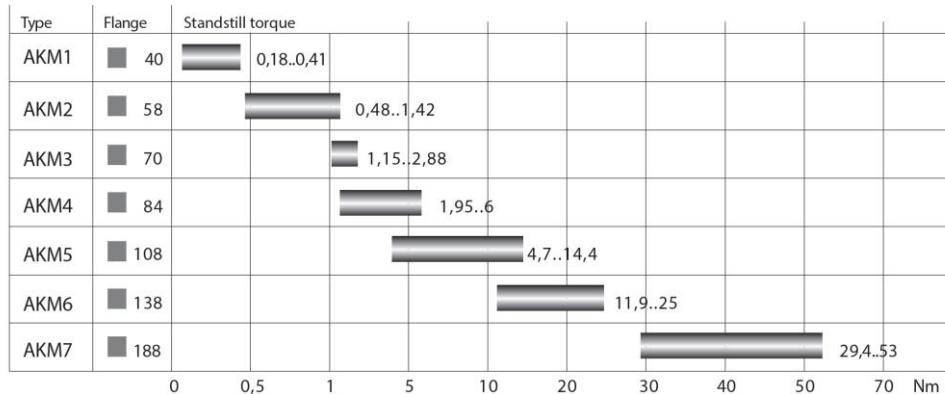


Servo Motors AKM



Select your motor:



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Subject to technical changes that serve to improve the devices!

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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



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

- 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.
-  **WARNING**
- 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.
- **A 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

Theodor 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)

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 BO



Example Servo Motor AKM 4 4 J-AN C N GB BO:
Motortype AKM 44J, flange according to IEC standard, smooth shaft, rotatable 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).

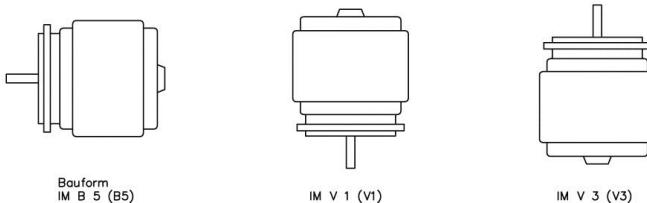
6.2 General Technical Data

Ambient temperature	5...+40°C at an installation height of up to 1000m over NN
(by nominal data)	At ambient temperatures over 40°C and encapsulated installation of the Motor, it is important to consult our applications department.
Permissible humidity nominal data)	95% relative humidity, uncondensed (according to nominal data)
Power reduction above NN (current and torque) at 40 °C	1% ranging from 40°C to 50°C at up to 1000 meters At installation heights above 1000 meters over NN and 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

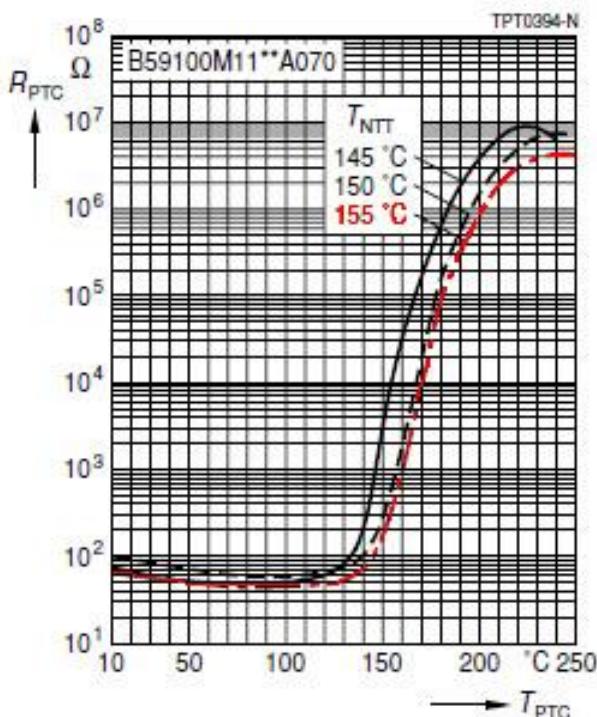
6.3.4 Protection Type

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 $155\text{ }^{\circ}\text{C} \pm 5\%$. 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 | M_0 | [Nm] |
| - Nominal rotation speed at nominal supply voltage | n_n | [min ⁻¹] |
| - Inertial torque from the motor and load | J | [kgcm ²] |
| - Effective torque (calculated) | 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

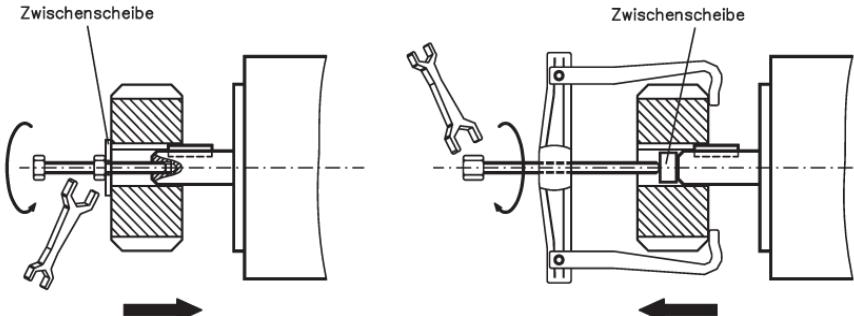
INFO

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.



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
- 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



- 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 servo 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

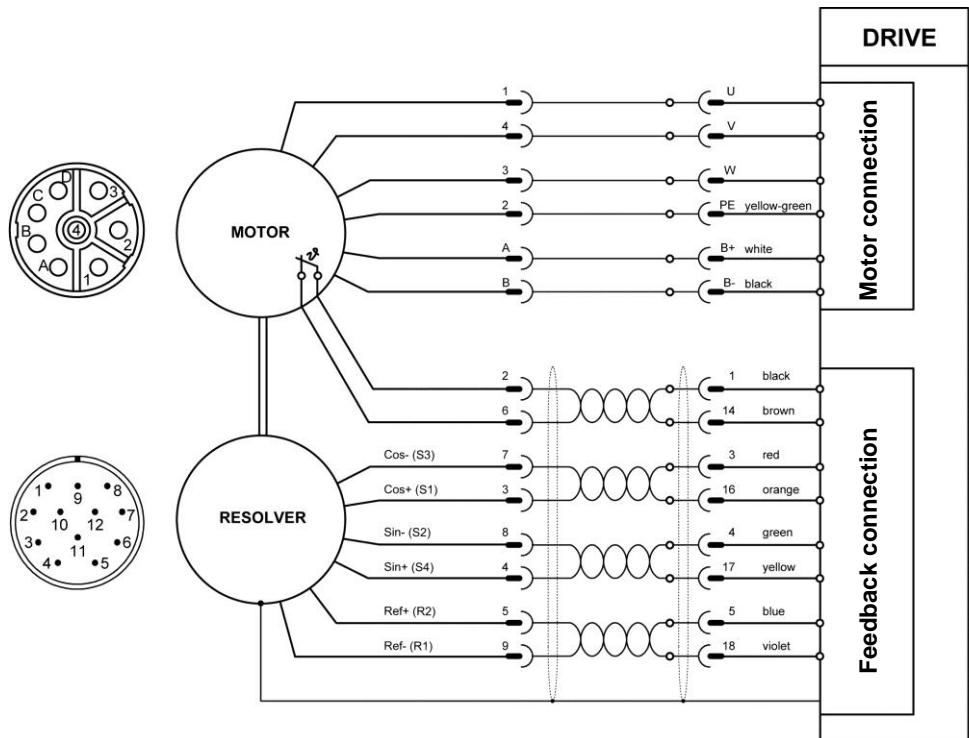
Feedback lines: smaller than 120 pF/m

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

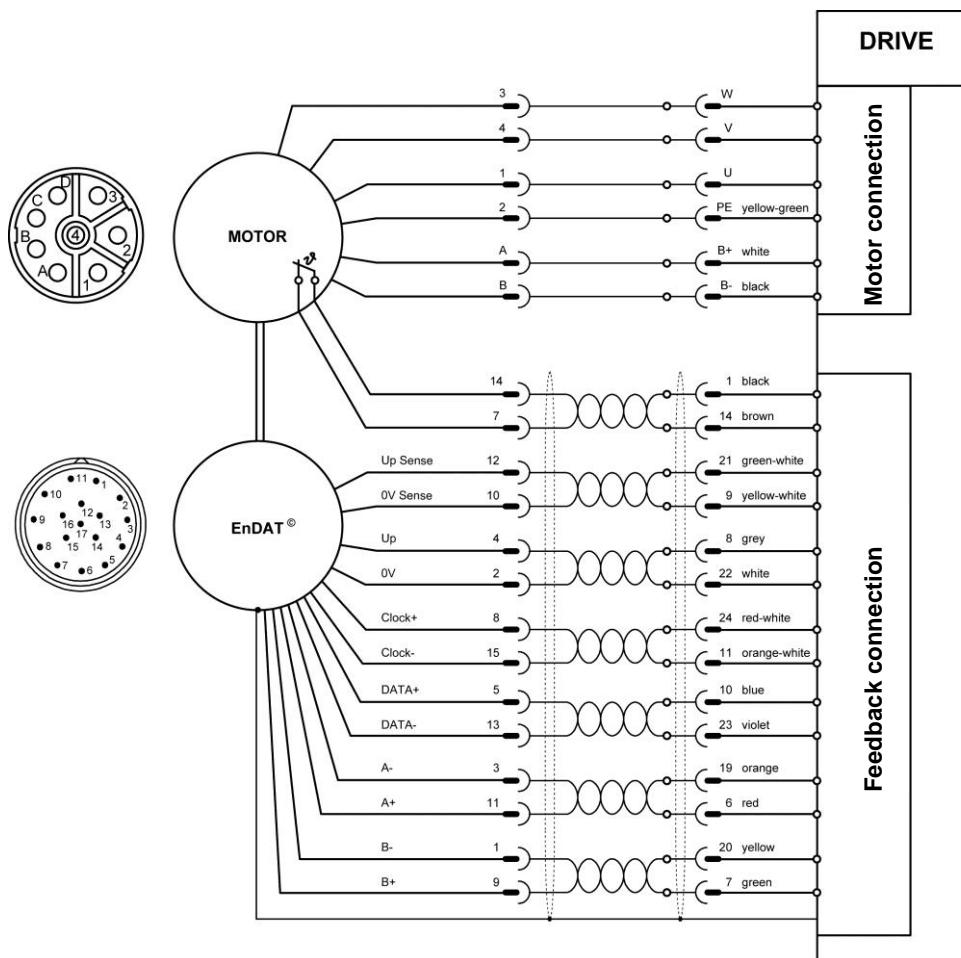
See page 239 ff.

8.4 Connection Diagrams

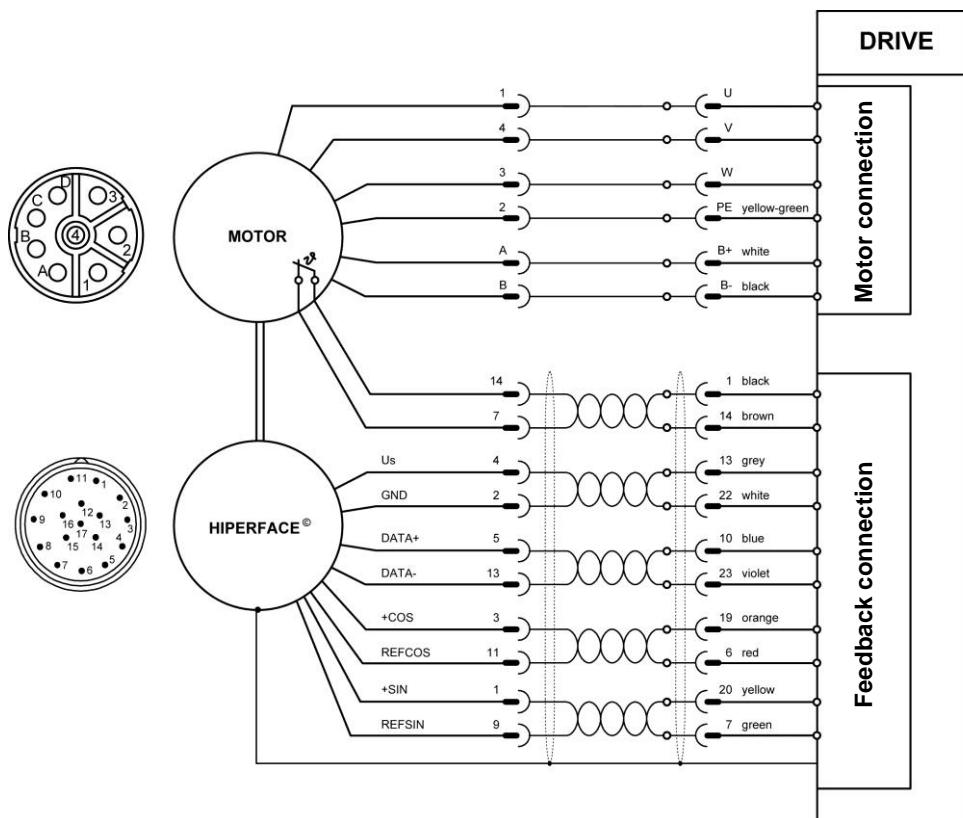
8.4.1 Connection Diagram for Motors with a Resolver



8.4.2 Connection Diagram for Motors with EnDAT



8.4.3 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	<ul style="list-style-type: none"> - Servo amplifier not released - Set value line interrupted - Motor phases interchanged - Brakes not released - Drive is mechanically blocked 	<ul style="list-style-type: none"> - Apply ENABLE signal - Check set value line - Correct motor phases - Check brake control - Check Mechanical parts
Run away motor	<ul style="list-style-type: none"> - Motor phases inverted 	<ul style="list-style-type: none"> - Correct motor phases
Motor vibrates	<ul style="list-style-type: none"> - Resolver line Shielding has been interrupted - Amplification too high 	<ul style="list-style-type: none"> - Replace resolver wire - Use motor default values
Brake error message	<ul style="list-style-type: none"> - Short in the voltage supply for the stop brakes - Brakes defective 	<ul style="list-style-type: none"> - Remove short - Exchange motor
Error message output stage error	<ul style="list-style-type: none"> - Motor line has a short-circuit/ground short- Motor has a short circuit or a ground short 	<ul style="list-style-type: none"> - Exchange cable - Exchange motor
Resolver error message	<ul style="list-style-type: none"> - Resolver plug is connected incorrectly - Resolver cable is broken or crimped 	<ul style="list-style-type: none"> - Check connector plug - Check cable
Motor temperature error message	<ul style="list-style-type: none"> - Motor thermo switch has activated - Resolver plug is loose or the Resolver cable is broken 	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Required stop torque too high - Brakes defective 	<ul style="list-style-type: none"> - 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 $n < 100 \text{ min}^{-1}$ 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 $I_{0\text{rms}}$ [A]

The idle current is the effective sinusoidal current value that the motor draws at $n < 100 \text{ min}^{-1}$, in order to deliver the idling torque.

Peak Current (Pulse Current) $I_{0\text{max}}$ [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 $K_{T\text{rms}}$ [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 $K_{E\text{rms}}$ [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:

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

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 $0,63 \times 100$ Kelvin over temperature. With a peak current load, the warming time is significantly shorter.

Brake Reaction Time Air Delay time t_{BRH} [ms] / Engage 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 [kgcm ²]	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)

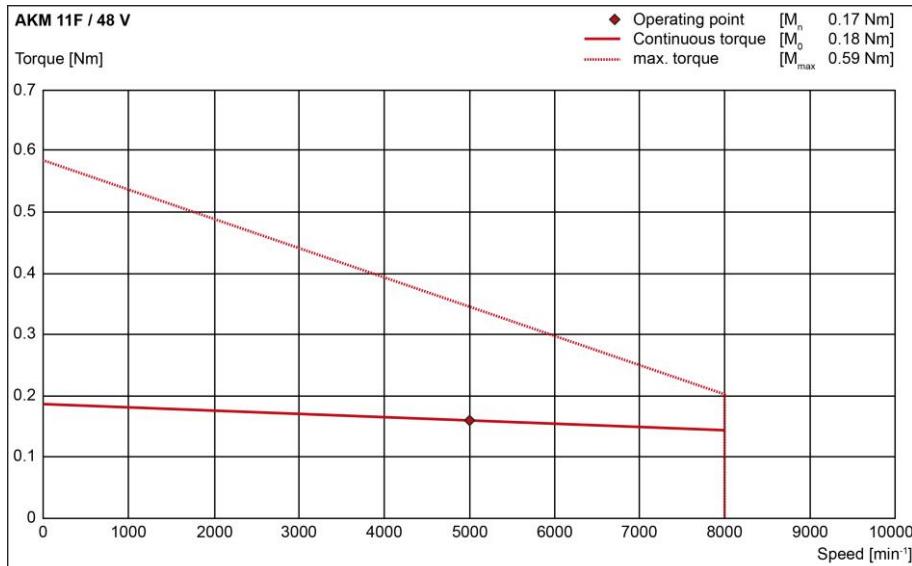
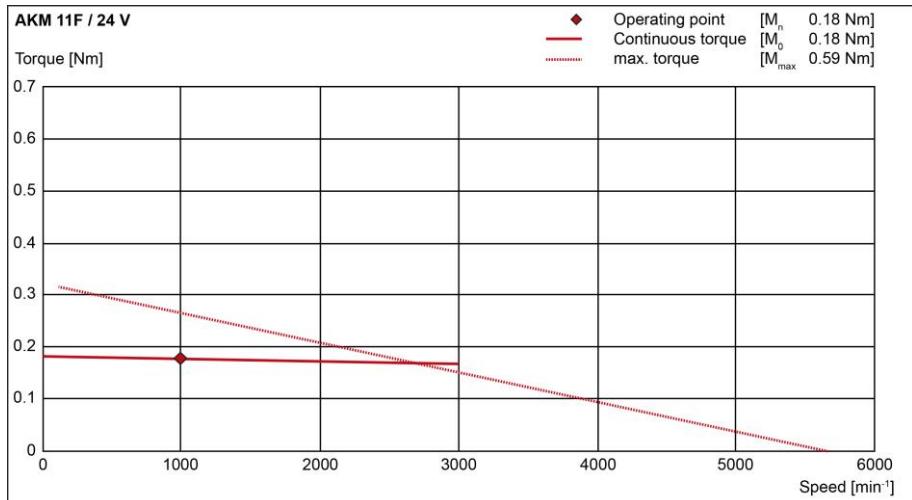
11F, 12E	see chapter 10.3.4 Dimensional Drawing
21J, 22H	see chapter 10.4.5 Dimensional Drawing
31K	see chapter 10.5.5 Dimensional Drawing

10.2.5 Radial Force on the Shaft End

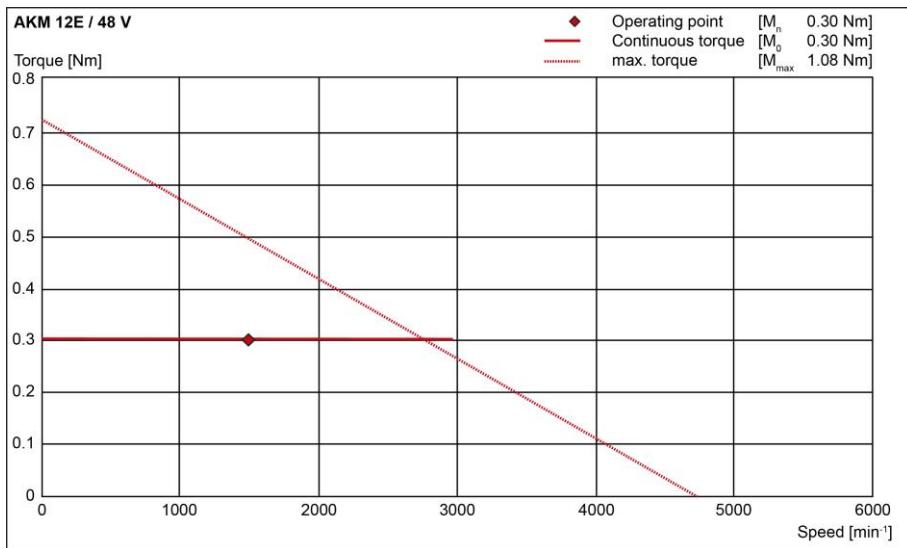
11F, 12E	see chapter 10.3.5 Radial Force on the Shaft End
21J, 22H	see chapter 10.4.6 Radial Force on the Shaft End
31K	see chapter 10.5.6 Radial Force on the Shaft End

