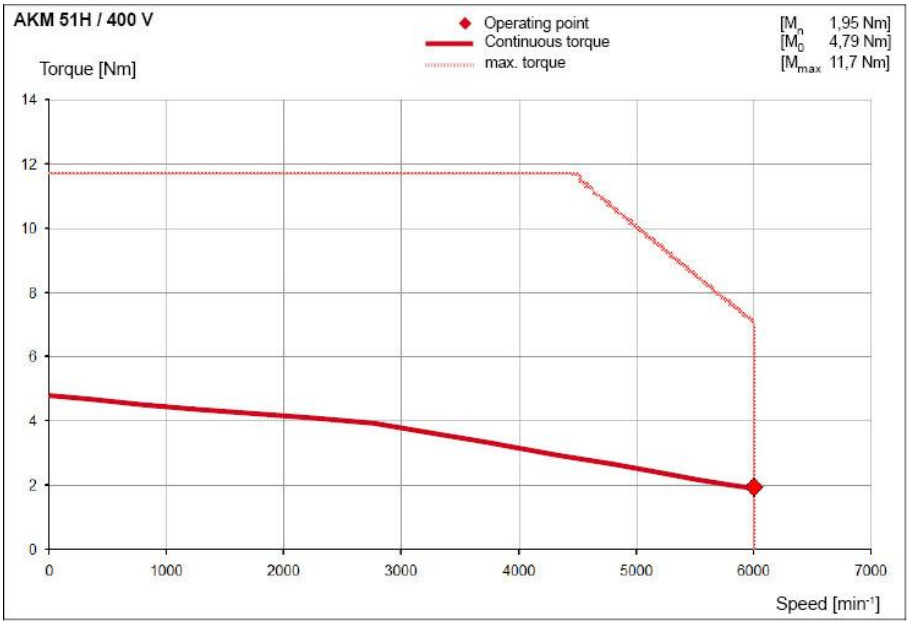

AKM 51G / 230 V
Operating point
Continuous torque
max. torque
[Mn 4,02 Nm]
[M0 4,75 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

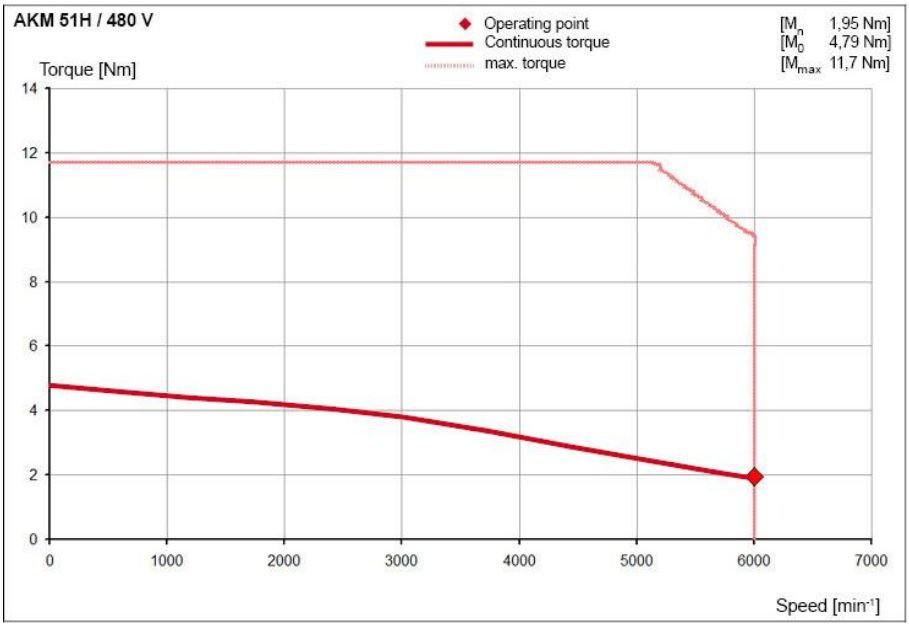

AKM 51G / 400 V
Operating point
Continuous torque
max. torque
[Mn 2,62 Nm]
[M0 4,75 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]


AKM 51G / 480 V
Operating point
Continuous torque
max. torque
[Mn 1,94 Nm]
[M0 4,75 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

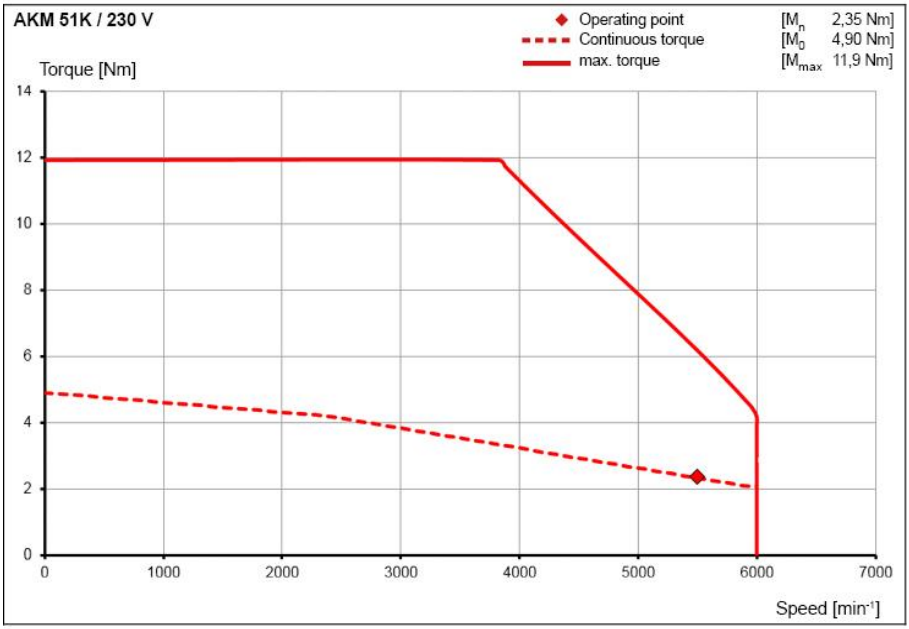
AKM 51H


AKM 51H / 230 V
Operating point
Continuous torque
max. torque
[Mn 3,87 Nm]
[M0 4,79 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]

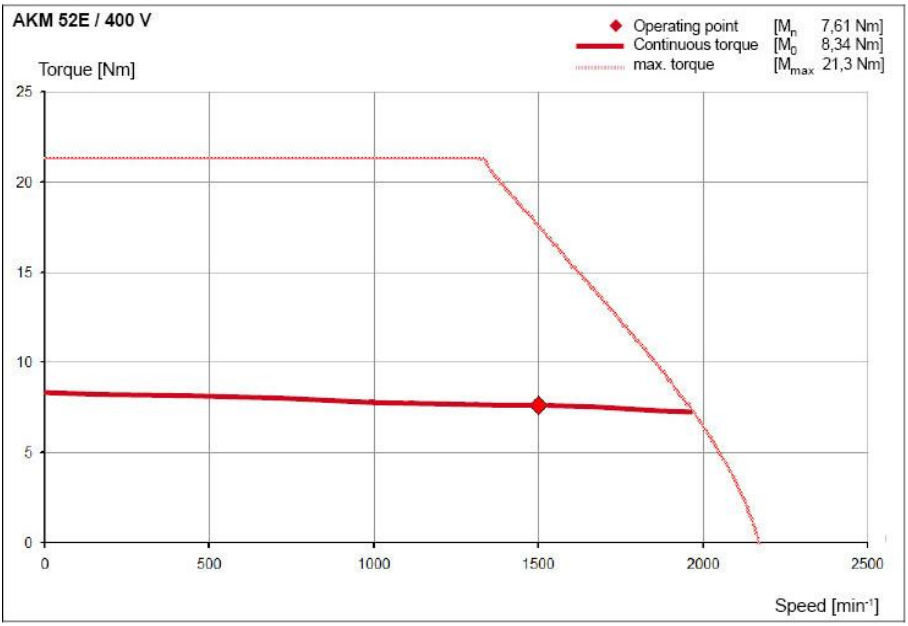

AKM 51H / 400 V
Operating point
Continuous torque
max. torque
[Mn 1,95 Nm]
[M0 4,79 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

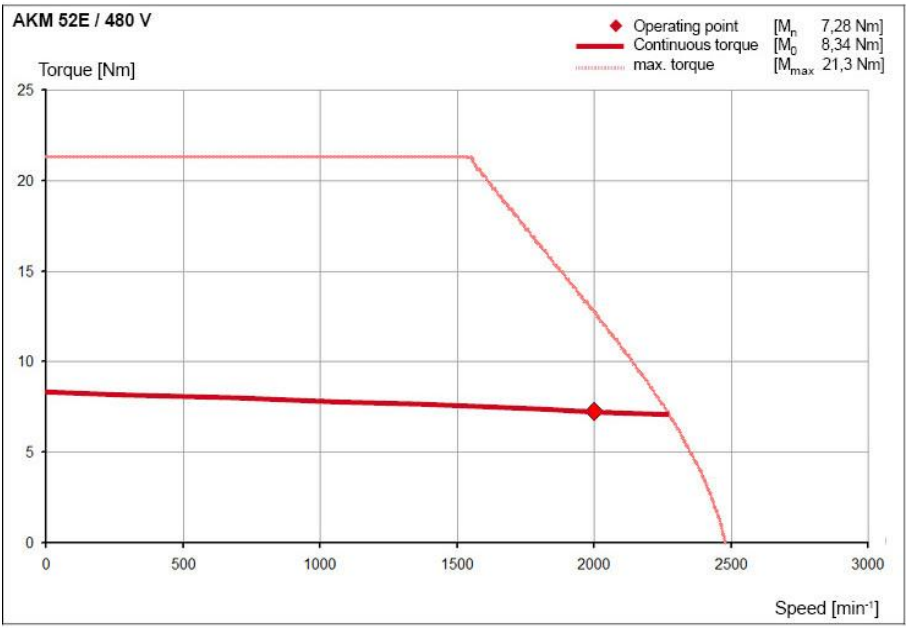

AKM 51H / 480 V
Operating point
Continuous torque
max. torque
[Mn 1,95 Nm]
[M0 4,79 Nm]
[Mmax 11,7 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

AKM 51K

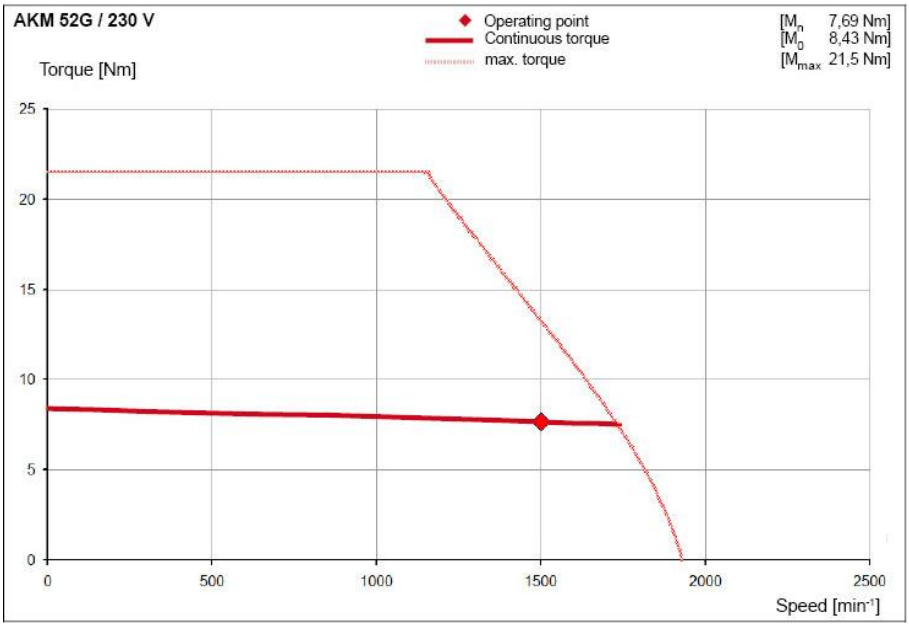

AKM 51K / 230 V
Operating point
Continuous torque
max. torque
[Mn 2,35 Nm]
[M0 4,90 Nm]
[Mmax 11,9 Nm]
Torque [Nm]
14
12
10
8
6
4
2
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

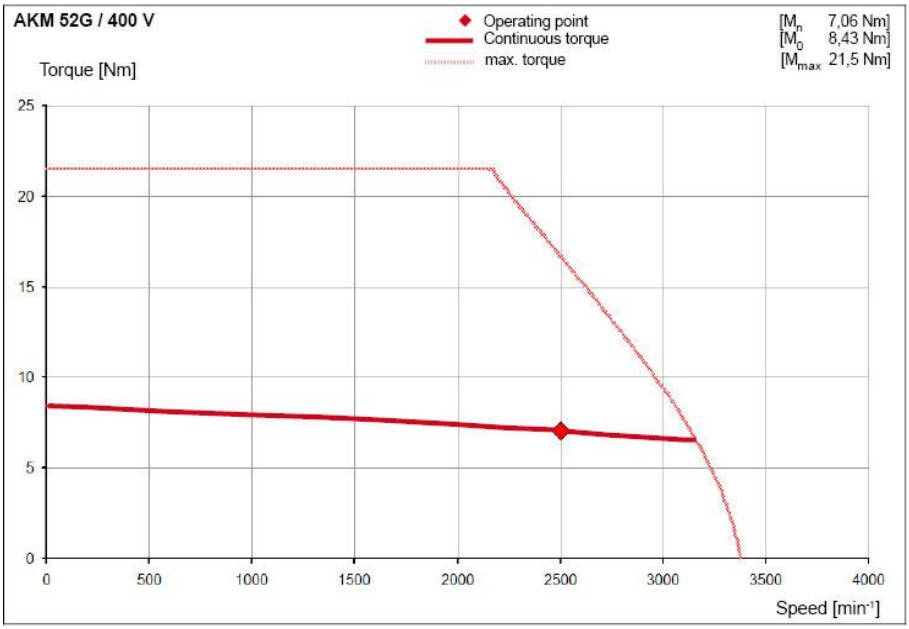
AKM 52E

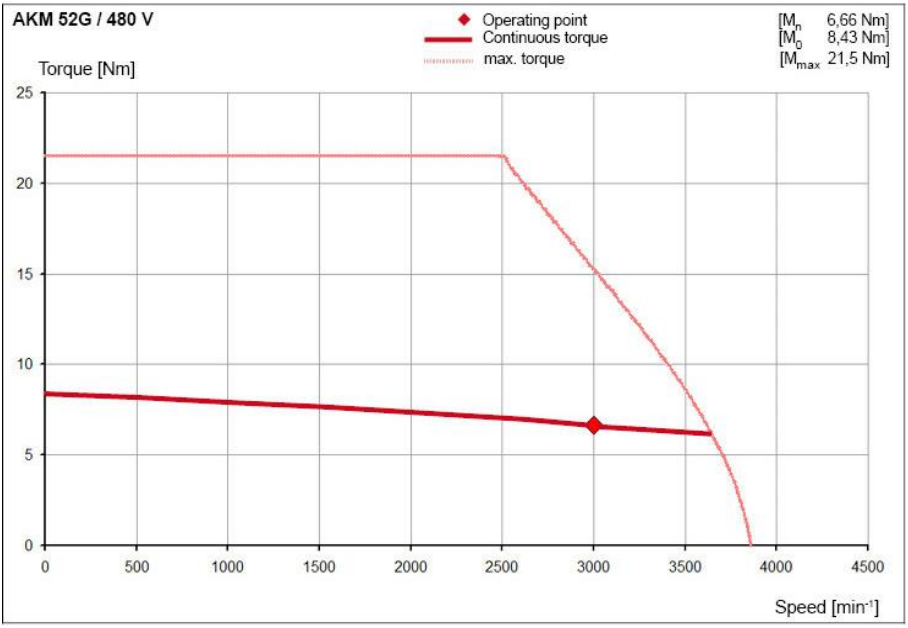

AKM 52E / 400 V
Operating point [Mn 7,61 Nm]
Continuous torque [M0 8,34 Nm]
max. torque [Mmax 21,3 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Speed [min-1]


AKM 52E / 480 V
Operating point [Mn 7,28 Nm]
Continuous torque [M0 8,34 Nm]
max. torque [Mmax 21,3 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

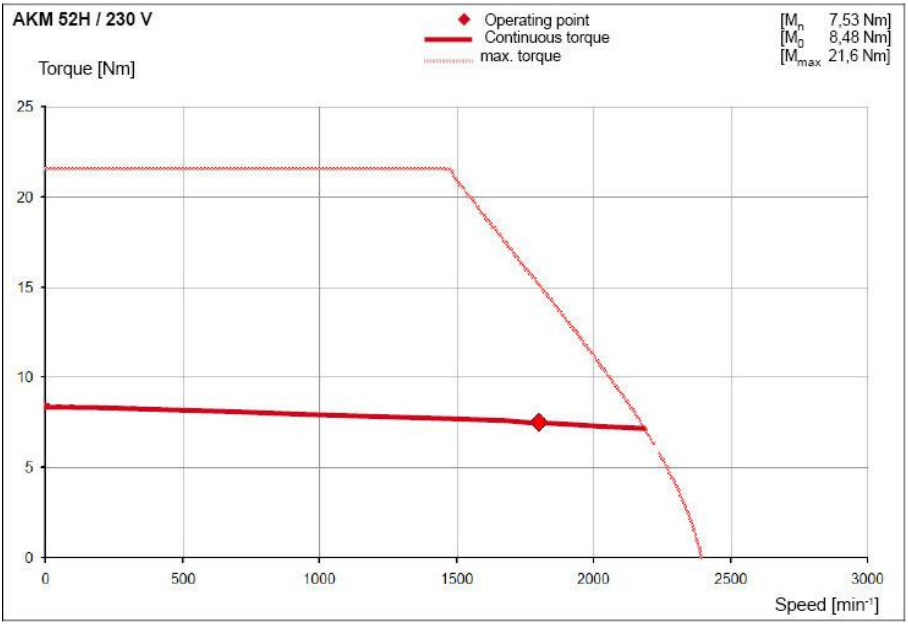
AKM 52G

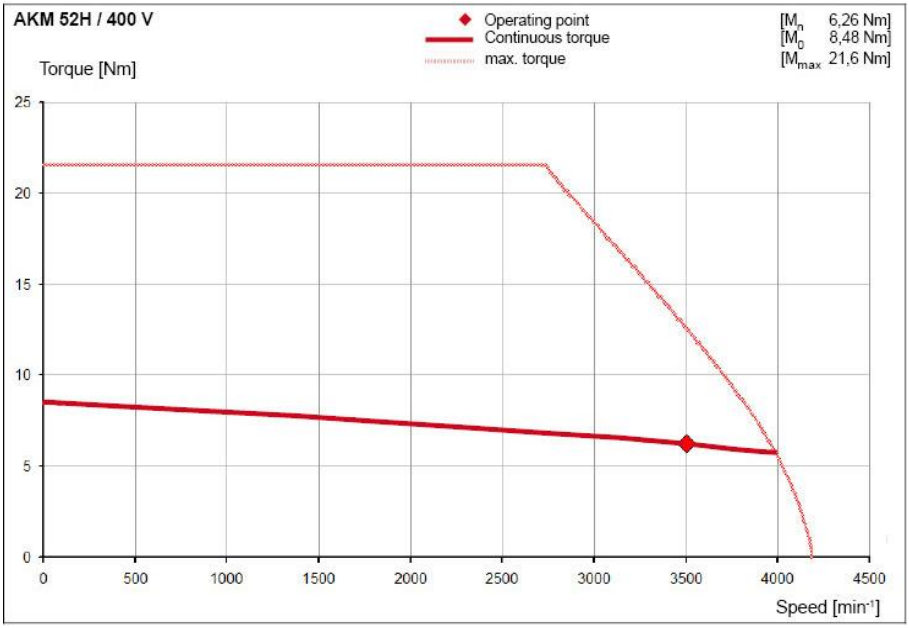

AKM 52G / 230 V
Operating point
Continuous torque
max. torque
[Mn 7,69 Nm]
[M0 8,43 Nm]
[Mmax 21,5 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Speed [min-1]

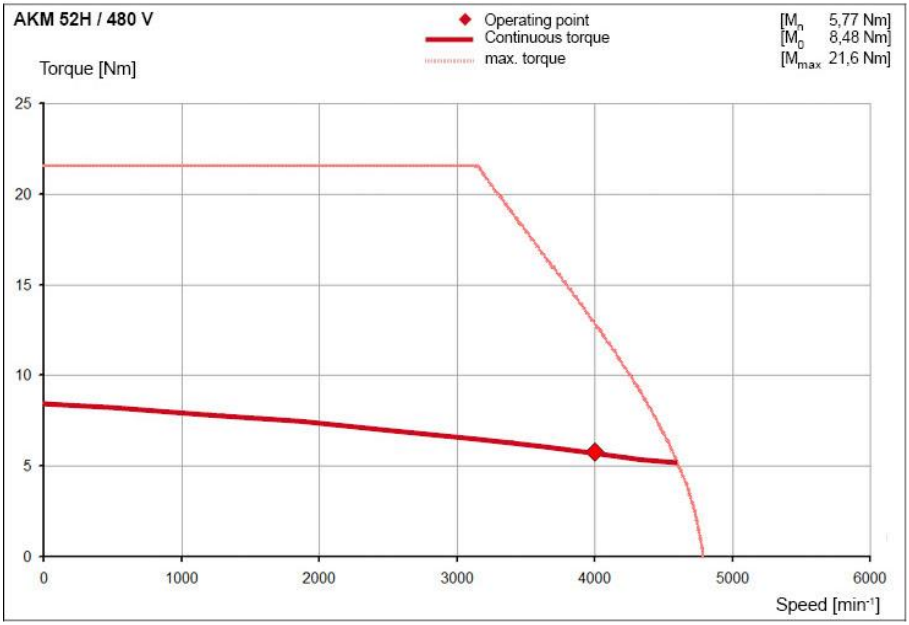

AKM 52G / 400 V
Operating point
Continuous torque
max. torque
[Mn 7,06 Nm]
[M0 8,43 Nm]
[Mmax 21,5 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]


AKM 52G / 480 V
Operating point
Continuous torque
max. torque
[Mn 6,66 Nm]
[M0 8,43 Nm]
[Mmax 21,5 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

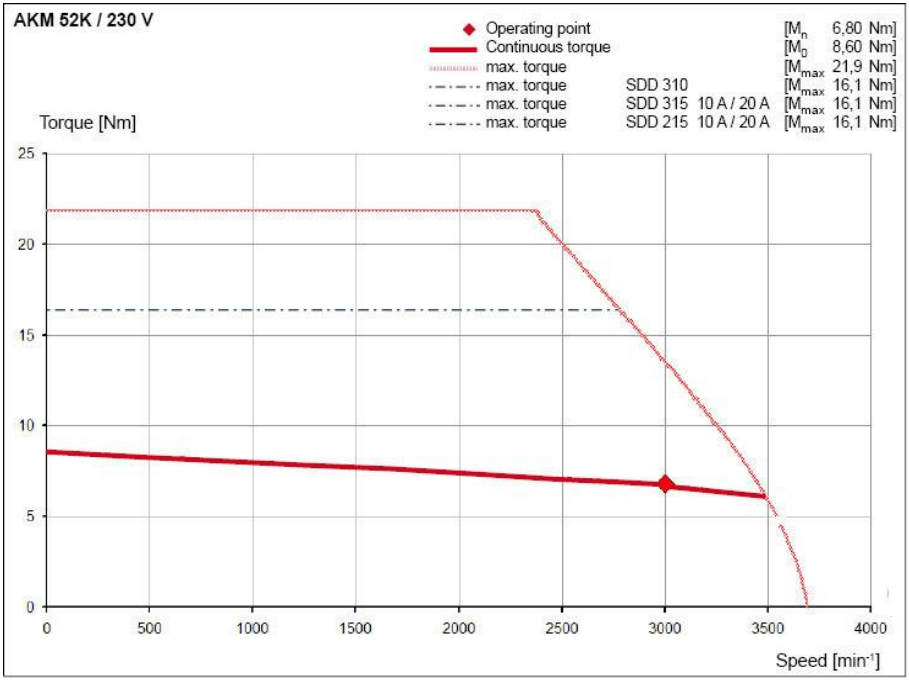
AKM 52H

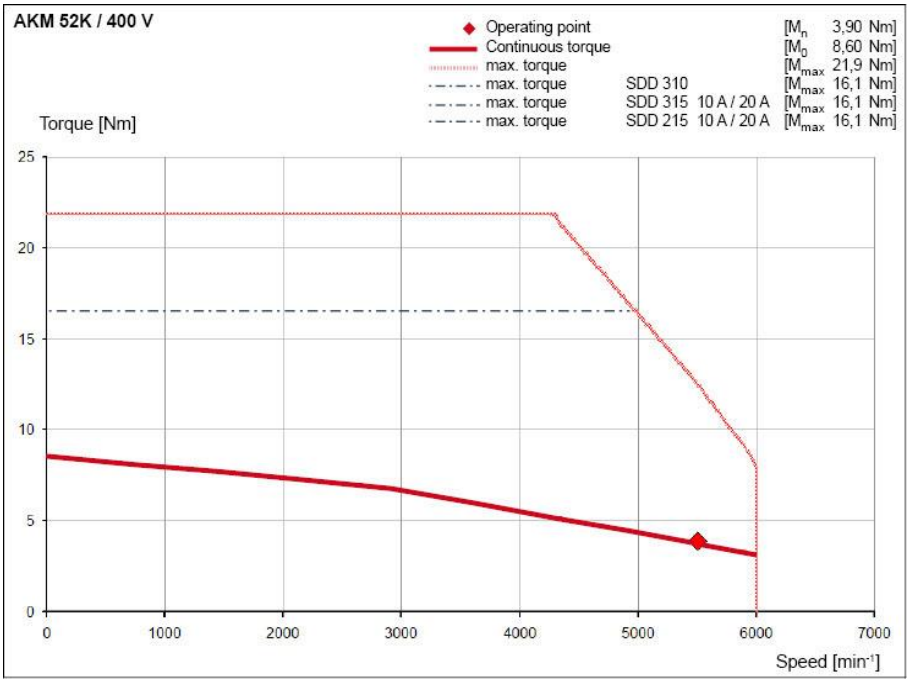

AKM 52H / 230 V
Operating point
Continuous torque
max. torque
[Mn 7,53 Nm]
[M0 8,48 Nm]
[Mmax 21,6 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

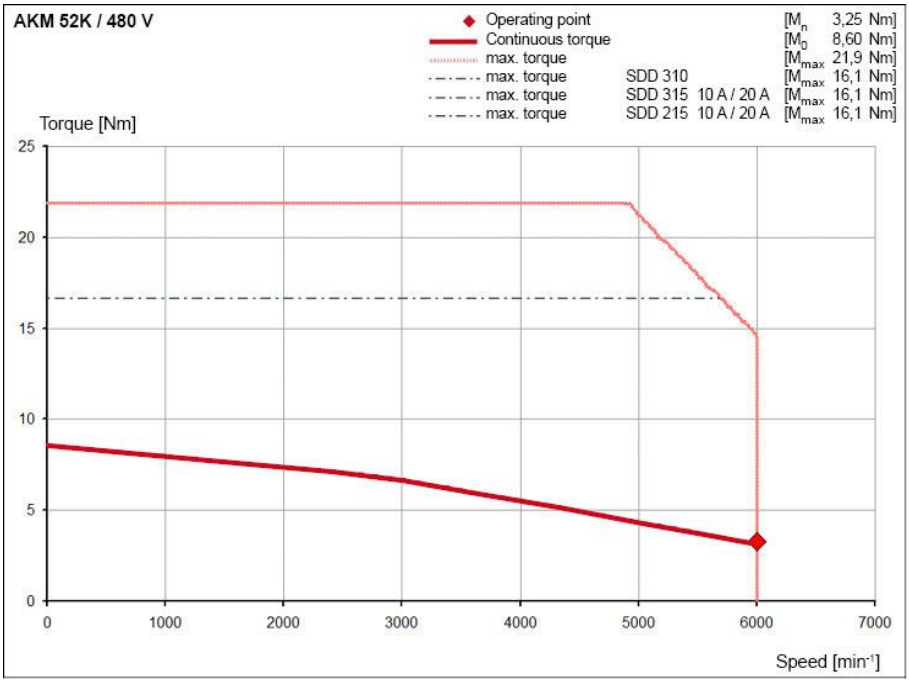

AKM 52H / 400 V
Operating point
Continuous torque
max. torque
[Mn 6,26 Nm]
[M0 8,48 Nm]
[Mmax 21,6 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]


AKM 52H / 480 V
Operating point
Continuous torque
max. torque
[Mn 5,77 Nm]
[M0 8,48 Nm]
[Mmax 21,6 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

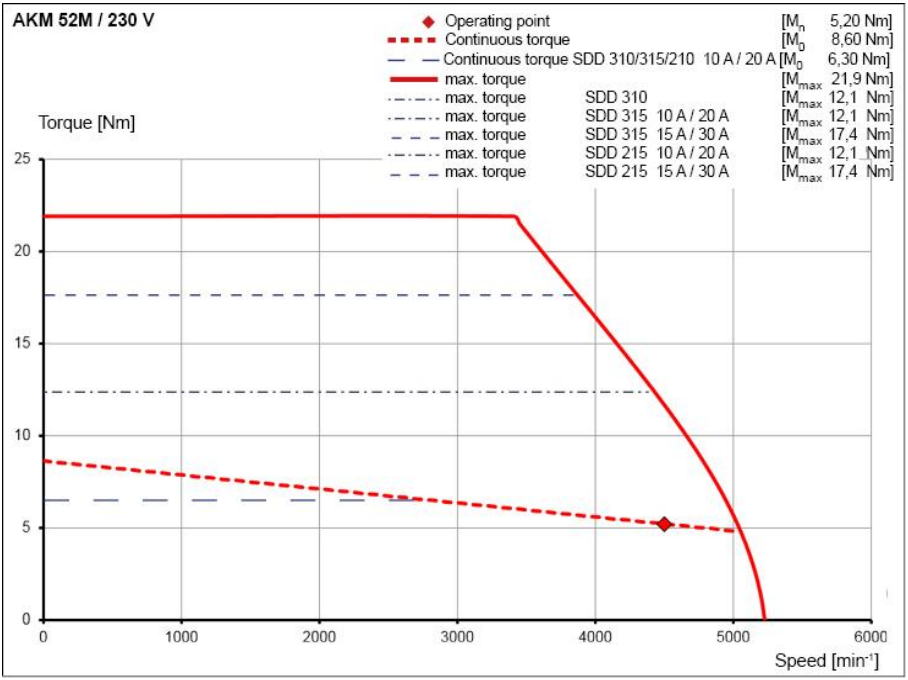
AKM 52K


AKM 52K / 230 V
Operating point [Mn 6,80 Nm]
Continuous torque [M0 8,60 Nm]
max. torque [Mmax 21,9 Nm]
max. torque SDD 310 [Mmax 16,1 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 16,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 16,1 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