10.2.6 Motor Characteristics U_n 24/48 V

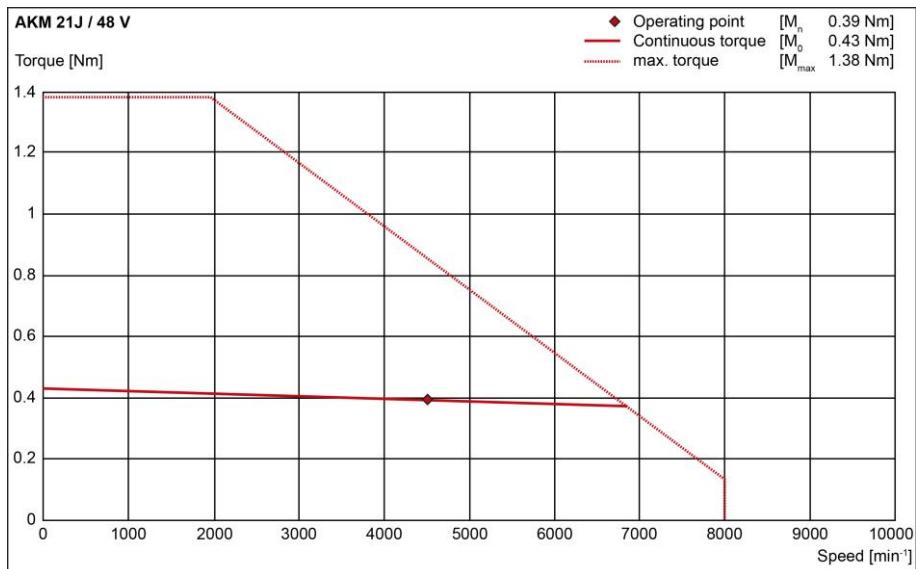
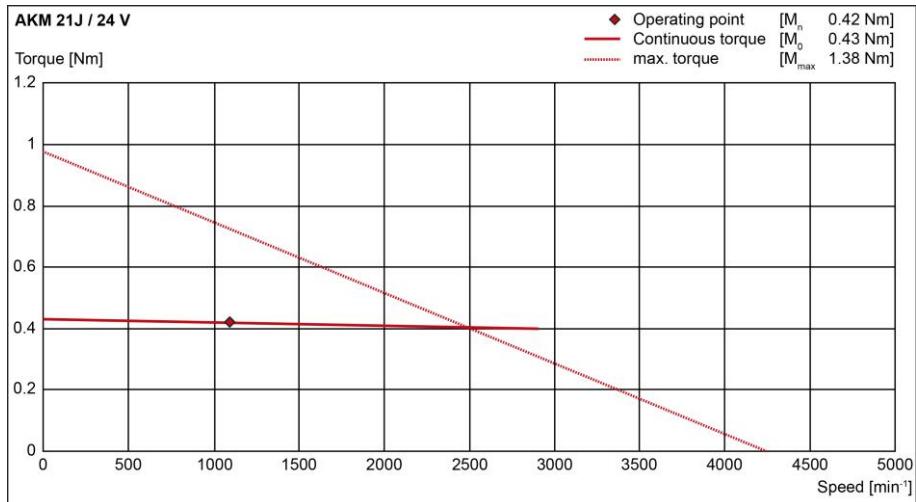
AKM 11F

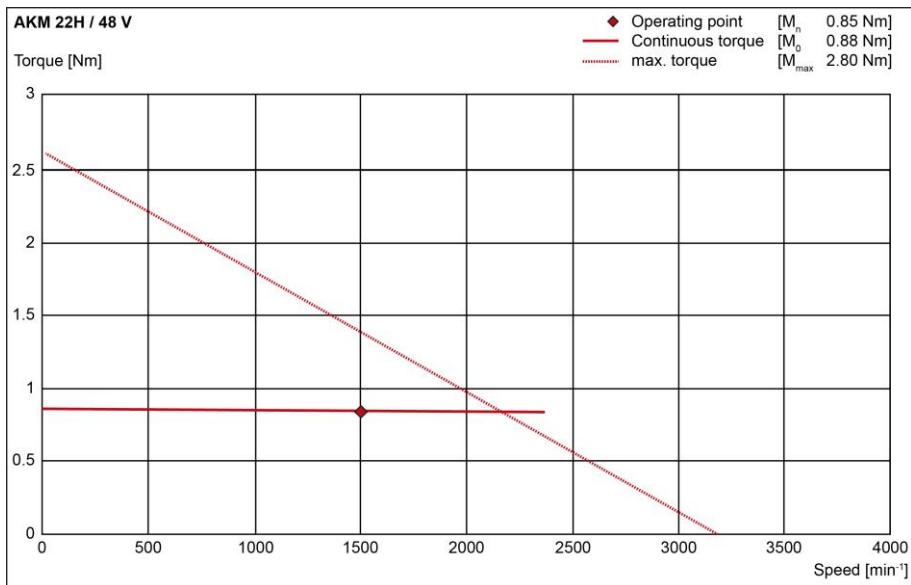
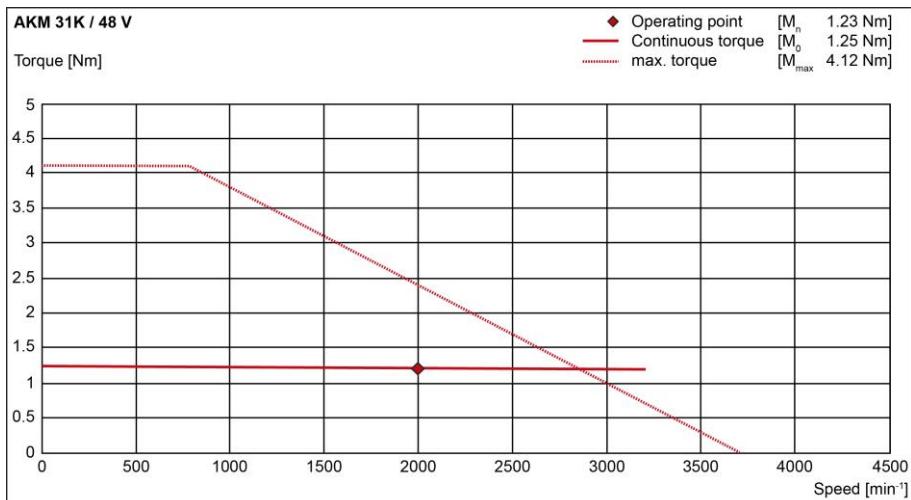


AKM 12E



AKM 21J



AKM 22H**AKM 31K**

10.3 AKM1

10.3.1 Technical Data

Data	Symbol [Unit]	AKM		
		11B	12C	13C
Electrical data				
U _N 230V	Standstill torque*	M ₀ [Nm]**	0,18	0,31
	Standstill current	I _{0rms} [A]**	1,16	1,51
	Max. nominal supply voltage	U _N [VAC]	230VAC	
U _N 230V	Nominal rotation speed	n _n [min ⁻¹]	8000	8000
	Nominal torque*	M _n [Nm]	0,17	0,28
	Nominal power	P _n [kW]	0,14	0,23
	Nominal current	I _n [A]	1,06	1,33
	Peak current	I _{0max} [A]	4,6	6
	Peak torque	M _{0max} [Nm]	0,61	1,08
	Torque constant	K _{Trms} [Nm/A]	0,16	0,21
	Voltage constant	K _{Erms} [mV/min]	10,2	13,3
	Winding resistance Ph-Ph	R ₂₅ [Ω]	18,2	12,4
	Winding inductance Ph-Ph	L [mH]	12,5	9,1
Mechanical Data				
	Rotor inertial torque	J [kgcm ²]	0,017	0,031
	Number of motor contacts		6	6
	Static drag torque	M _R [Nm]	0,0011	0,0021
	Thermal time constant	t _{TH} [min]	4	6
	Weight standard	G [kg]	0,35	0,49
	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 0,18mm ²

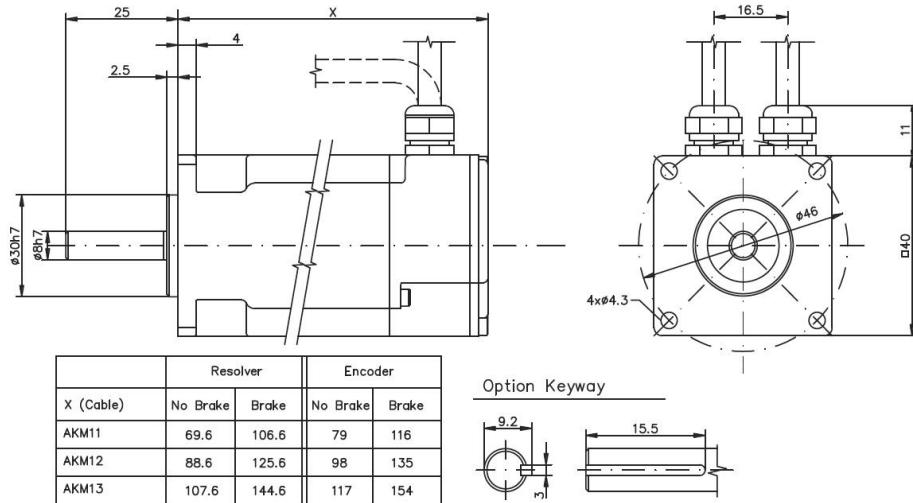
The wire diameters above are based on cable lengths of up to 20 m. For lengths over 20 m, the SIGMATEK applications department should be consulted.

10.3.3 Maximum and Continuous Torque

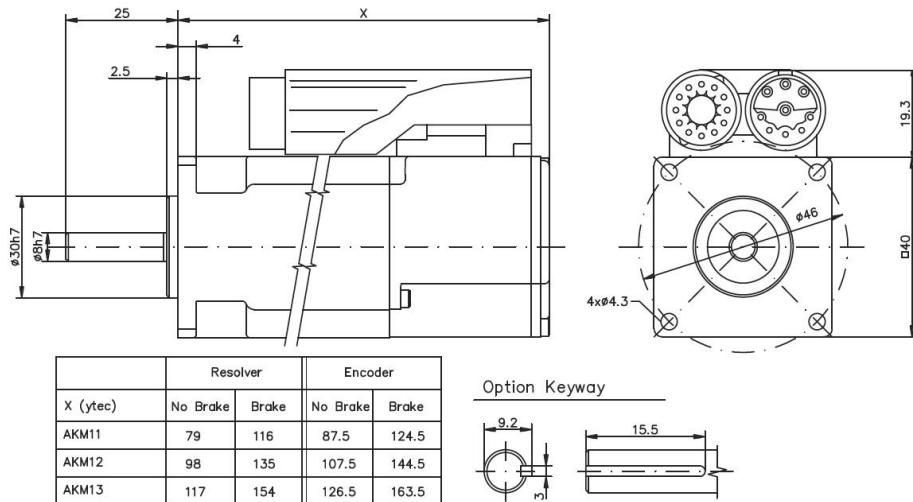
Power supply 1 x 230 V

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

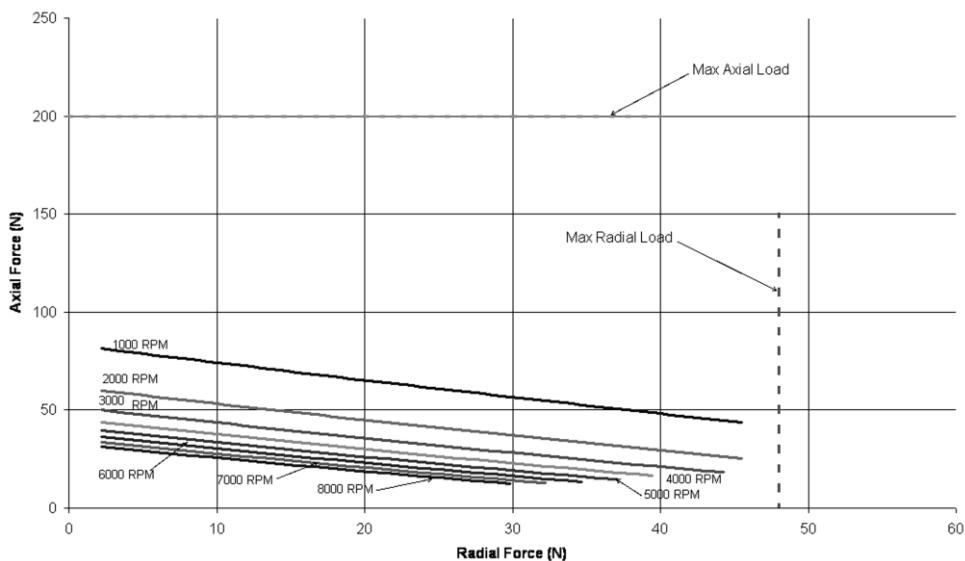
10.3.4 Dimensional Drawing (schematic diagram)



with mounted Y-TEC connectors

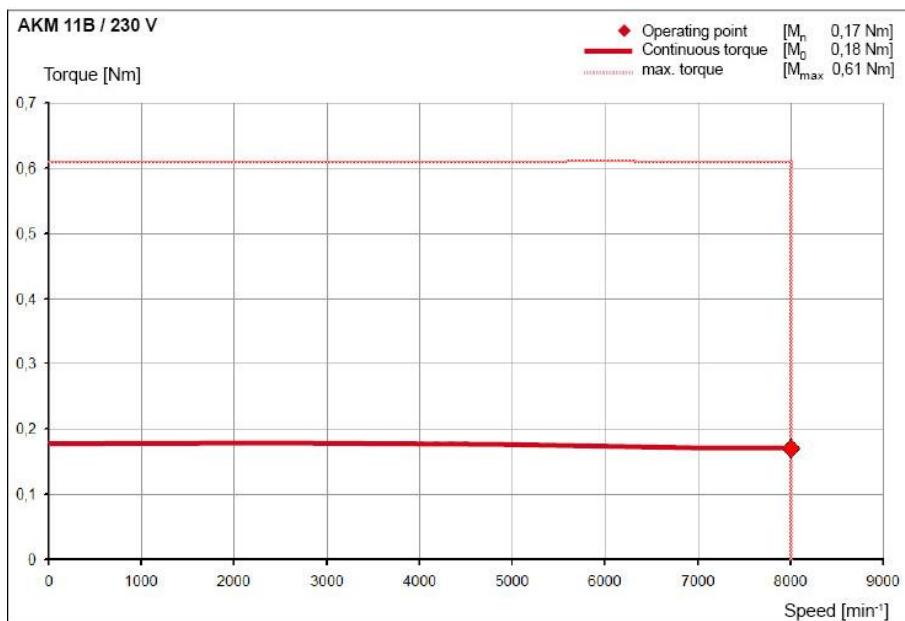


10.3.5 Radial Force on the Shaft End

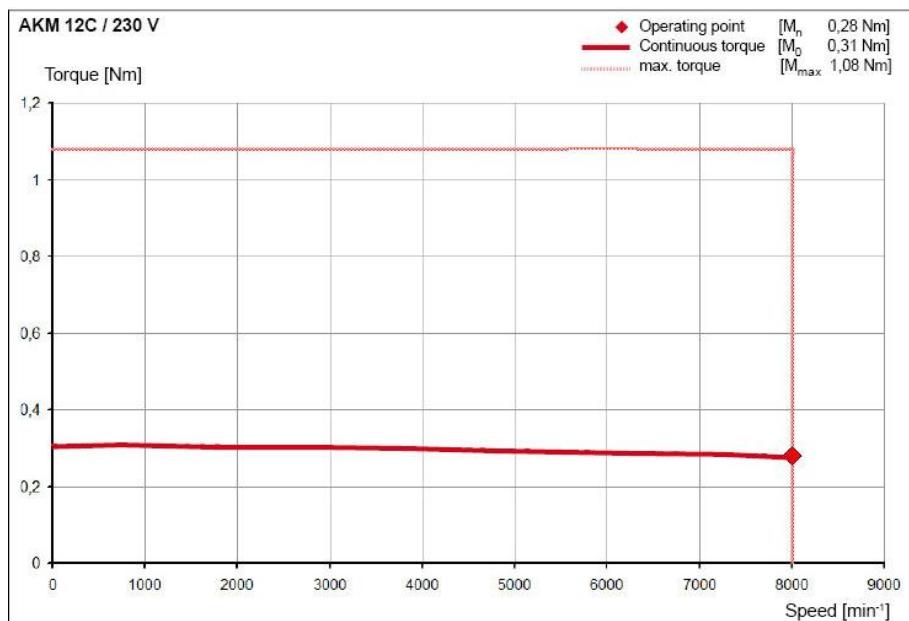


10.3.6 Motor Characteristics U_n 230 V

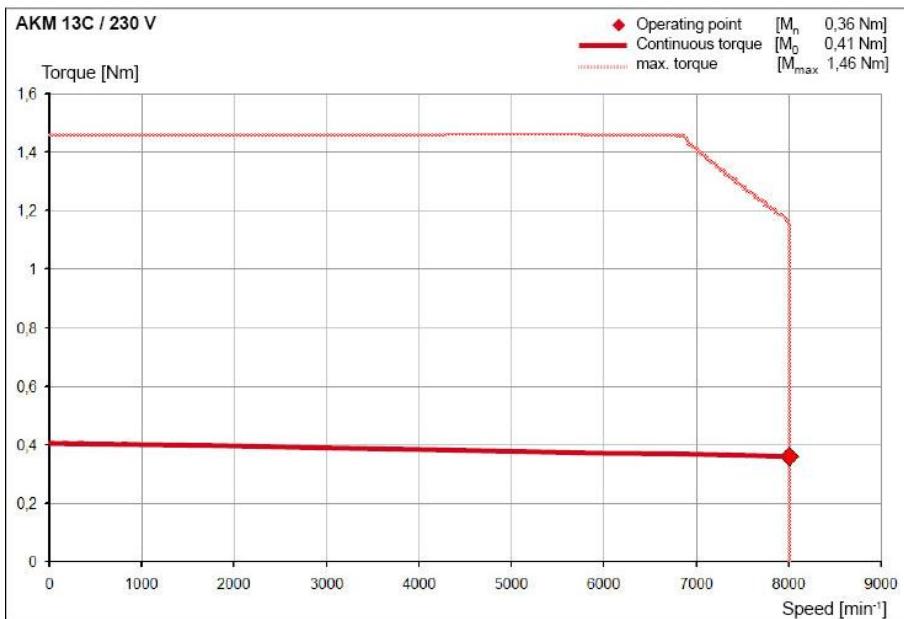
AKM 11B



AKM 12C



AKM 13C



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} [mV/min]	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 [kgcm ²]	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								
UN = 230V	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 = 400V	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 = 480V	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	—
	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 [mV/min]	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 [kgcm ²]	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} [kgcm ²]	0,011
Air delay time	t _{BRH} [ms]	20
Engage 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

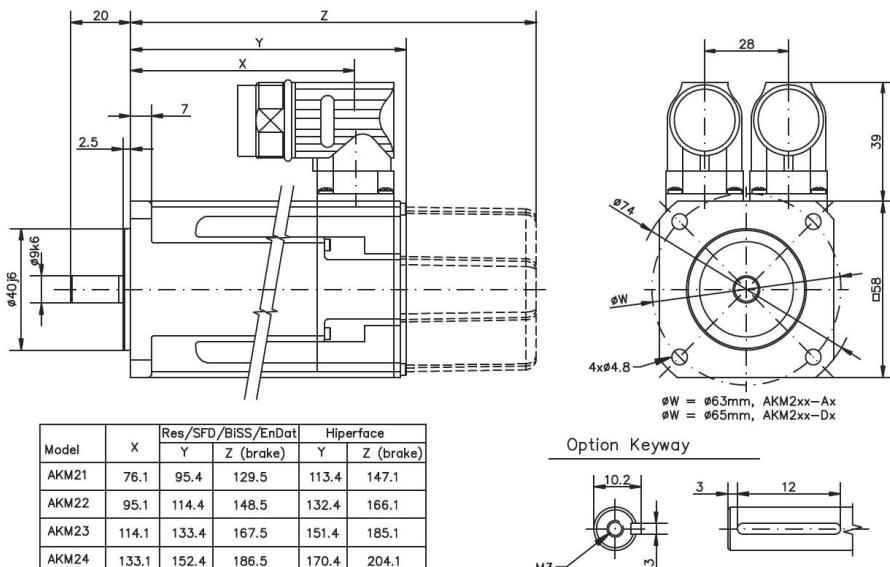
Power supply 3 x 400 V

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

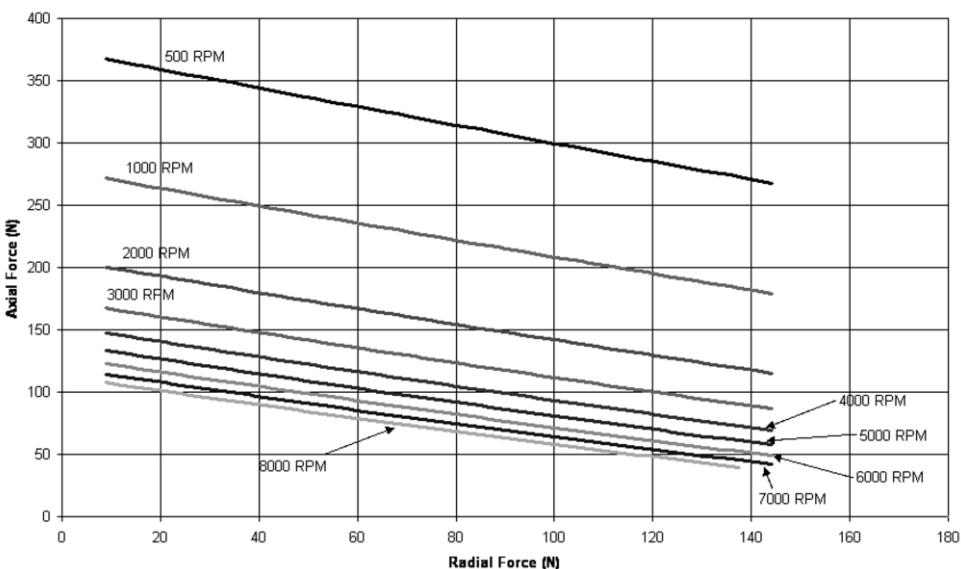
Power supply 3 x 480 V

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

10.4.5 Dimensional Drawing (schematic diagram)

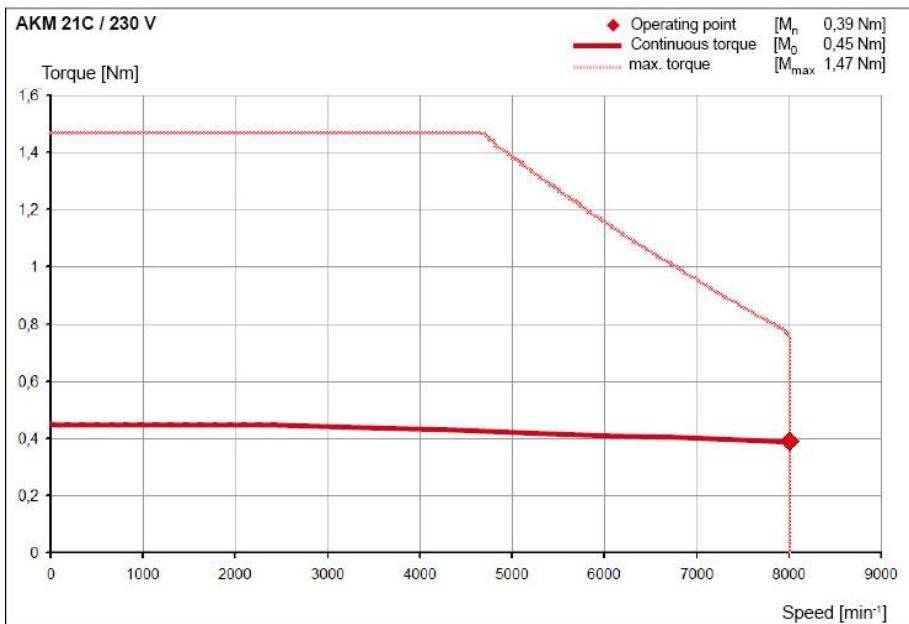


10.4.6 Radial Force on the Shaft End

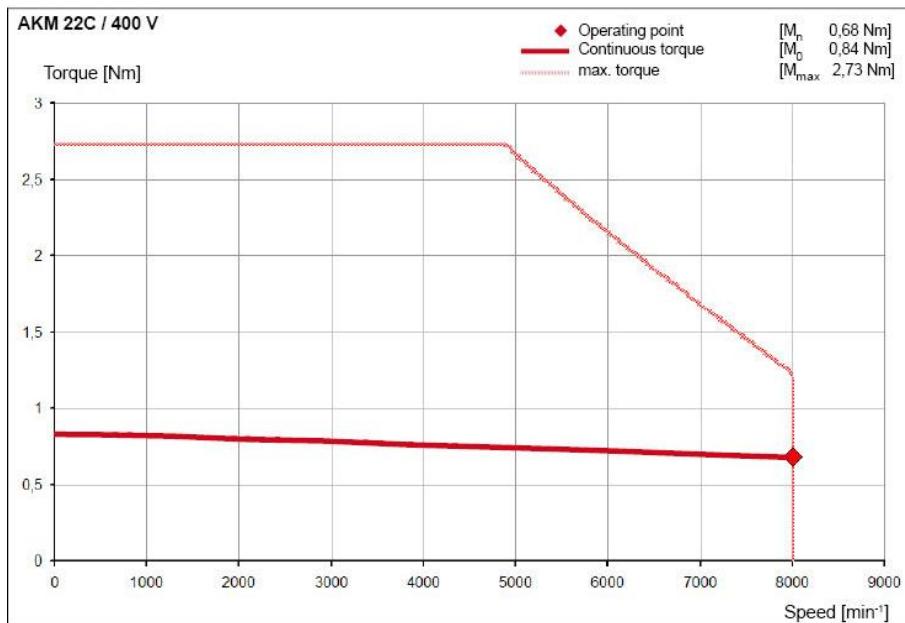
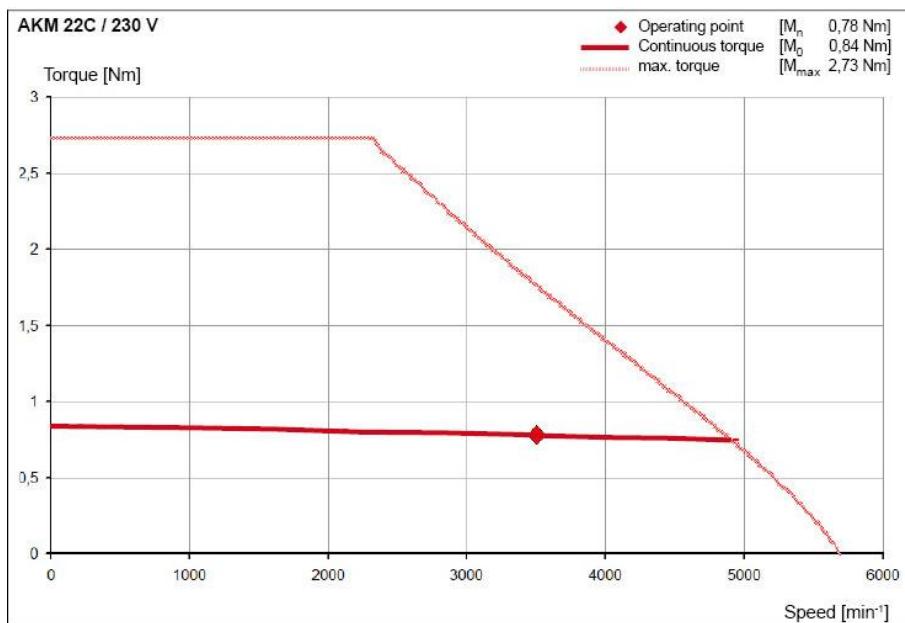


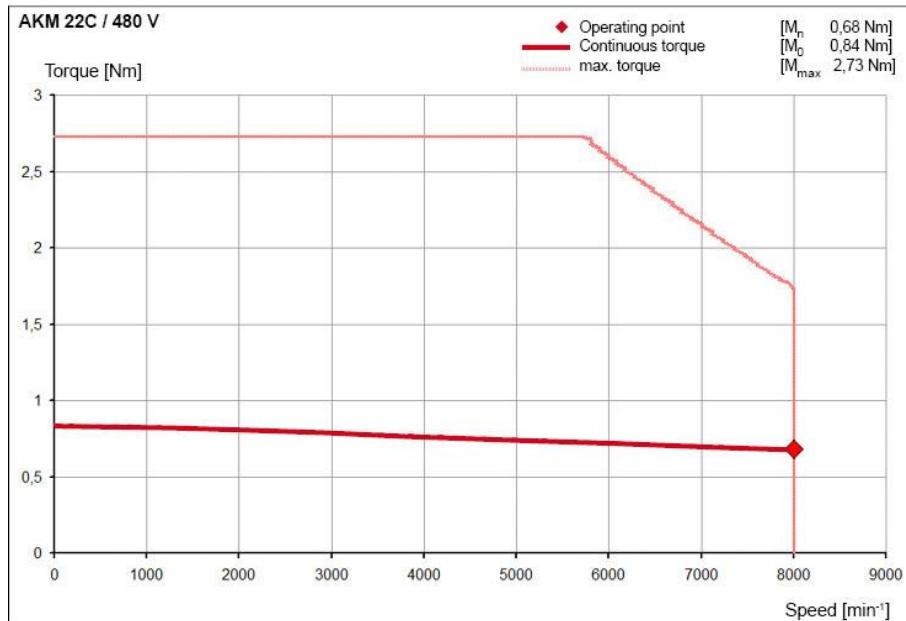
10.4.7 Motor Characteristics

AKM 21C

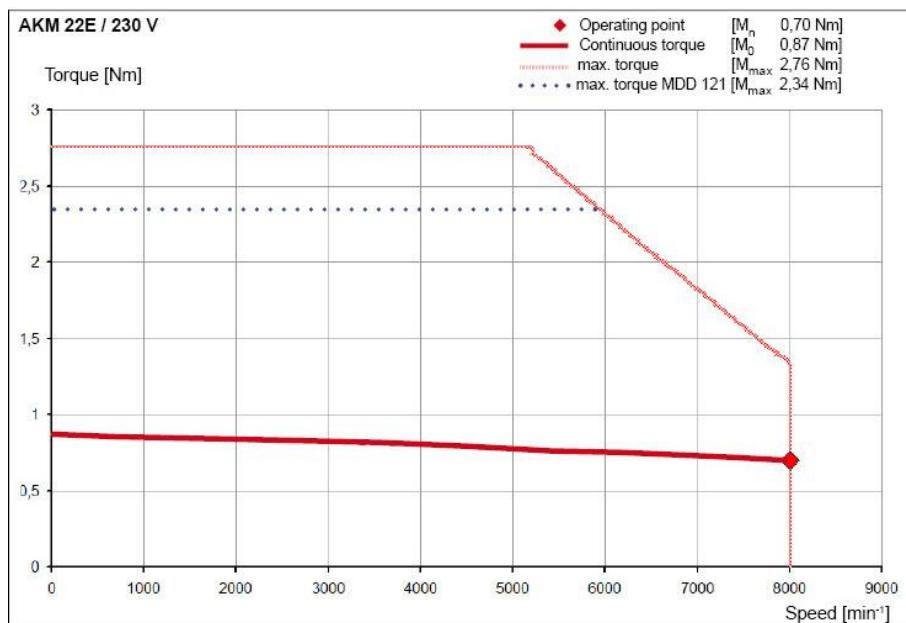


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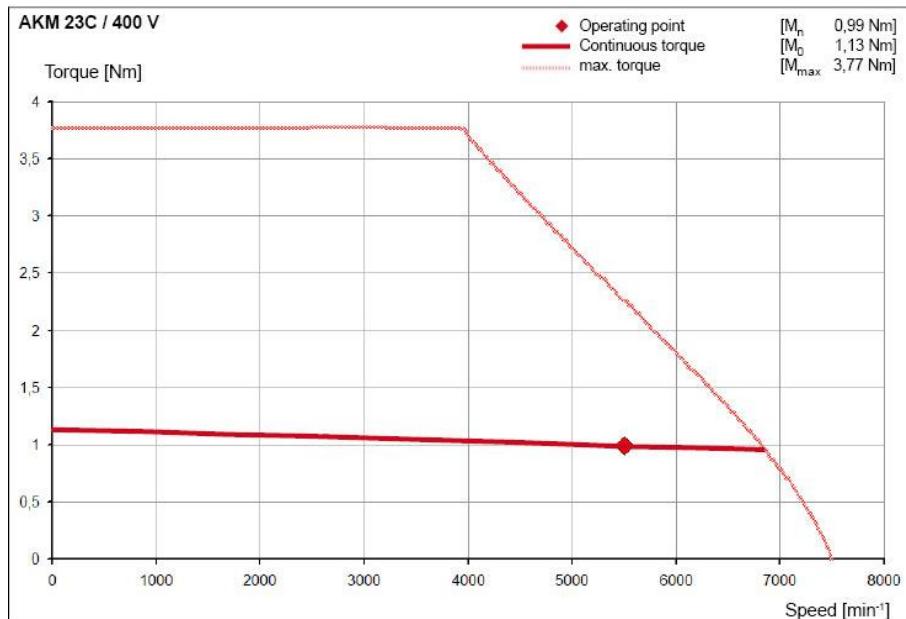
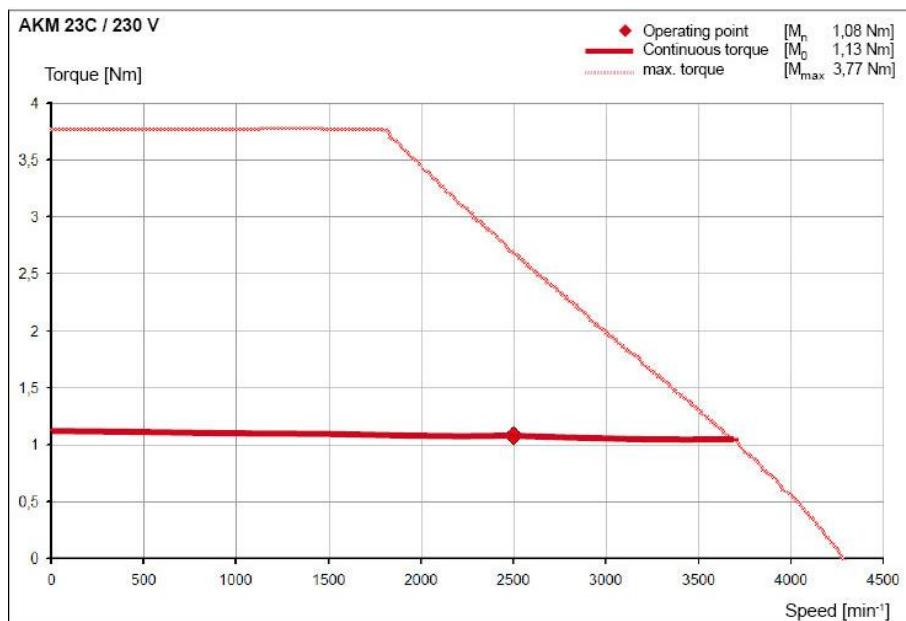


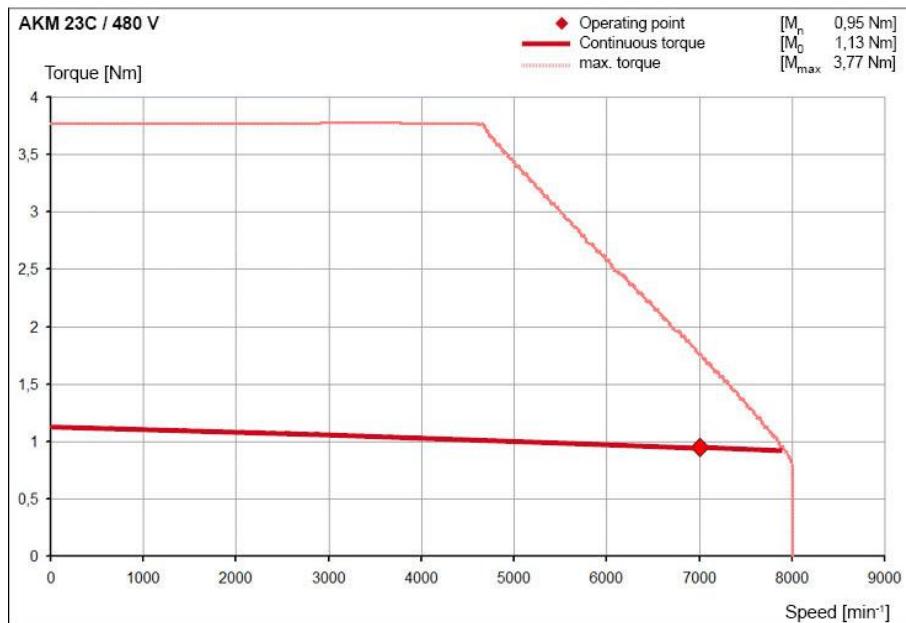


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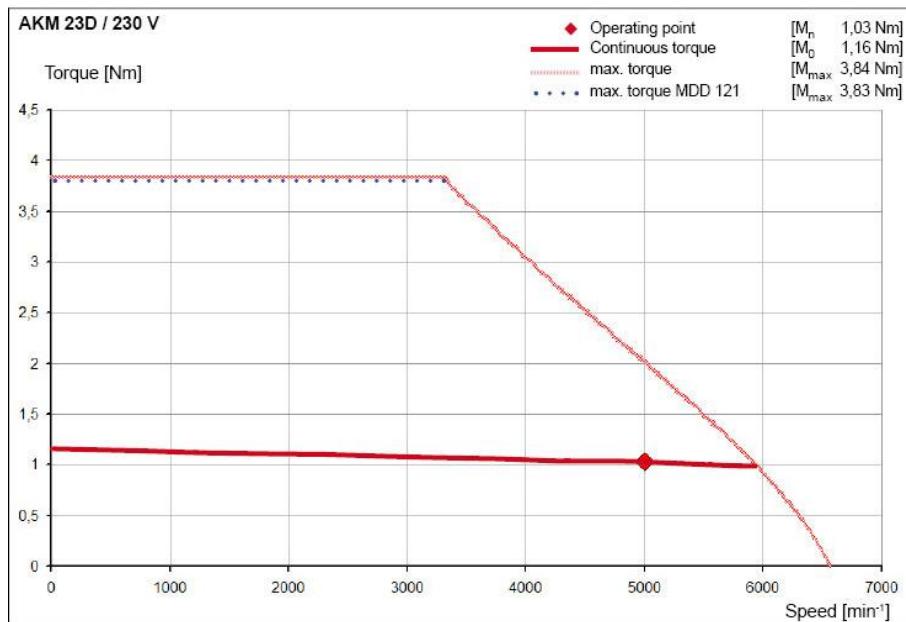


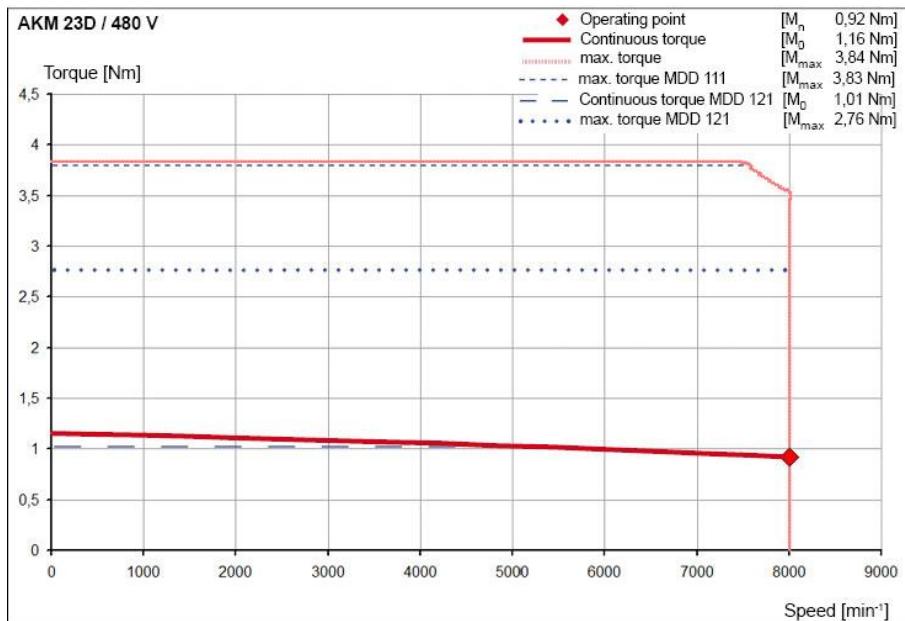
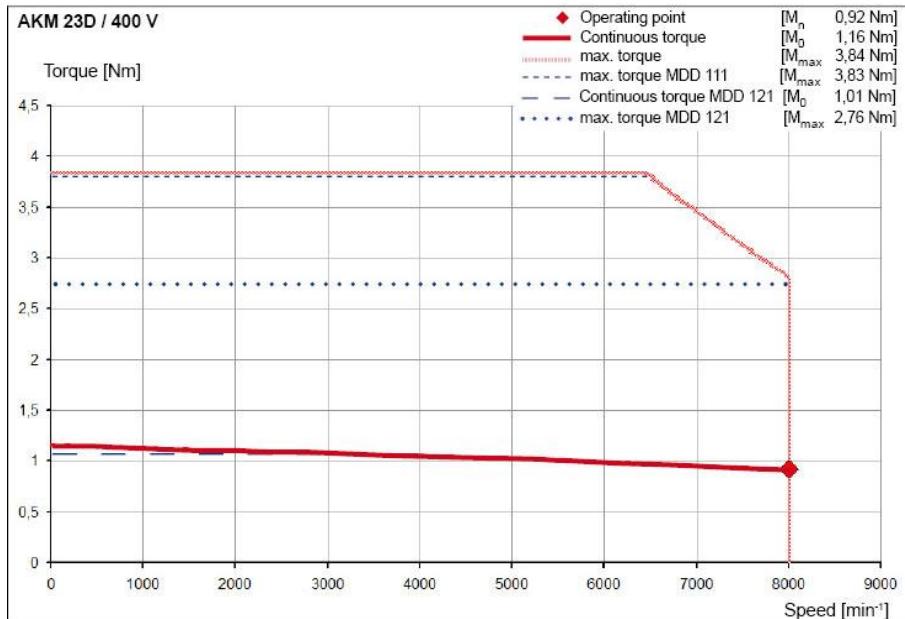
AKM 23C