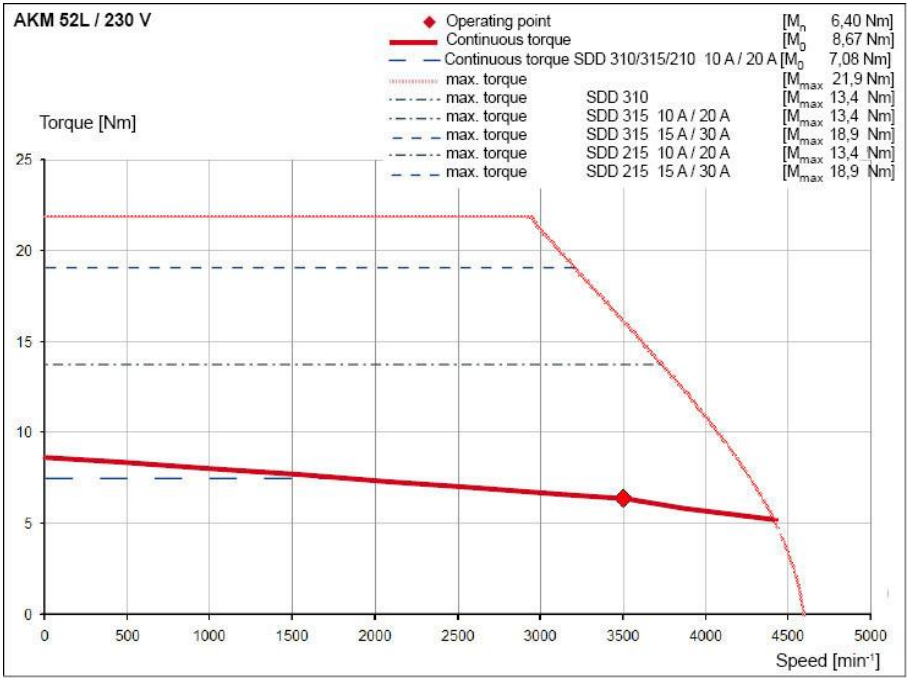

AKM 52K / 400 V
Operating point [Mn 3,90 Nm]
Continuous torque [M0 8,60 Nm]
max. torque [Mmax 21,9 Nm]
max. torque SDD 310 [Mmax 16,1 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 16,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 16,1 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

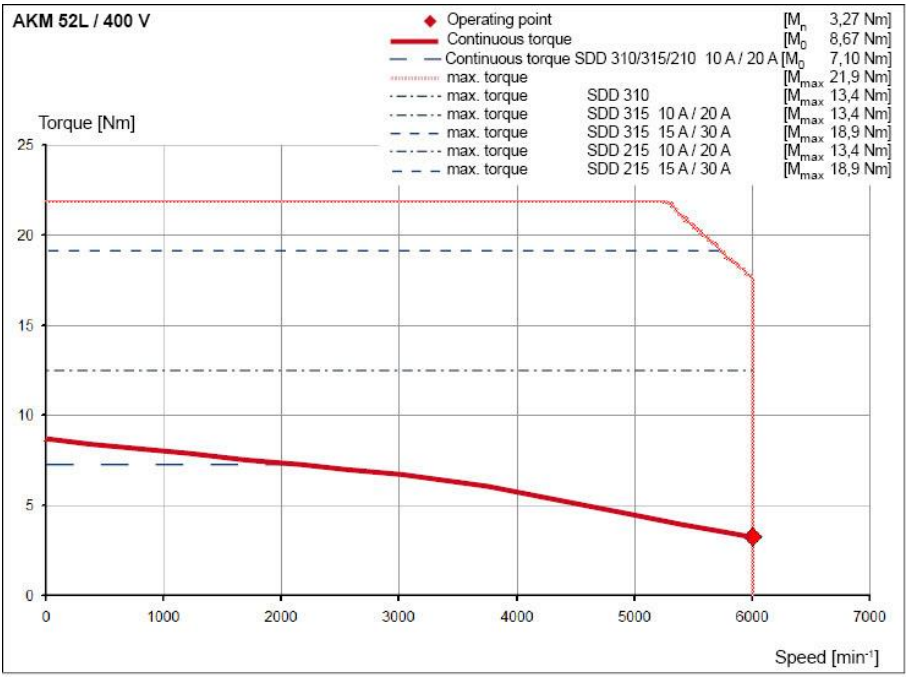

AKM 52K / 480 V
Operating point [Mn 3,25 Nm]
Continuous torque [M0 8,60 Nm]
max. torque [Mmax 21,9 Nm]
max. torque SDD 310 [Mmax 16,1 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 16,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 16,1 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

AKM 52M

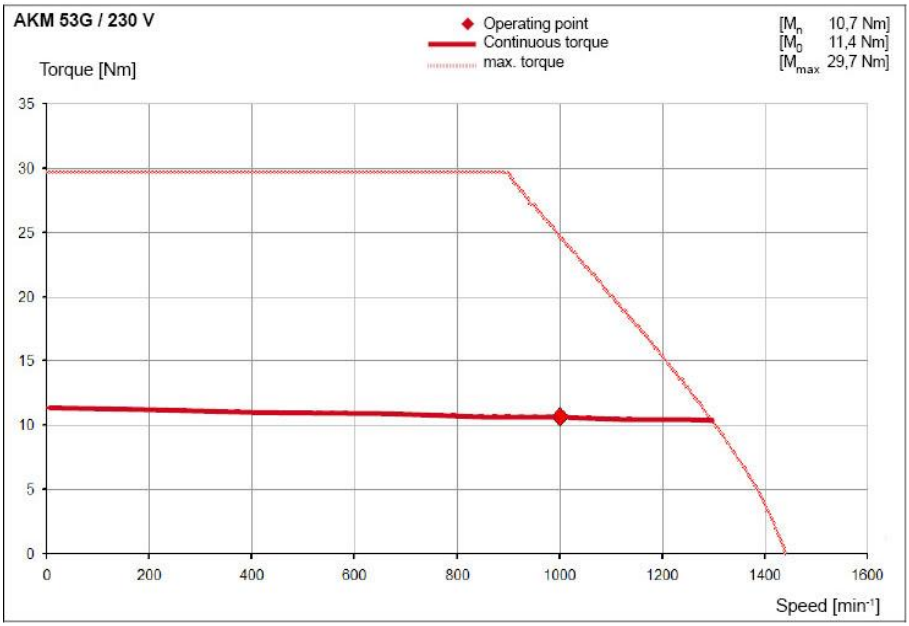

AKM 52M / 230 V
Operating point [M_n 5,20 Nm]
Continuous torque [M_0 8,60 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M_0 6,30 Nm]
max. torque [M_{max} 21,9 Nm]
max. torque SDD 310 [M_{max} 12,1 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 12,1 Nm]
max. torque SDD 315 15 A / 30 A [M_{max} 17,4 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 12,1 Nm]
max. torque SDD 215 15 A / 30 A [M_{max} 17,4 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min⁻¹]

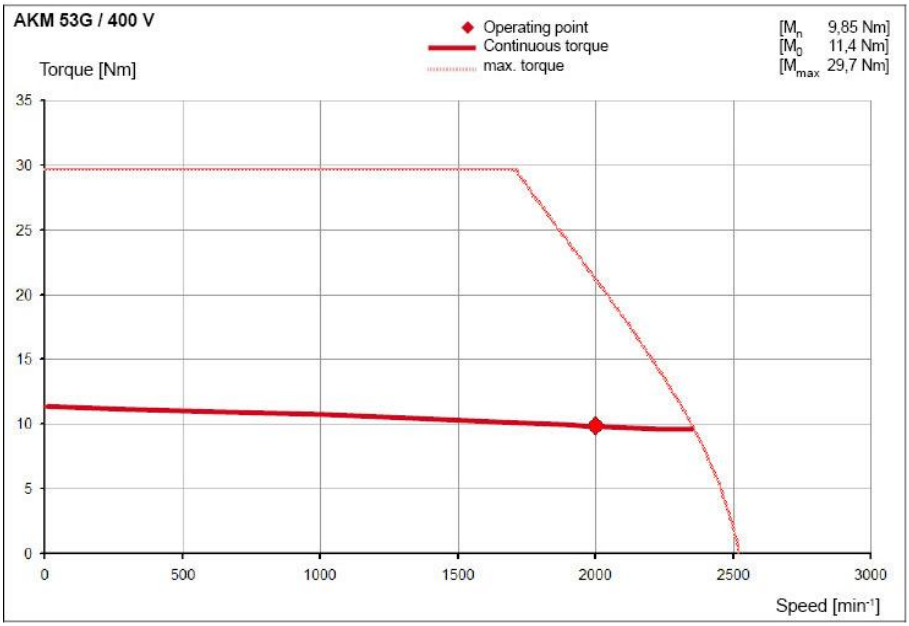
AKM 52L

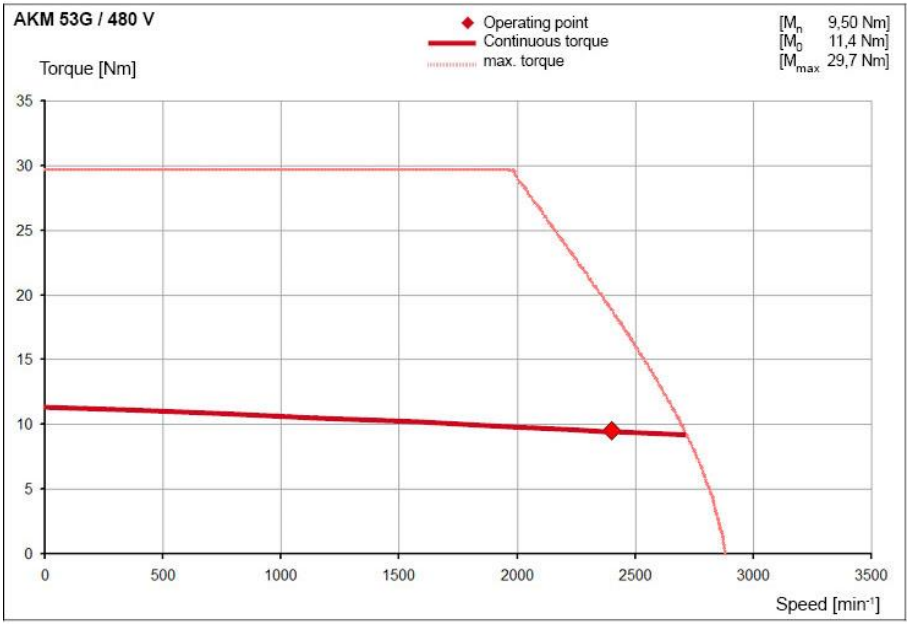

AKM 52L / 230 V
Operating point [M_n 6,40 Nm]
Continuous torque [M_0 8,67 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M_0 7,08 Nm]
max. torque [M_{max} 21,9 Nm]
max. torque SDD 310 [M_{max} 13,4 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 13,4 Nm]
max. torque SDD 315 15 A / 30 A [M_{max} 18,9 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 13,4 Nm]
max. torque SDD 215 15 A / 30 A [M_{max} 18,9 Nm]
Torque [Nm]
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min⁻¹]


AKM 52L / 400 V
Operating point [Mn 3,27 Nm]
Continuous torque [M0 8,67 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 7,10 Nm]
max. torque [Mmax 21,9 Nm]
max. torque SDD 310 [Mmax 13,4 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 13,4 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 18,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 13,4 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 18,9 Nm]
Torque [Nm]
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

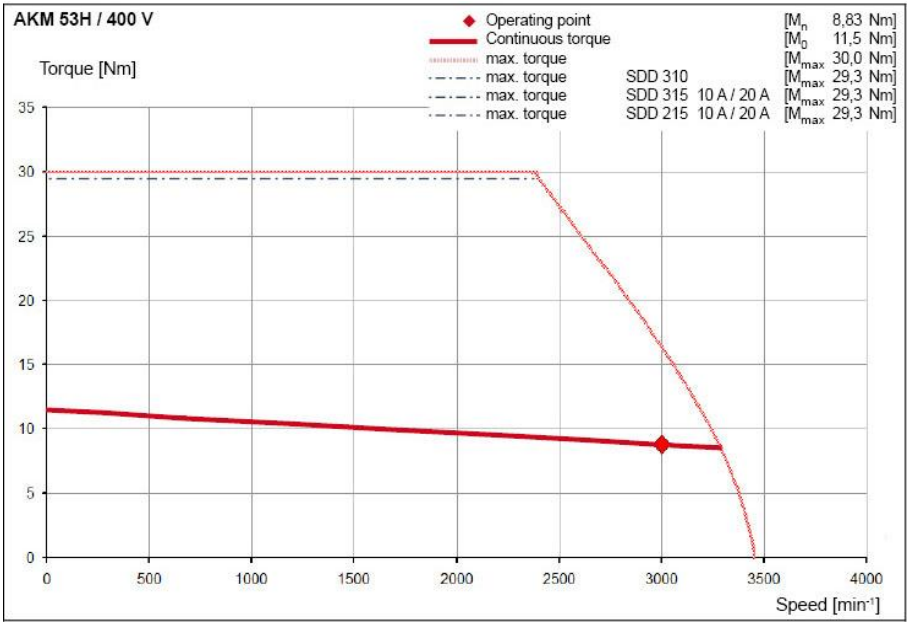
AKM 53G

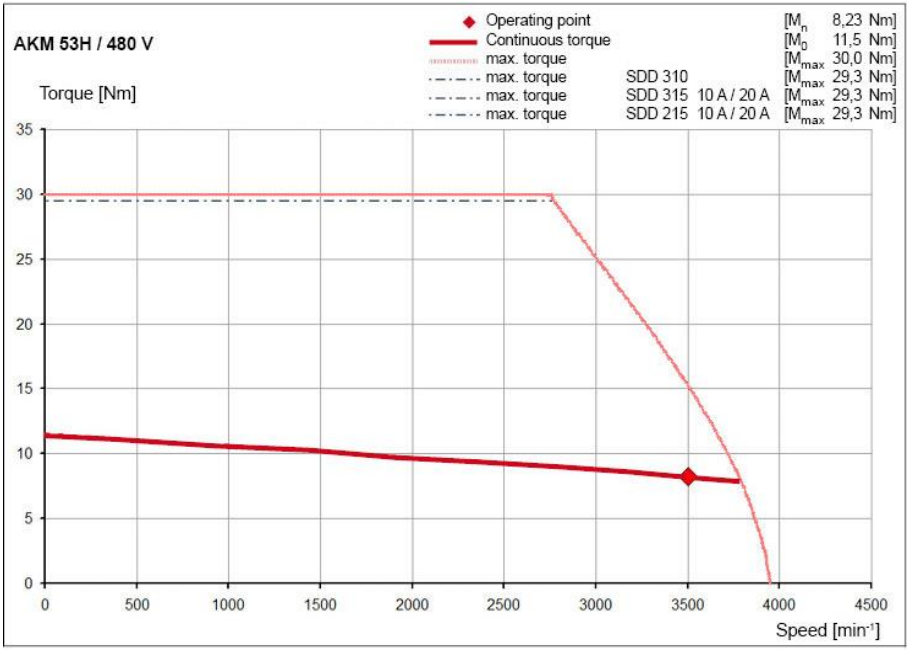

AKM 53G / 230 V
Operating point
Continuous torque
max. torque
[Mn 10,7 Nm]
[M0 11,4 Nm]
[Mmax 29,7 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
Speed [min-1]


AKM 53G / 400 V
Operating point
Continuous torque
max. torque
[Mn 9,85 Nm]
[M0 11,4 Nm]
[Mmax 29,7 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

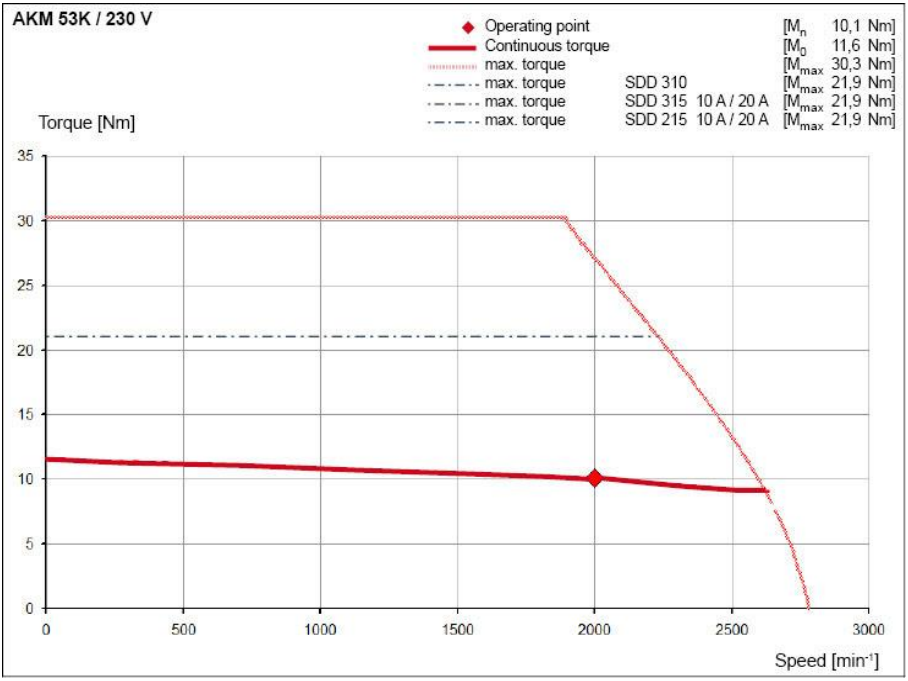

AKM 53G / 480 V
Operating point
Continuous torque
max. torque
[Mn 9,50 Nm]
[M0 11,4 Nm]
[Mmax 29,7 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

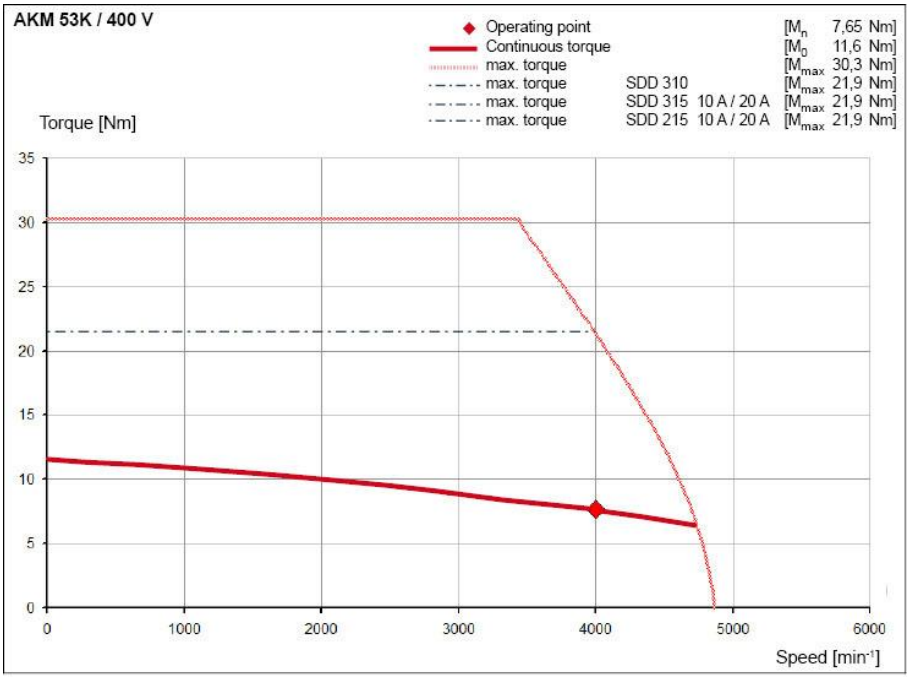
AKM 53H

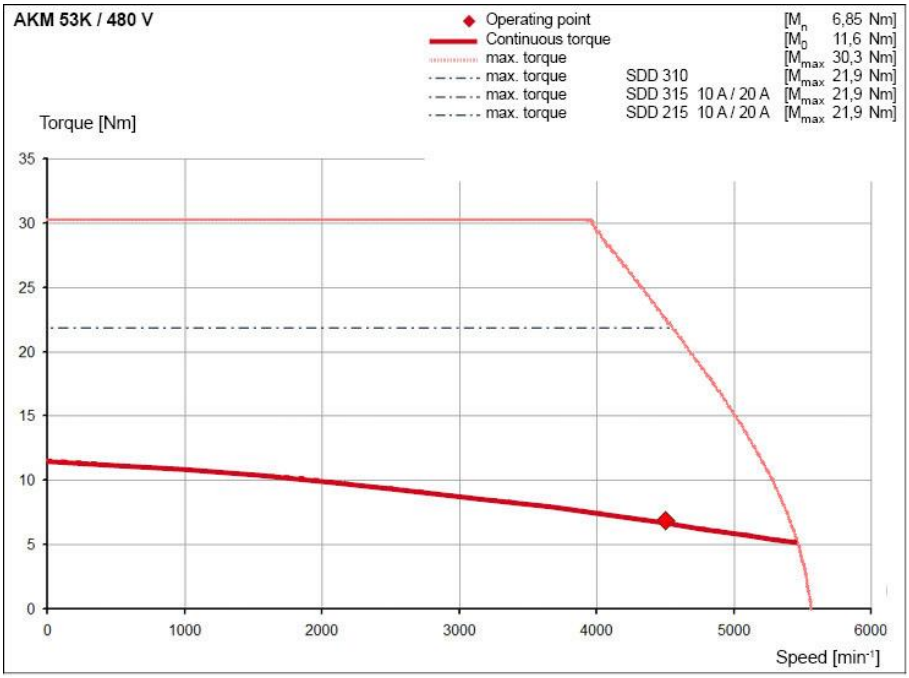

AKM 53H / 400 V
Operating point
Continuous torque
max. torque
max. torque SDD 310
max. torque SDD 315 10 A / 20 A
max. torque SDD 215 10 A / 20 A
[Mn 8,83 Nm]
[M0 11,5 Nm]
[Mmax 30,0 Nm]
[Mmax 29,3 Nm]
[Mmax 29,3 Nm]
[Mmax 29,3 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]


AKM 53H / 480 V
Torque [Nm]
Operating point [Mn 8,23 Nm]
Continuous torque [M0 11,5 Nm]
max. torque [Mmax 30,0 Nm]
max. torque SDD 310 [Mmax 29,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 29,3 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 29,3 Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

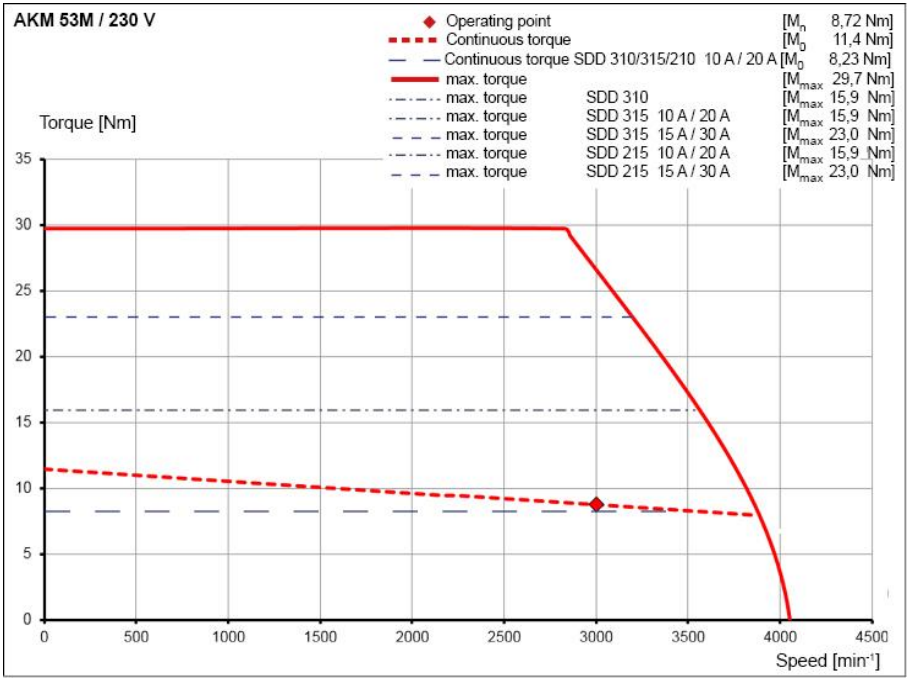
AKM 53K


AKM 53K / 230 V
Operating point [M_n 10,1 Nm]
Continuous torque [M_0 11,6 Nm]
max. torque [M_{max} 30,3 Nm]
max. torque SDD 310 [M_{max} 21,9 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 21,9 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 21,9 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min⁻¹]

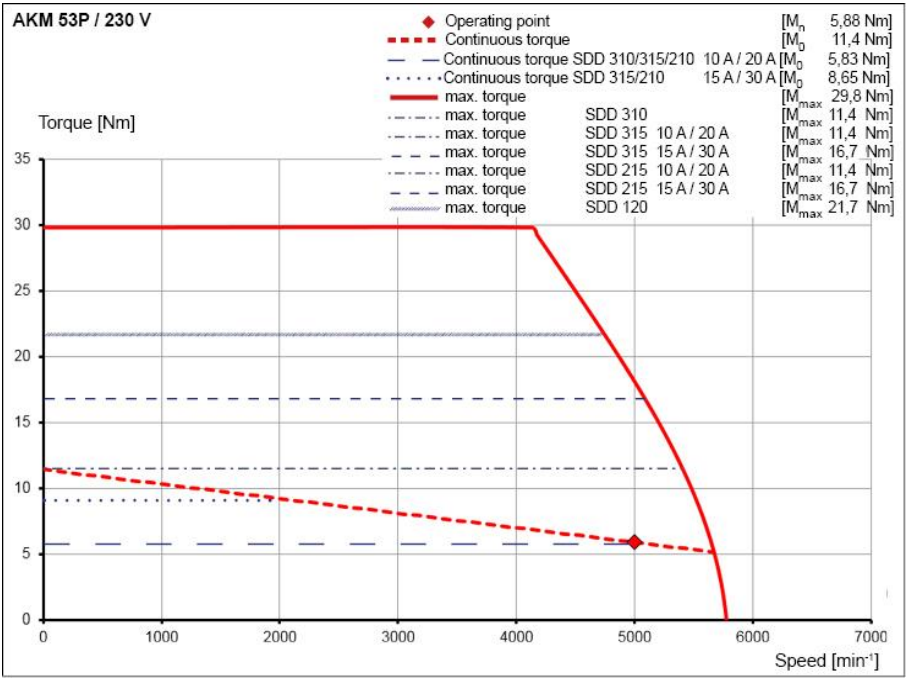

AKM 53K / 400 V
Operating point [Mn 7,65 Nm]
Continuous torque [M0 11,6 Nm]
max. torque [Mmax 30,3 Nm]
max. torque SDD 310 [Mmax 21,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 21,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 21,9 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 53K / 480 V
Operating point [Mn 6,85 Nm]
Continuous torque [M0 11,6 Nm]
max. torque [Mmax 30,3 Nm]
max. torque SDD 310 [Mmax 21,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 21,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 21,9 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

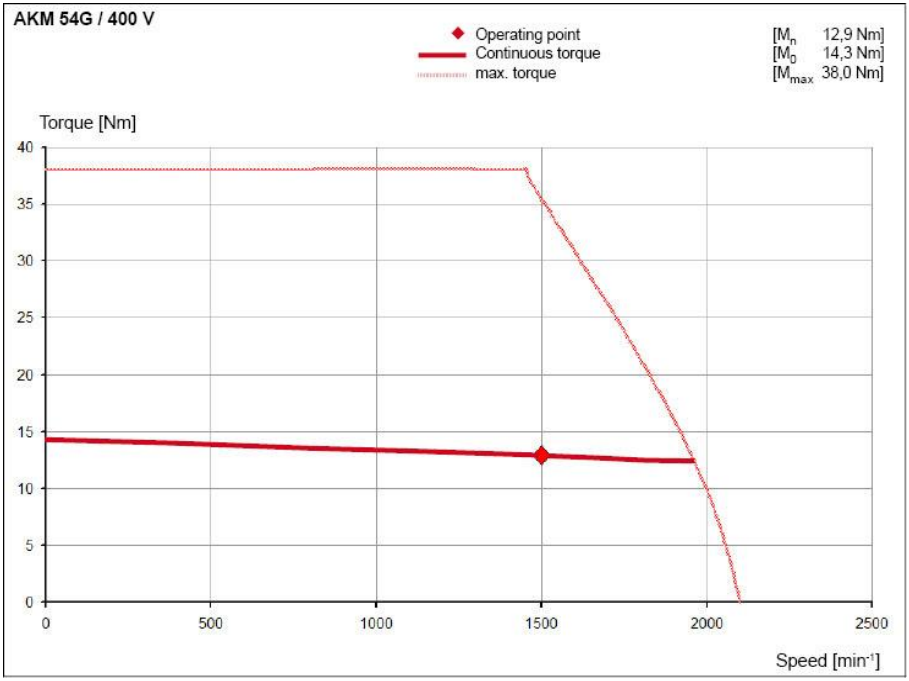
AKM 53M

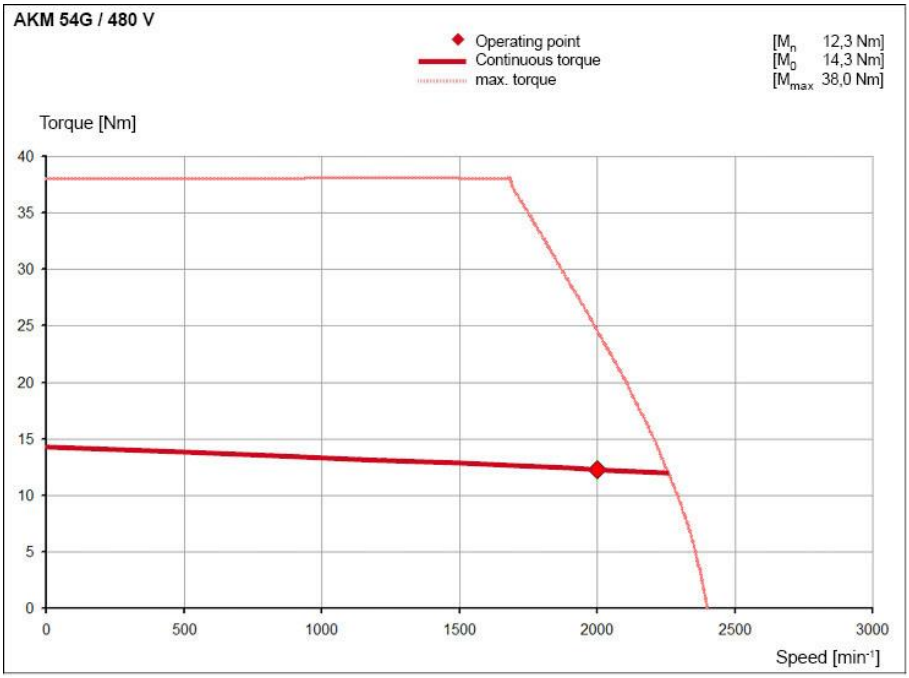

AKM 53M / 230 V
Operating point [Mn 8,72 Nm]
Continuous torque [M0 11,4 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 8,23 Nm]
max. torque [Mmax 29,7 Nm]
max. torque SDD 310 [Mmax 15,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 15,9 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 23,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 15,9 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 23,0 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

AKM 53P

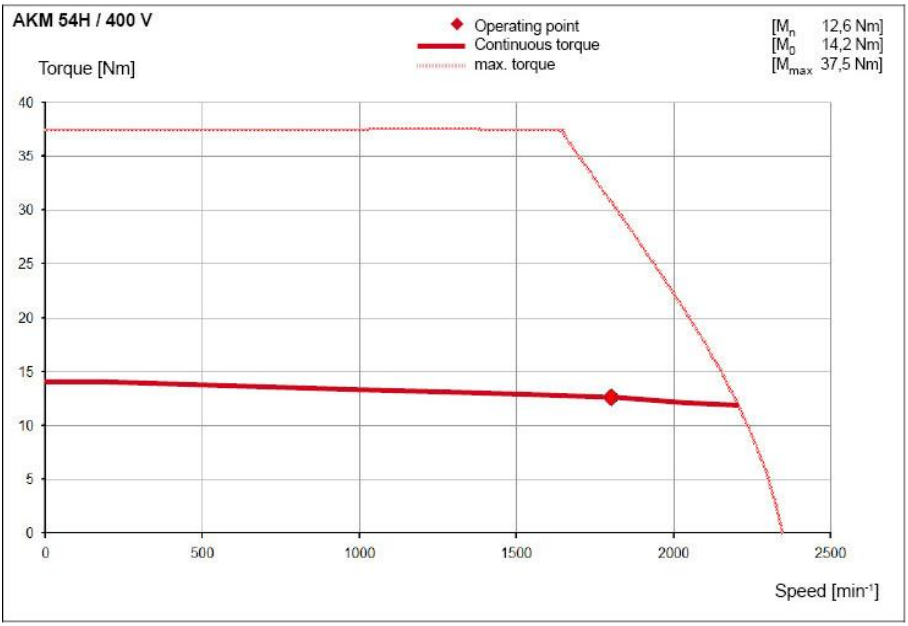

AKM 53P / 230 V
Operating point [M_n 5,88 Nm]
Continuous torque [M_0 11,4 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M_0 5,83 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M_0 8,65 Nm]
max. torque [M_max 29,8 Nm]
max. torque SDD 310 [M_max 11,4 Nm]
max. torque SDD 315 10 A / 20 A [M_max 11,4 Nm]
max. torque SDD 315 15 A / 30 A [M_max 16,7 Nm]
max. torque SDD 215 10 A / 20 A [M_max 11,4 Nm]
max. torque SDD 215 15 A / 30 A [M_max 16,7 Nm]
max. torque SDD 120 [M_max 21,7 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min⁻¹]

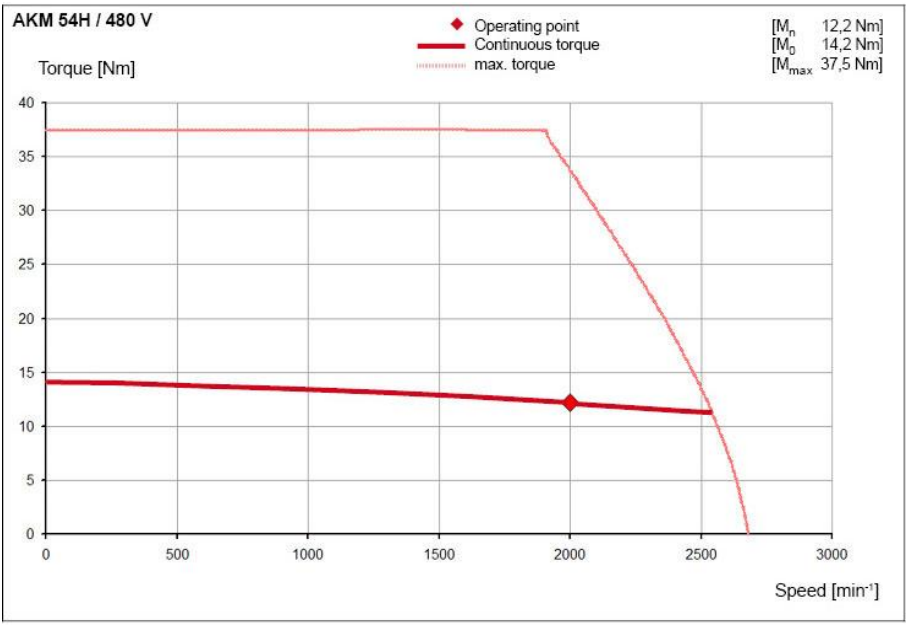
AKM 54G


AKM 54G / 400 V
Operating point
Continuous torque
max. torque
[Mn 12,9 Nm]
[M0 14,3 Nm]
[Mmax 38,0 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Speed [min-1]

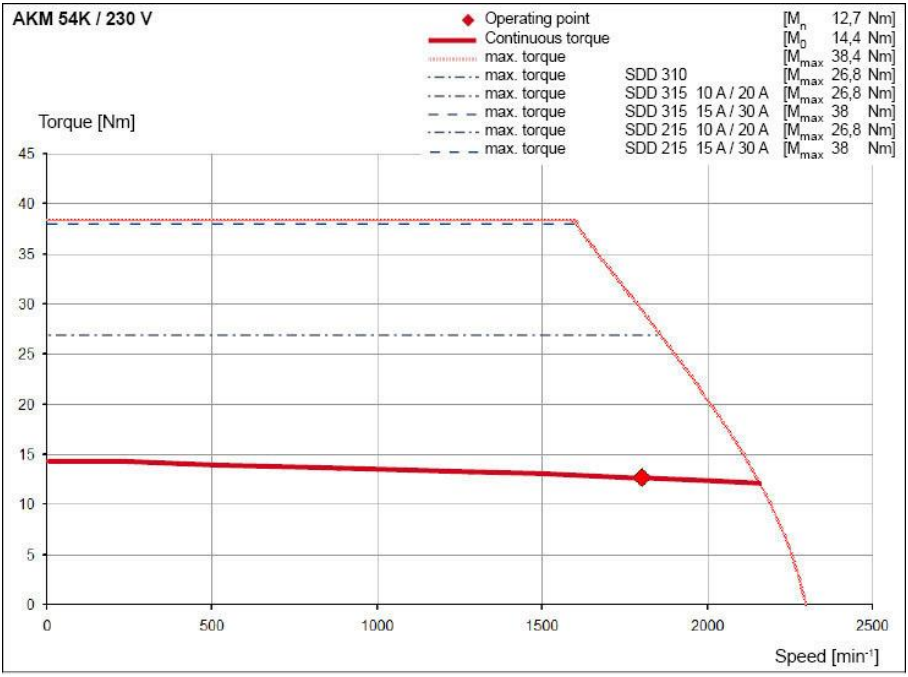

AKM 54G / 480 V
Operating point
Continuous torque
max. torque
[Mn 12,3 Nm]
[M0 14,3 Nm]
[Mmax 38,0 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

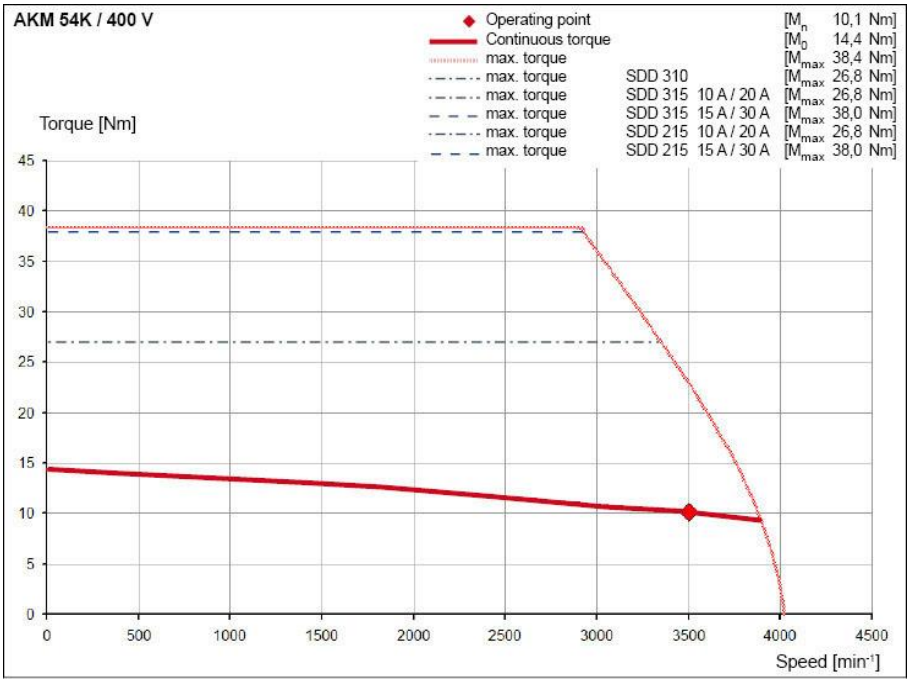
AKM 54H

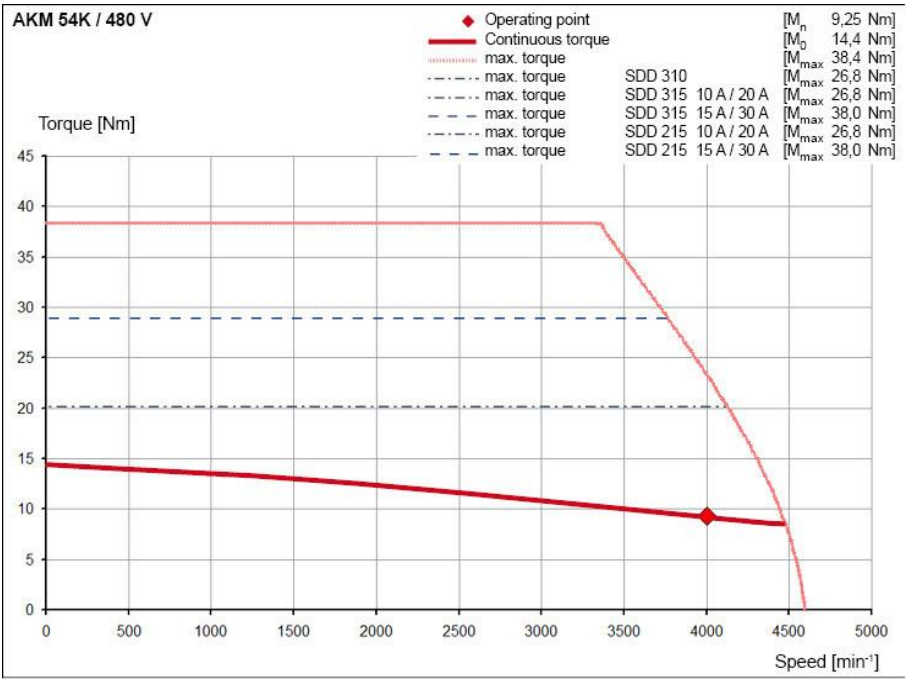

AKM 54H / 400 V
Operating point
Continuous torque
max. torque
[Mn 12,6 Nm]
[M0 14,2 Nm]
[Mmax 37,5 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Speed [min-1]


AKM 54H / 480 V
Operating point
Continuous torque
max. torque
[Mn 12,2 Nm]
[M0 14,2 Nm]
[Mmax 37,5 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

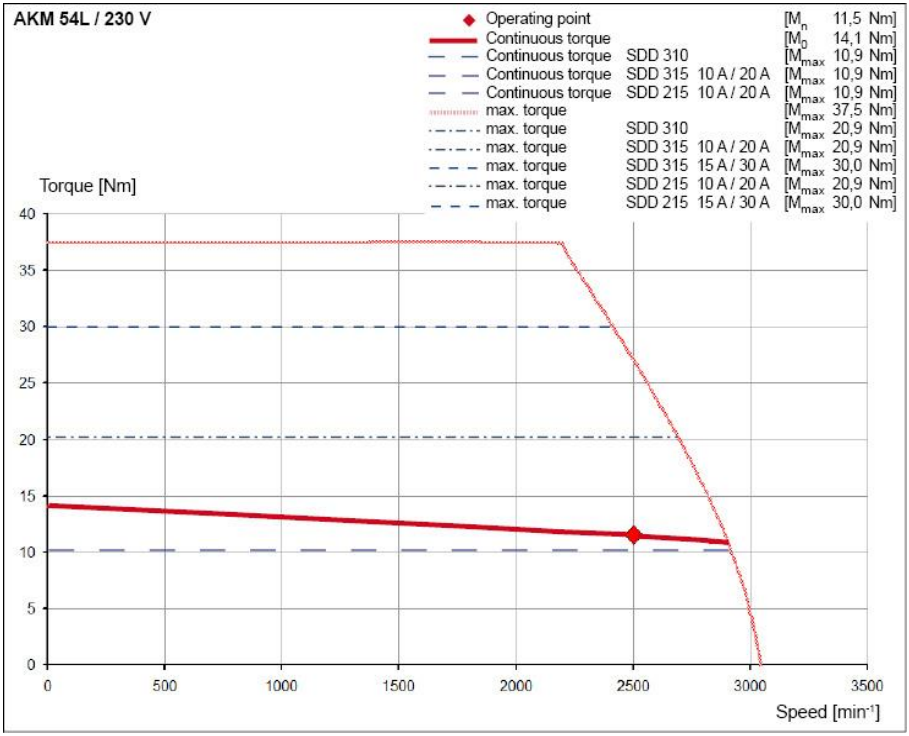
AKM 54K

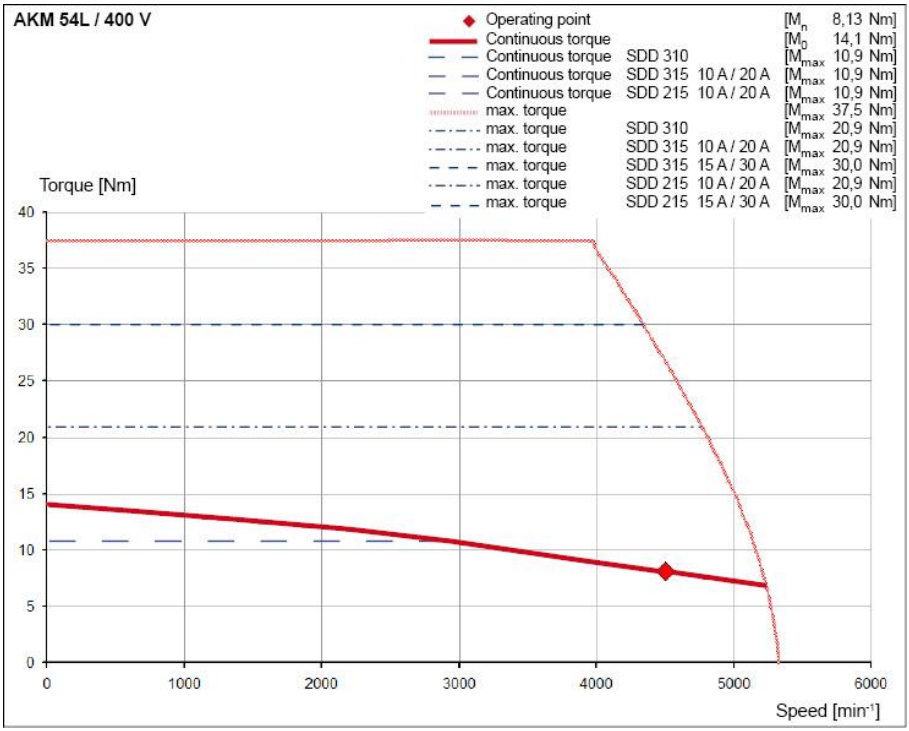

AKM 54K / 230 V
Operating point [Mn 12,7 Nm]
Continuous torque [M0 14,4 Nm]
max. torque [Mmax 38,4 Nm]
max. torque SDD 310 [Mmax 26,8 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 38 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 38 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
Speed [min-1]


AKM 54K / 400 V
Operating point [Mn 10,1 Nm]
Continuous torque [M0 14,4 Nm]
max. torque [Mmax 38,4 Nm]
max. torque SDD 310 [Mmax 26,8 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 38,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 38,0 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

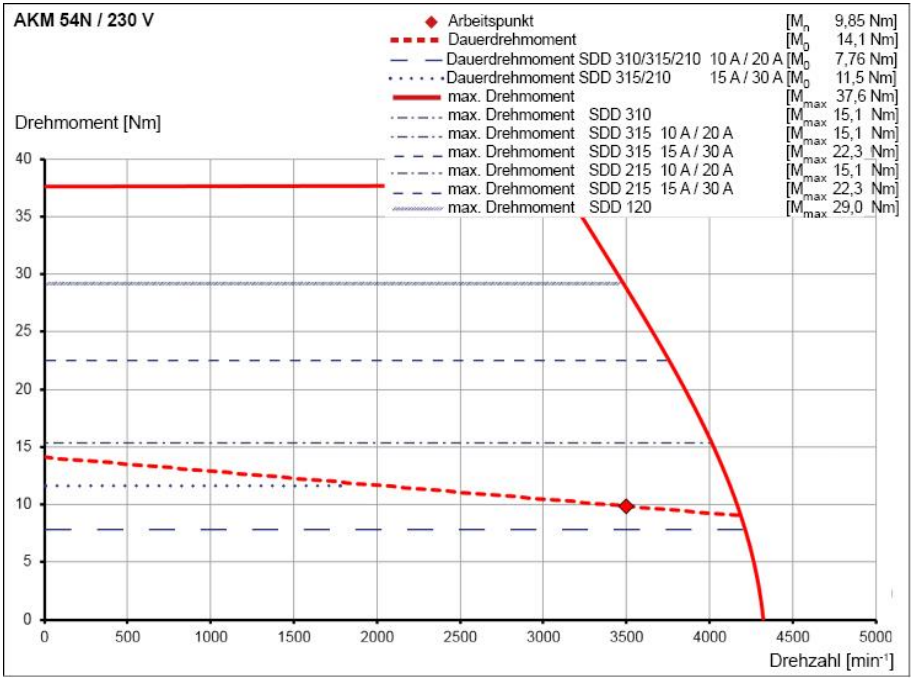

AKM 54K / 480 V
Operating point [Mn 9,25 Nm]
Continuous torque [M0 14,4 Nm]
max. torque [Mmax 38,4 Nm]
max. torque SDD 310 [Mmax 26,8 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 38,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 26,8 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 38,0 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]

AKM 54L


AKM 54L / 230 V
Operating point [Mn 11,5 Nm]
Continuous torque [M0 14,1 Nm]
Continuous torque SDD 310 [Mmax 10,9 Nm]
Continuous torque SDD 315 10 A / 20 A [Mmax 10,9 Nm]
Continuous torque SDD 215 10 A / 20 A [Mmax 10,9 Nm]
max. torque [Mmax 37,5 Nm]
max. torque SDD 310 [Mmax 20,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 20,9 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 30,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 20,9 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 30,0 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]


AKM 54L / 400 V
Operating point [M_n 8,13 Nm]
Continuous torque [M_0 14,1 Nm]
Continuous torque SDD 310 [M_max 10,9 Nm]
Continuous torque SDD 315 10 A / 20 A [M_max 10,9 Nm]
Continuous torque SDD 215 10 A / 20 A [M_max 10,9 Nm]
max. torque [M_max 37,5 Nm]
max. torque SDD 310 [M_max 20,9 Nm]
max. torque SDD 315 10 A / 20 A [M_max 20,9 Nm]
max. torque SDD 315 15 A / 30 A [M_max 30,0 Nm]
max. torque SDD 215 10 A / 20 A [M_max 20,9 Nm]
max. torque SDD 215 15 A / 30 A [M_max 30,0 Nm]
Torque [Nm]
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min⁻¹]

AKM 54N


AKM 54N / 230 V
Arbeitspunkt [Mn 9,85 Nm]
Dauerdrehmoment [M0 14,1 Nm]
Dauerdrehmoment SDD 310/315/210 10 A / 20 A [M0 7,76 Nm]
Dauerdrehmoment SDD 315/210 15 A / 30 A [M0 11,5 Nm]
max. Drehmoment [Mmax 37,6 Nm]
max. Drehmoment SDD 310 [Mmax 15,1 Nm]
max. Drehmoment SDD 315 10 A / 20 A [Mmax 15,1 Nm]
max. Drehmoment SDD 315 15 A / 30 A [Mmax 22,3 Nm]
max. Drehmoment SDD 215 10 A / 20 A [Mmax 15,1 Nm]
max. Drehmoment SDD 215 15 A / 30 A [Mmax 22,3 Nm]
max. Drehmoment SDD 120 [Mmax 29,0 Nm]
Drehmoment [Nm]
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Drehzahl [min-1]

10.8 AKM6

10.8.1 Technical Data

Data		Symbol [Unit]	AKM					
			62G	62K	62M	62P		
Electrical data								
	Standstill torque*	M_0 [Nm]**	11,9	12,2	12,2	12,3		
	Standstill current	I_{0rms} [A]**	4,9	9,6	13,4	18,8		
	Max. Nominal supply voltage	U_N [VAC]	230-480					
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	—	2000	3000	4500		
	Nominal torque*	M_n [Nm]	—	10,4	9,50	8,10		
	Nominal power	P_n [kW]	—	2,18	2,98	3,82		
	Nominal current	I_n [A]	—	8,13	10,44	12,27		
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	1800	3500	6000	—		
	Nominal torque*	M_n [Nm]	10,7	9,00	5,74	—		
	Nominal power	P_n [kW]	1,96	3,30	3,58	—		
	Nominal current	I_n [A]	4,21	7,03	6,26	—		
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	2000	4500	6000	—		
	Nominal torque*	M_n [Nm]	10,2	8,02	5,74	—		
	Nominal power	P_n [kW]	2,14	3,77	3,58	—		
	Nominal current	I_n [A]	4,13	6,25	6,26	—		
	Peak current	I_{0max} [A]	14,7	28,8	40,3	56,4		
	Peak torque	M_{0max} [Nm]	29,7	30,2	30,2	30,3		
	Torque constant	K_{Trms} [Nm/A]	2,47	1,28	0,91	0,66		
	Voltage constant	K_{Erms} [mVmin]	159	82,1	58,8	42,2		
	Winding resistance Ph-Ph	R_{25} [Ω]	4,13	1,08	0,57	0,30		
	Winding inductance Ph-Ph	L [mH]	31,7	8,5	4,4	2,2		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	17
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,05
	Thermal time constant	t_{TH} [min]	20
	Weight standard	G [kg]	8,9
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	770
	Axial force allowed	F_A [N]	280

* Measuring flange Aluminum 457mm * 457mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM62 = 0.5 Nm AKM63 = 0.9 Nm AKM64 = 1.3 Nm AKM65 = 1.7 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM62 = 0.9 Nm AKM63 = 1.2 Nm AKM64 = 1.5 Nm AKM65 = 1.8 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM62 = 1.6 Nm AKM63 = 2.4 Nm AKM64 = 3.1 Nm AKM65 = 4.0 Nm

For motors with optional shaft seal, reduce torque shown by 0.25 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM					
			63G	63K	63M	63N		
Electrical data								
	Standstill torque*	M_0 [Nm]**	16,5	16,8	17,0	17,0		
	Standstill current	I_{0rms} [A]**	4,5	9,9	13,8	17,4		
	Max. Nominal supply voltage	U_N [VAC]	230-480					
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	—	1500	2000	3000		
	Nominal torque*	M_n [Nm]	—	14,9	14,3	13,0		
	Nominal power	P_n [kW]	—	2,34	2,99	4,08		
	Nominal current	I_n [A]	—	8,71	11,53	13,27		
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	1200	3000	4000	5000		
	Nominal torque*	M_n [Nm]	15,3	12,9	11,3	9,60		
	Nominal power	P_n [kW]	1,87	4,05	4,73	5,03		
	Nominal current	I_n [A]	4,03	7,54	9,11	9,80		
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	1500	3500	4500	6000		
	Nominal torque*	M_n [Nm]	14,6	12,0	10,5	7,00		
	Nominal power	P_n [kW]	2,29	4,40	4,95	4,40		
	Nominal current	I_n [A]	3,95	7,02	8,47	7,14		
	Peak current	I_{0max} [A]	13,5	29,7	41,4	52,2		
	Peak torque	M_{0max} [Nm]	42,1	42,6	43,0	43,0		
	Torque constant	K_{Trms} [Nm/A]	3,70	1,71	1,24	0,98		
	Voltage constant	K_{Erms} [mVmin]	238	110	79,9	63,3		
	Winding resistance Ph-Ph	R_{25} [Ω]	5,50	1,14	0,61	0,39		
	Winding inductance Ph-Ph	L [mH]	43,5	9,3	4,9	3,1		

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	24
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,1
	Thermal time constant	t_{TH} [min]	25
	Weight standard	G [kg]	11,1
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	770
	Axial force allowed	F_A [N]	280

* Measuring flange Aluminum 457mm * 457mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM62 = 0.5 Nm AKM63 = 0.9 Nm AKM64 = 1.3 Nm AKM65 = 1.7 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM62 = 0.9 Nm AKM63 = 1.2 Nm AKM64 = 1.5 Nm AKM65 = 1.8 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM62 = 1.6 Nm AKM63 = 2.4 Nm AKM64 = 3.1 Nm AKM65 = 4.0 Nm

For motors with optional shaft seal, reduce torque shown by 0.25 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM							
			64K	64L	64P	64Q	65K	65M	65N	65P
Electrical data										
	Standstill torque	M_0 [Nm]**	20,8	21,0	20,4	20	24,8	25,0	24,3	24,5
	Standstill current	I_{0rms} [A]**	9,2	12,8	18,6	20,7	9,8	13,6	17,8	19,8
	Max. Nominal supply voltage	U_N [VAC]	230-480							
U_N = 230V	Nominal rotation speed	n_n [min^{-1}]	1200	1500	2500	3000	1000	1500	2000	2400
	Nominal torque	M_n [Nm]	18,8	18,4	16,0	15,3	22,8	21,9	19,8	19,1
	Nominal power	P_n [kW]	2,36	2,89	4,19	4,81	2,39	3,44	4,15	4,8
	Nominal current	I_n [A]	8,25	11,08	14,55	15,3	8,98	11,84	14,35	14,69
U_N = 400V	Nominal rotation speed	n_n [min^{-1}]	2000	3000	4500	5000	2000	2500	3500	4000
	Nominal torque	M_n [Nm]	17,2	15,6	11,9	10,7	20,2	19,2	16,0	14,9
	Nominal power	P_n [kW]	3,60	4,90	5,62	6,45	4,23	5,03	5,86	6,24
	Nominal current	I_n [A]	7,54	9,40	10,82	10,7	7,95	10,38	11,59	11,46
U_N = 480V	Nominal rotation speed	n_n [min^{-1}]	2500	3500	5500	6000	2200	3000	4000	5000
	Nominal torque	M_n [Nm]	16,3	14,4	9,00	7,4	19,7	18,1	14,7	11,6
	Nominal power	P_n [kW]	4,27	5,28	5,18	4,65	4,54	5,69	6,16	6,08
	Nominal current	I_n [A]	7,15	8,67	8,18	7,4	7,76	9,78	10,65	8,92
	Peak current	I_{0max} [A]	27,6	38,4	55,9	62,1	29,4	40,8	53,4	59,3
	Peak torque	M_{0max} [Nm]	53,5	54,1	52,9	53,2	64,5	65,2	63,7	64,1
	Torque constant	K_{Trms} [Nm/A]	2,28	1,66	1,10	1	2,54	1,85	1,38	1,3
	Voltage constant	K_{Erms} [mVmin]	147	107	71,0	64,4	164	119	88,8	80,5
	Winding resistance Ph-Ph	R_{25} [Ω]	1,41	0,75	0,36	0,32	1,35	0,73	0,43	0,37
	Winding inductance Ph-Ph	L [mH]	11,8	6,2	2,8	2,3	11,4	6,1	3,4	2,8

Mechanical Data			AKM 64	AKM 65
	Rotor inertial torque	J [kgcm²]	32	40
	Number of contacts		10	10
	Static drag torque	M_R [Nm]	0,15	0,2
	Thermal time constant	t_{TH} [min]	30	35
	Weight standard	G [kg]	13,3	15,4
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	770	
	Axial force allowed	F_A [N]	280	

* Measuring flange Aluminum 457mm * 457mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by:

AKM62 = 0.5 Nm AKM63 = 0.9 Nm AKM64 = 1.3 Nm AKM65 = 1.7 Nm

Non-resolver feedback options reduce continuous torque ratings by:

AKM62 = 0.9 Nm AKM63 = 1.2 Nm AKM64 = 1.5 Nm AKM65 = 1.8 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM62 = 1.6 Nm AKM63 = 2.4 Nm AKM64 = 3.1 Nm AKM65 = 4.0 Nm

For motors with optional shaft seal, reduce torque shown by 0.25 Nm and increase M_R by the same amount.