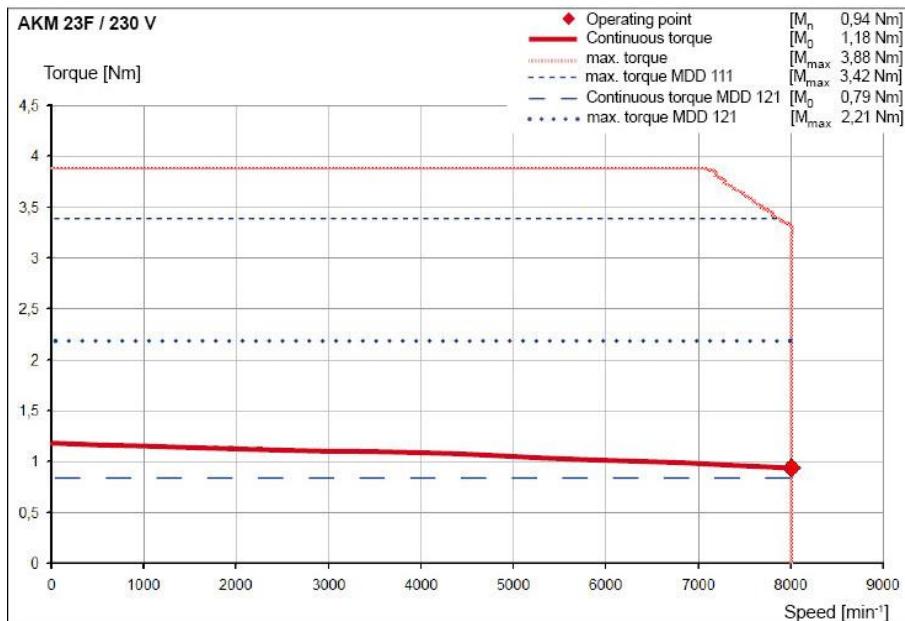


AKM 23D

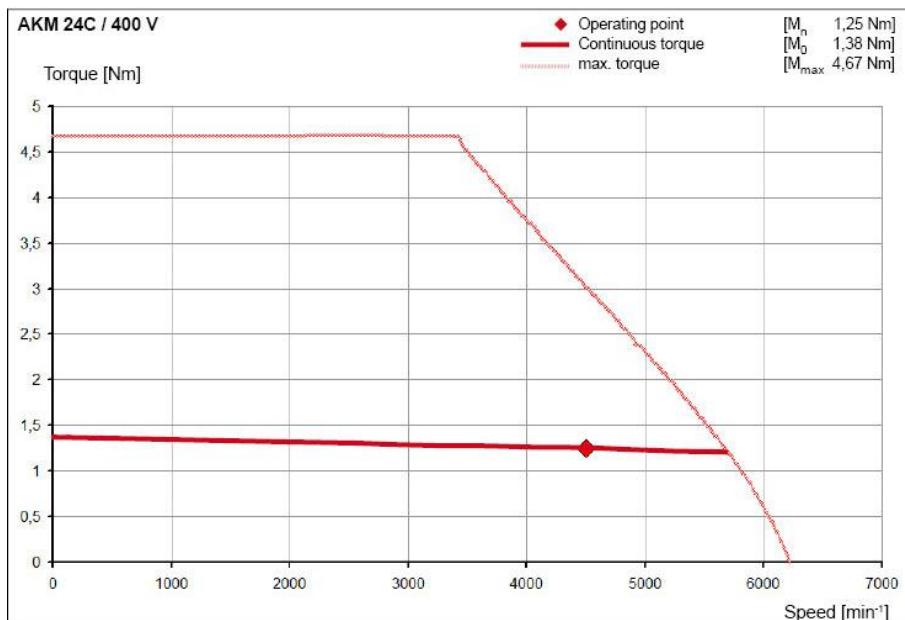
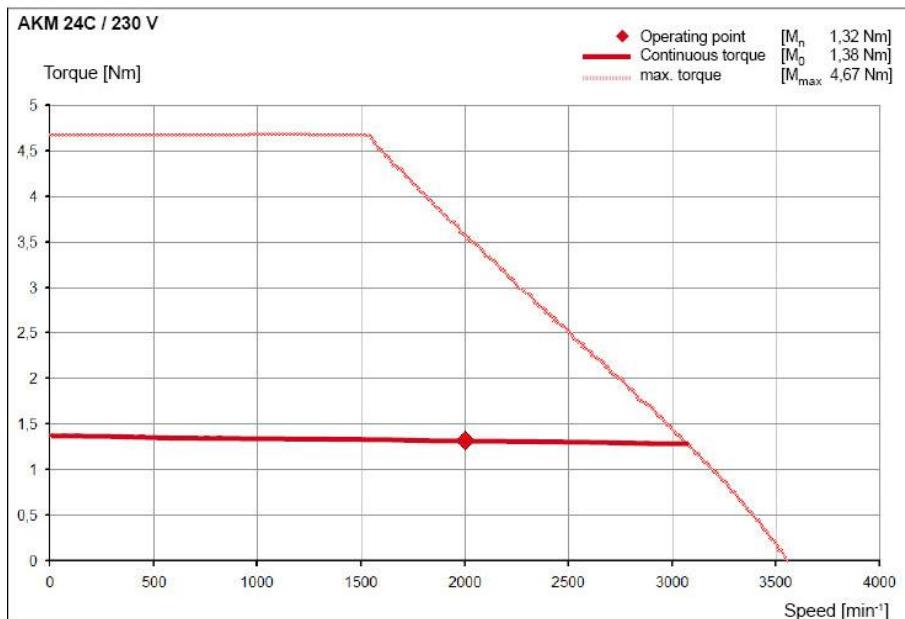


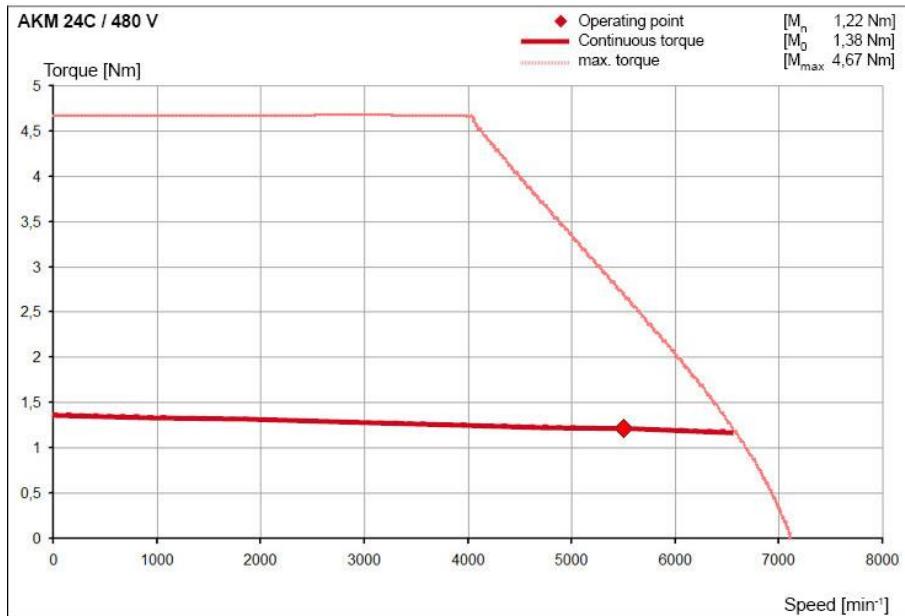


AKM 23F

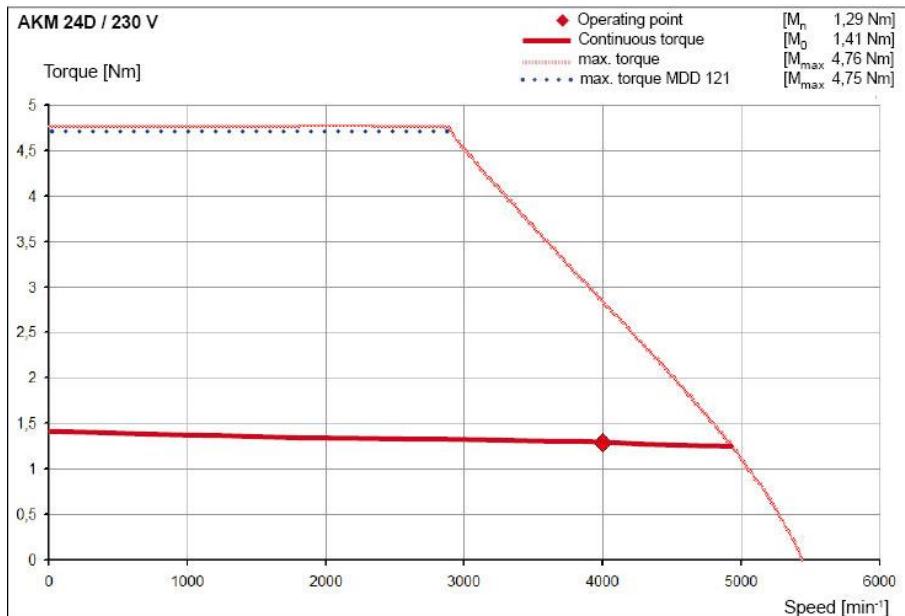


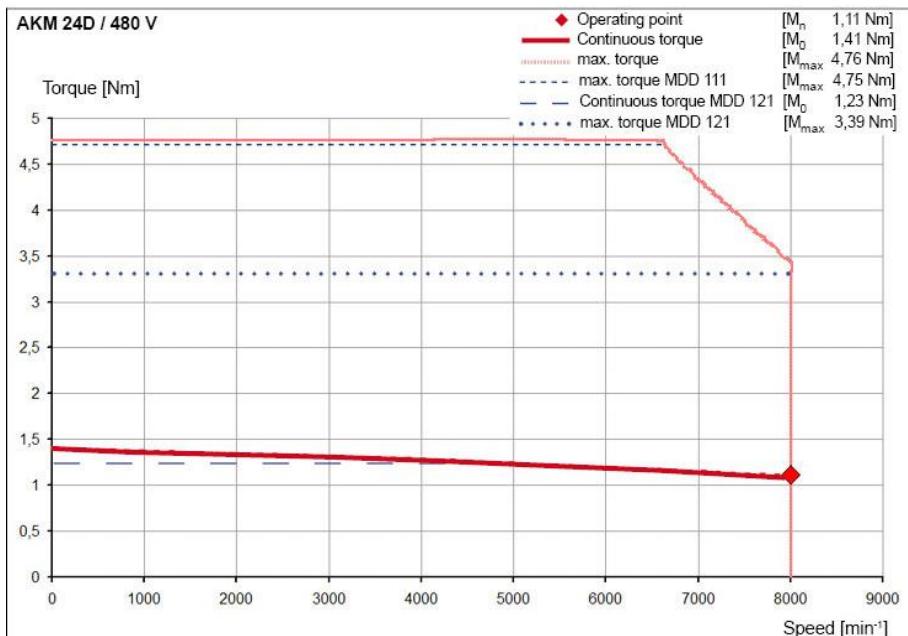
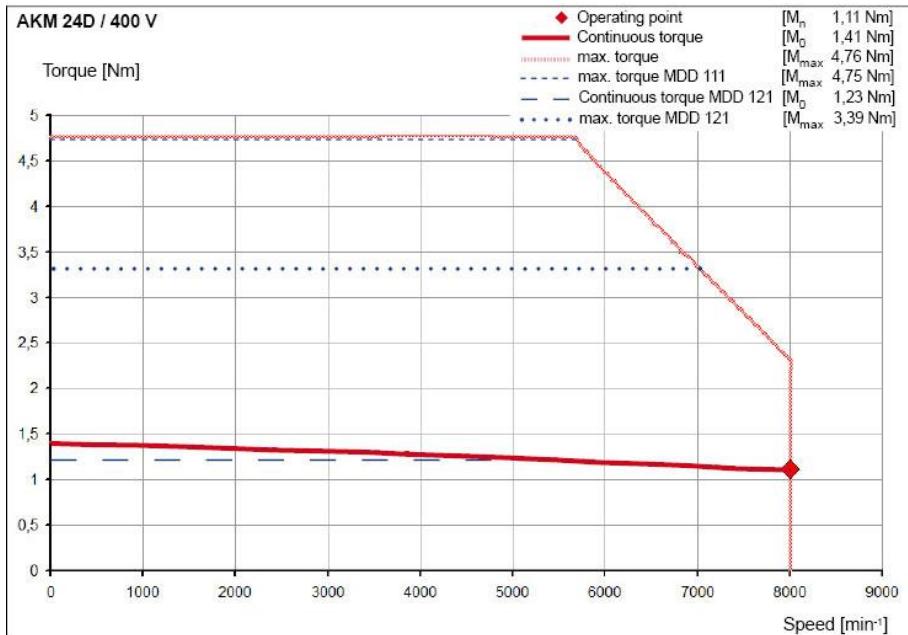
AKM 24C



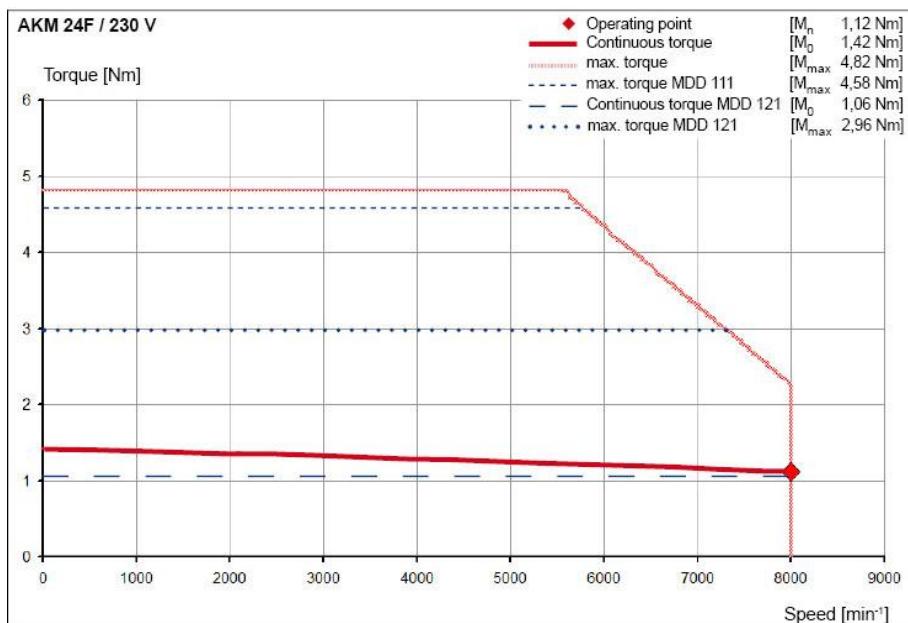


AKM 24D





AKM 24F



10.5 AKM3

10.5.1 Technical Data

Data		Symbol [Unit]	AKM								
			31C	31E	32C	32D	32E	32H	33C	33E	33H
Electrical data											
U _N = 230V	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 = 400V	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 = 480V	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 values	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} [mV/min]	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 [kgcm ²]	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	P _{BR} [W]	10,1
Inertial torque	J _{BR} [kgcm ²]	0,011
Air delay time	t _{BRH} [ms]	25
Engage delay time	t _{BRL} [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]	1,15	1,15	1,15
	M_n [Nm]	1,12	1,12	1,12
	M_{max} [Nm]	3,88	3,88	3,88
AKM 31E	M_0 [Nm]	1,20	1,20	1,15
	M_n [Nm]	0,95	0,95	0,95
	M_{max} [Nm]	4,00	4,00	3,10
AKM 32C	M_0 [Nm]	2,00	2,00	2,00
	M_n [Nm]	1,95	1,95	1,95
	M_{max} [Nm]	6,92	6,92	6,92
AKM 32D	M_0 [Nm]	2,04	2,04	2,04
	M_n [Nm]	1,93	1,93	1,93
	M_{max} [Nm]	7,01	7,01	6,98
AKM 32E	M_0 [Nm]	2,04	2,04	2,04
	M_n [Nm]	1,87	1,87	1,87
	M_{max} [Nm]	7,11	7,11	5,74
AKM 32H	M_0 [Nm]	2,10	2,10	1,12
	M_n [Nm]	1,45	1,45	1,45
	M_{max} [Nm]	7,26	5,12	3,22
AKM 33C	M_0 [Nm]	2,71	2,71	2,71
	M_n [Nm]	2,64	2,64	2,64
	M_{max} [Nm]	9,76	9,76	9,76
AKM 33E	M_0 [Nm]	2,79	2,79	2,79
	M_n [Nm]	2,62	2,62	2,62
	M_{max} [Nm]	9,96	9,96	8,66
AKM 33H	M_0 [Nm]	2,88	2,88	1,51
	M_n [Nm]	2,27	2,27	2,27
	M_{max} [Nm]	10,22	7,01	4,37

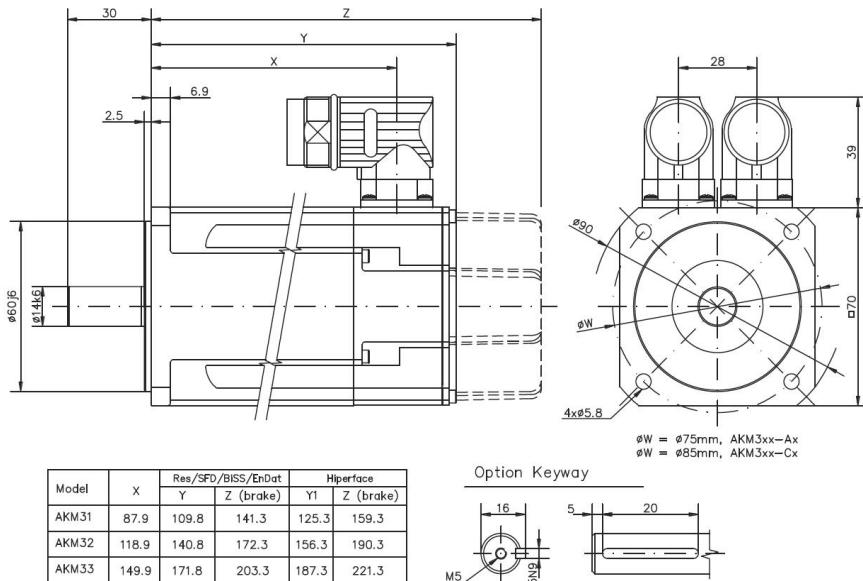
Power supply 3 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 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

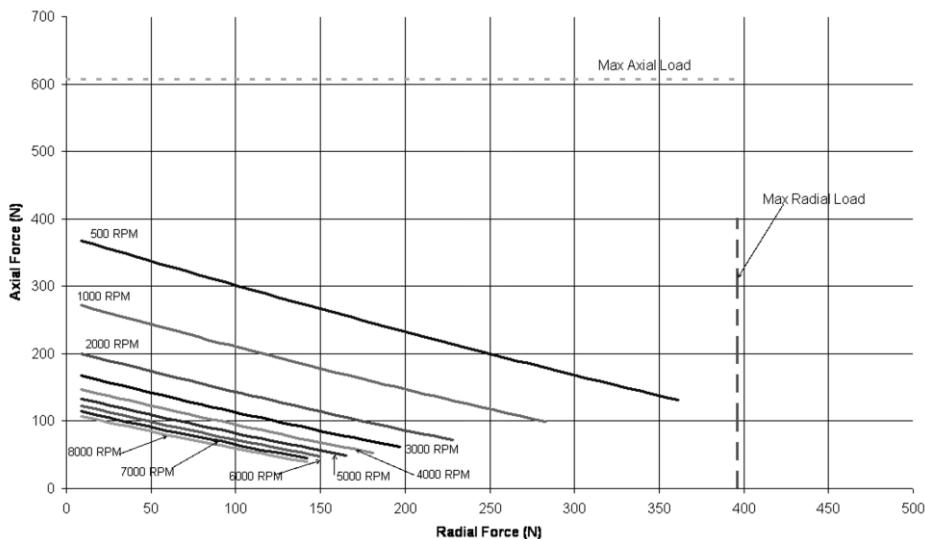
Power supply 3 x 480 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier							
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 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)

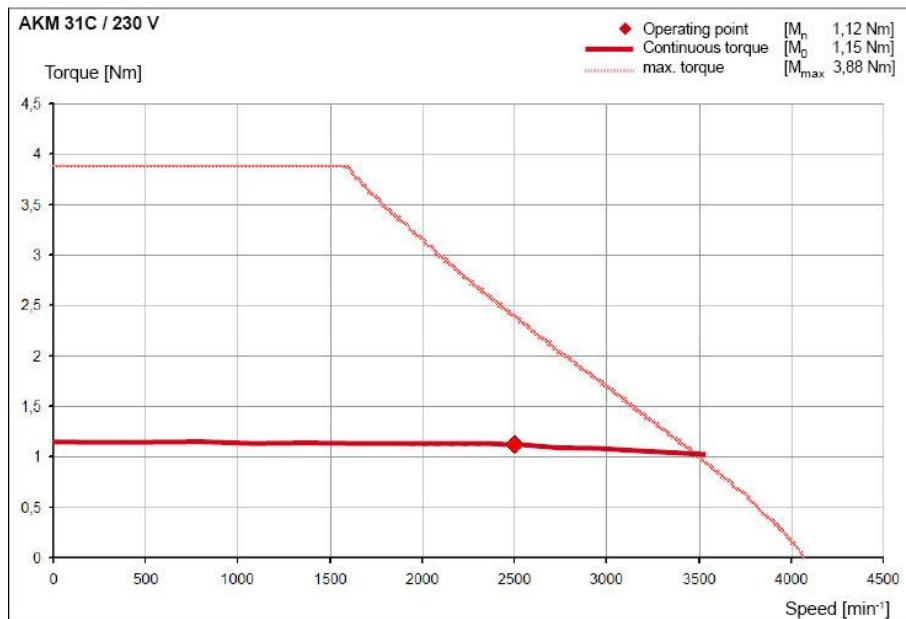


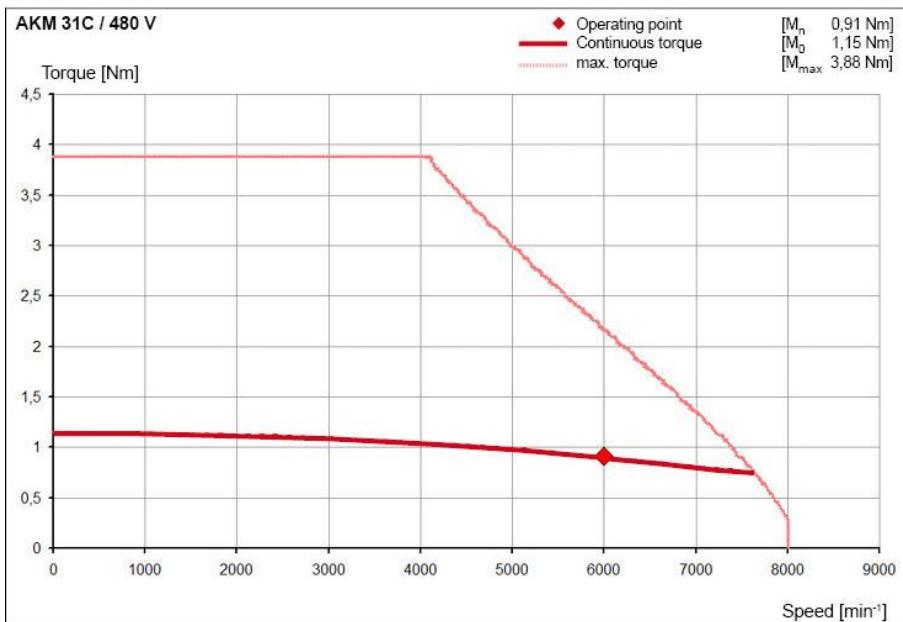
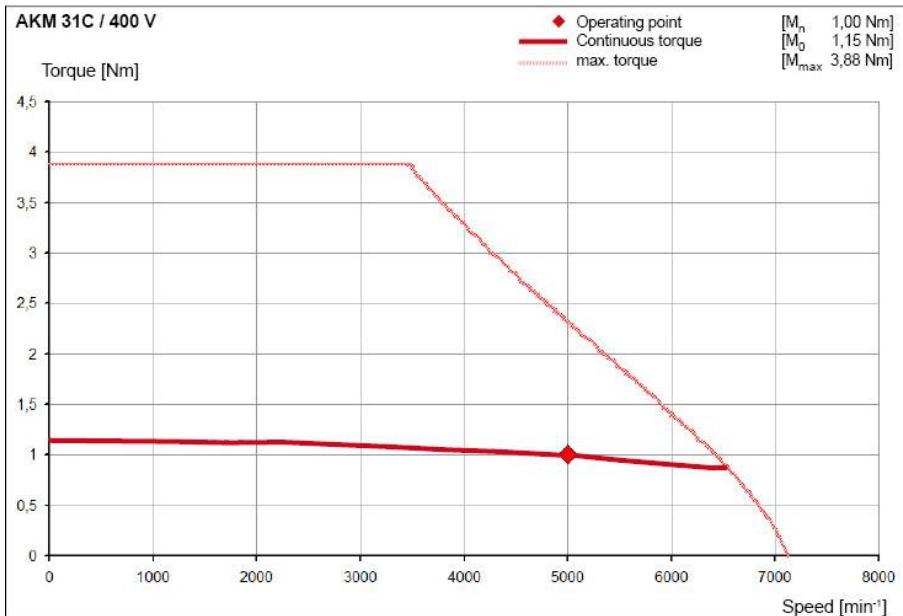
10.5.6 Radial Force on the Shaft End