10.8.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	MBR [Nm]	25
Connection voltage	UBR [VDC]	24 ± 10 %
Electrical power	PBR [W]	25,7
Inertial torque	JBR [kgcm²]	0,61
Release delay time	tBRH [ms]	105
Application delay time	tBRL [ms]	20
Brake weight	GBR [kg]	2
Typical play	[°mech.]	0,24
Switching energy	E [mJ]	64,29

10.8.3 Cables and Connections

Data	AKM6
Power connection	4 + 4-pin, round, angled
Motor cable, shielded	4 x 2,5
Motor cable with control wires, shielded	4 x 2,5 + 2 x 0,5
Resolver connection	12-pin, round, angled
Motor cable, shielded	4 x 2 x 0,18 mm²

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.8.4 Maximum and Continuous Torque

Power supply 1 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 62G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,9 10,7 29,7	11,9 10,7 29,7	11,9 10,7 29,7	11,9 10,7 29,7	11,9 10,7 29,7	11,9 10,7 29,7	11,9 10,7 29,7
AKM 62K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	12,2 9,00 30,2	11,8 9,00 22	11,8 9,00 22	12,2 9,00 30,2	11,8 9,00 22	12,2 9,00 30,2	12,2 9,00 30,2
AKM 62M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	12,2 5,74 30,2	8,66 5,74 16,4	8,66 5,74 16,4	12,2 5,74 23,3	8,66 5,74 16,4	12,2 5,74 23,3	12,2 5,74 29,4
AKM 63G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	16,5 15,3 42,1	16,5 15,3 42,1	16,5 15,3 42,1	16,5 15,3 42,1	16,5 15,3 42,1	16,5 15,3 42,1	16,5 15,3 42,1
AKM 63K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	16,8 12,9 42,6	16,0 12,9 30,0	16,0 12,9 30,0	16,8 12,9 41,9	16,0 12,9 30,0	16,8 12,9 41,9	16,8 12,9 42,6
AKM 63M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	17,0 11,3 43,0	11,8 11,3 22,5	11,8 11,3 22,5	17,0 11,3 32,2	11,8 11,3 22,5	17,0 11,3 32,2	17,0 11,3 40,8
AKM 63N	M_0 [Nm] M_n [Nm] M_{max} [Nm]	17,0 9,60 43,0	9,44 9,60 18,2	9,44 9,60 18,2	13,9 9,60 26,3	9,44 9,60 18,2	13,9 9,60 26,3	17,0 9,60 33,8
AKM 64K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,8 17,2 53,5	20,8 17,2 39,9	20,8 17,2 39,9	20,8 17,2 53,5	20,8 17,2 39,9	20,8 17,2 53,5	20,8 17,2 53,5
AKM 64L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	21,0 15,6 54,1	15,7 15,6 30,0	15,7 15,6 30,0	21,0 15,6 42,9	15,7 15,6 30,0	21,0 15,6 42,9	21,0 15,6 54,1
AKM 64P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,4 11,9 52,9	10,7 11,9 20,7	10,7 11,9 20,7	15,8 11,9 30,1	10,7 11,9 20,7	15,8 11,9 30,1	20,4 11,9 38,9
AKM 64Q	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,0 10,7 53,2	9,43 10,7 18,4	9,43 10,7 18,4	13,9 10,7 26,9	9,43 10,7 18,4	13,9 10,7 26,9	18,4 10,7 35,0
AKM 65K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,8 20,2 64,5	24,0 20,2 45,3	24,0 20,2 45,3	24,8 20,2 64,1	24,0 20,2 45,3	24,8 20,2 64,1	24,8 20,2 64,5

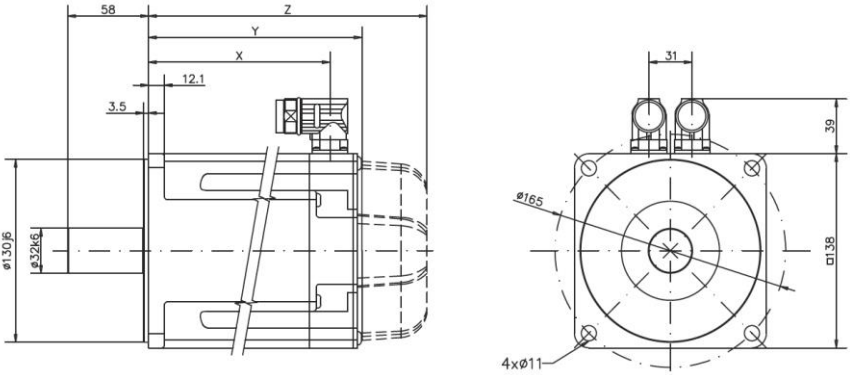
AKM 65M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	25,0 19,2 65,2	17,7 19,2 34,0	17,7 19,2 34,0	25,0 19,2 48,9	17,7 19,2 34,0	25,0 19,2 48,9	25,0 19,2 62,5
AKM 65N	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,3 16,0 63,7	13,3 16,0 25,8	13,3 16,0 25,8	19,6 16,0 37,6	13,3 16,0 25,8	19,6 16,0 37,6	24,3 16,0 48,6
AKM 65P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,5 14,9 64,1	12,1 14,9 23,7	12,1 14,9 23,7	18,0 14,9 34,7	12,1 14,9 23,7	18,0 14,9 34,7	23,7 14,9 45,3

Power supply 1 x 480 V

Motor type	**Symbol [Unit]**	**Motor data**	**Servo amplifier**					
			SDD 310	**SDD 315** 10A/20A	15A/30A	**SDD 215** 10A/20A	15A/30A	**SDD 120**
AKM 62G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	11,9 10,2 29,7	11,9 10,2 29,7	11,9 10,2 29,7	11,9 10,2 29,7	11,9 10,2 29,7	11,9 10,2 29,7	11,9 10,2 29,7
AKM 62K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	12,2 8,02 30,2	11,8 8,02 22	11,8 8,02 22	12,2 8,02 30,2	11,8 8,02 22	12,2 8,02 30,2	12,2 8,02 30,2
AKM 62M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	12,2 5,74 30,2	8,66 5,74 16,4	8,66 5,74 16,4	12,2 5,74 23,3	8,66 5,74 16,4	12,2 5,74 23,3	12,2 5,74 29,4
AKM 63G	M_0 [Nm] M_n [Nm] M_{max} [Nm]	16,5 14,6 42,1	16,5 14,6 42,1	16,5 14,6 42,1	16,5 14,6 42,1	16,5 14,6 42,1	16,5 14,6 42,1	16,5 14,6 42,1
AKM 63K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	16,8 12,0 42,6	16,0 12,0 30,0	16,0 12,0 30,0	16,8 12,0 41,9	16,0 12,0 30,0	16,8 12,0 41,9	16,8 12,0 42,6
AKM 63M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	17,0 10,5 43,0	11,8 10,5 22,5	11,8 10,5 22,5	17,0 10,5 32,2	11,8 10,5 22,5	17,0 10,5 32,2	17,0 10,5 40,8
AKM 63N	M_0 [Nm] M_n [Nm] M_{max} [Nm]	17,0 7,00 43,0	9,44 7,00 18,2	9,44 7,00 18,2	13,9 7,00 26,3	9,44 7,00 18,2	13,9 7,00 26,3	17,0 7,00 33,8
AKM 64K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,8 16,3 53,5	20,8 16,3 39,9	20,8 16,3 39,9	20,8 16,3 53,5	20,8 16,3 39,9	20,8 16,3 53,5	20,8 16,3 53,5
AKM 64L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	21,0 14,4 54,1	15,7 14,4 30,0	15,7 14,4 30,0	21,0 14,4 42,9	15,7 14,4 30,0	21,0 14,4 42,9	21,0 14,4 54,1
AKM 64P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,4 9,0 52,9	10,7 9,0 20,7	10,7 9,0 20,7	15,8 9,0 30,1	10,7 9,0 20,7	15,8 9,0 30,1	20,4 9,0 38,9

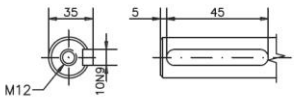
AKM 64Q	M_0 [Nm] M_n [Nm] M_{max} [Nm]	20,0 7,4 53,2	9,43 7,4 18,4	9,43 7,4 18,4	13,9 7,4 26,9	9,43 7,4 18,4	13,9 7,4 26,9	18,4 7,4 35,0
AKM 65K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,8 19,7 64,5	24,0 19,7 45,3	24,0 19,7 45,3	24,8 19,7 64,1	24,0 19,7 45,3	24,8 19,7 64,1	24,8 19,7 64,5
AKM 65M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	25,0 18,1 65,2	17,7 18,1 34,0	17,7 18,1 34,0	25,0 18,1 48,9	17,7 18,1 34,0	25,0 18,1 48,9	25,0 18,1 62,5
AKM 65N	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,3 14,7 63,7	13,3 14,7 25,8	13,3 14,7 25,8	19,6 14,7 37,6	13,3 14,7 25,8	19,6 14,7 37,6	24,3 14,7 48,6
AKM 65P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	24,5 11,6 64,1	12,1 11,6 23,7	12,1 11,6 23,7	18,0 11,6 34,7	12,1 11,6 23,7	18,0 11,6 34,7	23,7 11,6 45,3

10.8.5 Dimensional Drawing (schematic diagram)

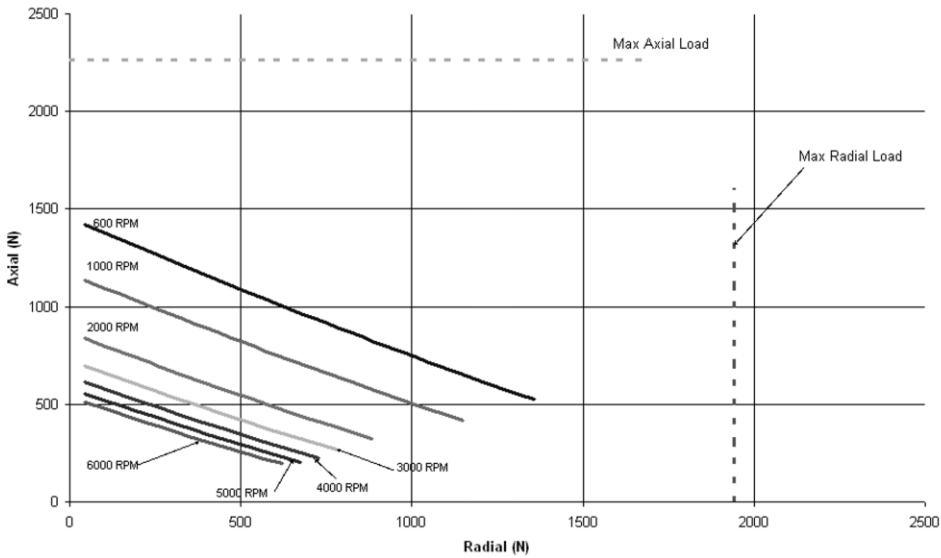


Model	X	Resolver/Comcoder		Encoder	
		Y	Z (brake)	Y	Z (brake)
AKM62	130.5	153.7	200.7	172.2	219.7
AKM63	155.5	178.7	225.7	197.2	244.7
AKM64	180.5	203.7	250.7	222.2	269.7
AKM65	205.5	228.7	275.7	247.2	294.7

Option Keyway

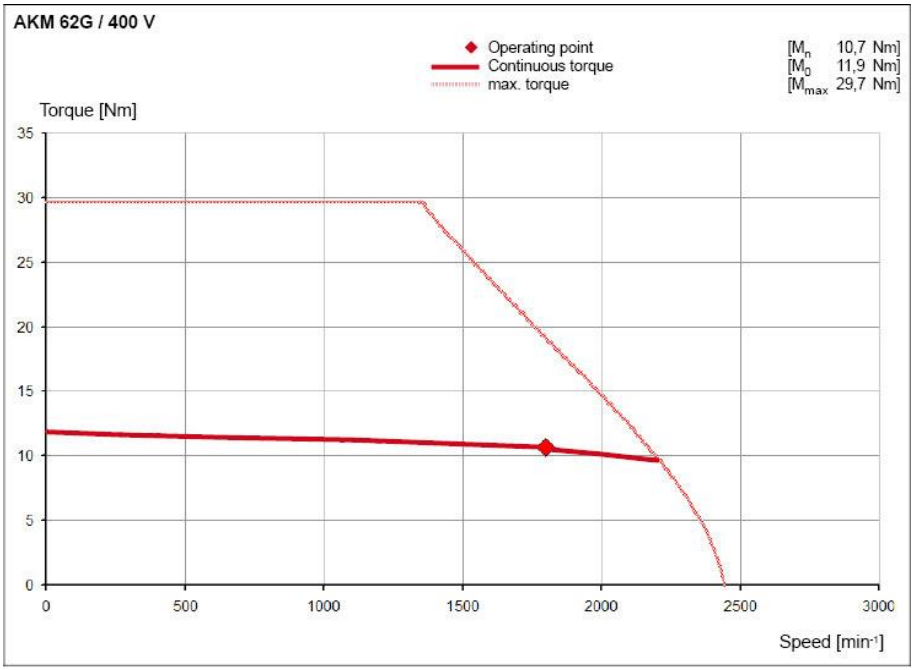


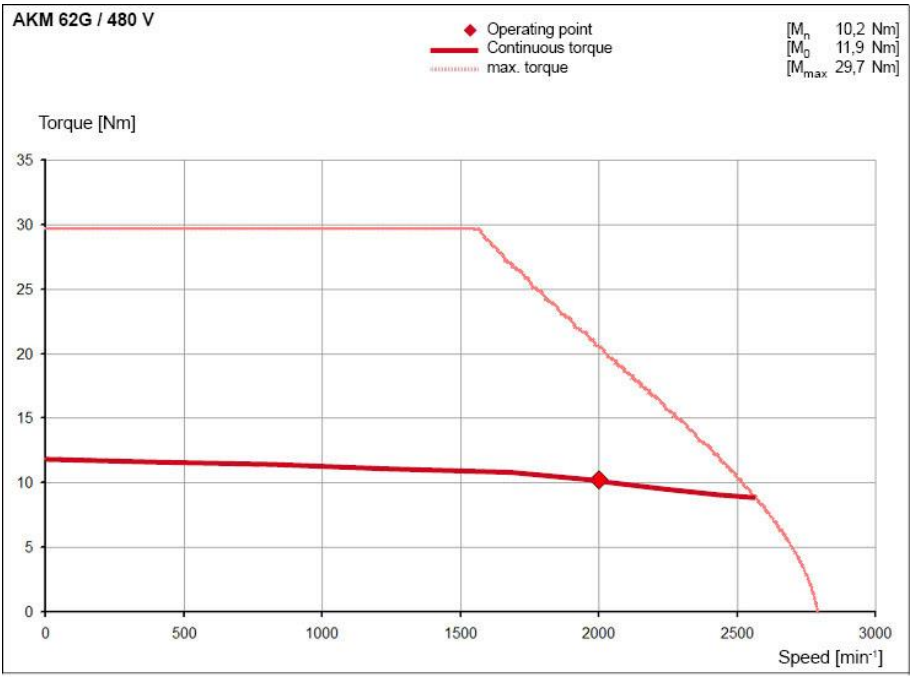
10.8.6 Radial Force on the Shaft End



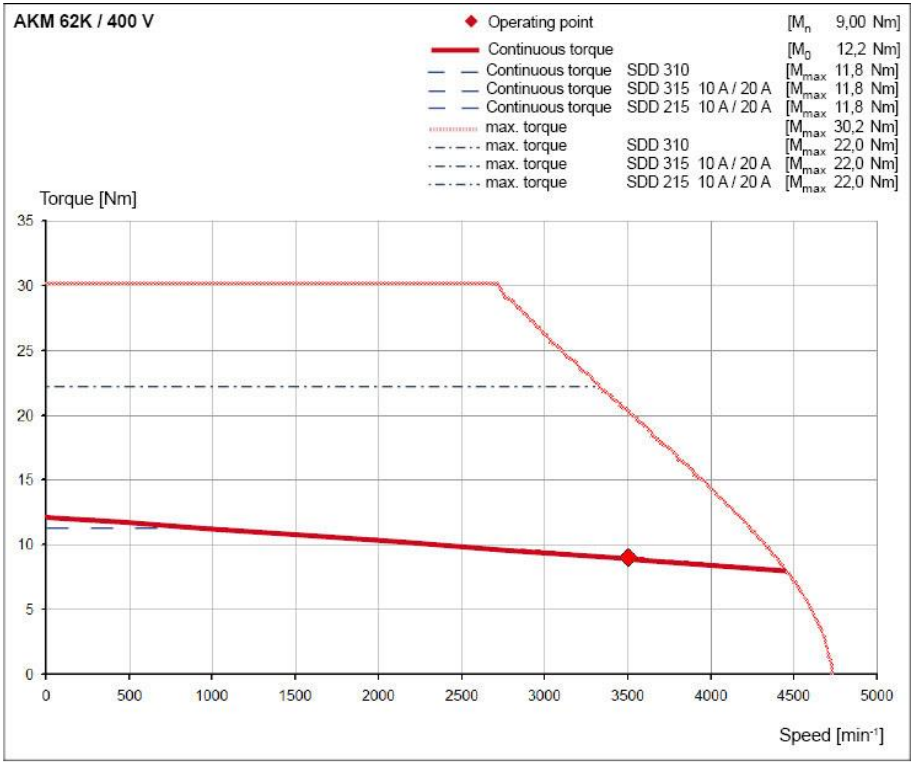
10.8.7 Motor Characteristics

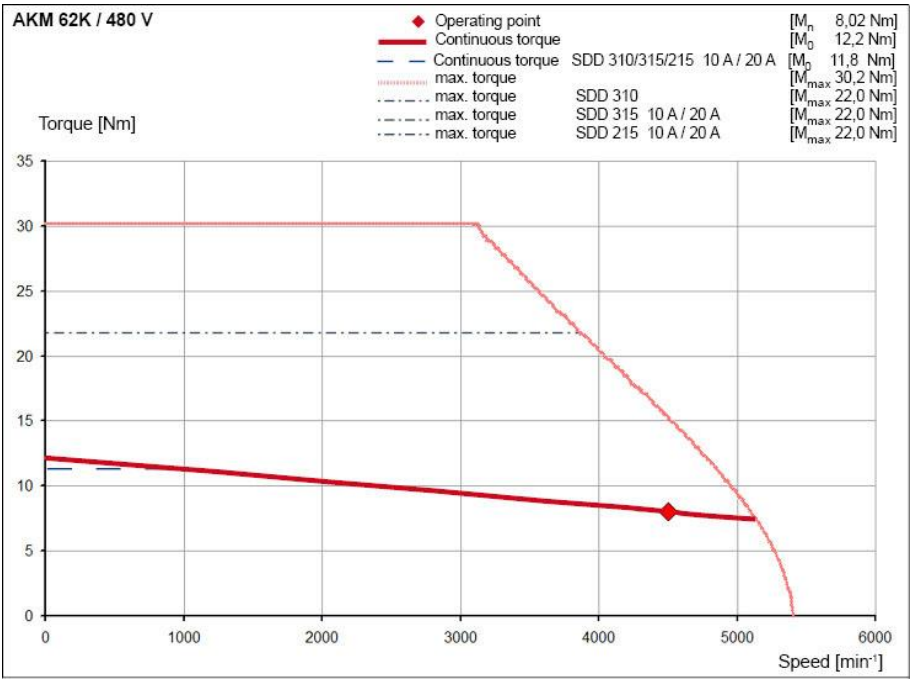
AKM 62G



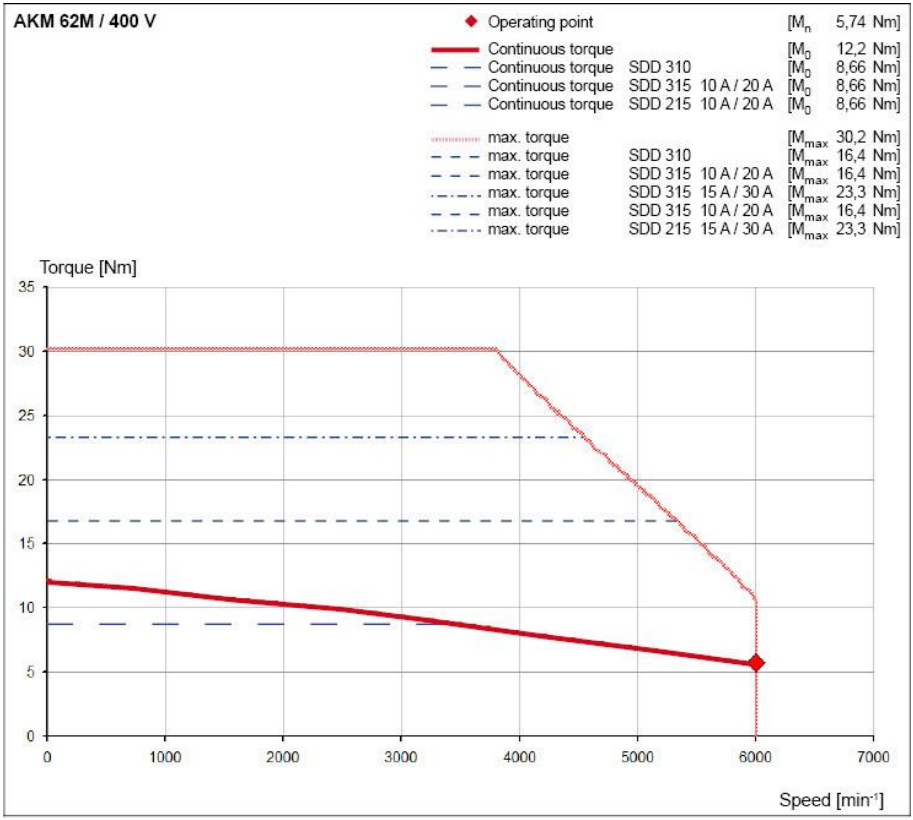

AKM 62G / 480 V
Operating point
Continuous torque
max. torque
[M_n 10,2 Nm]
[M_0 11,9 Nm]
[M_max 29,7 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

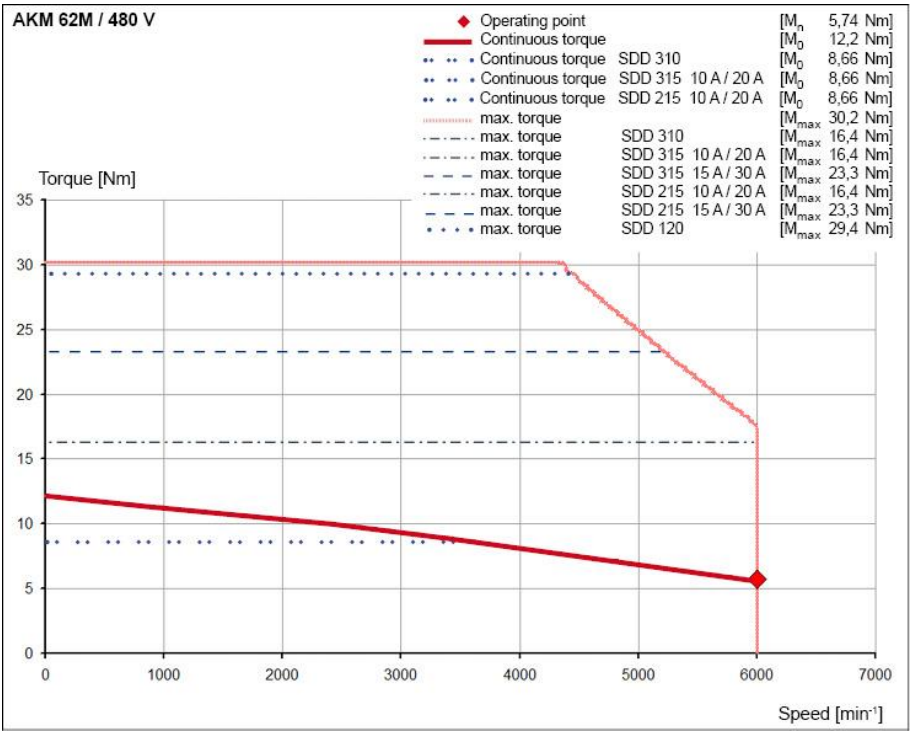
AKM 62K


AKM 62K / 400 V
Operating point [Mn 9,00 Nm]
Continuous torque [M0 12,2 Nm]
Continuous torque SDD 310 [Mmax 11,8 Nm]
Continuous torque SDD 315 10 A / 20 A [Mmax 11,8 Nm]
Continuous torque SDD 215 10 A / 20 A [Mmax 11,8 Nm]
max. torque [Mmax 30,2 Nm]
max. torque SDD 310 [Mmax 22,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 22,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 22,0 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]

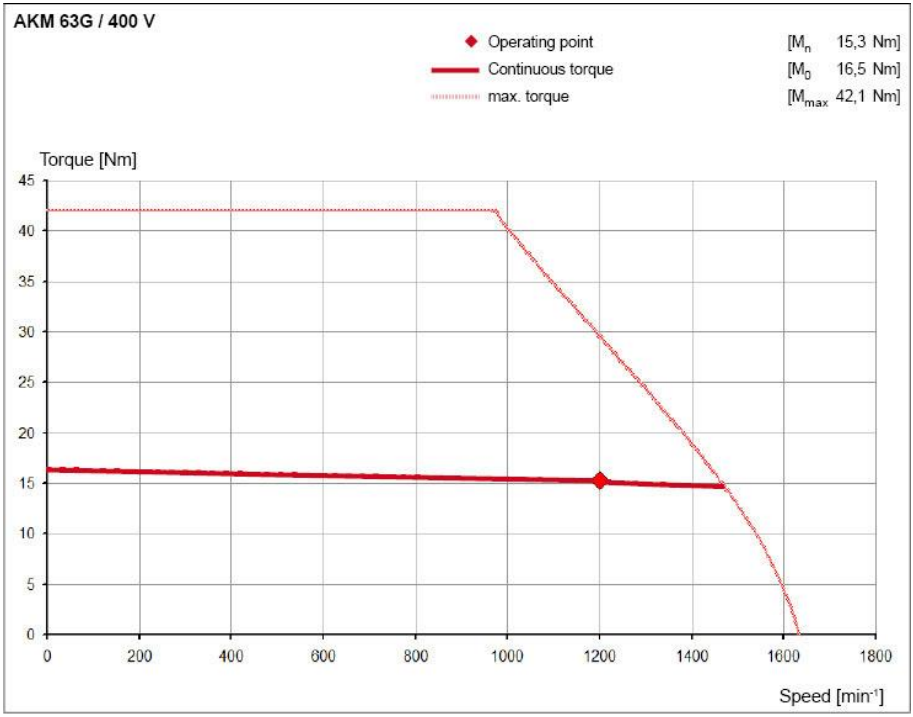

AKM 62K / 480 V
Operating point [Mn 8,02 Nm]
Continuous torque [M0 12,2 Nm]
Continuous torque SDD 310/315/215 10 A / 20 A [M0 11,8 Nm]
max. torque [Mmax 30,2 Nm]
max. torque SDD 310 [Mmax 22,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 22,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 22,0 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

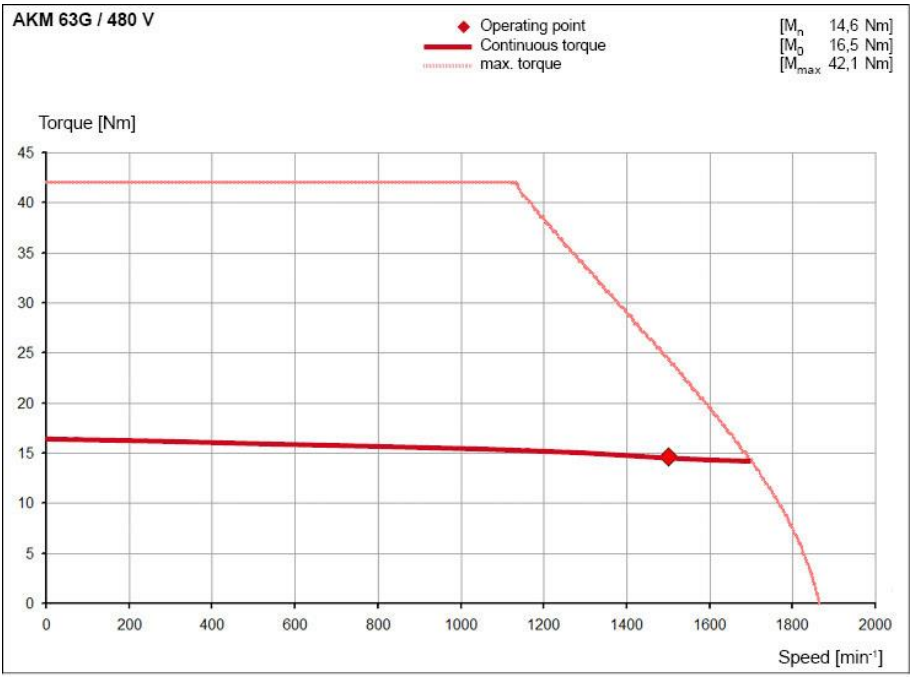
AKM 62M


AKM 62M / 400 V
Operating point [Mn 5,74 Nm]
Continuous torque [M0 12,2 Nm]
Continuous torque SDD 310 [M0 8,66 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 8,66 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 8,66 Nm]
max. torque [Mmax 30,2 Nm]
max. torque SDD 310 [Mmax 16,4 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 16,4 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 23,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 16,4 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 23,3 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

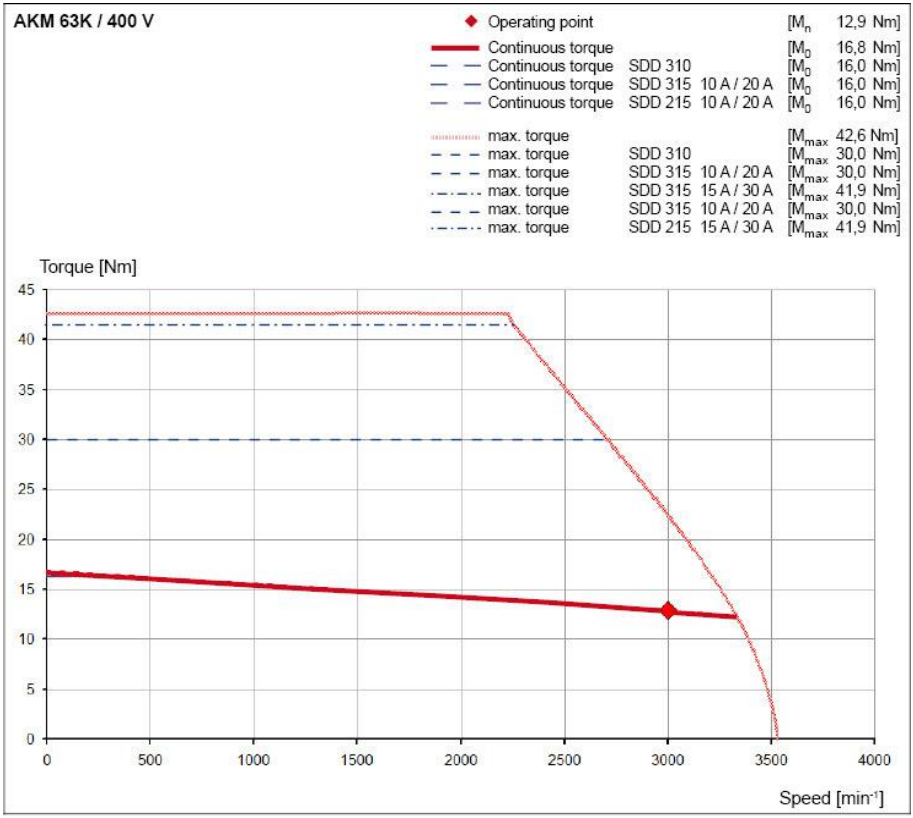

AKM 62M / 480 V
Operating point [M_n 5,74 Nm]
Continuous torque [M_0 12,2 Nm]
Continuous torque SDD 310 [M_0 8,66 Nm]
Continuous torque SDD 315 10 A / 20 A [M_0 8,66 Nm]
Continuous torque SDD 215 10 A / 20 A [M_0 8,66 Nm]
max. torque [M_max 30,2 Nm]
max. torque SDD 310 [M_max 16,4 Nm]
max. torque SDD 315 10 A / 20 A [M_max 16,4 Nm]
max. torque SDD 315 15 A / 30 A [M_max 23,3 Nm]
max. torque SDD 215 10 A / 20 A [M_max 16,4 Nm]
max. torque SDD 215 15 A / 30 A [M_max 23,3 Nm]
max. torque SDD 120 [M_max 29,4 Nm]
Torque [Nm]
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

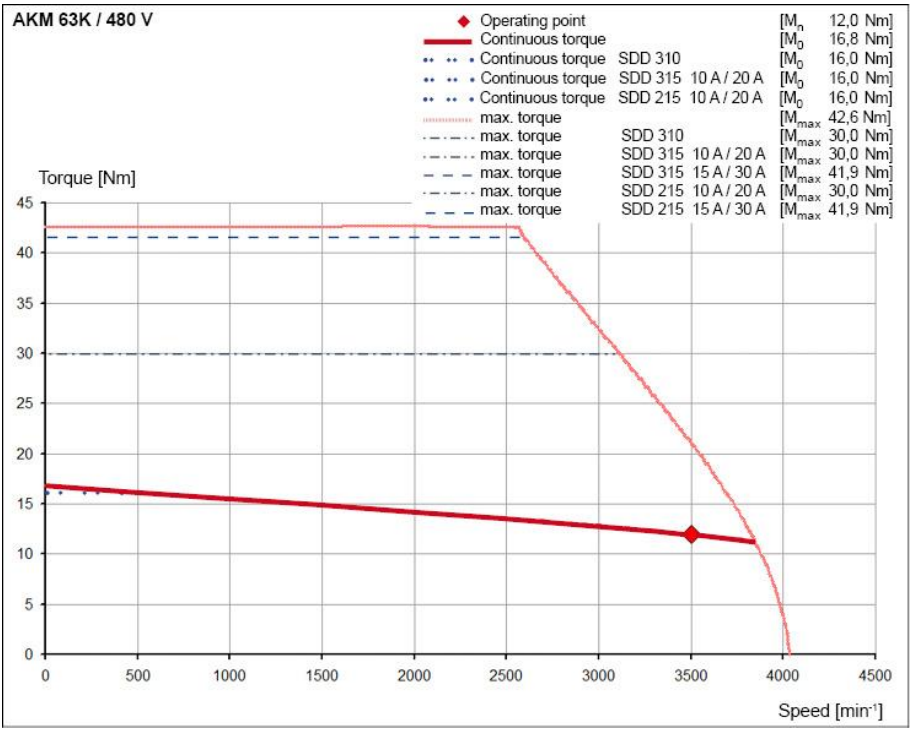
AKM 63G


AKM 63G / 400 V
Operating point
Continuous torque
max. torque
[Mn 15,3 Nm]
[M0 16,5 Nm]
[Mmax 42,1 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
Speed [min-1]

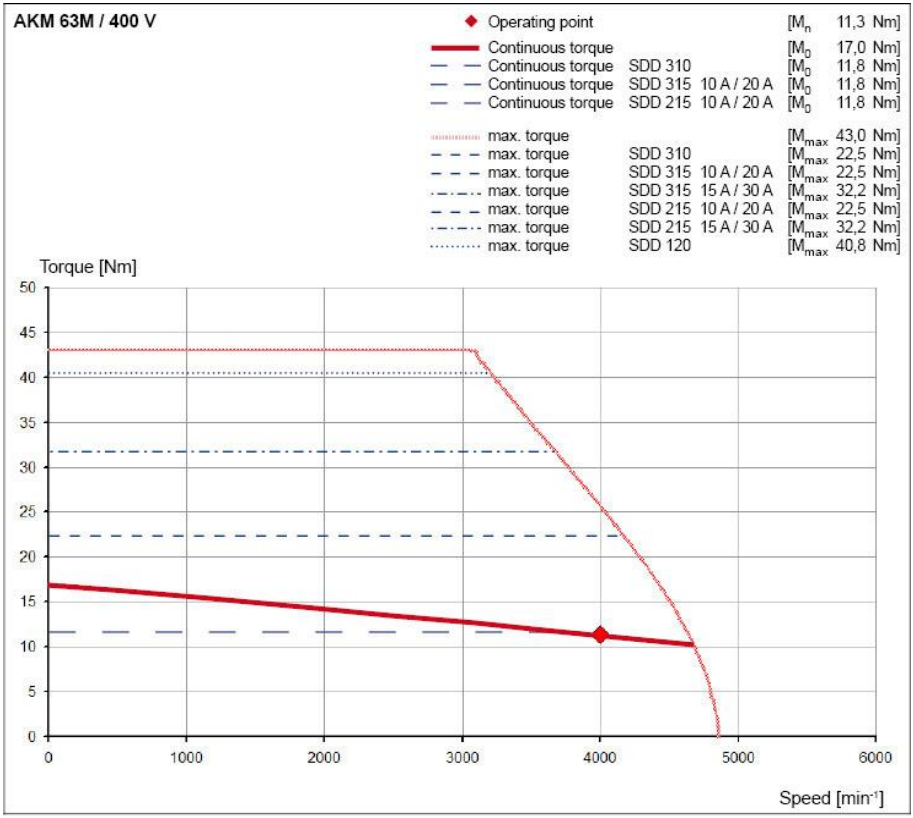

AKM 63G / 480 V
Operating point
Continuous torque
max. torque
[M_n 14,6 Nm]
[M_0 16,5 Nm]
[M_{max} 42,1 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Speed [min^{-1}]

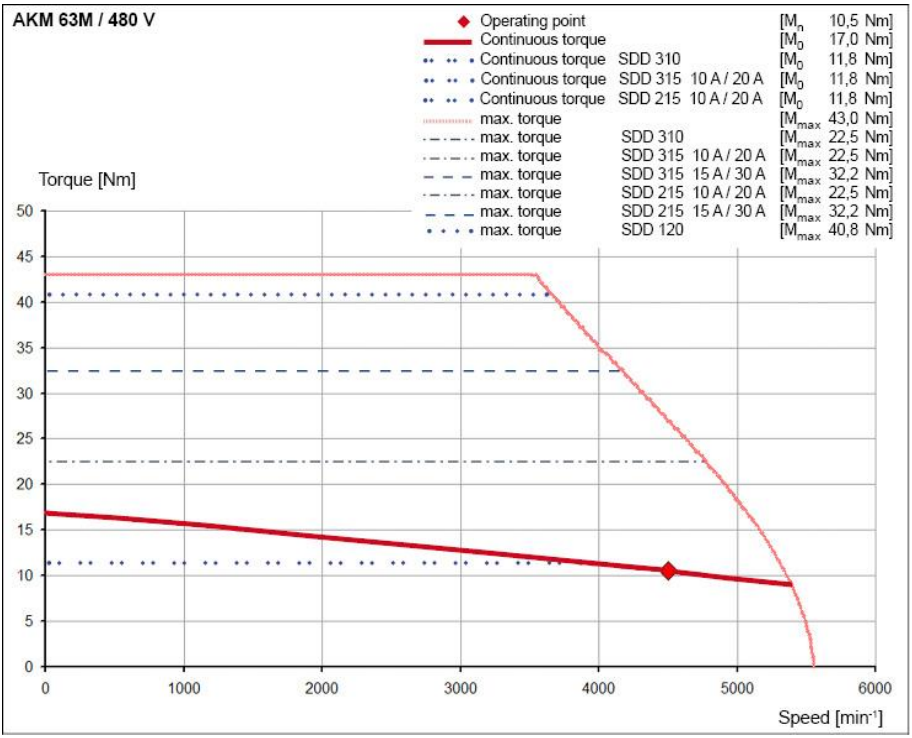
AKM 63K


AKM 63K / 400 V
Operating point [Mn 12,9 Nm]
Continuous torque [M0 16,8 Nm]
Continuous torque SDD 310 [M0 16,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 16,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 16,0 Nm]
max. torque [Mmax 42,6 Nm]
max. torque SDD 310 [Mmax 30,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 41,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 41,9 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

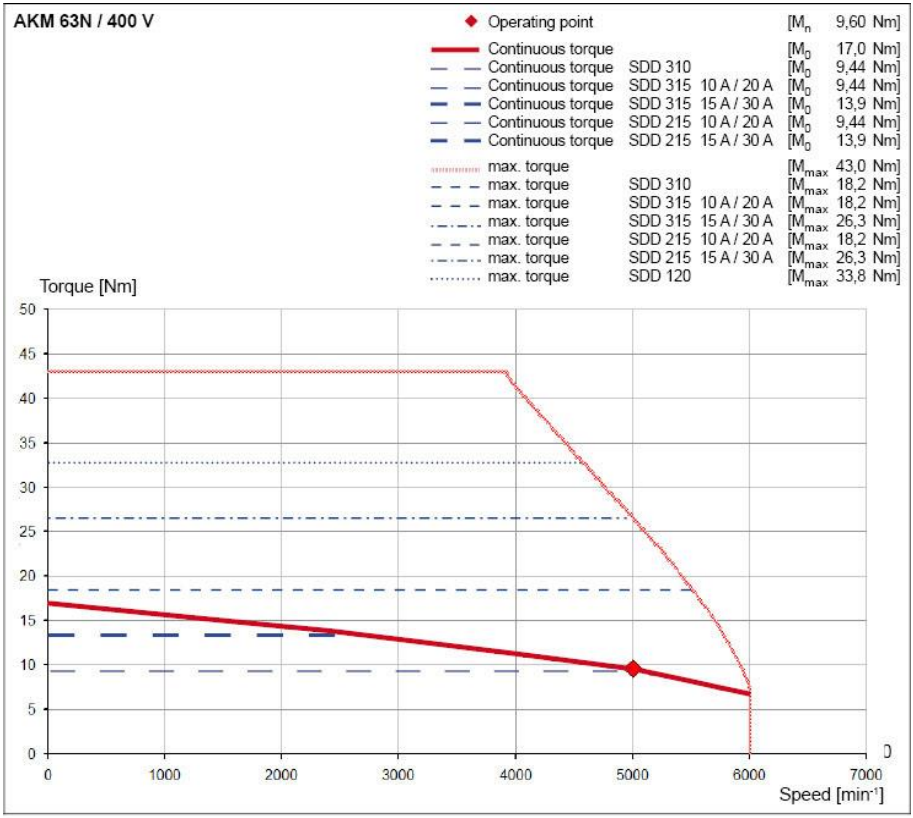

AKM 63K / 480 V
Operating point [Mn 12,0 Nm]
Continuous torque [M0 16,8 Nm]
Continuous torque SDD 310 [M0 16,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 16,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 16,0 Nm]
max. torque [Mmax 42,6 Nm]
max. torque SDD 310 [Mmax 30,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 41,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 41,9 Nm]
Torque [Nm]
45
40
35
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

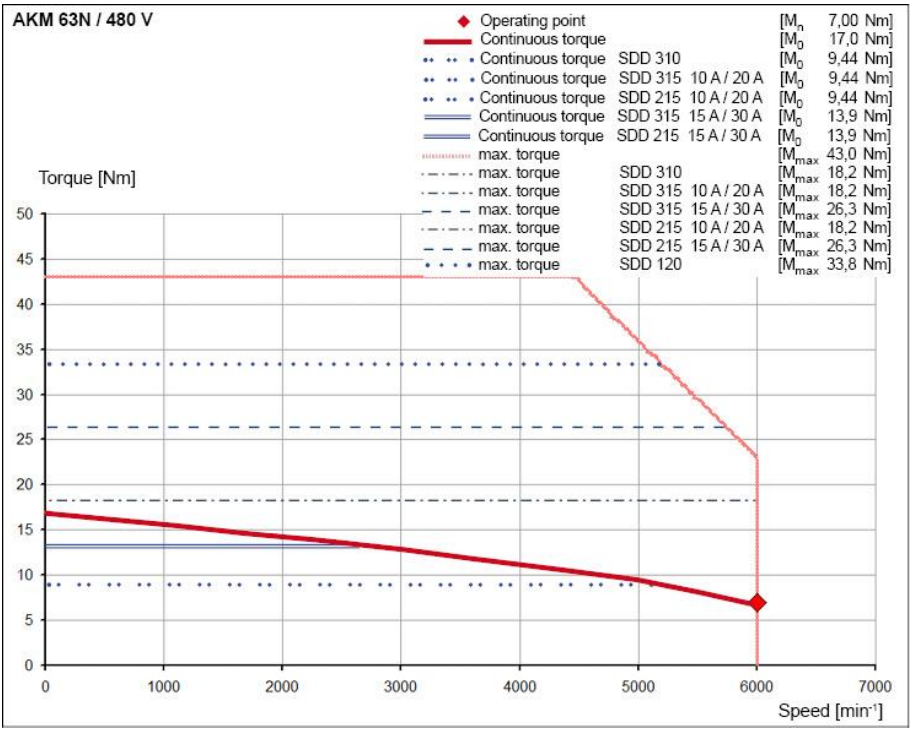
AKM 63M


AKM 63M / 400 V
Operating point [Mn 11,3 Nm]
Continuous torque [M0 17,0 Nm]
Continuous torque SDD 310 [M0 11,8 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 11,8 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 11,8 Nm]
max. torque [Mmax 43,0 Nm]
max. torque SDD 310 [Mmax 22,5 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 22,5 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 32,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 22,5 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 32,2 Nm]
max. torque SDD 120 [Mmax 40,8 Nm]
Torque [Nm]
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

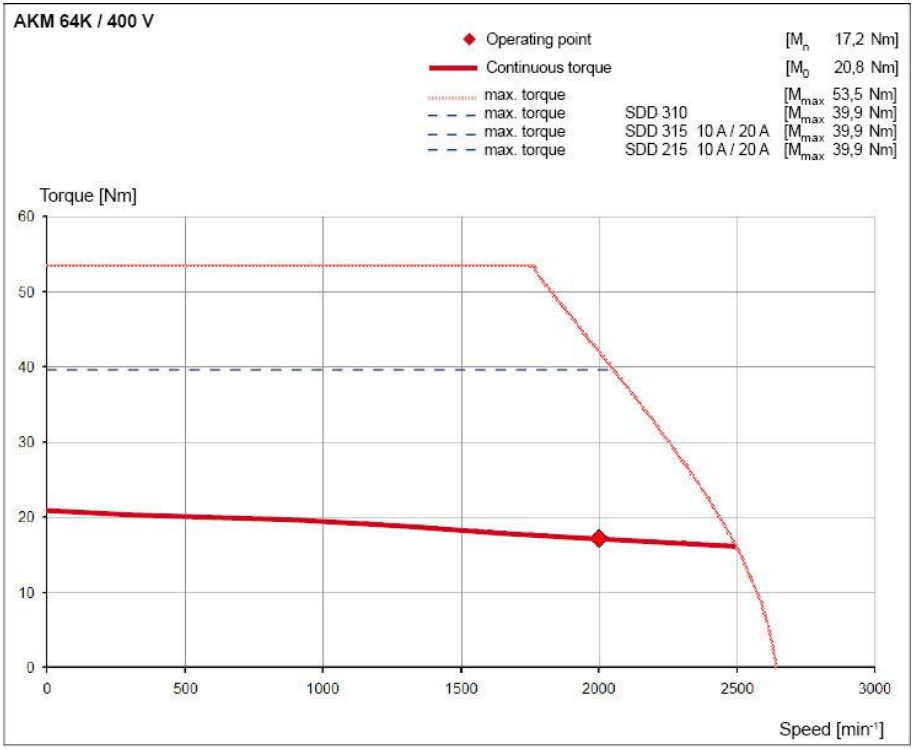

AKM 63M / 480 V
Operating point [Mn 10,5 Nm]
Continuous torque [M0 17,0 Nm]
Continuous torque SDD 310 [M0 11,8 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 11,8 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 11,8 Nm]
max. torque [Mmax 43,0 Nm]
max. torque SDD 310 [Mmax 22,5 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 22,5 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 32,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 22,5 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 32,2 Nm]
max. torque SDD 120 [Mmax 40,8 Nm]
Torque [Nm]
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

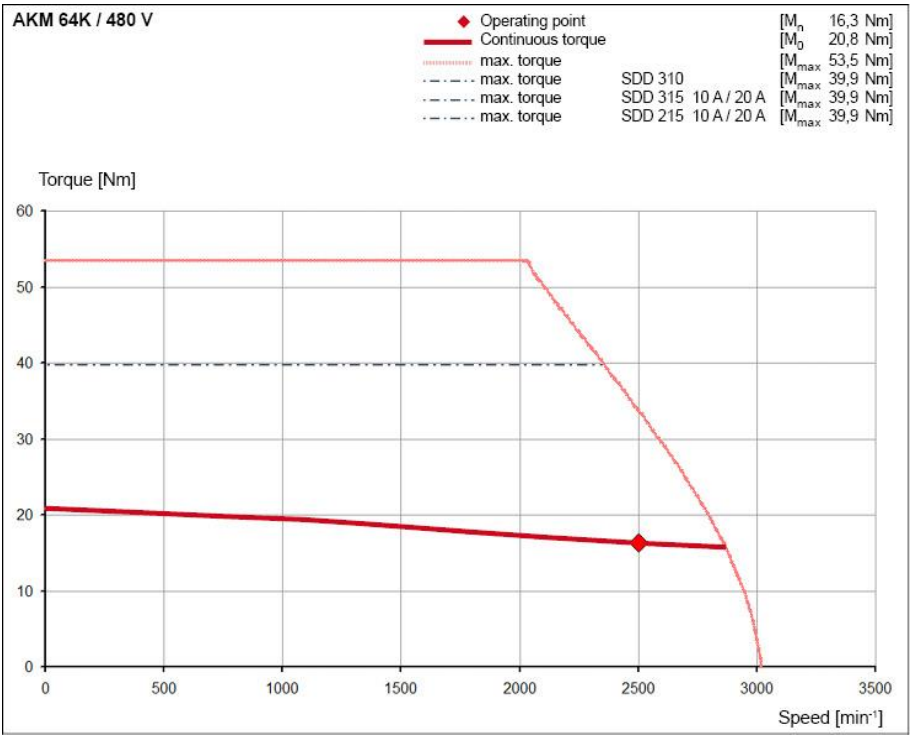
AKM 63N


AKM 63N / 400 V
Operating point [Mn 9,60 Nm]
Continuous torque [M0 17,0 Nm]
Continuous torque SDD 310 [M0 9,44 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 9,44 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 13,9 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 9,44 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 13,9 Nm]
max. torque [Mmax 43,0 Nm]
max. torque SDD 310 [Mmax 18,2 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 18,2 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 26,3 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 18,2 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 26,3 Nm]
max. torque SDD 120 [Mmax 33,8 Nm]
Torque [Nm]
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

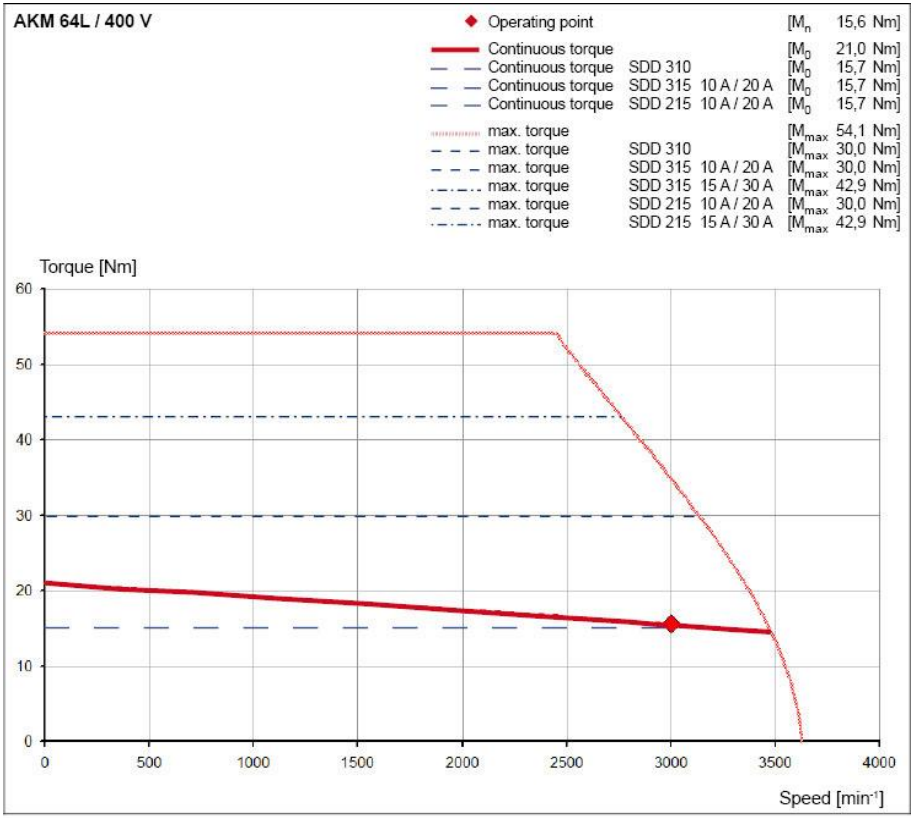

AKM 63N / 480 V
Operating point [Mn 7,00 Nm]
Continuous torque [M0 17,0 Nm]
Continuous torque SDD 310 [M0 9,44 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 9,44 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 9,44 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 13,9 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 13,9 Nm]
max. torque [Mmax 43,0 Nm]
max. torque SDD 310 [Mmax 18,2 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 18,2 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 26,3 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 18,2 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 26,3 Nm]
max. torque SDD 120 [Mmax 33,8 Nm]
Torque [Nm]
50
45
40
35
30
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

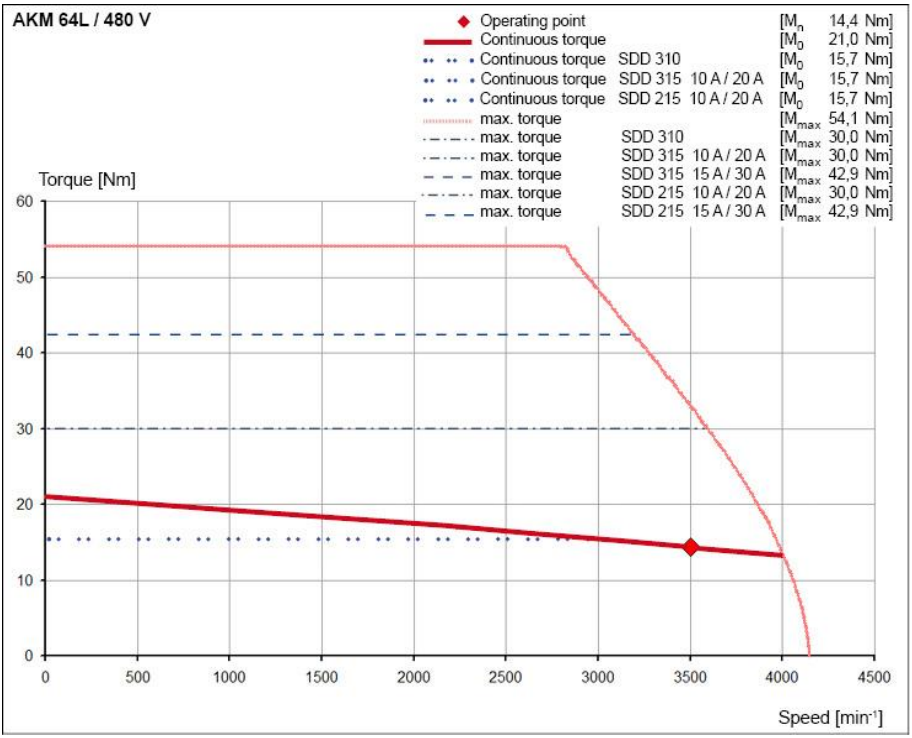
AKM 64K


AKM 64K / 400 V
Operating point [Mn 17,2 Nm]
Continuous torque [M0 20,8 Nm]
max. torque [Mmax 53,5 Nm]
max. torque SDD 310 [Mmax 39,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 39,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 39,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

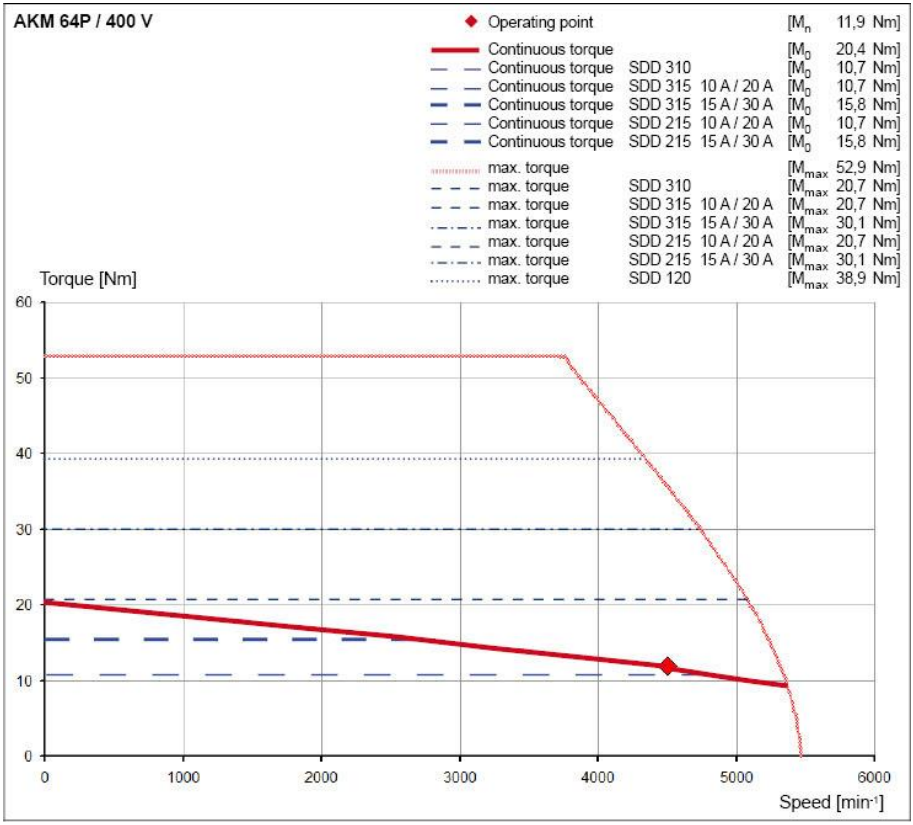

AKM 64K / 480 V
Operating point [Mn 16,3 Nm]
Continuous torque [M0 20,8 Nm]
max. torque [Mmax 53,5 Nm]
max. torque SDD 310 [Mmax 39,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 39,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 39,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

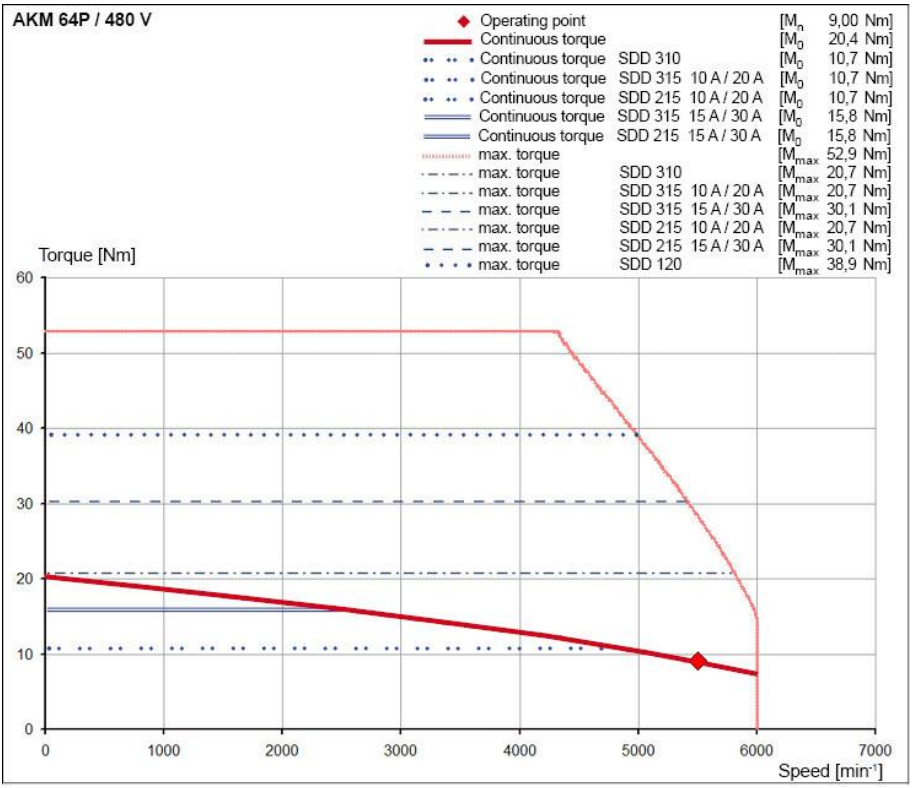
AKM 64L


AKM 64L / 400 V
Operating point [Mn 15,6 Nm]
Continuous torque [M0 21,0 Nm]
Continuous torque SDD 310 [M0 15,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 15,7 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 15,7 Nm]
max. torque [Mmax 54,1 Nm]
max. torque SDD 310 [Mmax 30,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 42,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 42,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

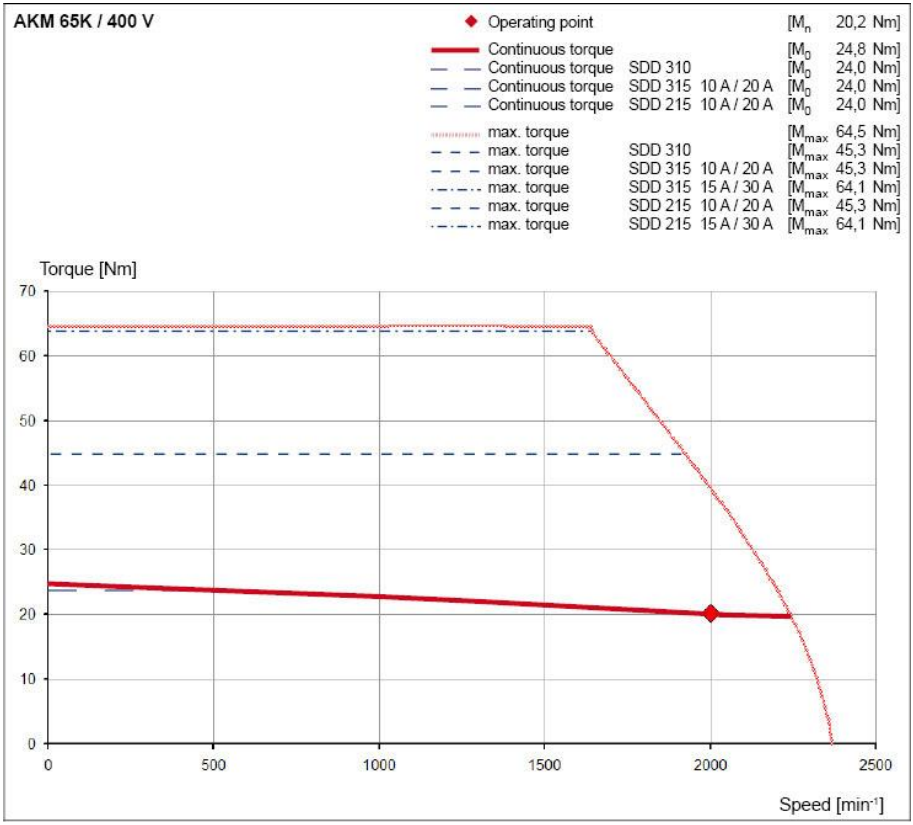

AKM 64L / 480 V
Operating point [Mn 14,4 Nm]
Continuous torque [M0 21,0 Nm]
Continuous torque SDD 310 [M0 15,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 15,7 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 15,7 Nm]
max. torque [Mmax 54,1 Nm]
max. torque SDD 310 [Mmax 30,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 42,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 30,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 42,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

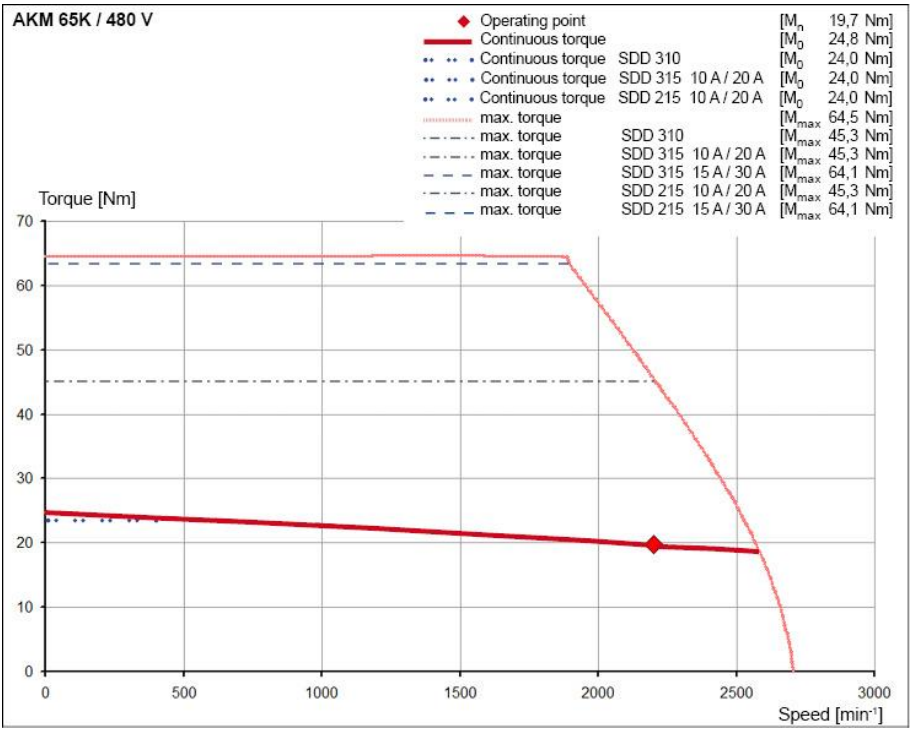
AKM 64P


AKM 64P / 400 V
Operating point [Mn 11,9 Nm]
Continuous torque [M0 20,4 Nm]
Continuous torque SDD 310 [M0 10,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 10,7 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 15,8 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 10,7 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 15,8 Nm]
max. torque [Mmax 52,9 Nm]
max. torque SDD 310 [Mmax 20,7 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 20,7 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 30,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 20,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 30,1 Nm]
max. torque SDD 120 [Mmax 38,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