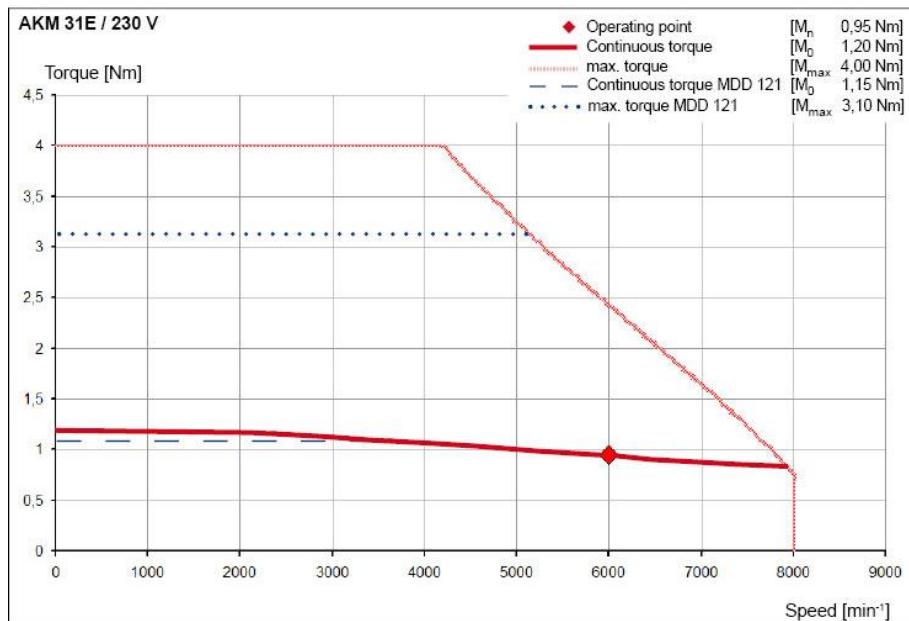
10.5.7 Motor Characteristics

AKM 31C

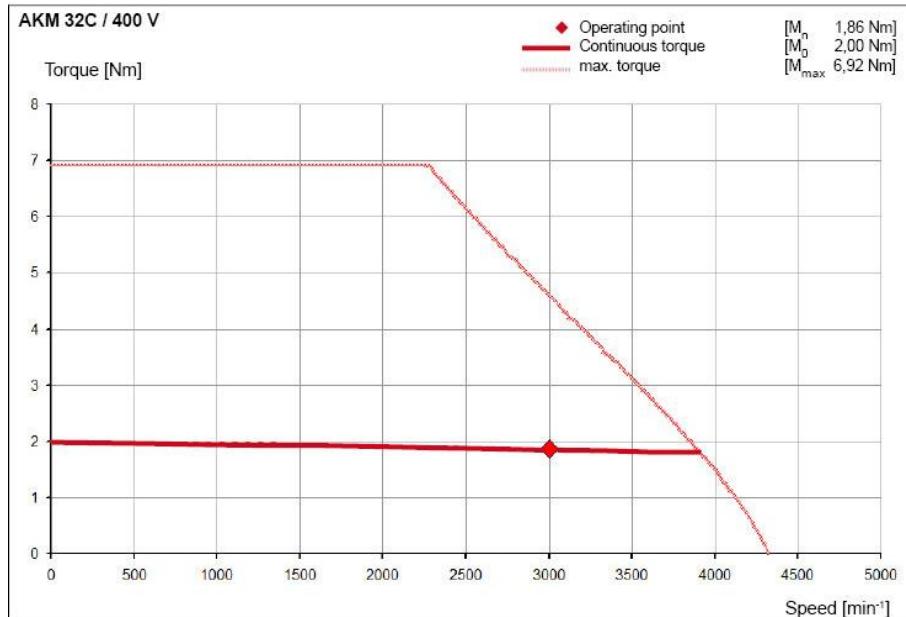
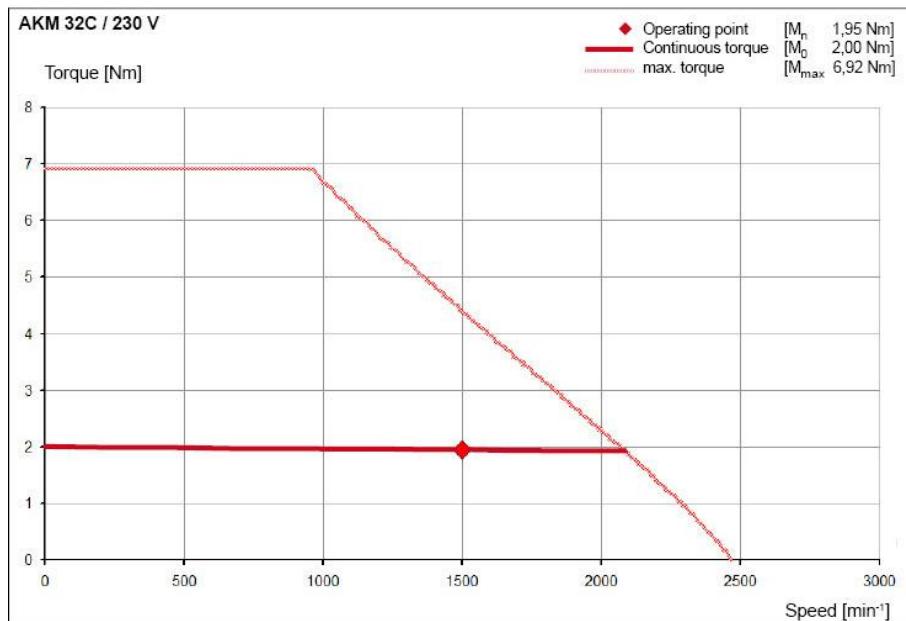


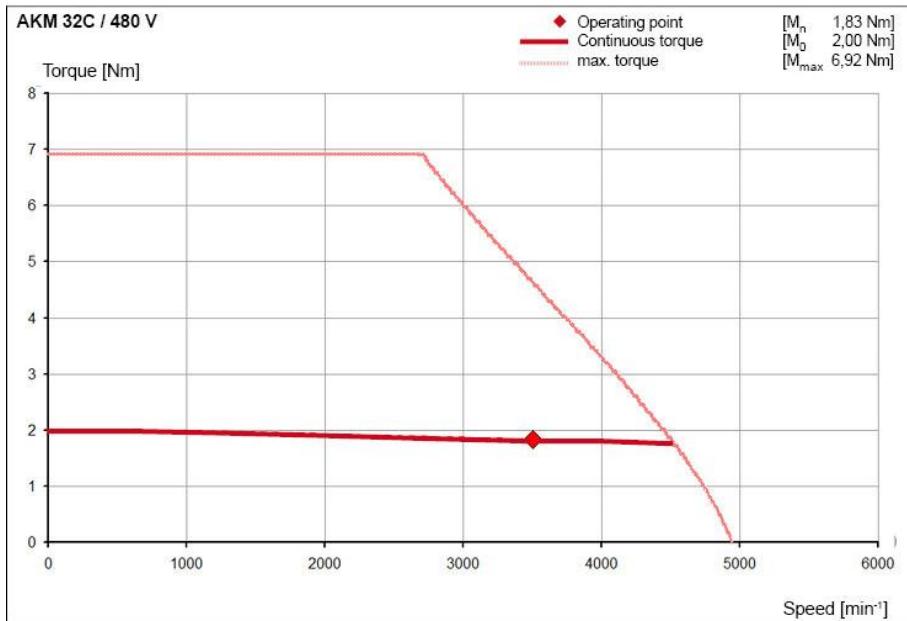


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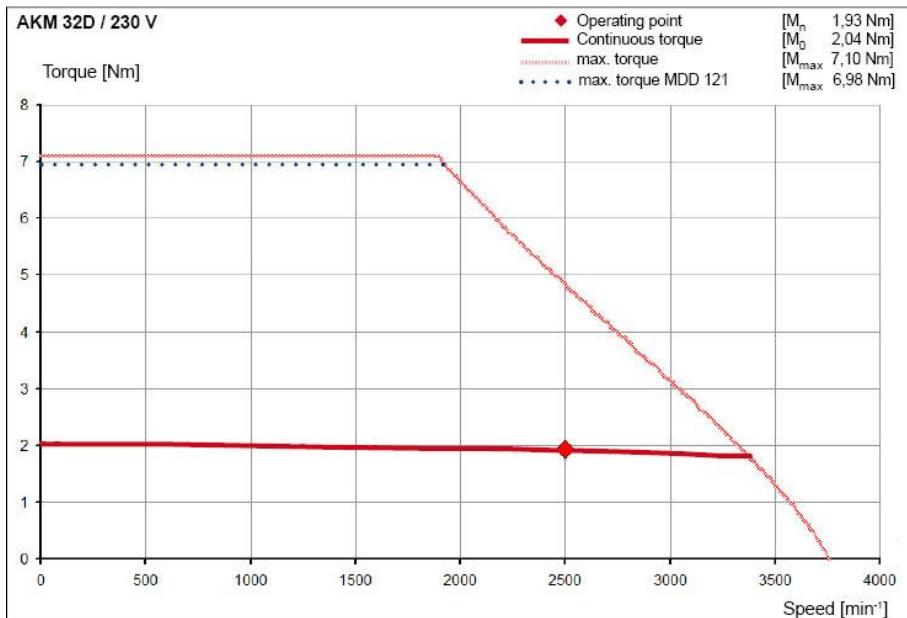


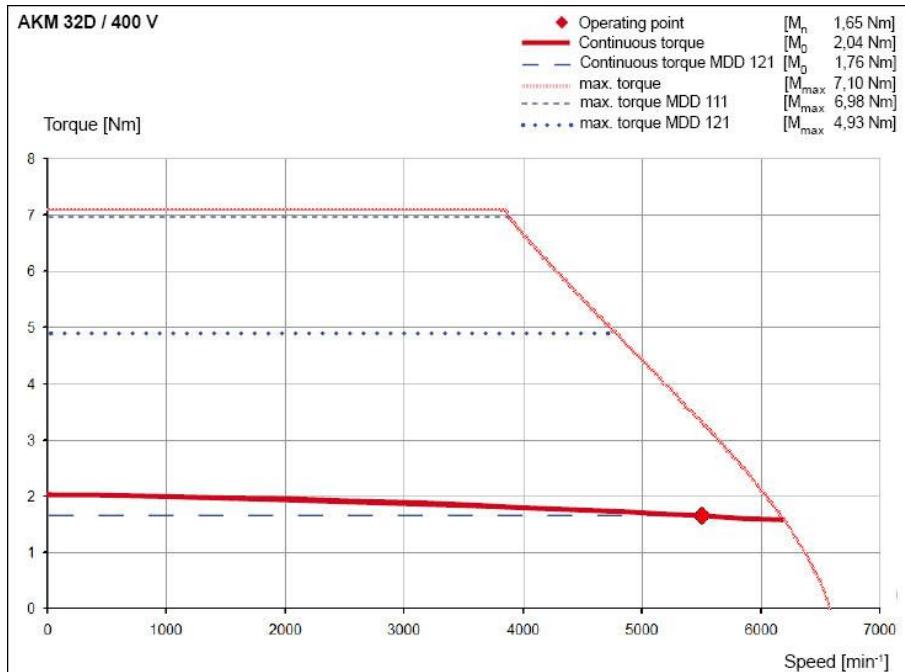
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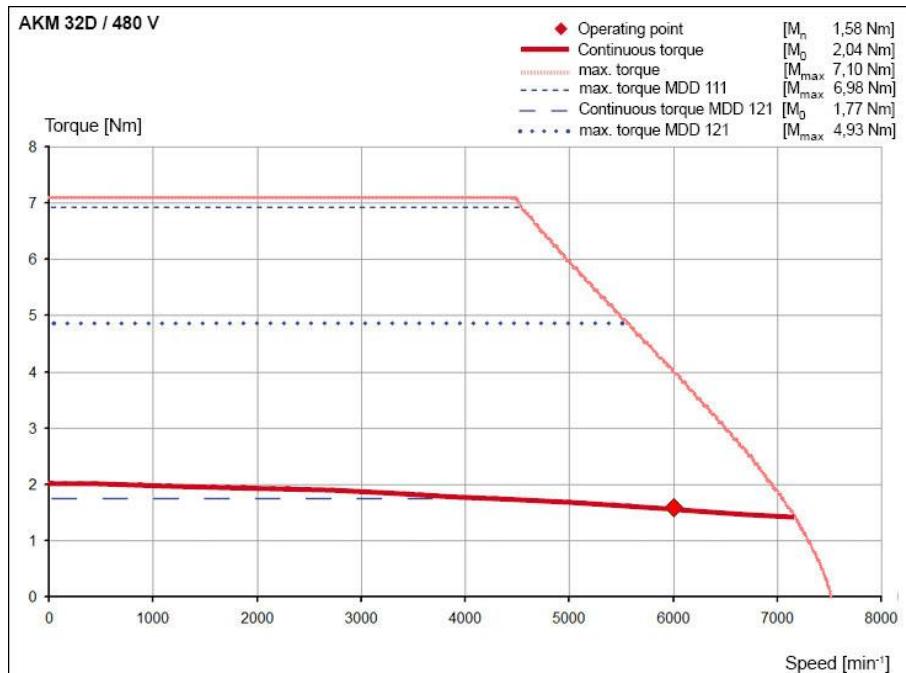




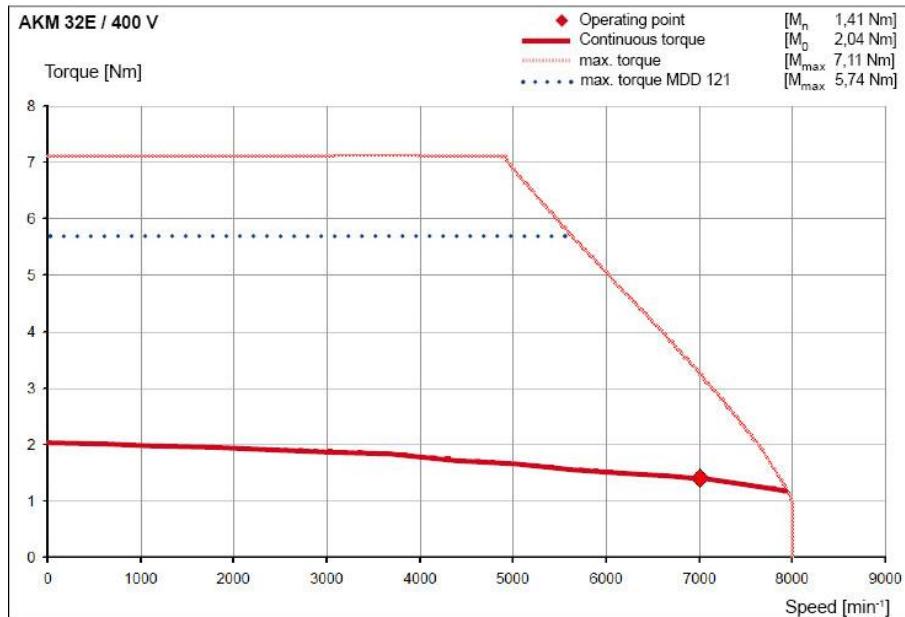
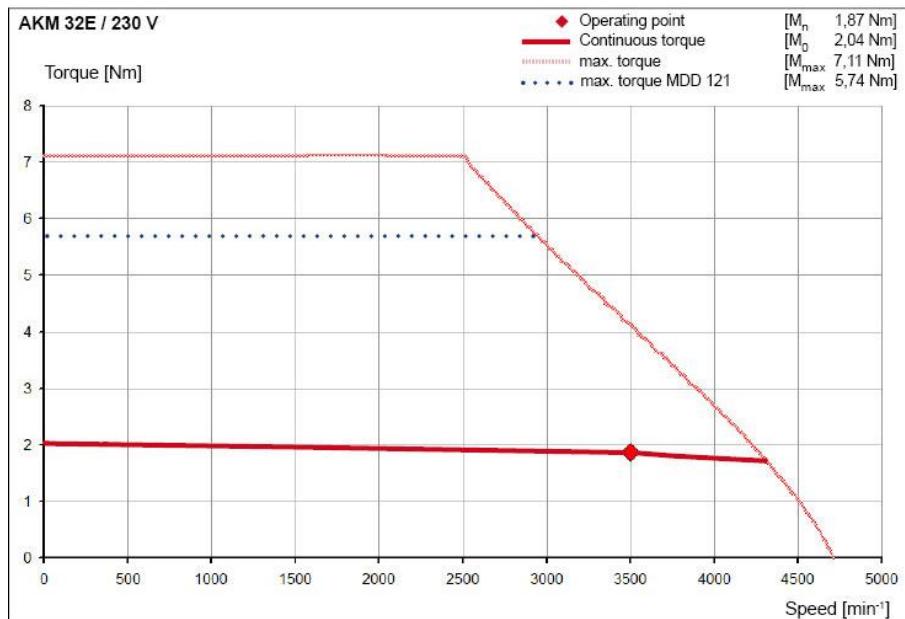
AKM 32D