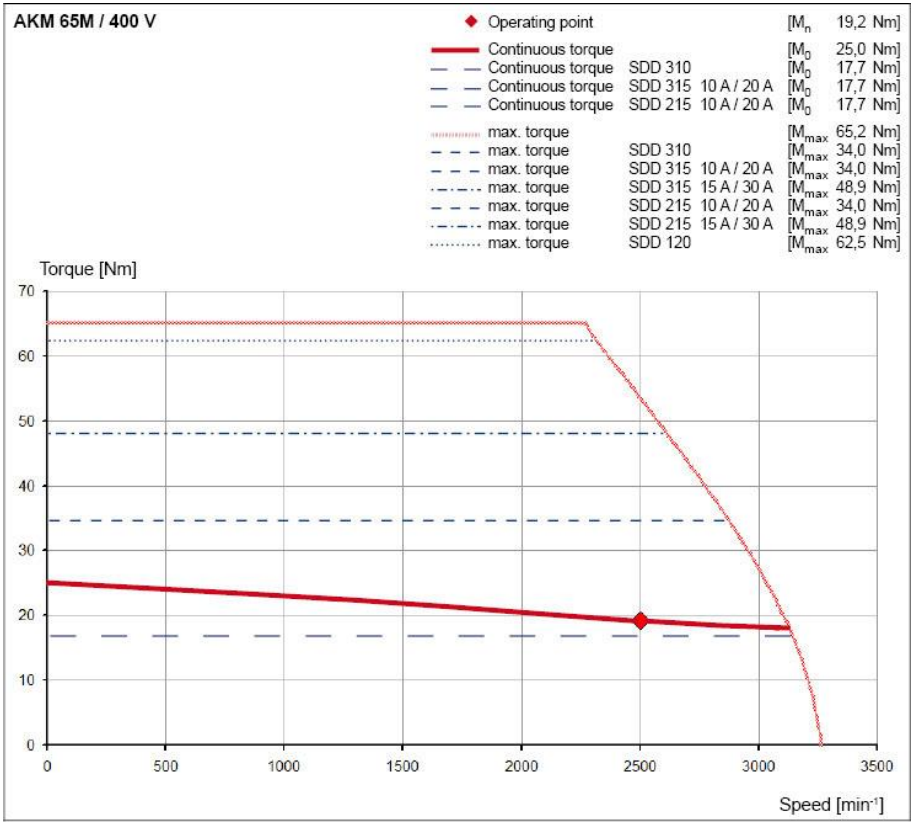

AKM 64P / 480 V
Operating point [Mn 9,00 Nm]
Continuous torque [M0 20,4 Nm]
Continuous torque SDD 310 [M0 10,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 10,7 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 10,7 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 15,8 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 15,8 Nm]
max. torque [Mmax 52,9 Nm]
max. torque SDD 310 [Mmax 20,7 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 20,7 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 30,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 20,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 30,1 Nm]
max. torque SDD 120 [Mmax 38,9 Nm]
Torque [Nm]
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
7000
Speed [min-1]

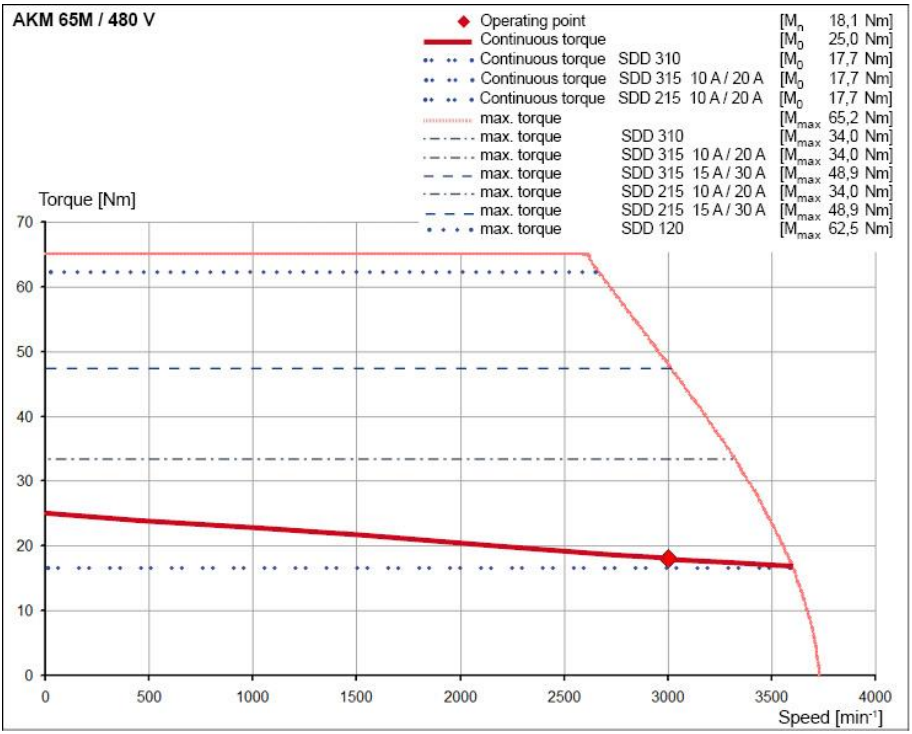
AKM 65K


AKM 65K / 400 V
Operating point [Mn 20,2 Nm]
Continuous torque [M0 24,8 Nm]
Continuous torque SDD 310 [M0 24,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 24,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 24,0 Nm]
max. torque [Mmax 64,5 Nm]
max. torque SDD 310 [Mmax 45,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 45,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 64,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 45,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 64,1 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
Speed [min-1]

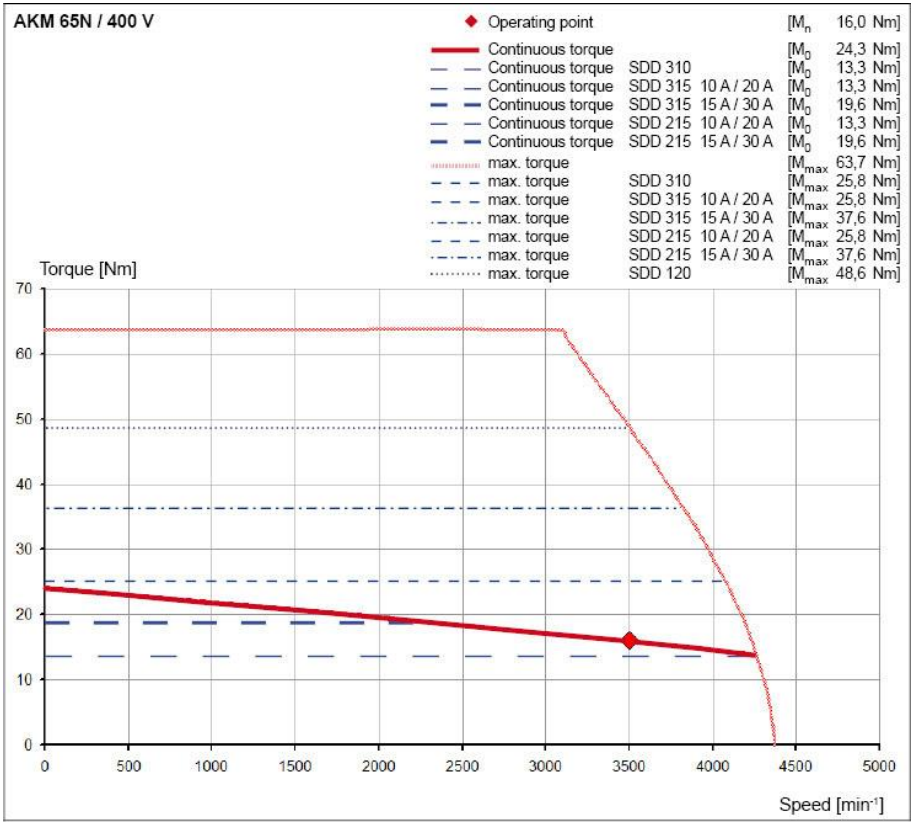

AKM 65K / 480 V
Operating point [Mn 19,7 Nm]
Continuous torque [M0 24,8 Nm]
Continuous torque SDD 310 [M0 24,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 24,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 24,0 Nm]
max. torque [Mmax 64,5 Nm]
max. torque SDD 310 [Mmax 45,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 45,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 64,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 45,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 64,1 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

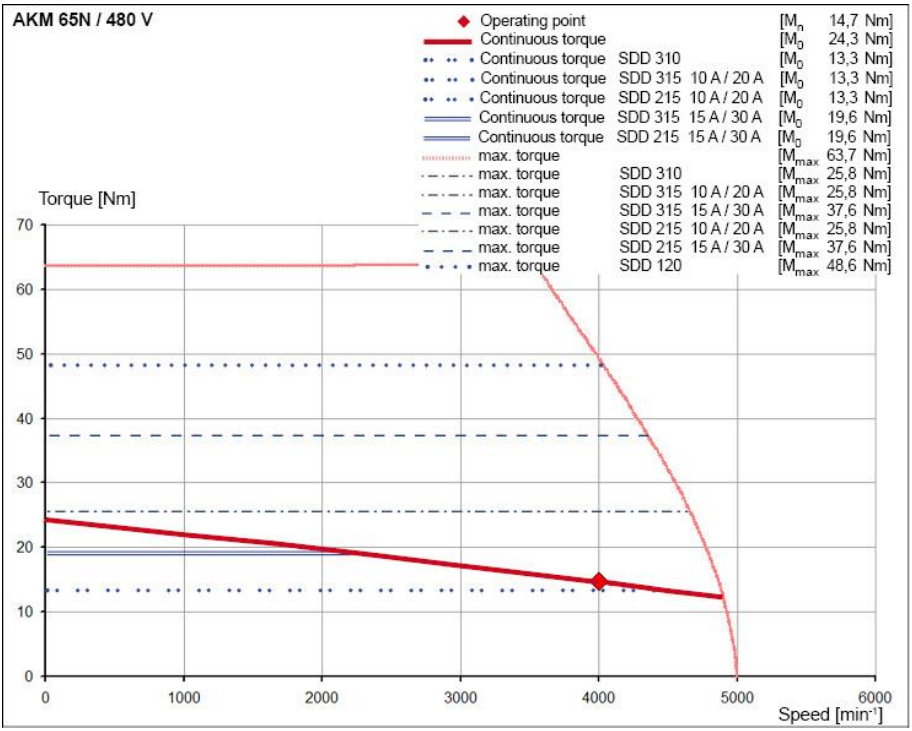
AKM 65M


AKM 65M / 400 V
Operating point [M_n 19,2 Nm]
Continuous torque [M_0 25,0 Nm]
Continuous torque SDD 310 [M_0 17,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M_0 17,7 Nm]
Continuous torque SDD 215 10 A / 20 A [M_0 17,7 Nm]
max. torque [M_{max} 65,2 Nm]
max. torque SDD 310 [M_{max} 34,0 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 34,0 Nm]
max. torque SDD 315 15 A / 30 A [M_{max} 48,9 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 34,0 Nm]
max. torque SDD 215 15 A / 30 A [M_{max} 48,9 Nm]
max. torque SDD 120 [M_{max} 62,5 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

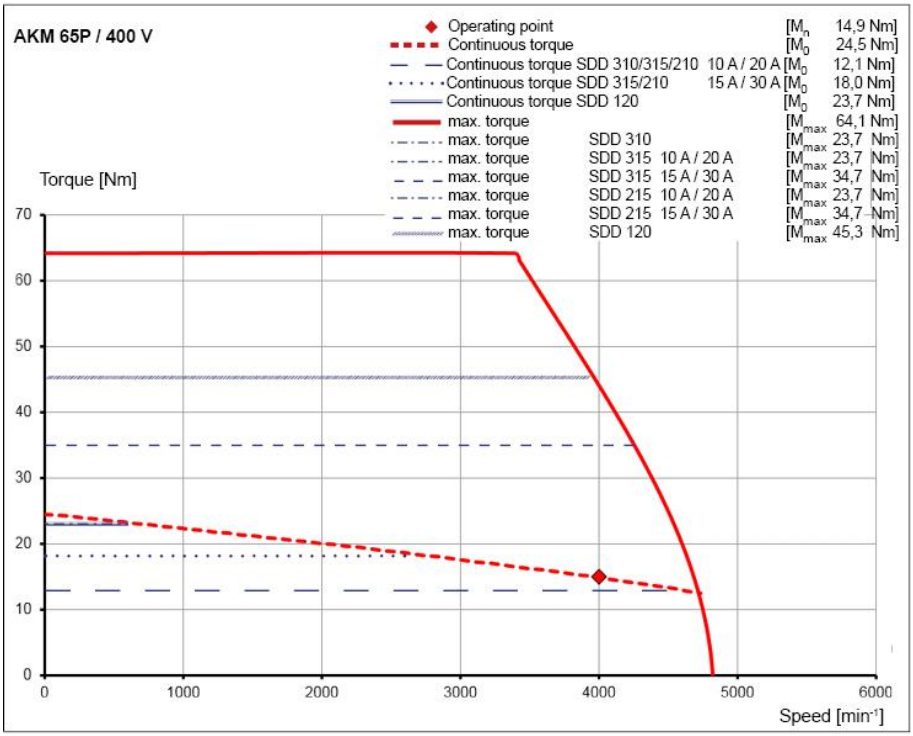

AKM 65M / 480 V
Operating point [Mn 18,1 Nm]
Continuous torque [M0 25,0 Nm]
Continuous torque SDD 310 [M0 17,7 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 17,7 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 17,7 Nm]
max. torque [Mmax 65,2 Nm]
max. torque SDD 310 [Mmax 34,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 34,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 48,9 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 34,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 48,9 Nm]
max. torque SDD 120 [Mmax 62,5 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

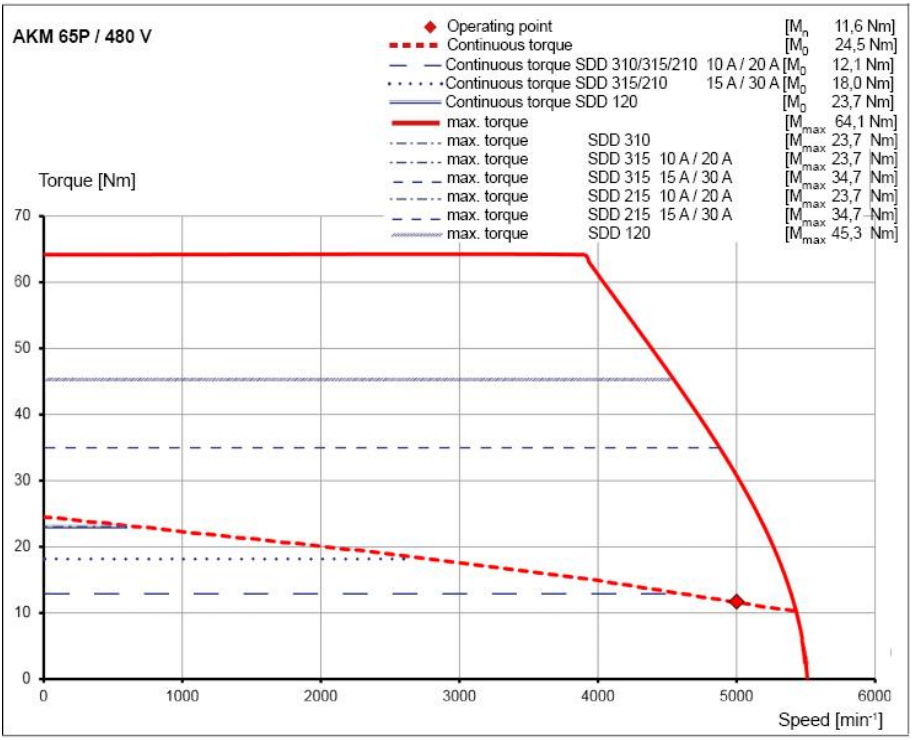
AKM 65N


AKM 65N / 400 V
Operating point [Mn 16,0 Nm]
Continuous torque [M0 24,3 Nm]
Continuous torque SDD 310 [M0 13,3 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 13,3 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 19,6 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 13,3 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 19,6 Nm]
max. torque [Mmax 63,7 Nm]
max. torque SDD 310 [Mmax 25,8 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 25,8 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 37,6 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 25,8 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 37,6 Nm]
max. torque SDD 120 [Mmax 48,6 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]


AKM 65N / 480 V
Operating point [Mn 14,7 Nm]
Continuous torque [M0 24,3 Nm]
Continuous torque SDD 310 [M0 13,3 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 13,3 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 13,3 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 19,6 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 19,6 Nm]
max. torque [Mmax 63,7 Nm]
max. torque SDD 310 [Mmax 25,8 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 25,8 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 37,6 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 25,8 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 37,6 Nm]
max. torque SDD 120 [Mmax 48,6 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

AKM 65P


AKM 65P / 400 V
Operating point [Mn 14,9 Nm]
Continuous torque [M0 24,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 12,1 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 18,0 Nm]
Continuous torque SDD 120 [M0 23,7 Nm]
max. torque [Mmax 64,1 Nm]
max. torque SDD 310 [Mmax 23,7 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 23,7 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 34,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 23,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 34,7 Nm]
max. torque SDD 120 [Mmax 45,3 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]


AKM 65P / 480 V
Operating point [Mn 11,6 Nm]
Continuous torque [M0 24,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 12,1 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 18,0 Nm]
Continuous torque SDD 120 [M0 23,7 Nm]
max. torque [Mmax 64,1 Nm]
max. torque SDD 310 [Mmax 23,7 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 23,7 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 34,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 23,7 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 34,7 Nm]
max. torque SDD 120 [Mmax 45,3 Nm]
Torque [Nm]
70
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

10.9 AKM7

10.9.1 Technical Data

Data		Symbol [Unit]	AKM						
			72K	72M	72P	72Q	73M	73P	73Q
Electrical data									
	Standstill torque*	M_0 [Nm]**	29,7	30,0	29,4	29,5	42,0	41,6	41,5
	Standstill current	I_{0rms} [A]**	9,3	13,0	18,7	23,5	13,6	19,5	24,5
	Max. Nominal supply voltage	U_N [VAC]	480						
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	—	—	1800	2000	—	1300	1500
	Nominal torque*	M_n [Nm]	—	—	23,8	23,2	—	34,7	33,4
	Nominal power	P_n [kW]	—	—	4,49	4,86	—	4,72	5,25
	Nominal current	I_n [A]	—	—	15,06	17,85	—	16,29	19,65
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	1500	2000	3000	4000	1500	2400	3000
	Nominal torque*	M_n [Nm]	25,1	23,6	20,1	16,3	33,8	28,5	25,2
	Nominal power	P_n [kW]	3,94	4,94	6,31	6,83	5,31	7,16	7,92
	Nominal current	I_n [A]	7,77	10,13	12,72	12,54	10,90	13,38	14,82
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	1800	2500	3500	4500	1800	2800	3500
	Nominal torque*	M_n [Nm]	24,0	22,1	18,2	14,1	32,1	26,3	22
	Nominal power	P_n [kW]	4,52	5,79	6,67	6,65	6,05	7,71	8,07
	Nominal current	I_n [A]	7,43	9,48	11,52	10,85	10,35	12,35	12,94
	Peak current	I_{0max} [A]	27,9	39	56,1	70,5	40,8	58,6	73,5
	Peak torque	M_{0max} [Nm]	79,4	79,8	78,5	78,4	112	111	111
	Torque constant	K_{Trms} [Nm/A]	3,23	2,33	1,58	1,3	3,10	2,13	1,7
	Voltage constant	K_{Erms} [mVmin]	208	150	102	81,2	200	137	109
	Winding resistance Ph-Ph	R_{25} [Ω]	1,36	0,69	0,35	0,26	0,76	0,38	0,27
	Winding inductance Ph-Ph	L [mH]	20,7	10,8	5,0	3,2	12,4	5,9	3,7

Mechanical Data				
	Rotor inertial torque	J [kgcm²]	65	92
	Number of contacts		10	10
	Static drag torque	M_R [Nm]	0,16	0,24
	Thermal time constant	t_{TH} [min]	46	53
	Weight standard	G [kg]	19,7	26,7
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	1300	
	Axial force allowed	F_A [N]	500	

* Measuring flange Aluminum 457mm * 457mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by 1Nm.
Non-resolver feedback options reduce continuous torque ratings by:

AKM72 = 2.0 Nm AKM73 = 2.7 Nm AKM74 = 3.4 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM72 = 3.9 Nm AKM73 = 5.1 Nm AKM74 = 6.2 Nm

For motors with optional shaft seal, reduce torque shown by 0.25 Nm and increase M_R by the same amount.

Data		Symbol [Unit]	AKM						
			74L	74P	74Q				
Electrical data									
	Standstill torque*	M_0 [Nm]**	53,0	52,5	52,2				
	Standstill current	I_{0rms} [A]**	12,9	18,5	26,1				
	Max. Nominal supply voltage	U_N [VAC]	480						
UN = 230V	Nominal rotation speed	n_n [min^{-1}]	—	—	1300				
	Nominal torque*	M_n [Nm]	—	—	41,9				
	Nominal power	P_n [kW]	—	—	5,71				
	Nominal current	I_n [A]	—	—	20,95				
UN = 400V	Nominal rotation speed	n_n [min^{-1}]	1200	1800	2500				
	Nominal torque*	M_n [Nm]	45,5	37,6	31,5				
	Nominal power	P_n [kW]	5,47	7,46	8,25				
	Nominal current	I_n [A]	10,51	13,94	15,75				
UN = 480V	Nominal rotation speed	n_n [min^{-1}]	1400	2000	3000				
	Nominal torque*	M_n [Nm]	41,5	35,9	27,3				
	Nominal power	P_n [kW]	6,08	7,52	8,58				
	Nominal current	I_n [A]	10,02	12,64	13,65				
	Peak current	I_{0max} [A]	38,7	55,5	78,3				
	Peak torque	M_{0max} [Nm]	143	142	141				
	Torque constant	K_{Trms} [Nm/A]	4,14	2,84	2				
	Voltage constant	K_{Erms} [mVmin]	266	183	129				
	Winding resistance Ph-Ph	R_{25} [Ω]	0,93	0,47	0,26				
	Winding inductance Ph-Ph	L [mH]	16,4	7,7	3,8				

Mechanical Data			
	Rotor inertial torque	J [kgcm²]	120
	Number of contacts		10
	Static drag torque	M_R [Nm]	0,33
	Thermal time constant	t_{TH} [min]	60
	Weight standard	G [kg]	33,6
	Radial force allowed on the shaft end at 8000 min-1	F_R [N]	1300
	Axial force allowed	F_A [N]	500

* Measuring flange Aluminum 457mm * 457mm * 12,7mm
** Derating:

Brake motor option reduces continuous torque ratings by 1Nm.
Non-resolver feedback options reduce continuous torque ratings by:

AKM72 = 2.0 Nm AKM73 = 2.7 Nm AKM74 = 3.4 Nm

Motors with non-resolver feedback and brake option, reduce continuous torque by:

AKM72 = 3.9 Nm AKM73 = 5.1 Nm AKM74 = 6.2 Nm

For motors with optional shaft seal, reduce torque shown by 0.25 Nm and increase M_R by the same amount.

10.9.2 Brake Data

Data	Symbol (Unit)	Value
Stop torque at 120 °C	MBR [Nm]	53
Connection voltage	UBR [VDC]	24 ± 10 %
Electrical power	PBR [W]	35,6
Inertial torque	JBR [kgcm²]	1,64
Release delay time	tBRH [ms]	110
Application delay time	tBRL [ms]	35
Brake weight	GBR [kg]	2,1
Typical play	[°mech.]	0,2
Switching energy	E [mJ]	94,38

10.9.3 Cables and Connections

Data	AKM7
Power connection	4 + 4-pin, round, angled
Motor cable, shielded	4 x 2,5
Motor cable with control wires, shielded	4 x 2,5 + 2 x 0,5
Resolver connection	4 x 1
Motor cable, shielded	12-pin, round, angled

The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.9.4 Maximum and Continuous Torque

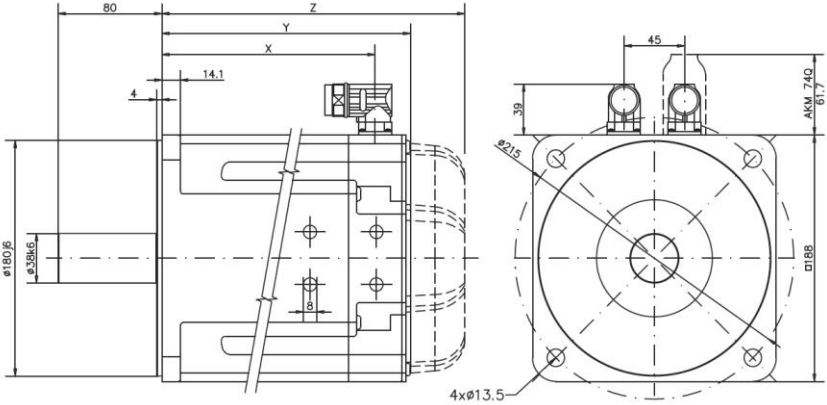
Power supply 1 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 72K	M_0 [Nm]	29,7	29,7	29,7	29,7	29,7	29,7	29,7
	M_n [Nm]	25,1	25,1	25,1	25,1	25,1	25,1	25,1
	M_{max} [Nm]	79,4	58,4	58,4	79,4	58,4	79,4	79,4
AKM 72M	M_0 [Nm]	30,0	22,4	22,4	30,0	22,4	30,0	30,0
	M_n [Nm]	23,6	23,6	23,6	23,6	23,6	23,6	23,6
	M_{max} [Nm]	79,8	43,2	43,2	62,7	43,2	62,7	79,8
AKM 72P	M_0 [Nm]	29,4	15,4	15,4	22,8	15,4	22,8	29,4
	M_n [Nm]	20,1	20,1	20,1	20,1	20,1	20,1	20,1
	M_{max} [Nm]	78,5	30,1	30,1	44,1	30,1	44,1	57,5
AKM72Q	M_0 [Nm]	29,5	12,3	12,3	18,4	12,3	18,4	24,3
	M_n [Nm]	16,3	16,3	16,3	16,3	16,3	16,3	16,3
	M_{max} [Nm]	78,4	24,3	24,3	35,8	24,3	35,8	47,0
AKM 73M	M_0 [Nm]	42,0	30,0	30,0	42,0	30,0	42,0	42,0
	M_n [Nm]	33,8	33,8	33,8	33,8	33,8	33,8	33,8
	M_{max} [Nm]	112	58,3	58,3	84,8	58,3	84,8	109,6
AKM 73P	M_0 [Nm]	41,6	20,9	20,9	31,1	20,9	31,1	41,0
	M_n [Nm]	28,5	28,5	28,5	28,5	28,5	28,5	28,5
	M_{max} [Nm]	111	41,0	41,0	60,2	41,0	60,2	78,6
AKM 73Q	M_0 [Nm]	41,5	16,7	16,7	24,8	16,7	24,8	32,9
	M_n [Nm]	25,2	25,2	25,2	25,2	25,2	25,2	25,2
	M_{max} [Nm]	111	32,9	32,9	48,6	32,9	48,6	63,8
AKM 74L	M_0 [Nm]	53,0	40,0	40,0	53,0	40,0	53,0	53,0
	M_n [Nm]	45,5	45,5	45,5	45,5	45,5	45,5	45,5
	M_{max} [Nm]	143	77,6	77,6	113,0	77,6	113,0	143
AKM 74P	M_0 [Nm]	52,5	27,8	27,8	41,3	27,8	41,3	52,5
	M_n [Nm]	37,6	37,6	37,6	37,6	37,6	37,6	37,6
	M_{max} [Nm]	142	54,6	54,6	80,2	54,6	80,2	104,7
AKM 74Q	M_0 [Nm]	52,2	19,7	19,7	29,4	19,7	29,4	39,0
	M_n [Nm]	31,5	31,5	31,5	31,5	31,5	31,5	31,5
	M_{max} [Nm]	141	39,0	39,0	57,7	39,0	57,7	76,0

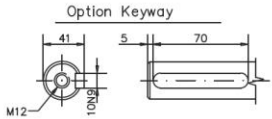
Power supply 1 x 480 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A	SDD 315 15A/30A	SDD 215 10A/20A	SDD 215 15A/30A	SDD 120
AKM 72K	M_0 [Nm] M_n [Nm] M_{max} [Nm]	29,7 24,0 79,4	29,7 24,0 58,4	29,7 24,0 58,4	29,7 24,0 79,4	29,7 24,0 58,4	29,7 24,0 79,4	29,7 24,0 79,4
AKM 72M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	30,0 22,1 79,8	22,4 22,1 43,2	22,4 22,1 43,2	30,0 22,1 62,7	22,4 22,1 43,2	30,0 22,1 62,7	30,0 22,1 79,8
AKM 72P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	29,4 18,2 78,5	15,4 18,2 30,1	15,4 18,2 30,1	22,8 18,2 44,1	15,4 18,2 30,1	22,8 18,2 44,1	29,4 18,2 57,5
AKM 72Q	M_0 [Nm] M_n [Nm] M_{max} [Nm]	29,5 14,1 78,4	12,3 14,1 24,3	12,3 14,1 24,3	18,4 14,1 35,8	12,3 14,1 24,3	18,4 14,1 35,8	24,3 14,1 47,0
AKM 73M	M_0 [Nm] M_n [Nm] M_{max} [Nm]	42,0 32,1 112	30,0 32,1 58,3	30,0 32,1 58,3	42,0 32,1 84,8	30,0 32,1 58,3	42,0 32,1 84,8	42,0 32,1 109,6
AKM 73P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	41,6 26,3 111	20,9 26,3 41,0	20,9 26,3 41,0	31,1 26,3 60,2	20,9 26,3 41,0	31,1 26,3 60,2	41,0 26,3 78,6
AKM 73Q	M_0 [Nm] M_n [Nm] M_{max} [Nm]	41,5 22 111	16,7 22 32,9	16,7 22 32,9	24,8 22 48,6	16,7 22 32,9	24,8 22 48,6	32,9 22 63,8
AKM 74L	M_0 [Nm] M_n [Nm] M_{max} [Nm]	53,0 41,5 143	40,0 41,5 77,6	40,0 41,5 77,6	53,0 41,5 113,0	40,0 41,5 77,6	53,0 41,5 113,0	53,0 41,5 143
AKM 74P	M_0 [Nm] M_n [Nm] M_{max} [Nm]	52,5 35,9 142	27,8 35,9 54,6	27,8 35,9 54,6	41,3 35,9 80,2	27,8 35,9 54,6	41,3 35,9 80,2	52,5 35,9 104,7
AKM 74Q	M_0 [Nm] M_n [Nm] M_{max} [Nm]	52,2 27,3 141	19,7 27,3 39,0	19,7 27,3 39,0	29,4 27,3 57,7	19,7 27,3 39,0	29,4 27,3 57,7	39,0 27,3 76,0

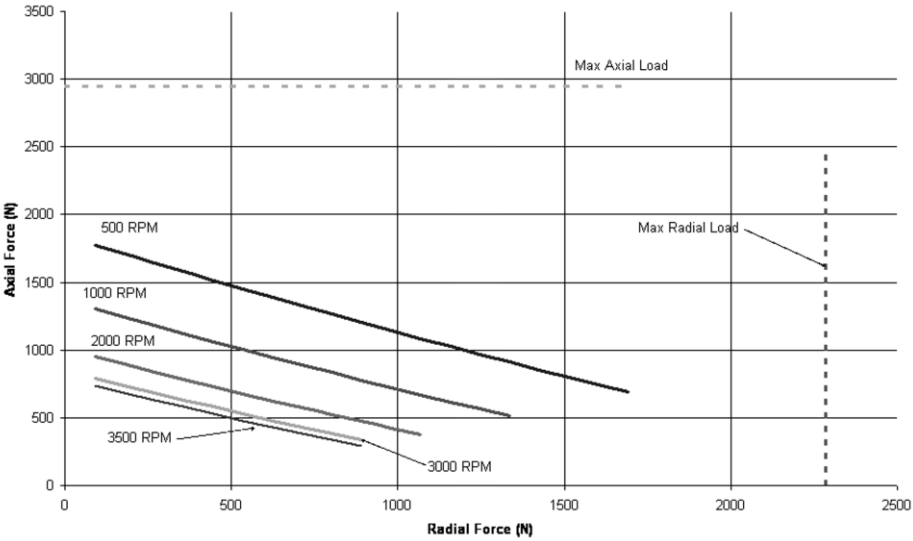
10.9.5 Dimensional Drawing (schematic diagram)



Model	X	Resolver/Comcoder		Encoder	
		Y	Z (brake)	Y	Z (brake)
AKM72	164.5	192.5	234.5	201.7	253.3
AKM73	198.5	226.5	268.5	235.7	287.3
AKM74	232.5	260.5	302.5	269.7	321.3