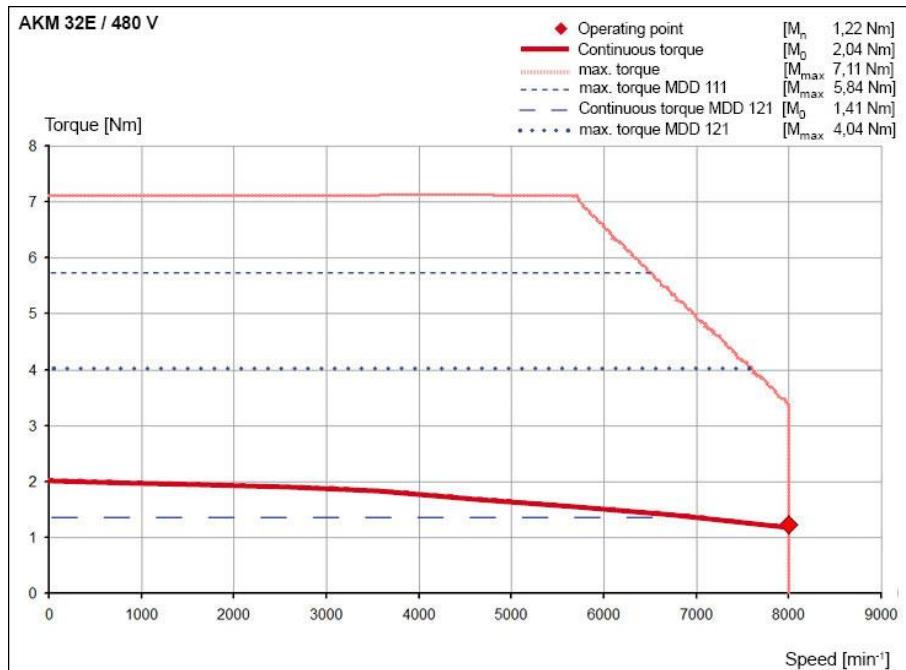




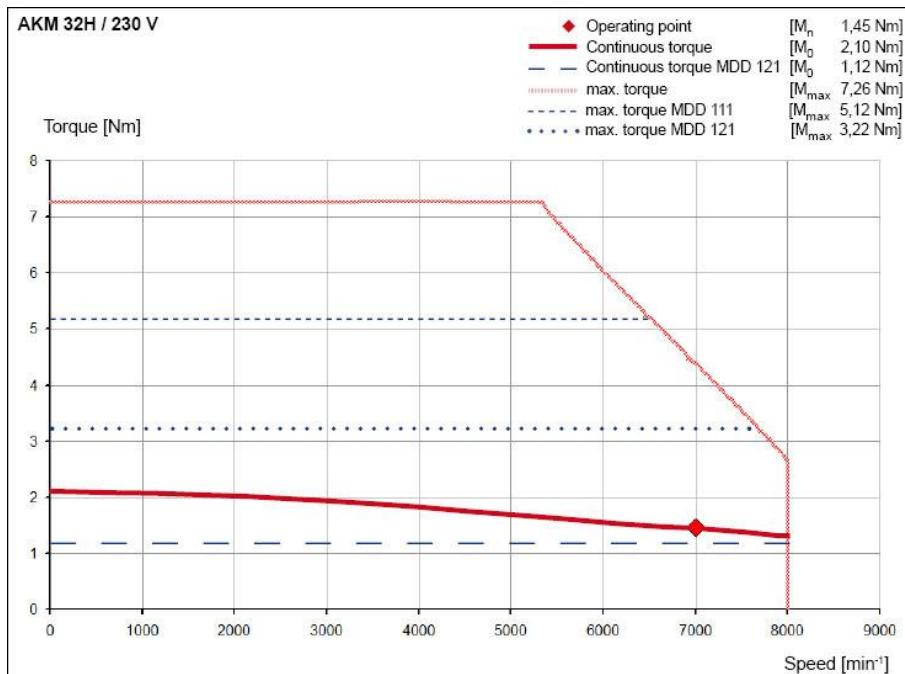


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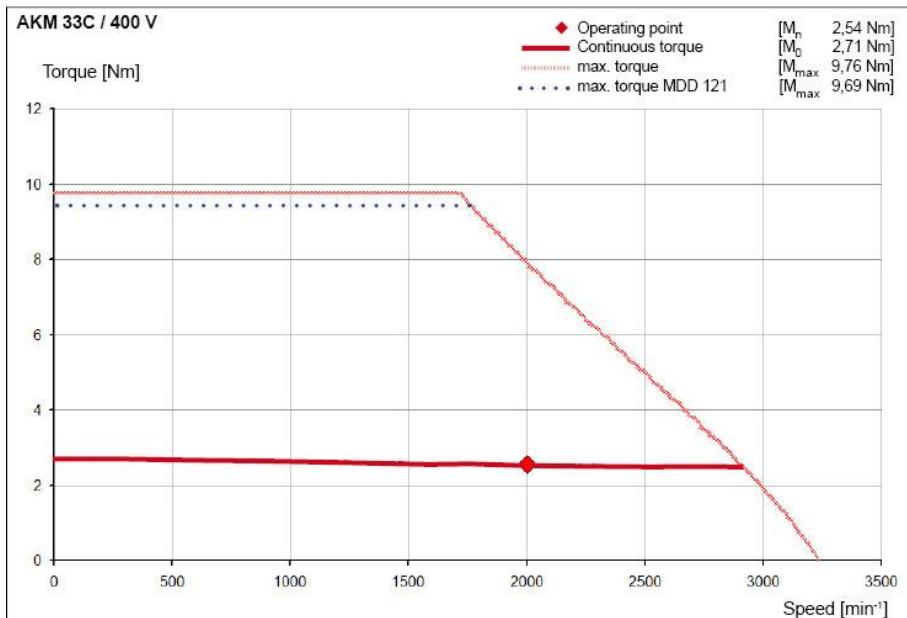
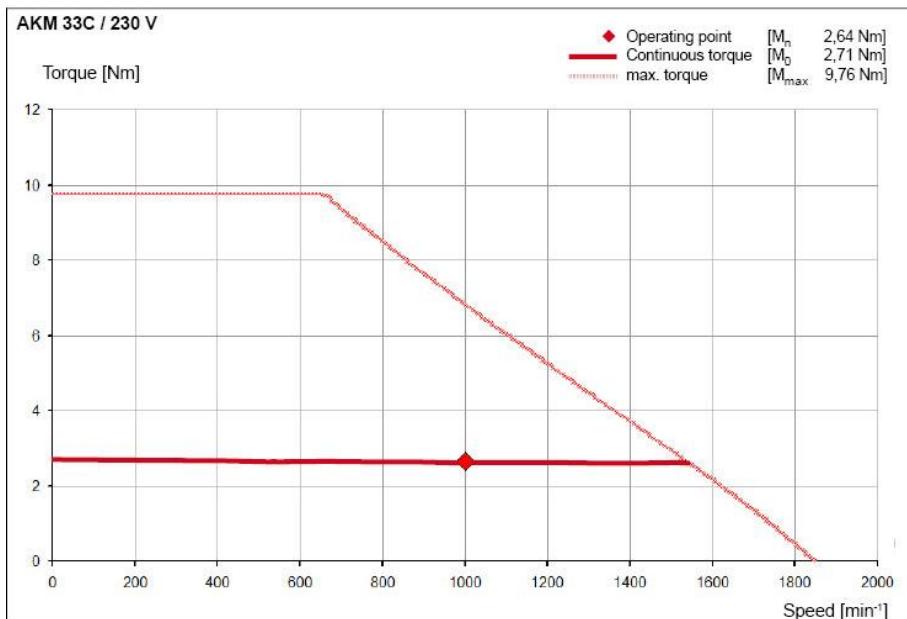


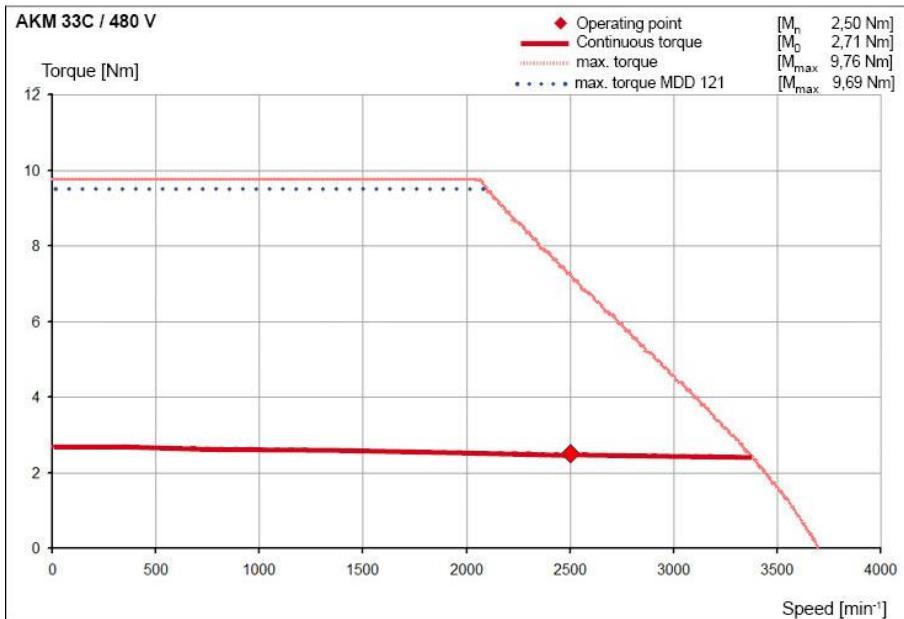


AKM 32H

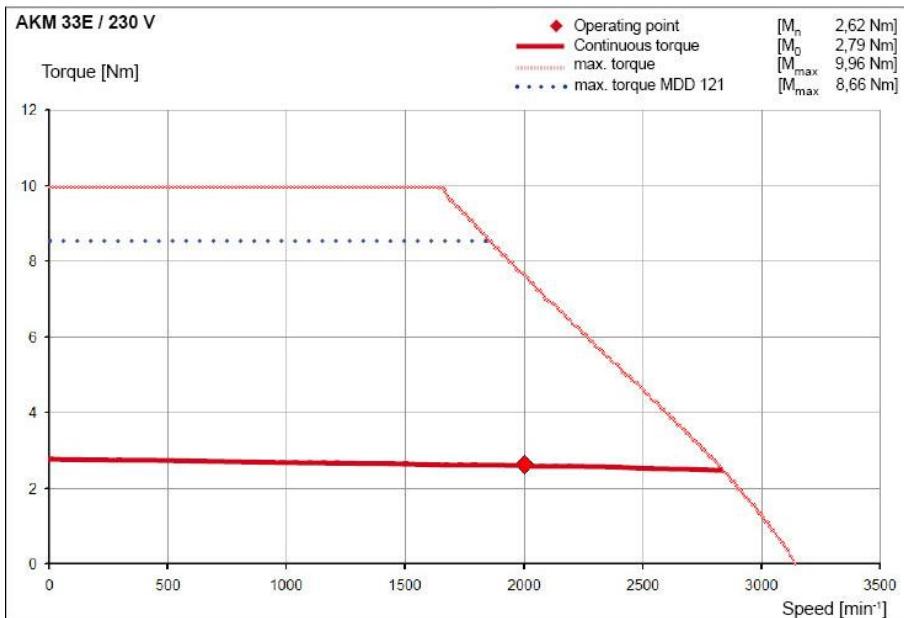


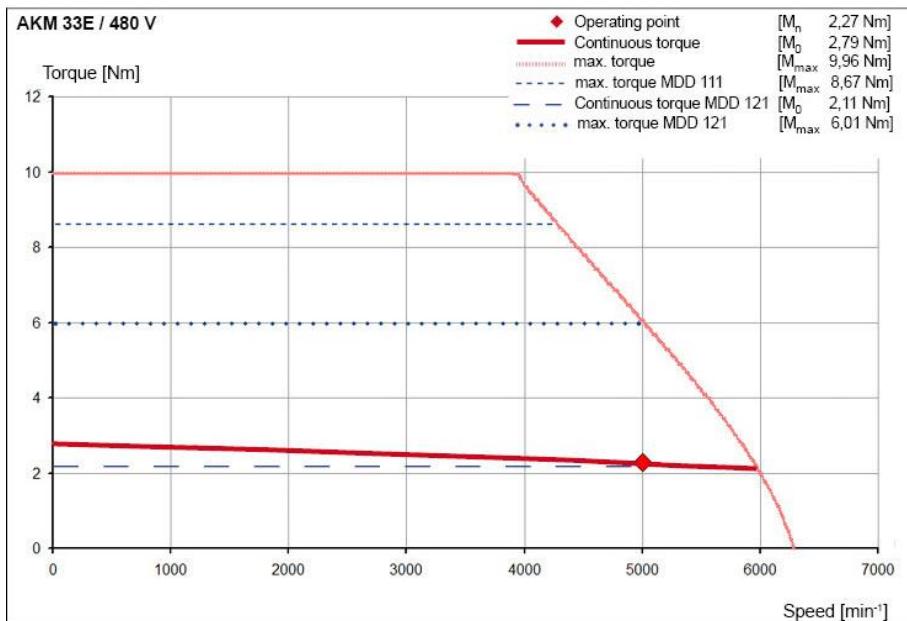
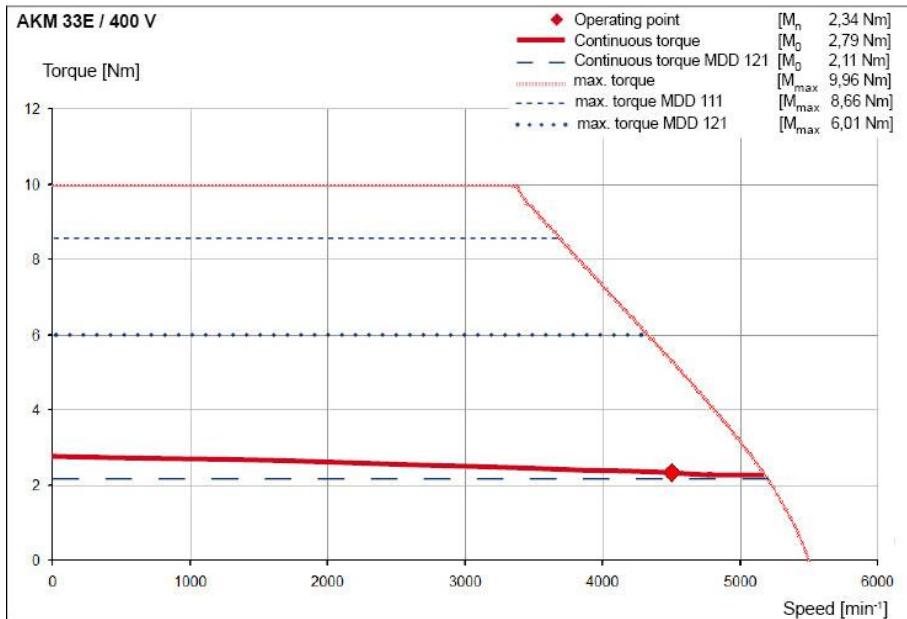
AKM 33C



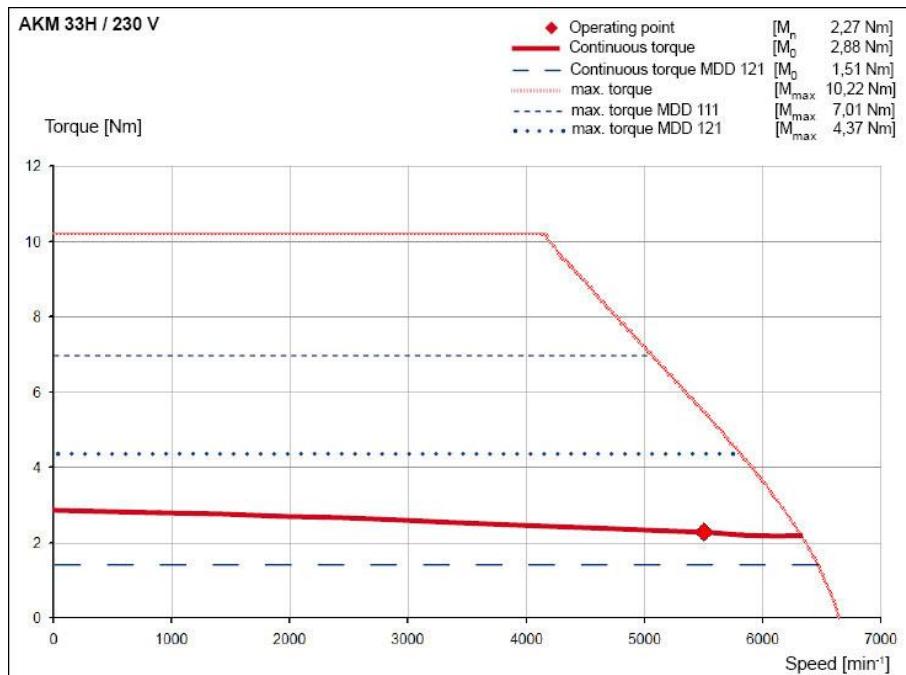


AKM 33E





AKM 33H



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} [mV/min]	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 [kgcm ²]		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							
UN = 230V	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 = 400V	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 = 480V	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	—	
	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} [mV/min]	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 [kgcm ²]		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} [mV/min]	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 [kgcm ²]	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 [kgcm ²]	0,068
Air delay time	tBRH [ms]	35
Engage 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 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.

10.6.4 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]	1,95	1,95	1,95
	M_n [Nm]	1,88	1,88	1,88
	M_{max} [Nm]	6,12	6,12	6,12
AKM 41E	M_0 [Nm]	2,02	2,02	2,02
	M_n [Nm]	1,82	1,82	1,82
	M_{max} [Nm]	6,28	6,28	5,20
AKM 41H	M_0 [Nm]	2,06	2,06	1,07
	M_n [Nm]	1,62	1,62	1,62
	M_{max} [Nm]	6,36	4,63	2,99
AKM 42C	M_0 [Nm]	-	-	-
	M_n [Nm]	-	-	-
	M_{max} [Nm]	-	-	-
AKM 42E	M_0 [Nm]	3,42	3,42	3,42
	M_n [Nm]	3,12	3,12	3,12
	M_{max} [Nm]	11,3	13	9,47
AKM 42G	M_0 [Nm]	3,53	3,53	2,14
	M_n [Nm]	2,90	2,90	2,90
	M_{max} [Nm]	11,5	9,31	6,00
AKM 42J	M_0 [Nm]	3,56	2,46	1,25
	M_n [Nm]	2,38	2,38	2,38
	M_{max} [Nm]	11,6	11,6	11,6
AKM 43E	M_0 [Nm]	4,70	4,70	4,70
	M_n [Nm]	4,24	4,24	4,24
	M_{max} [Nm]	15,9	15,9	13,2
AKM 43G	M_0 [Nm]	4,80	4,80	2,88
	M_n [Nm]	4,00	4,00	4,00
	M_{max} [Nm]	16,1	12,8	8,16
AKM 43K	M_0 [Nm]	4,90	2,98	1,51
	M_n [Nm]	2,62	2,62	2,62
	M_{max} [Nm]	16,4	16,4	16,4
AKM 44E	M_0 [Nm]	5,76	5,76	5,76
	M_n [Nm]	5,22	5,22	5,22
	M_{max} [Nm]	19,9	19,9	15,9
AKM 44G	M_0 [Nm]	5,88	5,88	3,45
	M_n [Nm]	4,90	4,90	4,90
	M_{max} [Nm]	20,3	15,6	9,85
AKM 44J	M_0 [Nm]	6,00	-	-
	M_n [Nm]	3,84	-	-
	M_{max} [Nm]	20,4	-	-

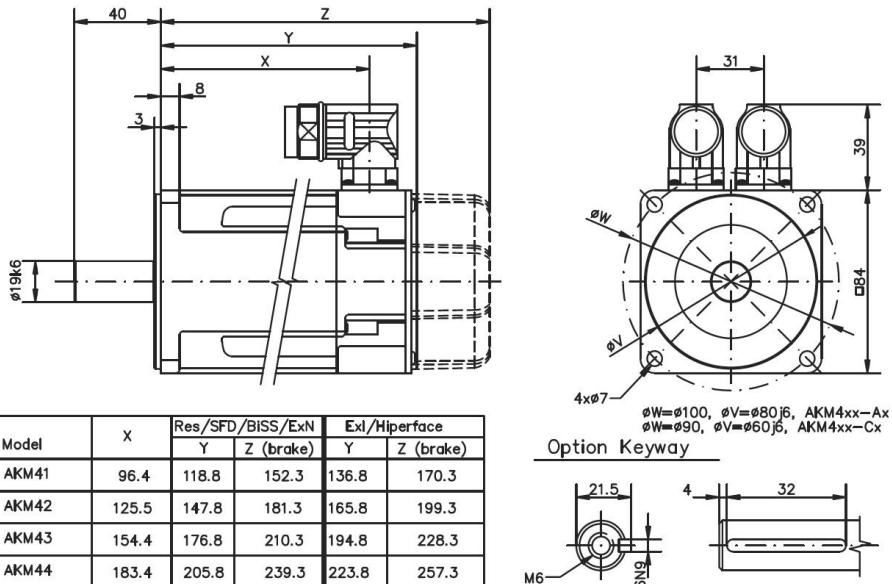
Power supply 3 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier						
			MDD 111	MDD 121	SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 15A/30A	
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
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
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
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
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
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
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
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
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
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

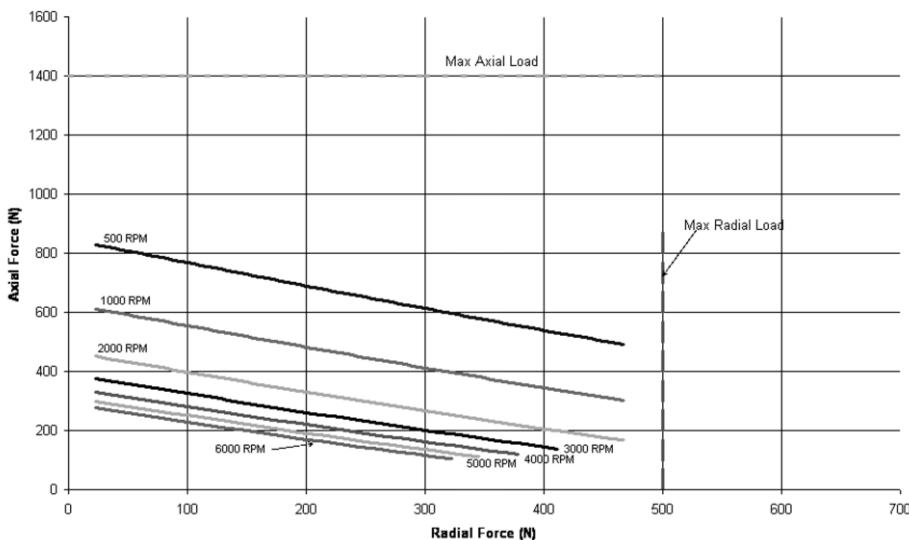
Power supply 3 x 480 V

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

10.6.5 Dimensional Drawing (schematic diagram)

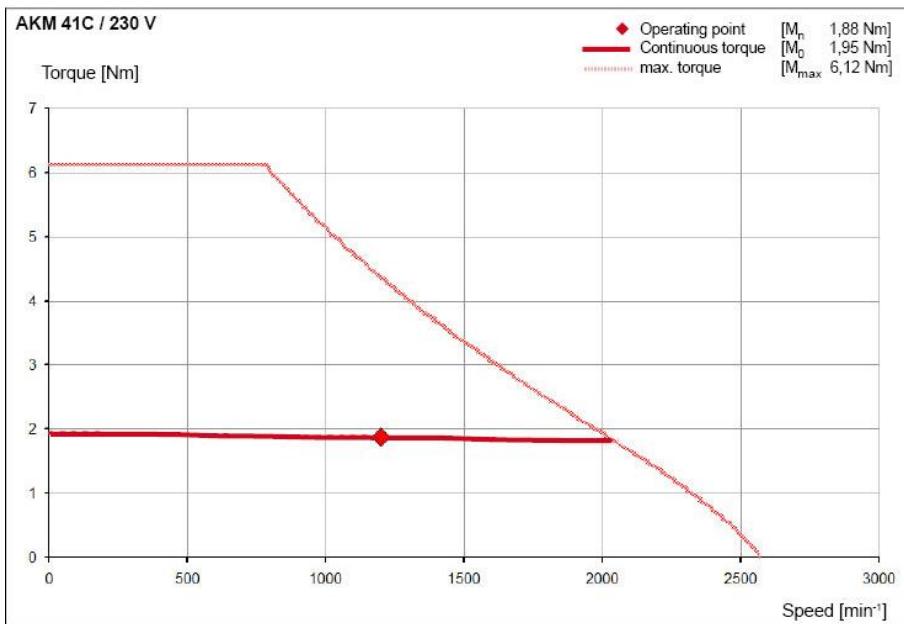


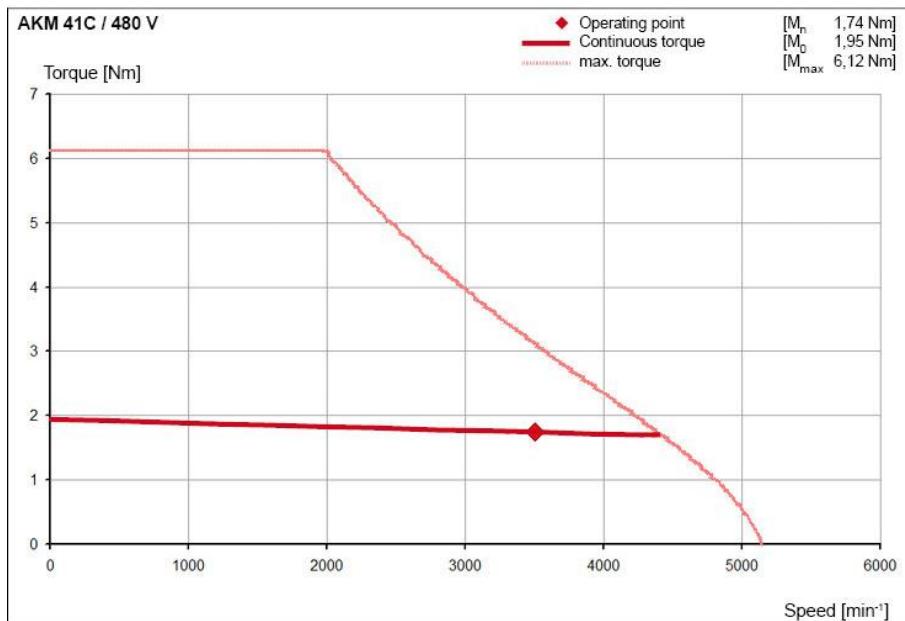
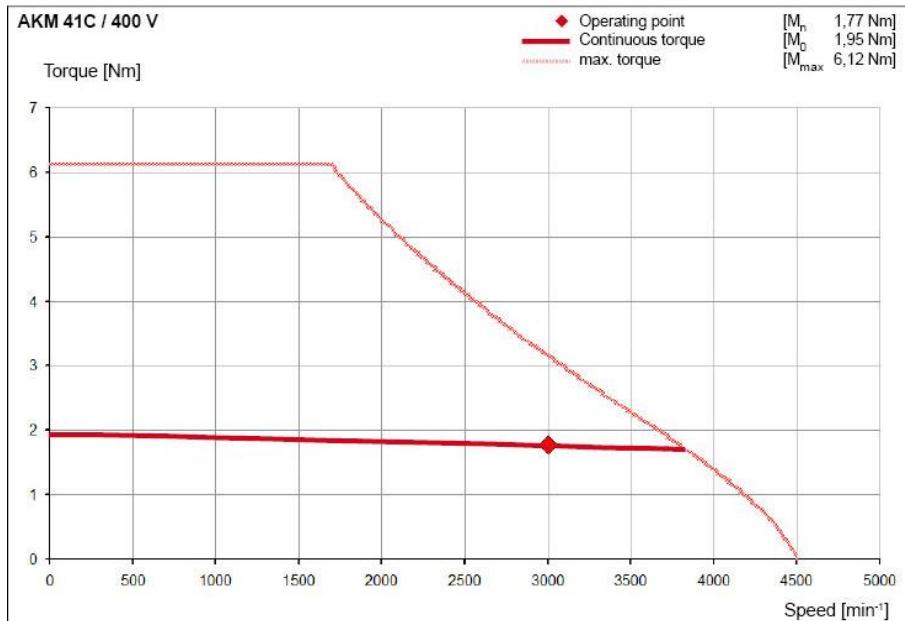
10.6.6 Radial Force on the Shaft End



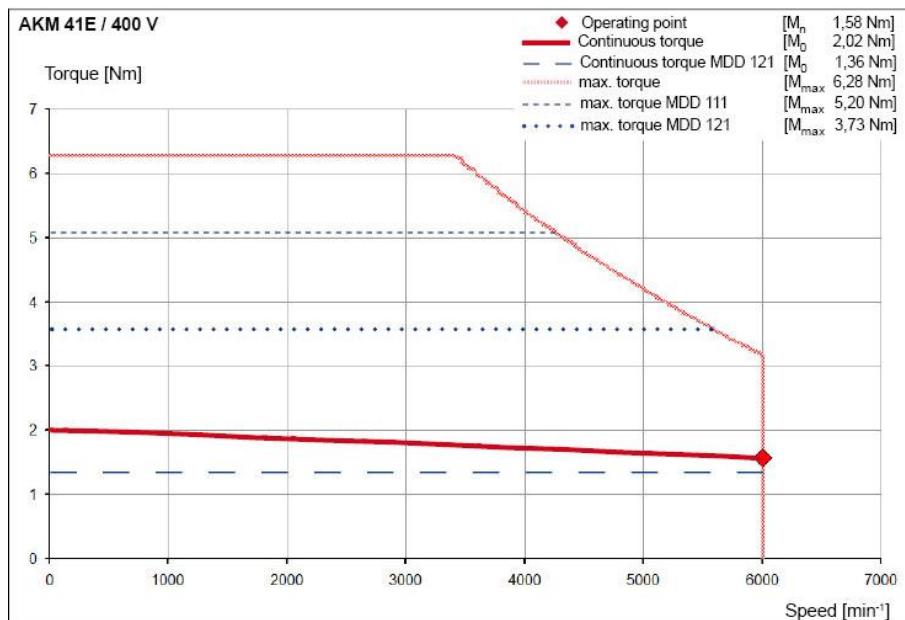
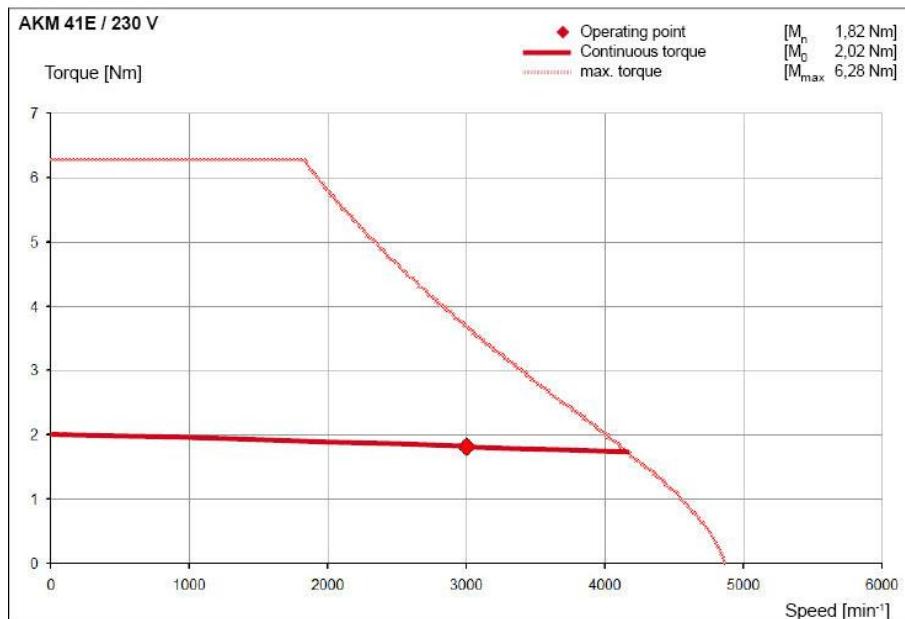
10.6.7 Motor Characteristics

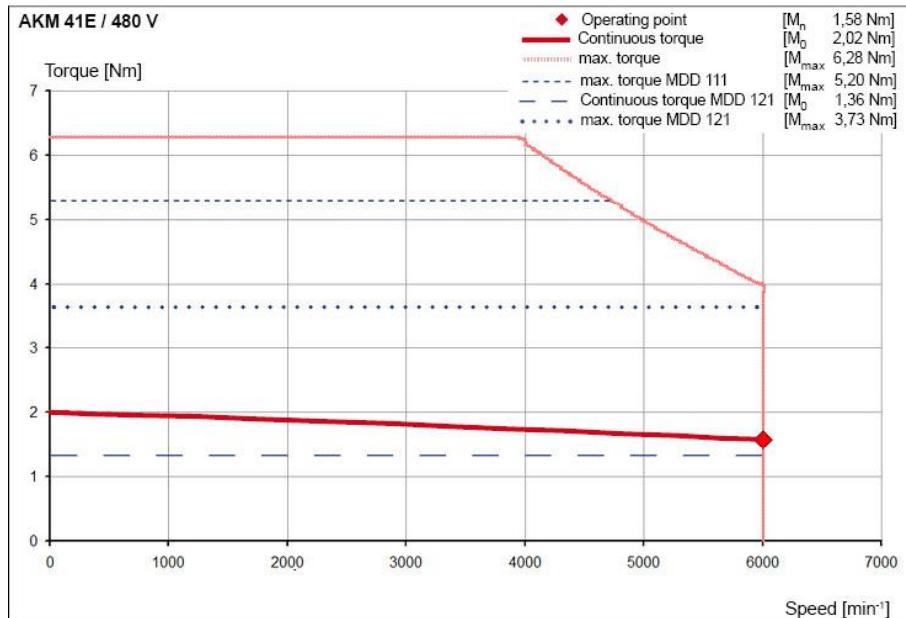
AKM 41C



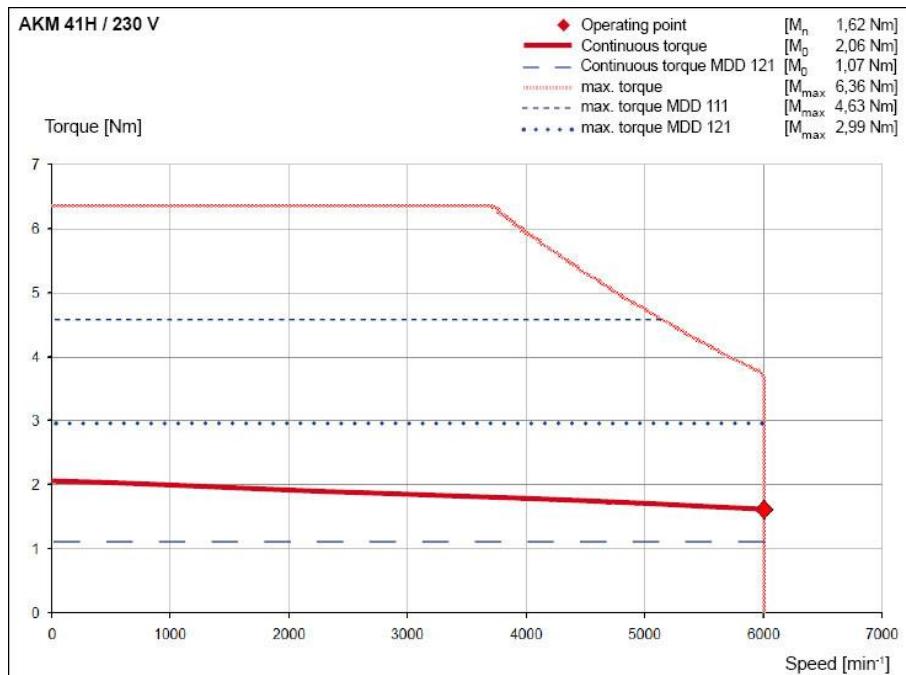


AKM 41E

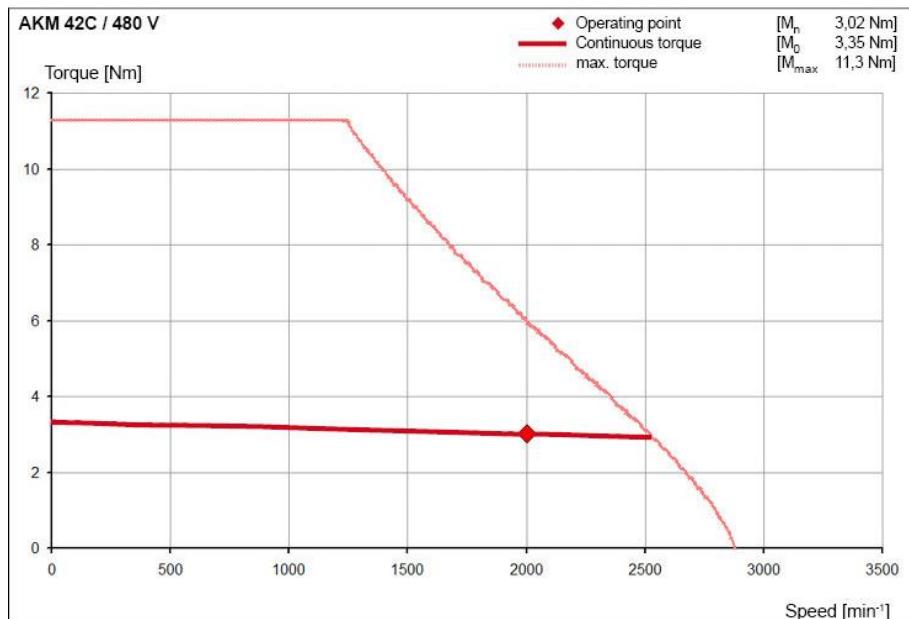
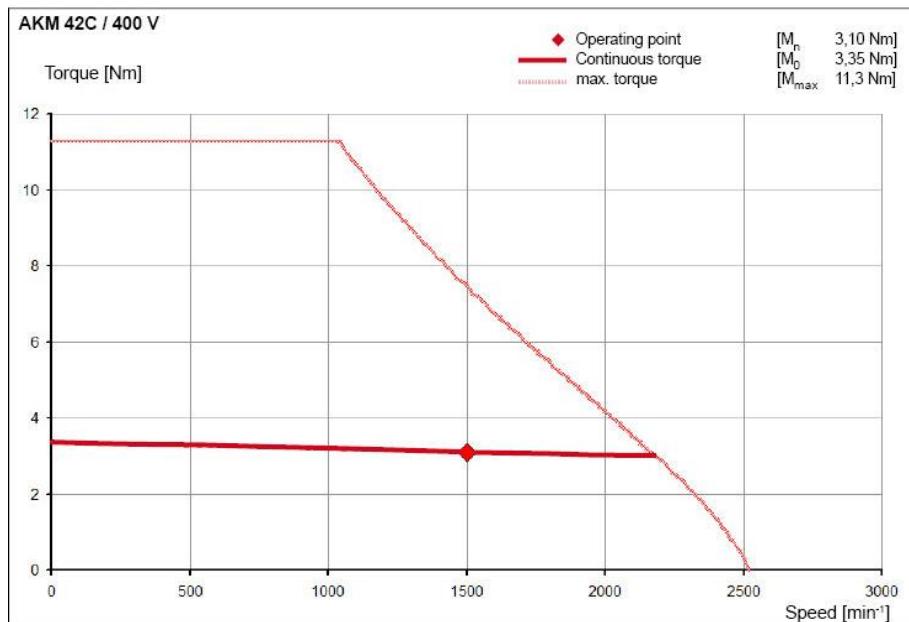




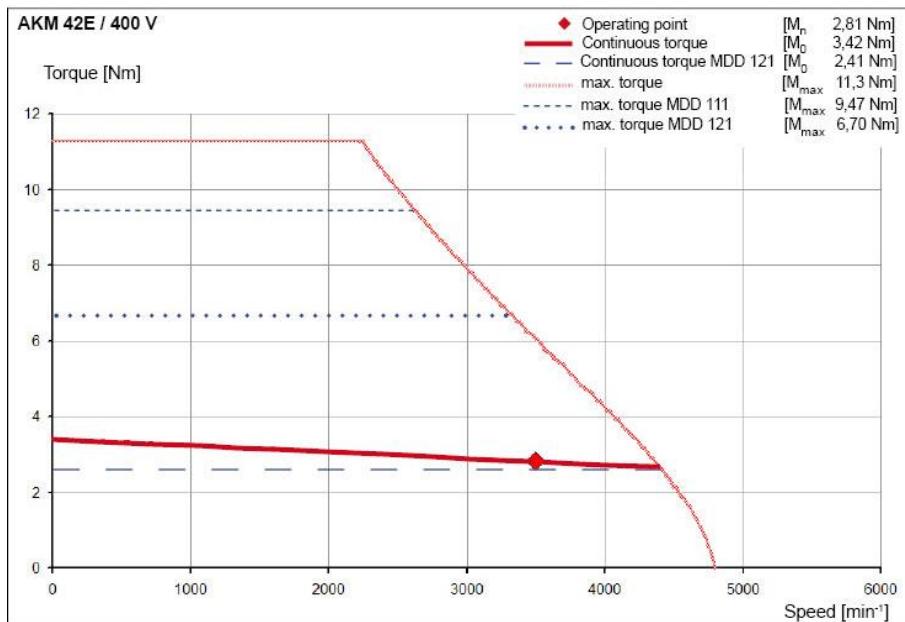
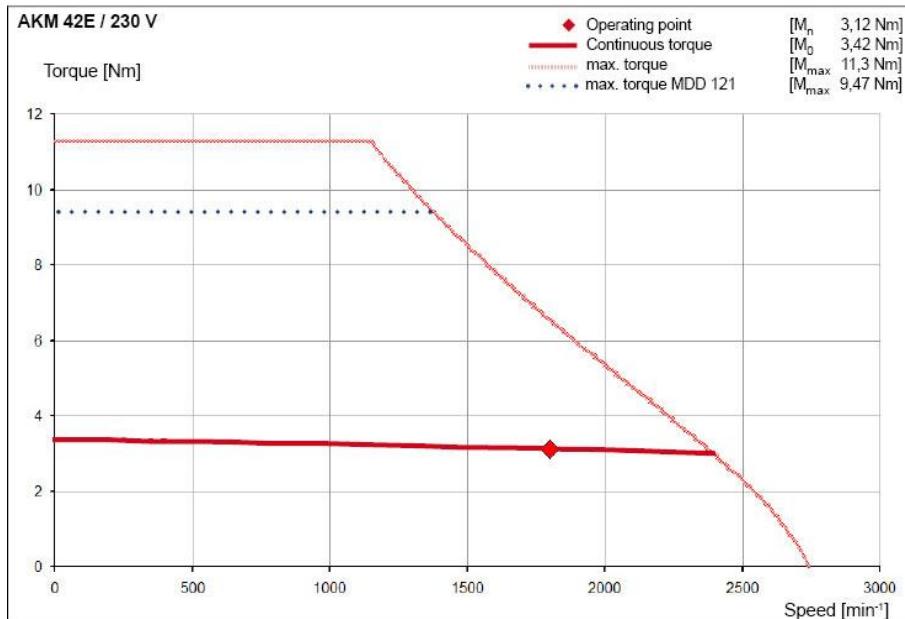
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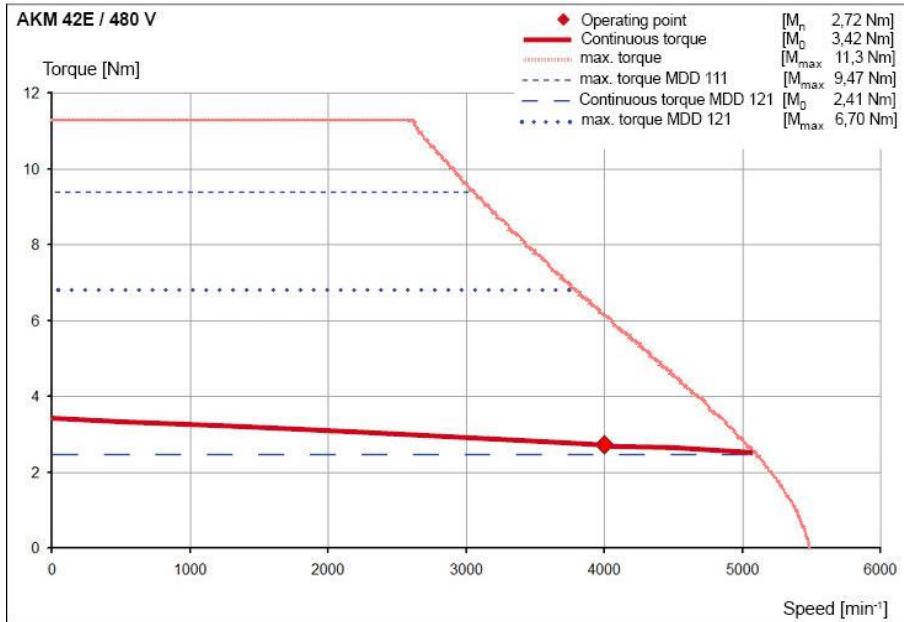