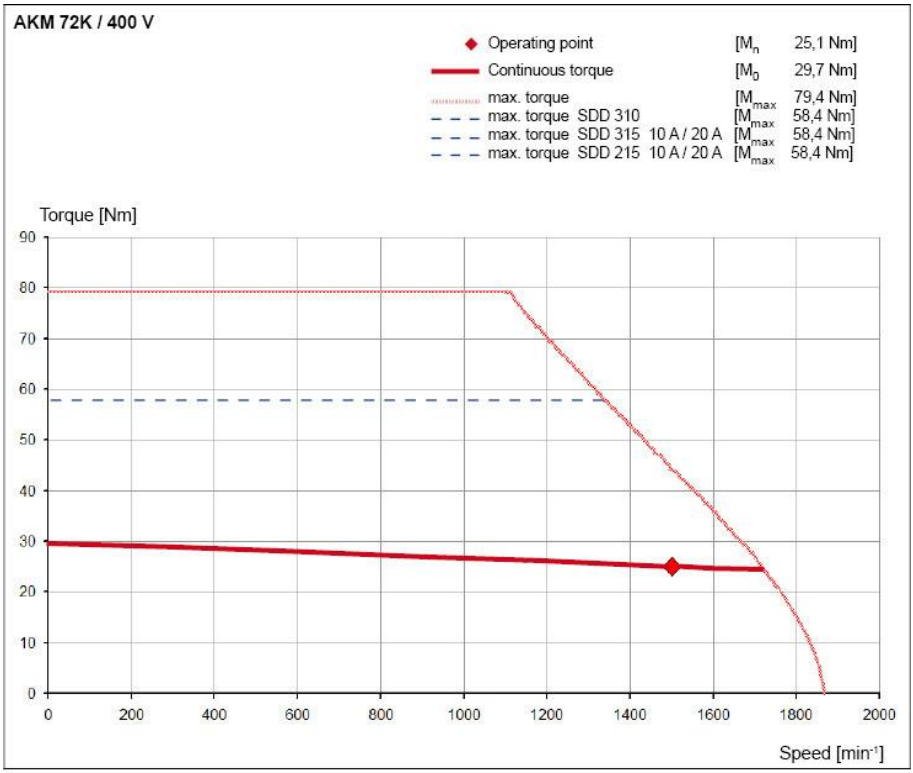


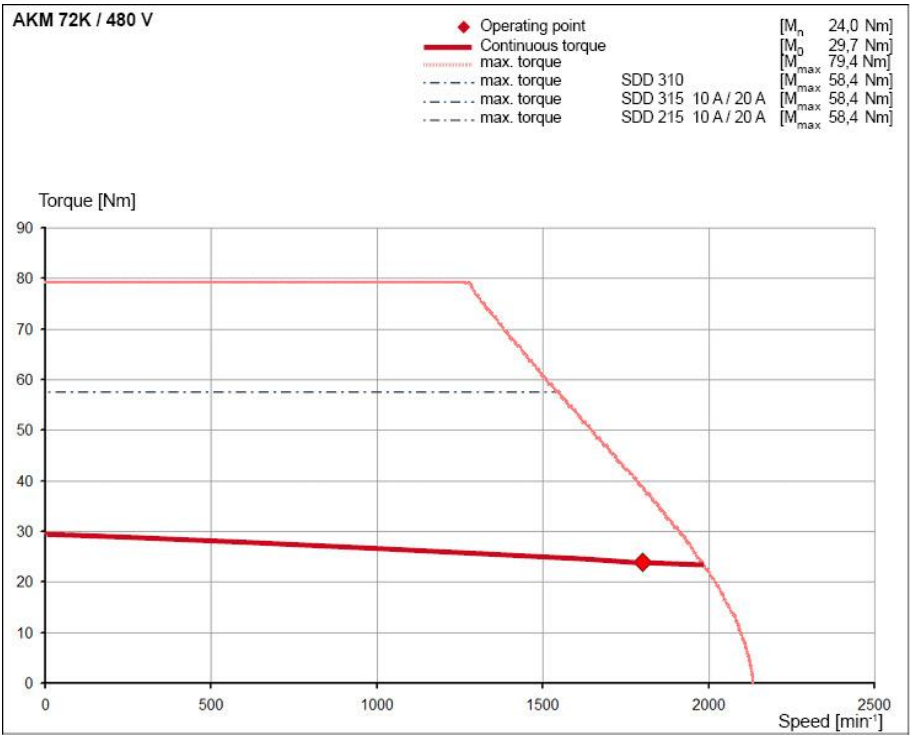
10.9.6 Radial Force on the Shaft End



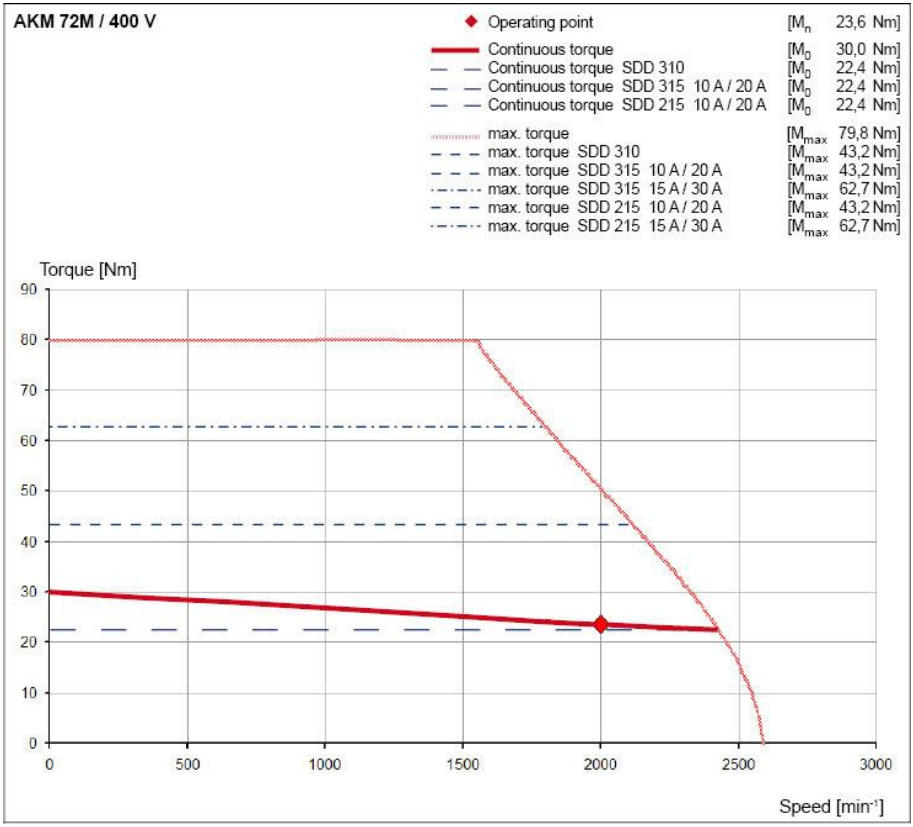
10.9.7 Motor Characteristics

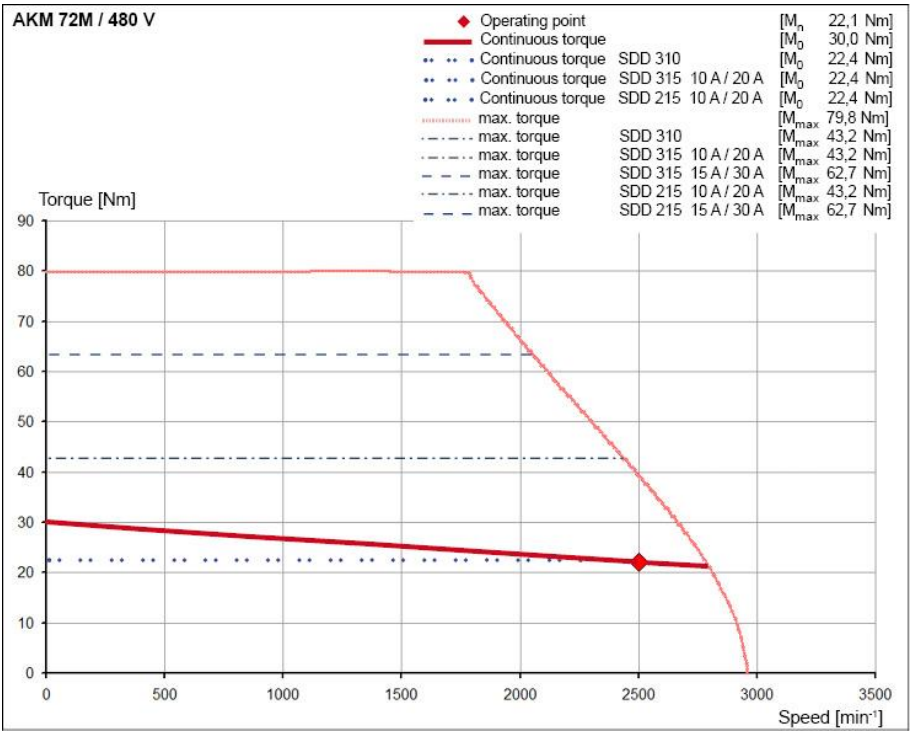
AKM 72K



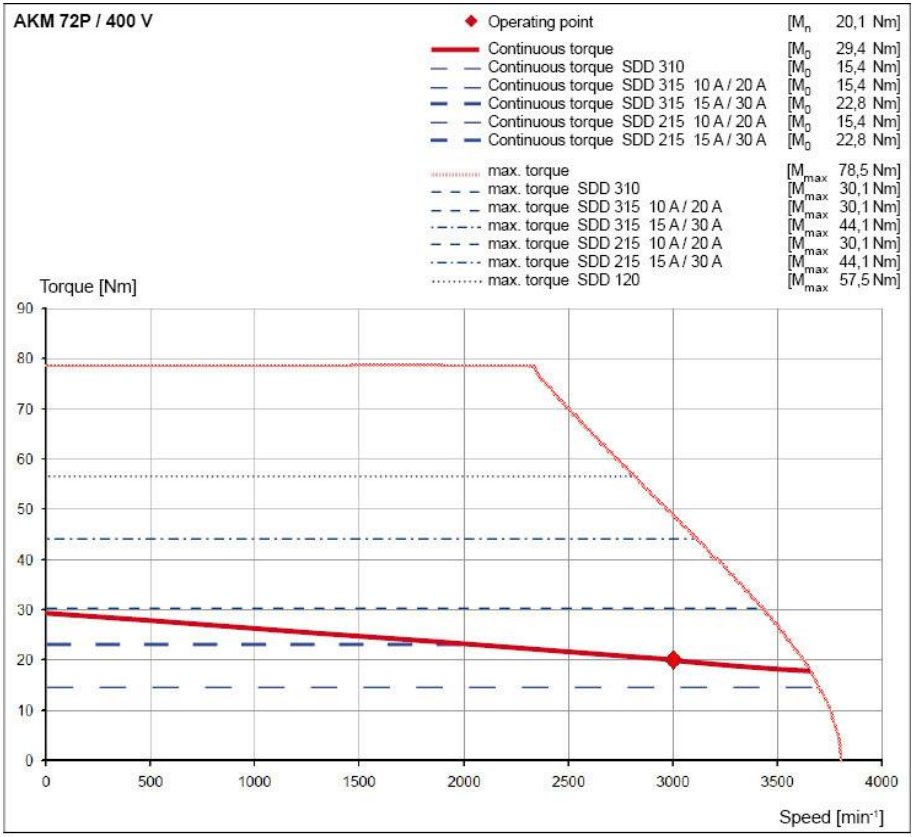

AKM 72K / 480 V
Operating point [Mn 24,0 Nm]
Continuous torque [M0 29,7 Nm]
max. torque [Mmax 79,4 Nm]
max. torque SDD 310 [Mmax 58,4 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 58,4 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 58,4 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
Speed [min-1]

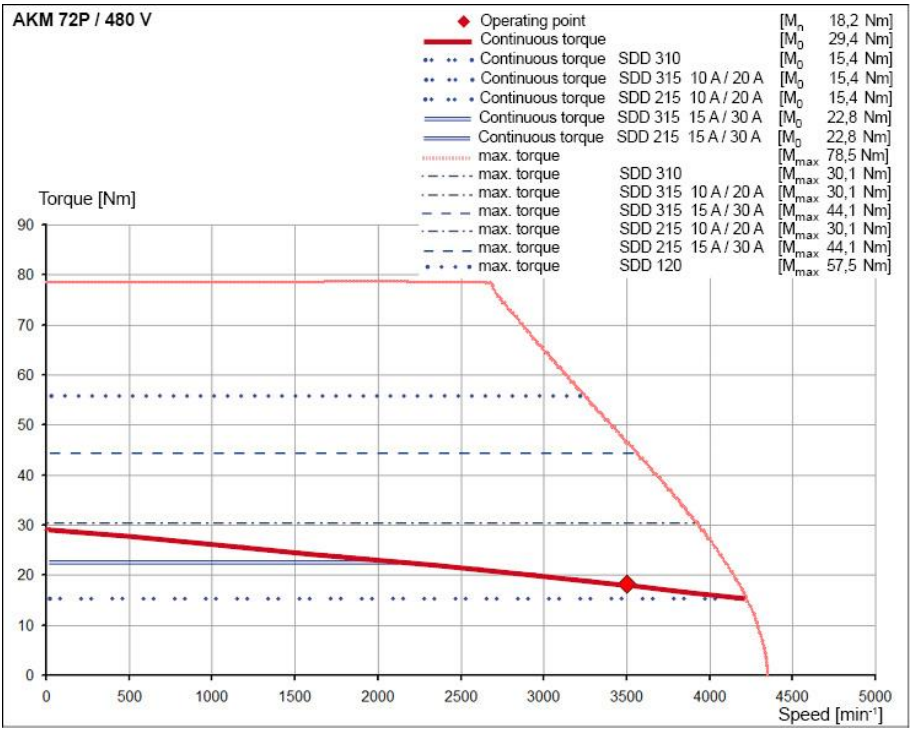
AKM 72M


AKM 72M / 400 V
Operating point [Mn 23,6 Nm]
Continuous torque [M0 30,0 Nm]
Continuous torque SDD 310 [M0 22,4 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 22,4 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 22,4 Nm]
max. torque [Mmax 79,8 Nm]
max. torque SDD 310 [Mmax 43,2 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 43,2 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 62,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 43,2 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 62,7 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

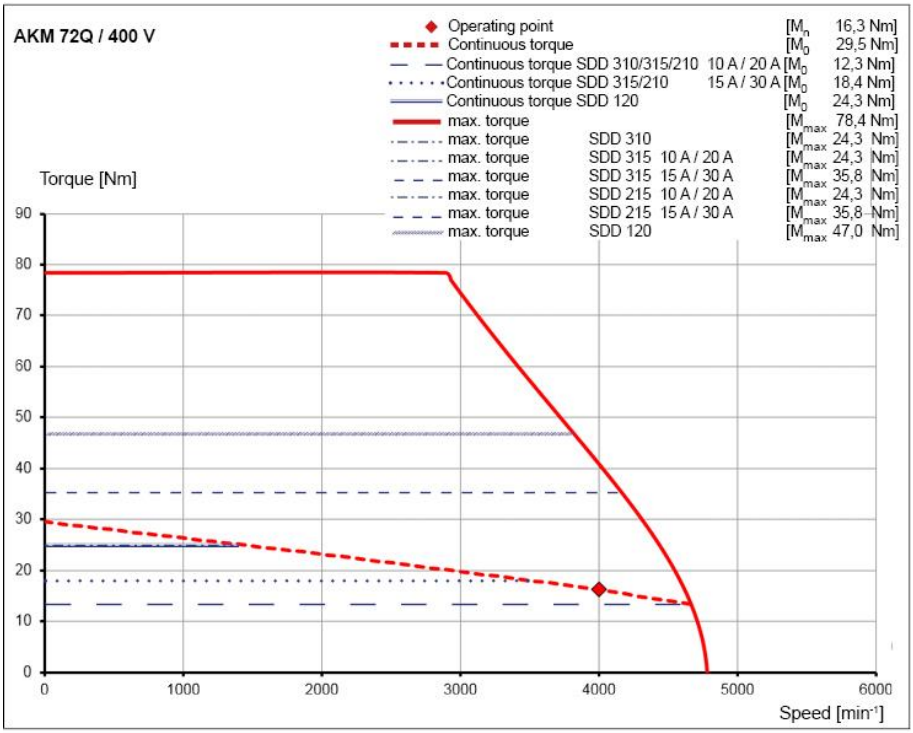

AKM 72M / 480 V
Operating point [Mn 22,1 Nm]
Continuous torque [M0 30,0 Nm]
Continuous torque SDD 310 [M0 22,4 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 22,4 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 22,4 Nm]
max. torque [Mmax 79,8 Nm]
max. torque SDD 310 [Mmax 43,2 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 43,2 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 62,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 43,2 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 62,7 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

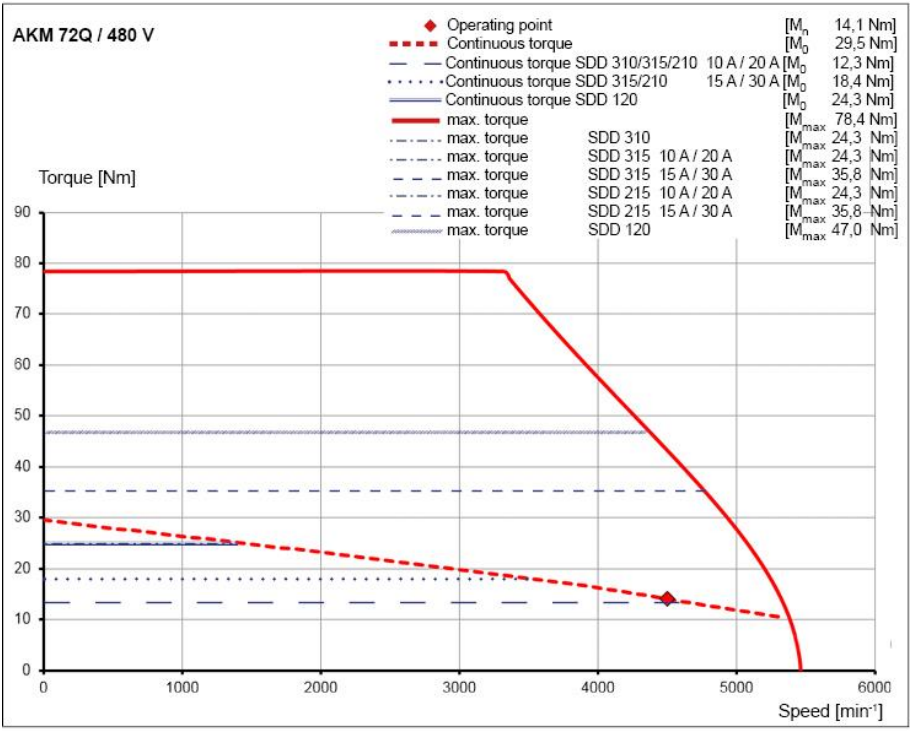
AKM 72P


AKM 72P / 400 V
Operating point [Mn 20,1 Nm]
Continuous torque [M0 29,4 Nm]
Continuous torque SDD 310 [M0 15,4 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 15,4 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 22,8 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 15,4 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 22,8 Nm]
max. torque [Mmax 78,5 Nm]
max. torque SDD 310 [Mmax 30,1 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,1 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 44,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 30,1 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 44,1 Nm]
max. torque SDD 120 [Mmax 57,5 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

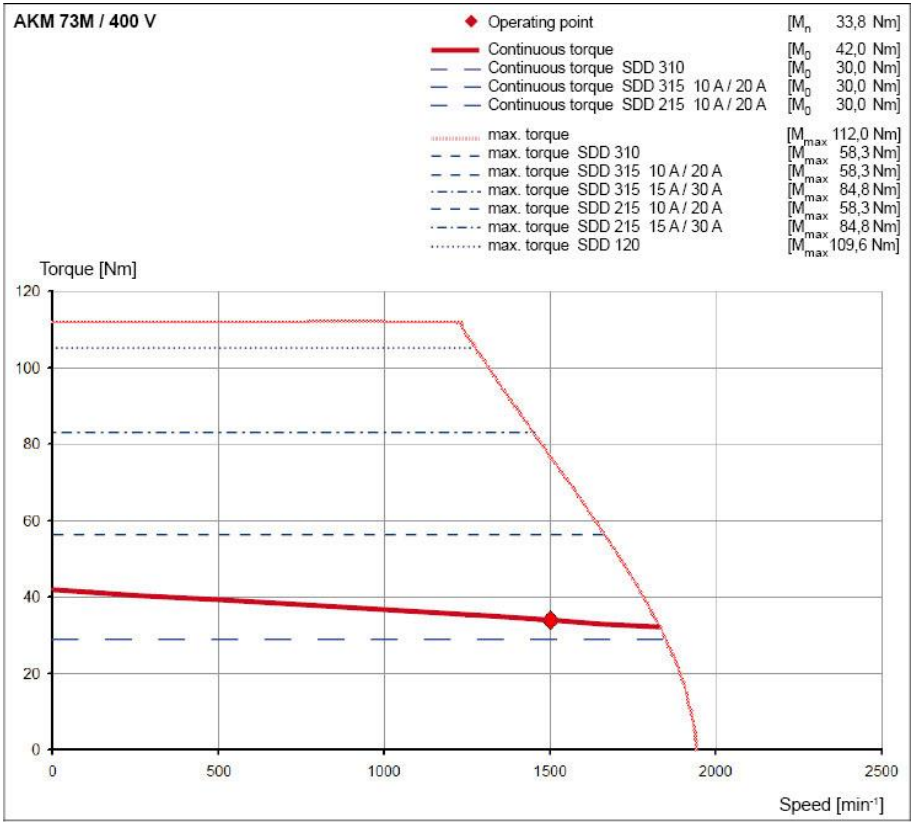

AKM 72P / 480 V
Operating point [Mn 18,2 Nm]
Continuous torque [M0 29,4 Nm]
Continuous torque SDD 310 [M0 15,4 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 15,4 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 15,4 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 22,8 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 22,8 Nm]
max. torque [Mmax 78,5 Nm]
max. torque SDD 310 [Mmax 30,1 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 30,1 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 44,1 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 30,1 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 44,1 Nm]
max. torque SDD 120 [Mmax 57,5 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Speed [min-1]

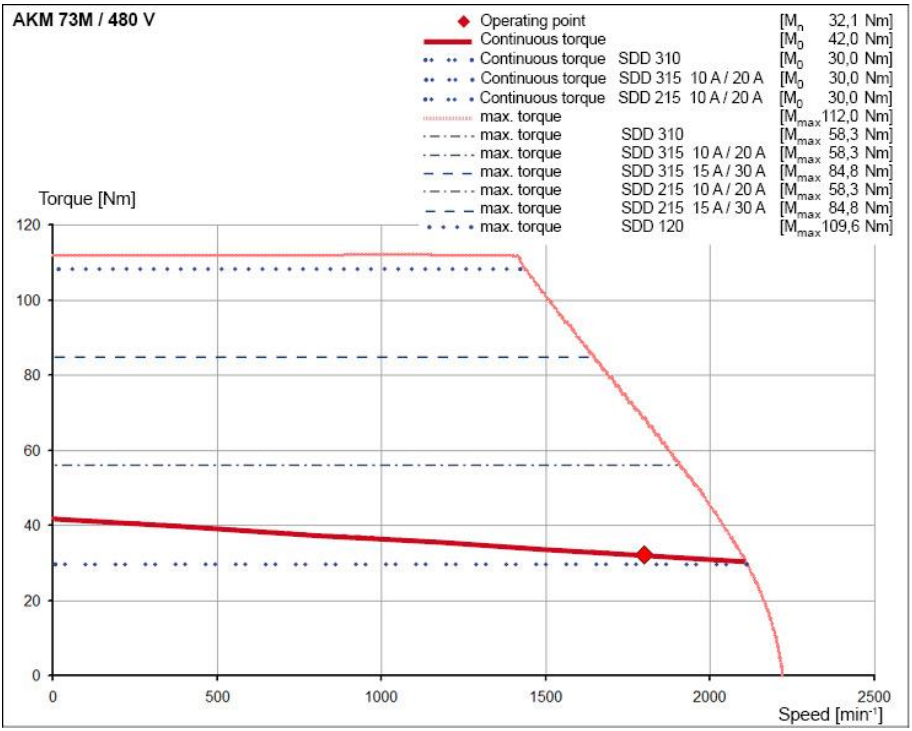
AKM 72Q


AKM 72Q / 400 V
Operating point [Mn 16,3 Nm]
Continuous torque [M0 29,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 12,3 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 18,4 Nm]
Continuous torque SDD 120 [M0 24,3 Nm]
max. torque [Mmax 78,4 Nm]
max. torque SDD 310 [Mmax 24,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 24,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 35,8 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 24,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 35,8 Nm]
max. torque SDD 120 [Mmax 47,0 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

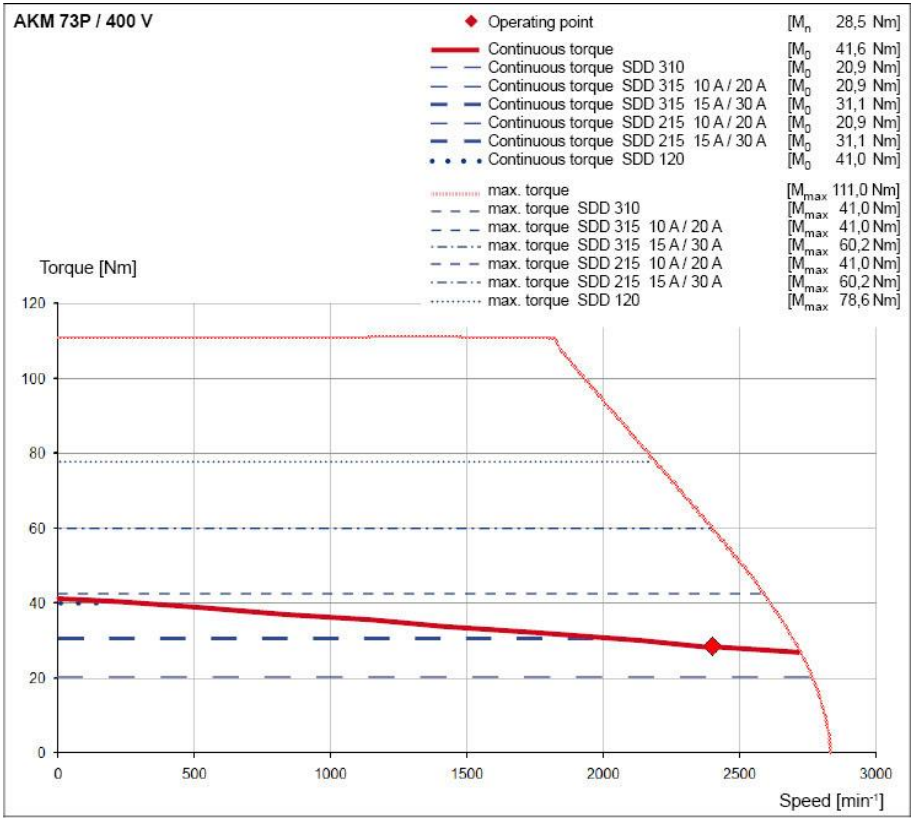

AKM 72Q / 480 V
Operating point [Mn 14,1 Nm]
Continuous torque [M0 29,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 12,3 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 18,4 Nm]
Continuous torque SDD 120 [M0 24,3 Nm]
max. torque [Mmax 78,4 Nm]
max. torque SDD 310 [Mmax 24,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 24,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 35,8 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 24,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 35,8 Nm]
max. torque SDD 120 [Mmax 47,0 Nm]
Torque [Nm]
90
80
70
60
50
40
30
20
10
0
0
1000
2000
3000
4000
5000
6000
Speed [min-1]

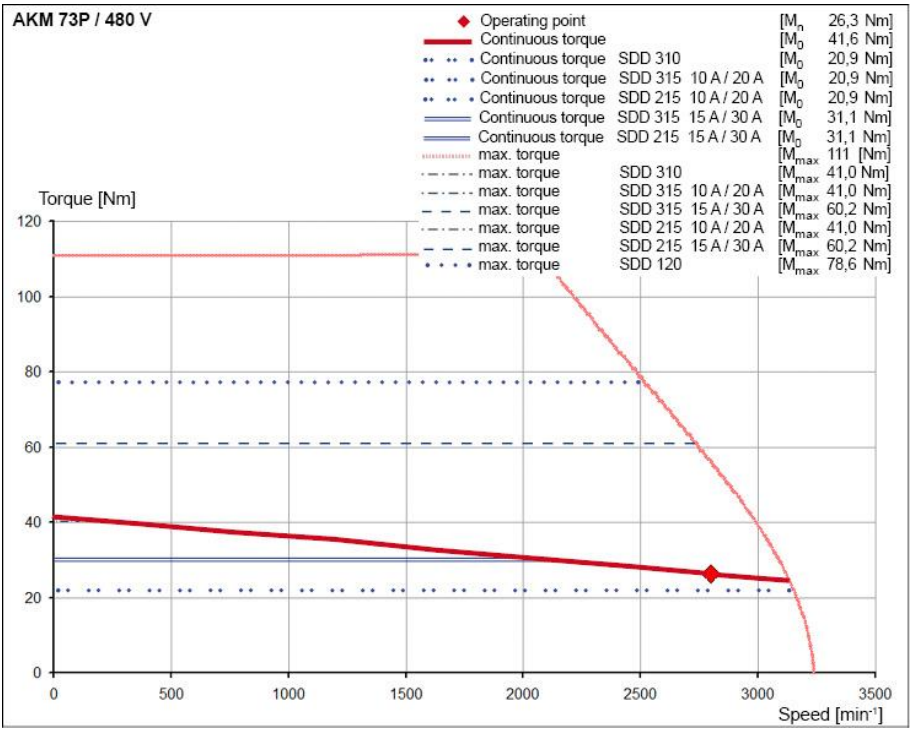
AKM 73M


AKM 73M / 400 V
Operating point [Mn 33,8 Nm]
Continuous torque [M0 42,0 Nm]
Continuous torque SDD 310 [M0 30,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 30,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 30,0 Nm]
max. torque [Mmax 112,0 Nm]
max. torque SDD 310 [Mmax 58,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 58,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 84,8 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 58,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 84,8 Nm]
max. torque SDD 120 [Mmax 109,6 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
Speed [min-1]

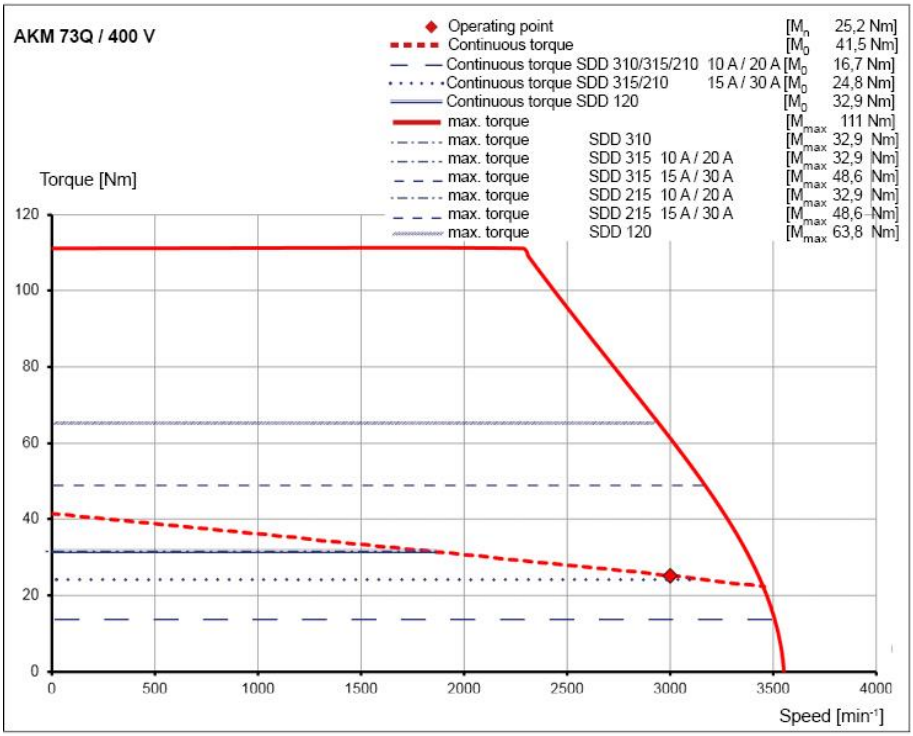

AKM 73M / 480 V
Operating point [Mn 32,1 Nm]
Continuous torque [M0 42,0 Nm]
Continuous torque SDD 310 [M0 30,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 30,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 30,0 Nm]
max. torque [Mmax 112,0 Nm]
max. torque SDD 310 [Mmax 58,3 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 58,3 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 84,8 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 58,3 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 84,8 Nm]
max. torque SDD 120 [Mmax 109,6 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
Speed [min-1]

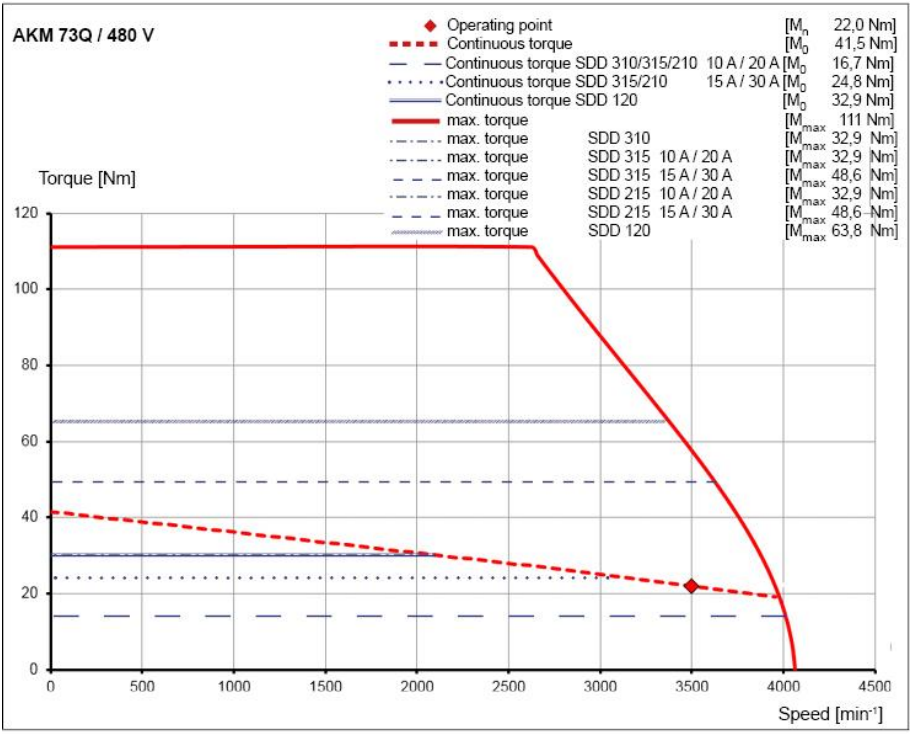
AKM 73P


AKM 73P / 400 V
Operating point [Mn 28,5 Nm]
Continuous torque [M0 41,6 Nm]
Continuous torque SDD 310 [M0 20,9 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 20,9 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 31,1 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 20,9 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 31,1 Nm]
Continuous torque SDD 120 [M0 41,0 Nm]
max. torque [Mmax 111,0 Nm]
max. torque SDD 310 [Mmax 41,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 41,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 60,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 41,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 60,2 Nm]
max. torque SDD 120 [Mmax 78,6 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

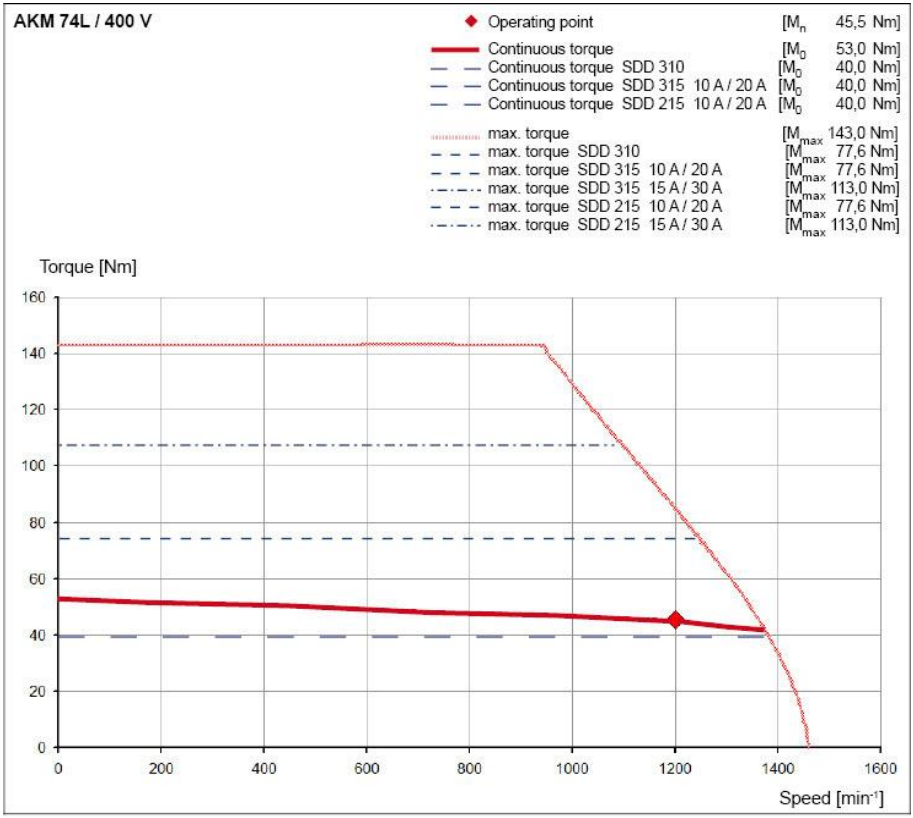

AKM 73P / 480 V
Operating point [Mn 26,3 Nm]
Continuous torque [M0 41,6 Nm]
Continuous torque SDD 310 [M0 20,9 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 20,9 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 20,9 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 31,1 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 31,1 Nm]
max. torque [Mmax 111 [Nm]
max. torque SDD 310 [Mmax 41,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 41,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 60,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 41,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 60,2 Nm]
max. torque SDD 120 [Mmax 78,6 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]

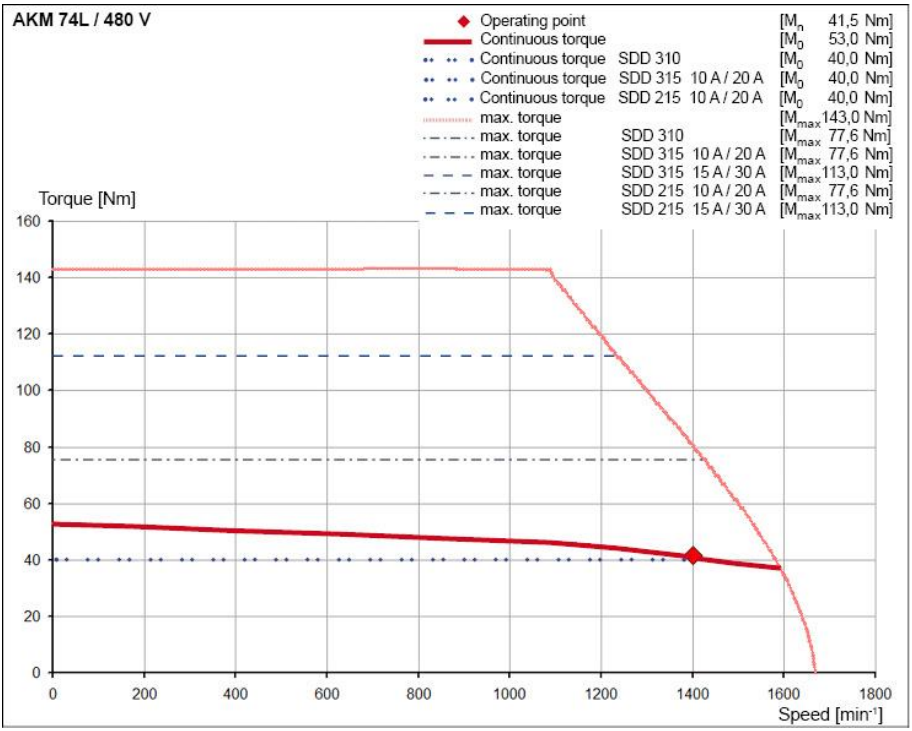
AKM 73Q


AKM 73Q / 400 V
Operating point [Mn 25,2 Nm]
Continuous torque [M0 41,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 16,7 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 24,8 Nm]
Continuous torque SDD 120 [M0 32,9 Nm]
max. torque [Mmax 111 Nm]
max. torque SDD 310 [Mmax 32,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 32,9 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 48,6 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 32,9 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 48,6 Nm]
max. torque SDD 120 [Mmax 63,8 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

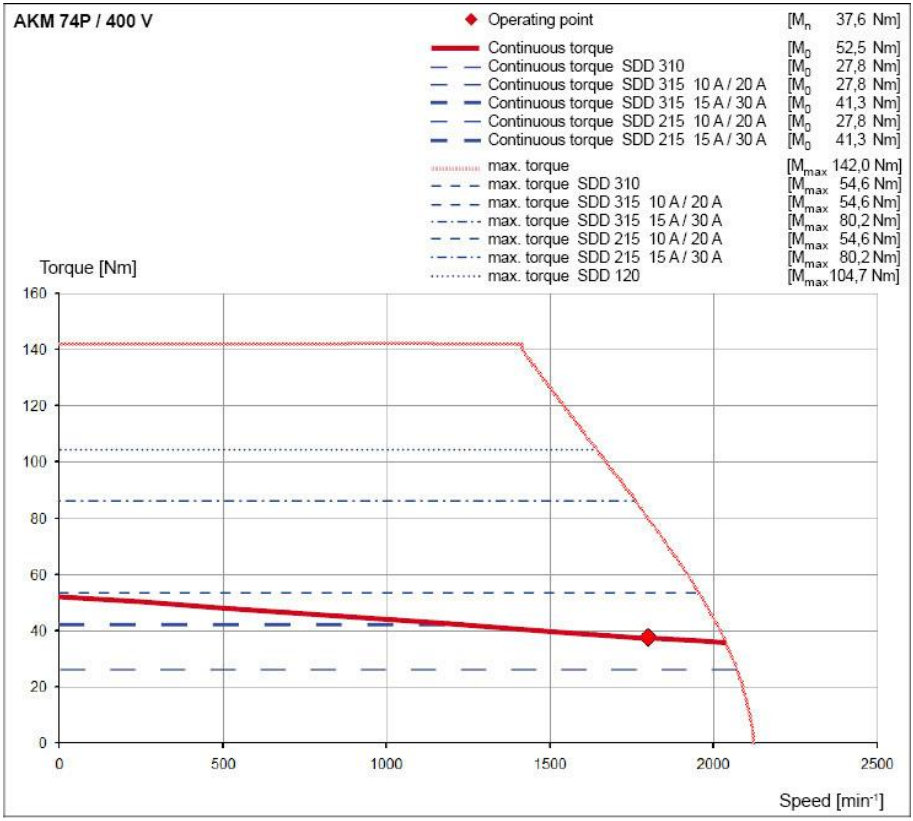

AKM 73Q / 480 V
Operating point [Mn 22,0 Nm]
Continuous torque [M0 41,5 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 16,7 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 24,8 Nm]
Continuous torque SDD 120 [M0 32,9 Nm]
max. torque [Mmax 111 Nm]
max. torque SDD 310 [Mmax 32,9 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 32,9 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 48,6 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 32,9 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 48,6 Nm]
max. torque SDD 120 [Mmax 63,8 Nm]
Torque [Nm]
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Speed [min-1]

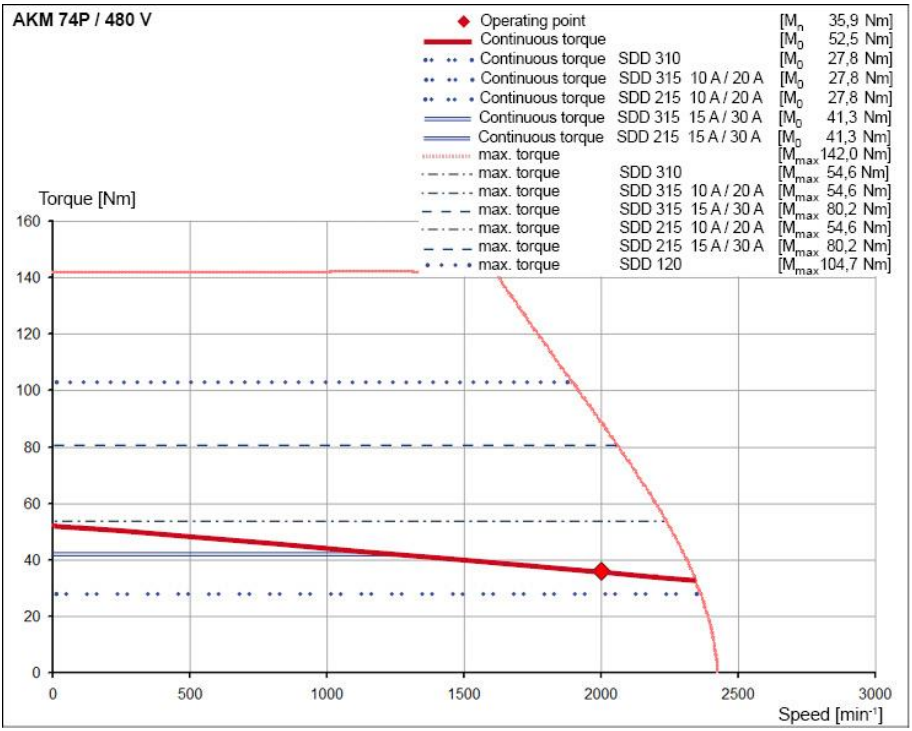
AKM 74L


AKM 74L / 400 V
Operating point [M_n 45,5 Nm]
Continuous torque [M_0 53,0 Nm]
Continuous torque SDD 310 [M_0 40,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M_0 40,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M_0 40,0 Nm]
max. torque [M_{max} 143,0 Nm]
max. torque SDD 310 [M_{max} 77,6 Nm]
max. torque SDD 315 10 A / 20 A [M_{max} 77,6 Nm]
max. torque SDD 315 15 A / 30 A [M_{max} 113,0 Nm]
max. torque SDD 215 10 A / 20 A [M_{max} 77,6 Nm]
max. torque SDD 215 15 A / 30 A [M_{max} 113,0 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1000
1200
1400
1600
Speed [min⁻¹]

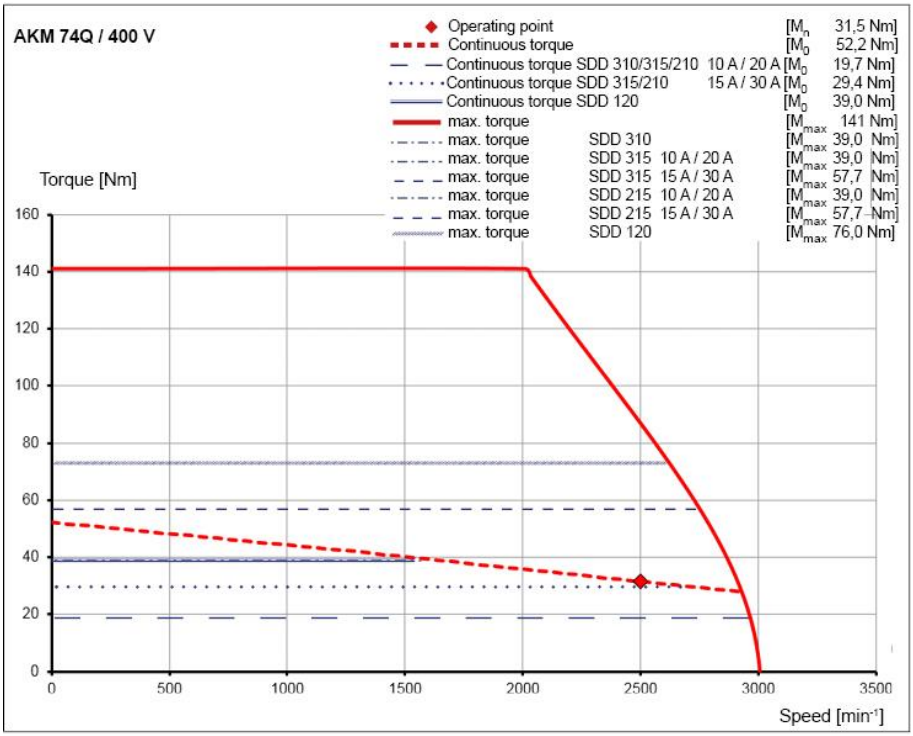

AKM 74L / 480 V
Operating point [Mn 41,5 Nm]
Continuous torque [M0 53,0 Nm]
Continuous torque SDD 310 [M0 40,0 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 40,0 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 40,0 Nm]
max. torque [Mmax 143,0 Nm]
max. torque SDD 310 [Mmax 77,6 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 77,6 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 113,0 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 77,6 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 113,0 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
200
400
600
800
1000
1200
1400
1600
1800
Speed [min-1]

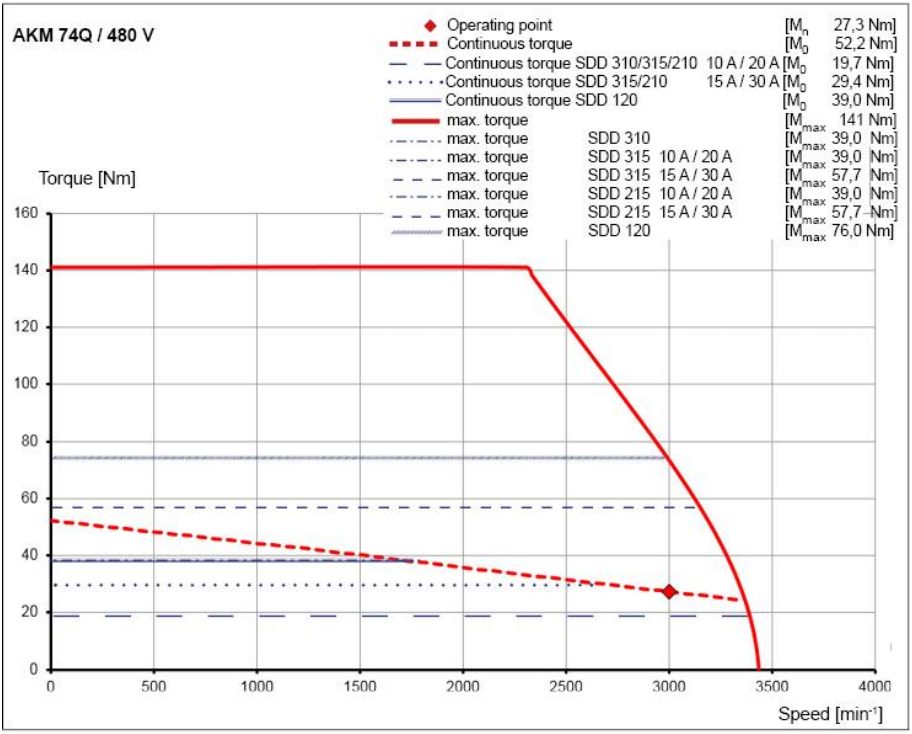
AKM 74P


AKM 74P / 400 V
Operating point [Mn 37,6 Nm]
Continuous torque [M0 52,5 Nm]
Continuous torque SDD 310 [M0 27,8 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 27,8 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 41,3 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 27,8 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 41,3 Nm]
max. torque [Mmax 142,0 Nm]
max. torque SDD 310 [Mmax 54,6 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 54,6 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 80,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 54,6 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 80,2 Nm]
max. torque SDD 120 [Mmax 104,7 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
Speed [min-1]


AKM 74P / 480 V
Operating point [Mn 35,9 Nm]
Continuous torque [M0 52,5 Nm]
Continuous torque SDD 310 [M0 27,8 Nm]
Continuous torque SDD 315 10 A / 20 A [M0 27,8 Nm]
Continuous torque SDD 215 10 A / 20 A [M0 27,8 Nm]
Continuous torque SDD 315 15 A / 30 A [M0 41,3 Nm]
Continuous torque SDD 215 15 A / 30 A [M0 41,3 Nm]
max. torque [Mmax 142,0 Nm]
max. torque SDD 310 [Mmax 54,6 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 54,6 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 80,2 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 54,6 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 80,2 Nm]
max. torque SDD 120 [Mmax 104,7 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
Speed [min-1]

AKM 74Q


AKM 74Q / 400 V
Operating point [Mn 31,5 Nm]
Continuous torque [M0 52,2 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 19,7 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 29,4 Nm]
Continuous torque SDD 120 [M0 39,0 Nm]
max. torque [Mmax 141 Nm]
max. torque SDD 310 [Mmax 39,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 39,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 57,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 39,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 57,7 Nm]
max. torque SDD 120 [Mmax 76,0 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
Speed [min-1]


AKM 74Q / 480 V
Operating point [Mn 27,3 Nm]
Continuous torque [M0 52,2 Nm]
Continuous torque SDD 310/315/210 10 A / 20 A [M0 19,7 Nm]
Continuous torque SDD 315/210 15 A / 30 A [M0 29,4 Nm]
Continuous torque SDD 120 [M0 39,0 Nm]
max. torque [Mmax 141 Nm]
max. torque SDD 310 [Mmax 39,0 Nm]
max. torque SDD 315 10 A / 20 A [Mmax 39,0 Nm]
max. torque SDD 315 15 A / 30 A [Mmax 57,7 Nm]
max. torque SDD 215 10 A / 20 A [Mmax 39,0 Nm]
max. torque SDD 215 15 A / 30 A [Mmax 57,7 Nm]
max. torque SDD 120 [Mmax 76,0 Nm]
Torque [Nm]
160
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
4000
Speed [min-1]

11 Servomotor and Sensor Cables

Highly flexible servomotor and sensor cables for power lines. The oil resistant, abrasion and tear-proof polyurethane jacket allows for use especially in industrial environments.

Advantages:
UL and CSA-certified, halogen-free and flexible at low temperatures. The cables are available in fixed lengths.

Temperature range:
Moveable: -10°C to +60 °C, fixed: -50 °C to +80 °C

Minimum bend radius:
Fixed: 7,5 x D / flexible application: 1,5 mm² - 4,0 mm²: 10 x D from 4,0 mm²: 12 x D

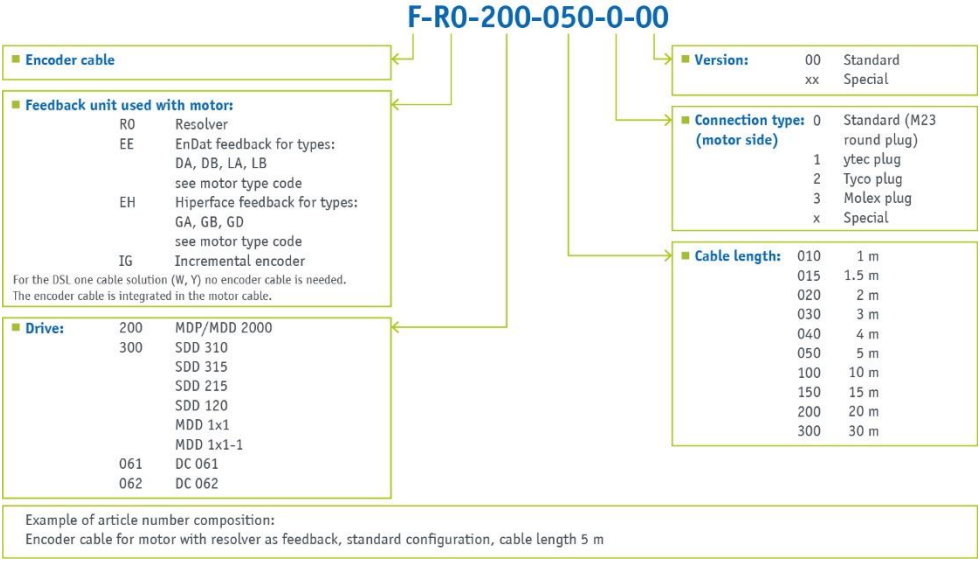
11.1 Sensor Cables

Sensor cables, shielded, preassembled on both ends, drag chain suitable and highly flexible (5 million bend cycles) cables with round plugs on the motor side and module connectors.

Description	Sensor type	Length	Outside diameter
F-R0-061-015-0-00	Resolver	1.5 meters	approx. 6.4 mm
F-R0-061-015-3-00	Resolver	1.5 meters	approx. 6.4 mm
F-R0-061-030-0-00	Resolver	3 meters	approx. 6.4 mm
F-R0-061-030-3-00	Resolver	3 meters	approx. 6.4 mm
F-R0-061-050-0-00	Resolver	5 meters	approx. 6.4 mm
F-R0-061-050-3-00	Resolver	5 meters	approx. 6.4 mm
F-R0-061-100-0-00	Resolver	10 meters	approx. 6.4 mm
F-R0-061-100-3-00	Resolver	10 meters	approx. 6.4 mm
F-RO-300-010-0-00	Resolver	1 meter	approx. 6.4 mm
F-RO-300-020-0-00	Resolver	2 meters	approx. 6.4 mm
F-RO-300-030-0-00	Resolver	3 meters	approx. 6.4 mm
F-RO-300-040-0-00	Resolver	4 meters	approx. 6.4 mm
F-R0-300-050-0-00	Resolver	5 meters	approx. 6.4 mm
F-R0-300-100-0-00	Resolver	10 meters	approx. 6.4 mm
F-R0-300-150-0-00	Resolver	15 meters	approx. 6.4 mm
F-R0-300-200-0-00	Resolver	20 meters	approx. 6.4 mm
F-EE-300-010-0-00	EnDat sensor	1 meter	approx. 7.8 mm
F-EE-300-020-0-00	EnDat sensor	2 meters	approx. 7.8 mm
F-EE-300-030-0-00	EnDat sensor	3 meters	approx. 7.8 mm
F-EE-300-040-0-00	EnDat sensor	4 meters	approx. 7.8 mm
F-EE-300-050-0-00	EnDat sensor	5 meters	approx. 7.8 mm
F-EE-300-100-0-00	EnDat sensor	10 meters	approx. 7.8 mm
F-EE-300-150-0-00	EnDat sensor	15 meters	approx. 7.8 mm
F-EE-300-200-0-00	EnDat sensor	20 meters	approx. 7.8 mm

F-EH-300-010-0-00	Hiperface sensor	1 meter	approx. 7.8 mm
F-EH-300-020-0-00	Hiperface sensor	2 meters	approx. 7.8 mm
F-EH-300-030-0-00	Hiperface sensor	3 meters	approx. 7.8 mm
F-EH-300-040-0-00	Hiperface sensor	4 meters	approx. 7.8 mm
F-EH-300-050-0-00	Hiperface sensor	5 meters	approx. 7.8 mm
F-EH-300-100-0-00	Hiperface sensor	10 meters	approx. 7.8 mm
F-EH-300-150-0-00	Hiperface sensor	15 meters	approx. 7.8 mm
F-EH-300-200-0-00	Hiperface sensor	20 meters	approx. 7.8 mm

11.2 Sensor Cable Type Code



11.3 Motor Cables

For motors with or without holding brakes, shielded, preassembled on both sides, can be used is a power cable carrier and highly flexible (5 million bend cycles) cables with round plugs on the motor side and module connectors.

Description	Brakes	Length	Cable cross section	Outside diameter
For SDD 310 / 315 / 335 / 215 / 120				
M310B-10-1-050-0-00	X	5 meters	1.0 mm^2	10 mm
M310B-10-1-100-0-00	X	10 meters	1.0 mm^2	10 mm
M310B-10-1-150-0-00	X	15 meters	1.0 mm^2	10 mm
M310B-10-1-200-0-00	X	20 meters	1.0 mm^2	10 mm
M310B-15-0-050-0-00		5 meters	1.5 mm^2	9.1 ± 0.4 mm
M310B-15-0-100-0-00		10 meters	1.5 mm^2	9.1 ± 0.4 mm
M310B-15-0-150-0-00		15 meters	1.5 mm^2	9.1 ± 0.4 mm
M310B-15-0-200-0-00		20 meters	1.5 mm^2	9.1 ± 0.4 mm
M310B-15-1-050-0-00	X	5 meters	1.5 mm^2	11.5 mm
M310B-15-1-100-0-00	X	10 meters	1.5 mm^2	11.5 mm
M310B-15-1-150-0-00	X	15 meters	1.5 mm^2	11.5 mm
M310B-15-1-200-0-00	X	20 meters	1.5 mm^2	11.5 mm
M310B-25-0-050-0-00		5 meters	2.5 mm^2	10.6 ± 0.4 mm
M310B-25-0-100-0-00		10 meters	2.5 mm^2	10.6 ± 0.4 mm
M310B-25-0-150-0-00		15 meters	2.5 mm^2	10.6 ± 0.4 mm
M310B-25-0-200-0-00		20 meters	2.5 mm^2	10.6 ± 0.4 mm
M310B-25-1-050-0-00	X	5 meters	2.5 mm^2	13.2 mm
M310B-25-1-100-0-00	X	10 meters	2.5 mm^2	13.2 mm
M310B-25-1-150-0-00	X	15 meters	2.5 mm^2	13.2 mm
M310B-25-1-200-0-00	X	20 meters	2.5 mm^2	13.2 mm

Description	Length	Cable cross sections	Outside diameter
For MDD 111-1/121-1			
M101B-10-1-010-0-00	1 meter	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-020-0-00	2 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-030-0-00	3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-040-0-00	4 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-050-0-00	5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-100-0-00	10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-150-0-00	15 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-200-0-00	20 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M101B-10-1-250-0-00	25 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm

Description	Brake	Length	Cable cross sections	Outside diameter
for DC 061-1/062				
M061E-10-0-015-0-0		1.5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-015-3-0		1.5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-030-0-0		3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-030-3-0		3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-050-0-0		5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-050-3-0		5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-100-0-0		10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-0-100-3-0		10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-015-0-0	X	1.5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-015-3-0	X	1.5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-030-0-0	X	3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-030-3-0	X	3 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-050-0-0	X	5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-050-3-0	X	5 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-100-0-0	X	10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm
M061E-10-1-100-3-0	X	10 meters	4x1 mm^2 + 2x0.5 mm^2	10 mm

11.4 Motor Cable Type Code

M 200 B-15-0-050-0-00

Motor cable

Drive:

200	MDP/MDD 2000
310	SDD 310
	SDD 315
	SDD 215
	SDD 120
100	MDD 111
	MDD121
101	MDD 111-1
	MDD 121-1
061	DC 061-1
062	DC 062

Assembly:

B	both sides
*E	one-sided

*with y-tec only one side is possible

Cable cross section:

*10	1.0 mm²
15	1.5 mm²
25	2.5 mm²
40	4.0 mm²

*with DC and MDD 10X, only 10 possible

Version:

00	Standard
01	drive type 310 only without shield plate
*02	Hiperface DSL (only Drive type 200)
03	Motor thermostat (only Drive type 200)
x	Special

*for encoder types W and Y

Conncetion type: (motor side)

0	Standard (M23 round plug)
1	ytec plug
2	Tyco plug
3	Molex plug
4	M40 Round connectors
x	Special

Cable length:

*010	1 m
**015	1.5 m
*020	2 m
* **030	3 m
*040	4 m
050	5 m
100	10 m
150	15 m
200	20 m
250	25 m
300	30 m

*possible for MDD only
**possible for DC only

Brake:*

0	no brake
1	brake (+2x0.5 mm²)

*only MDD with brake

Example of article number composition:
Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², withou brake, cable length 5 m, Standard configuration

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