AKM 42C

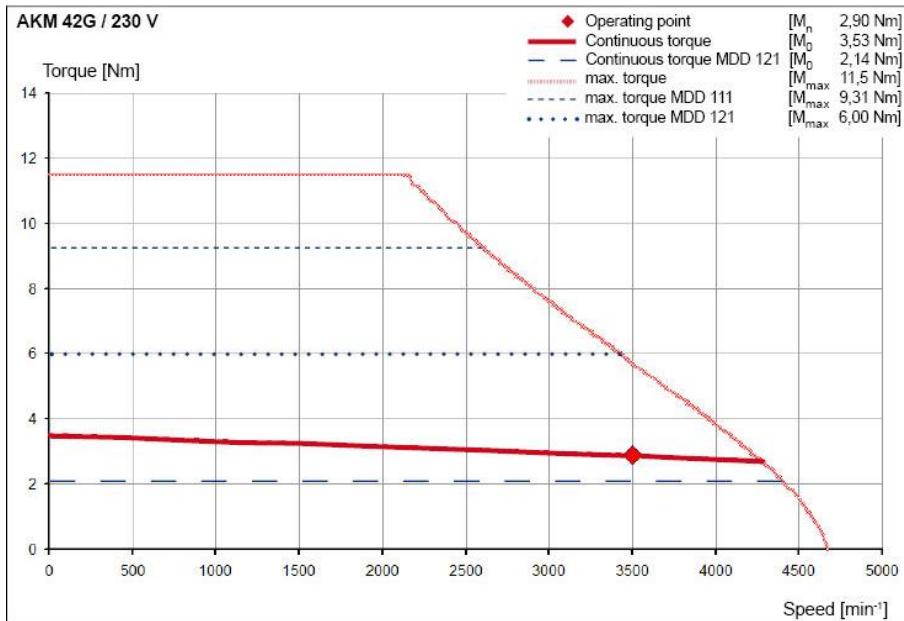


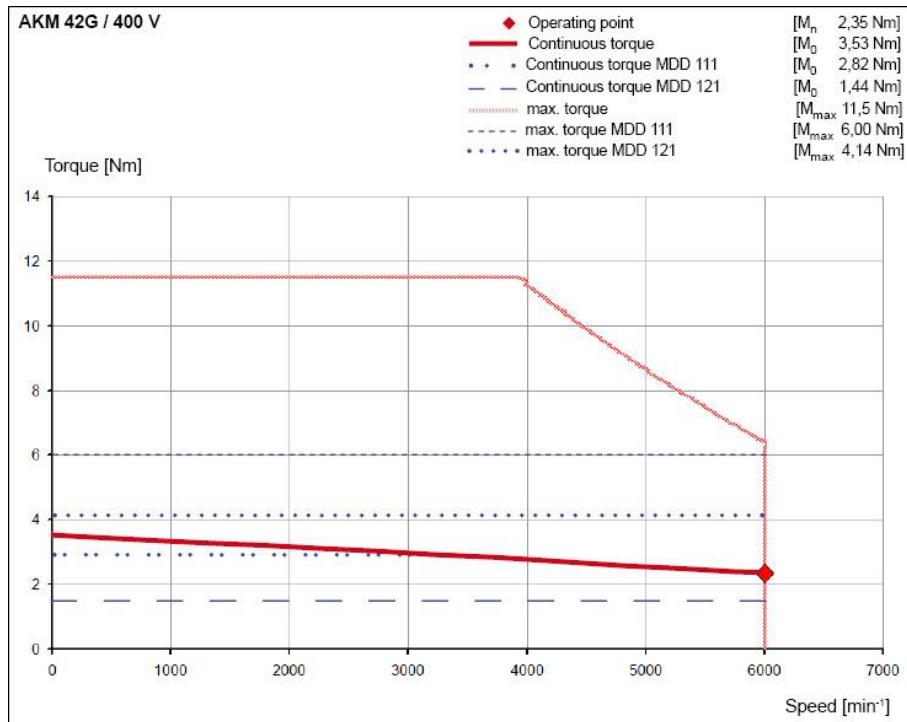
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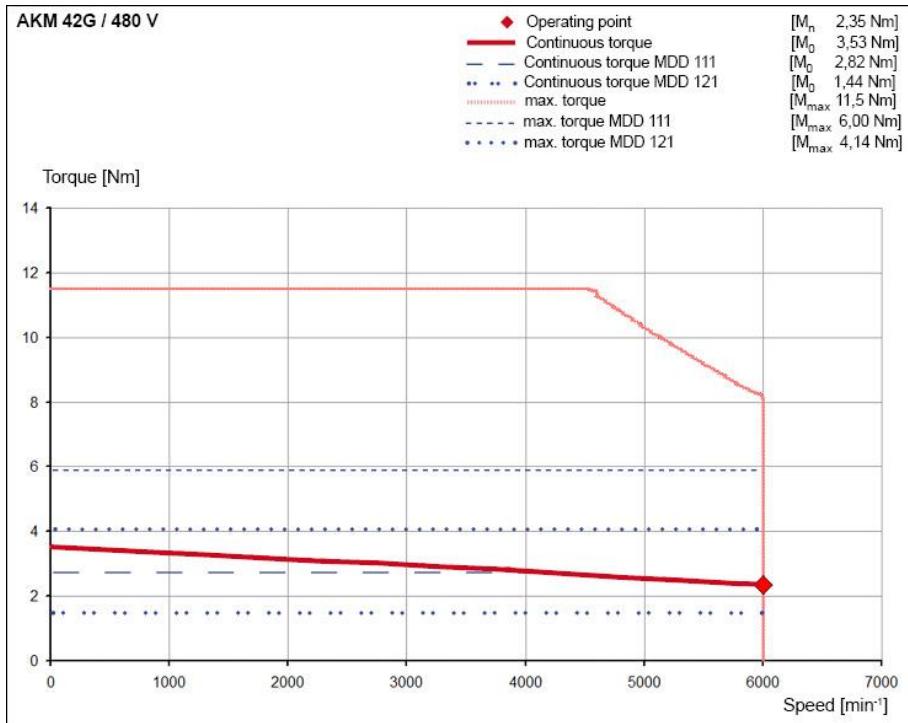




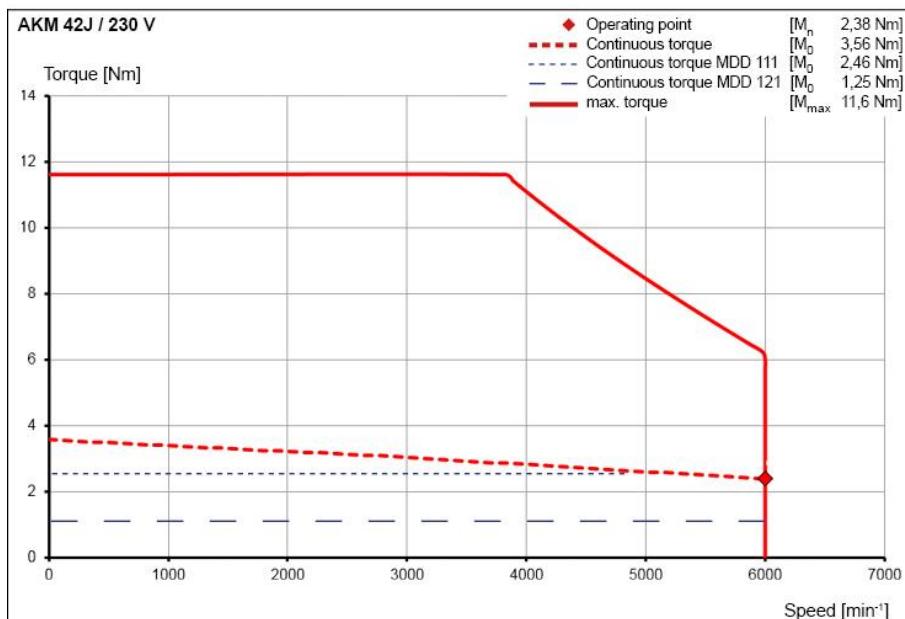
AKM 42G



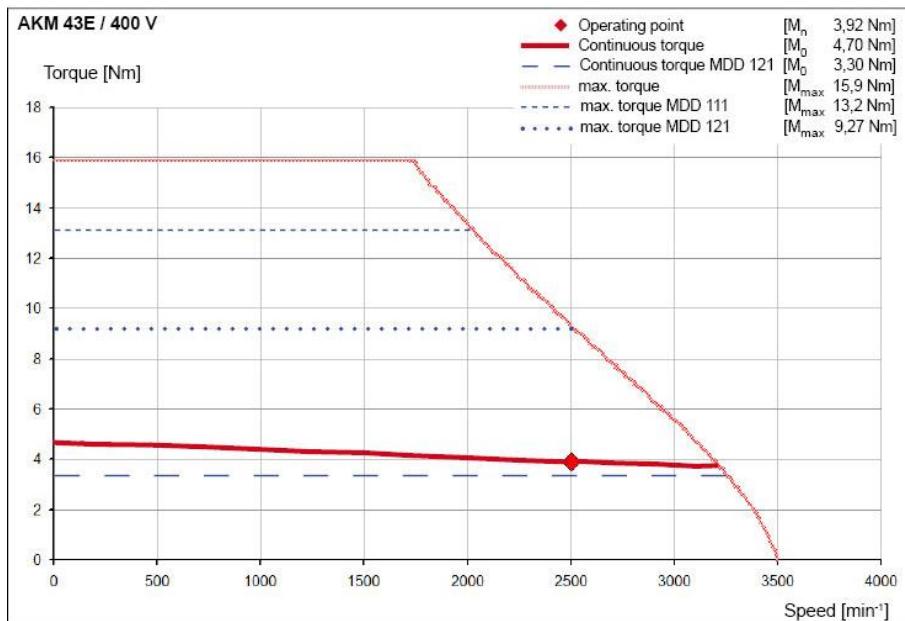
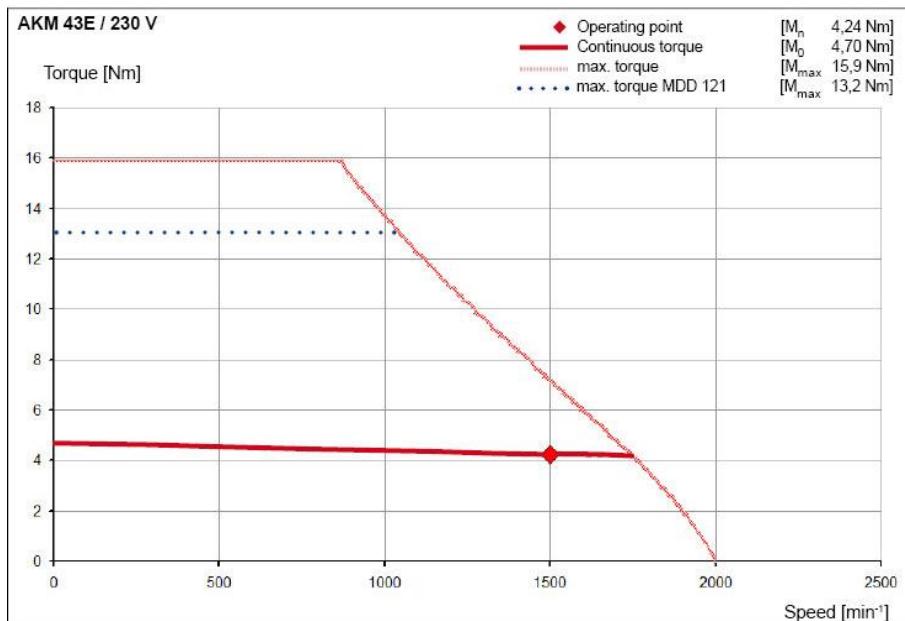


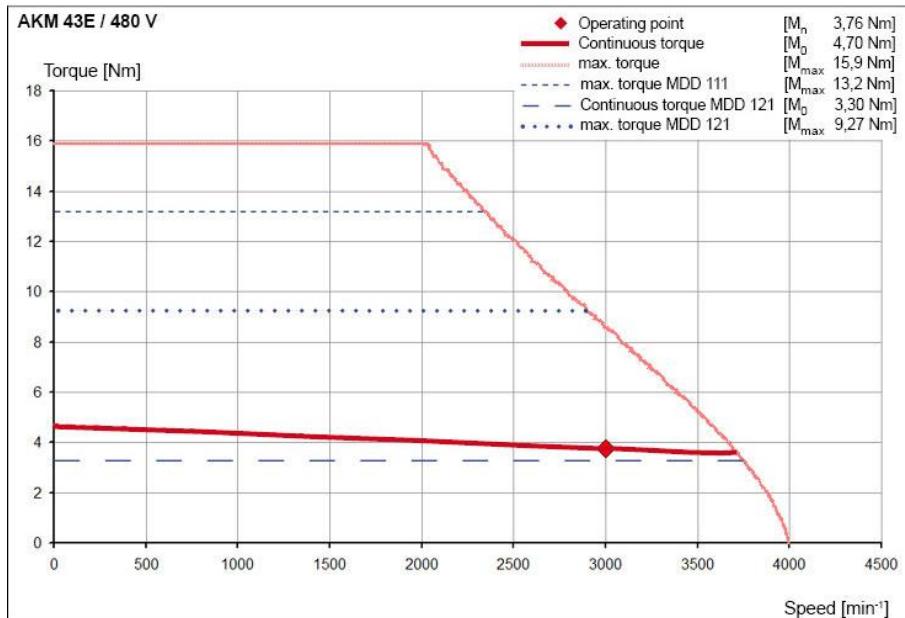


AKM 42J

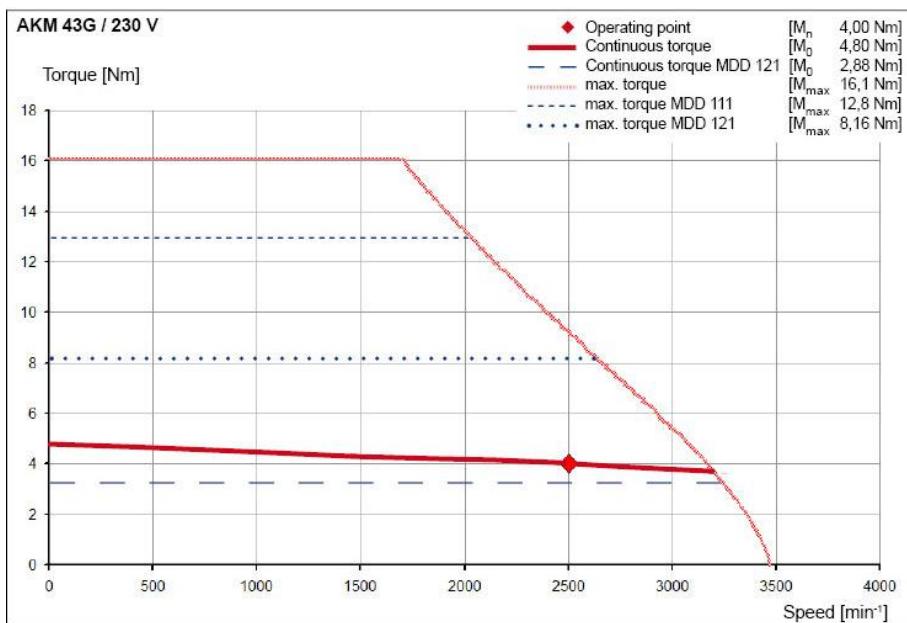


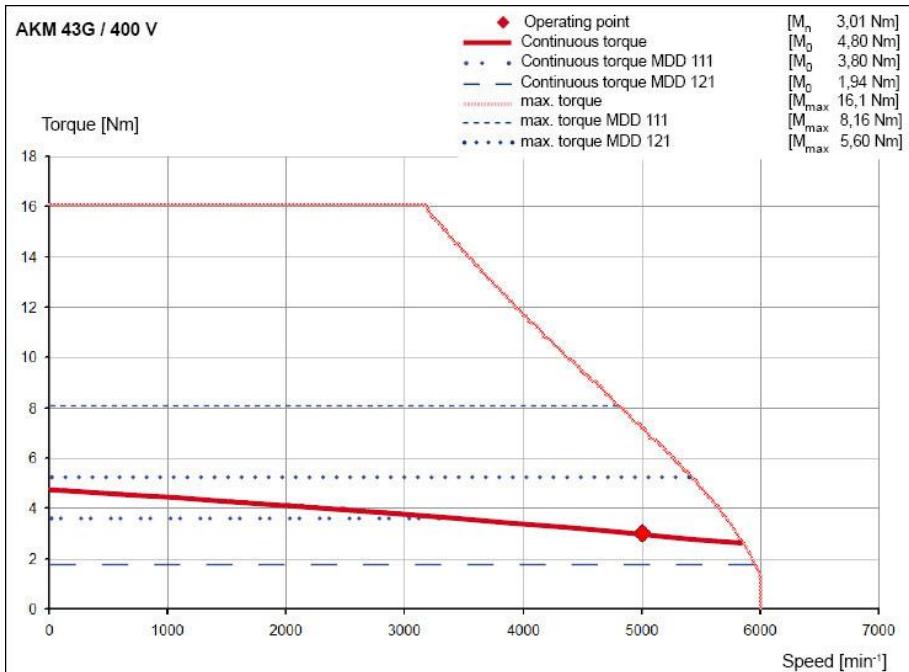
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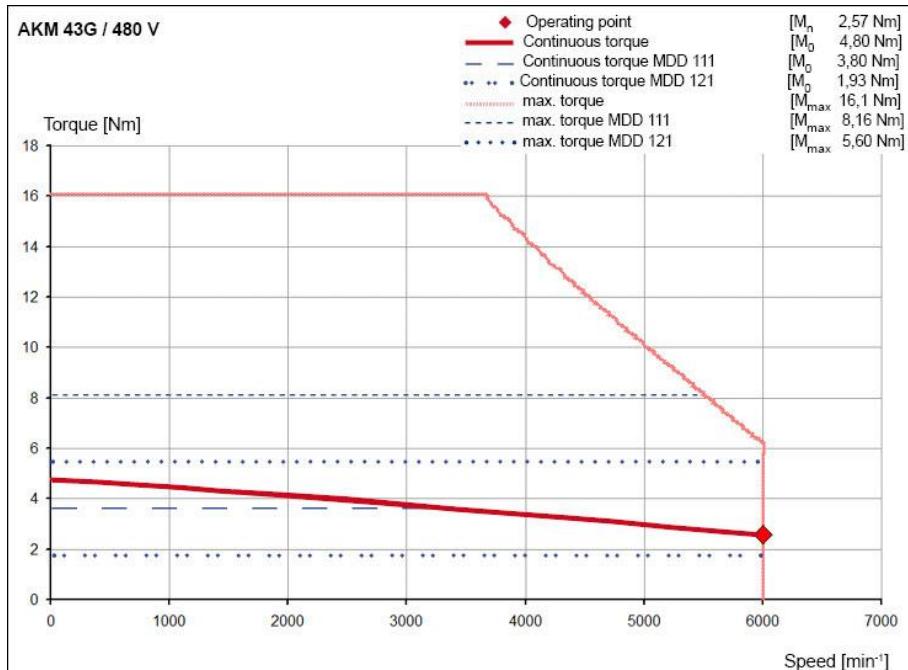




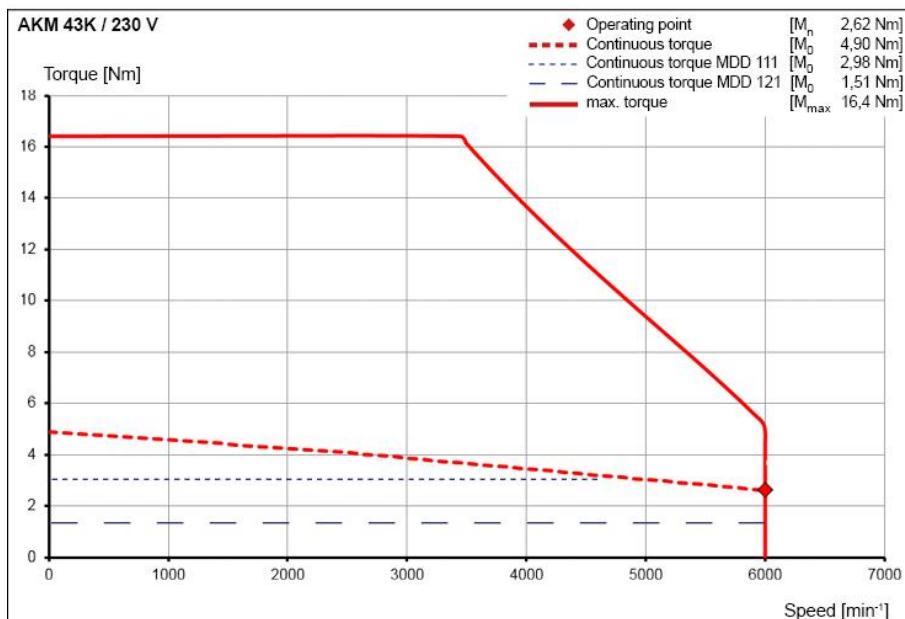
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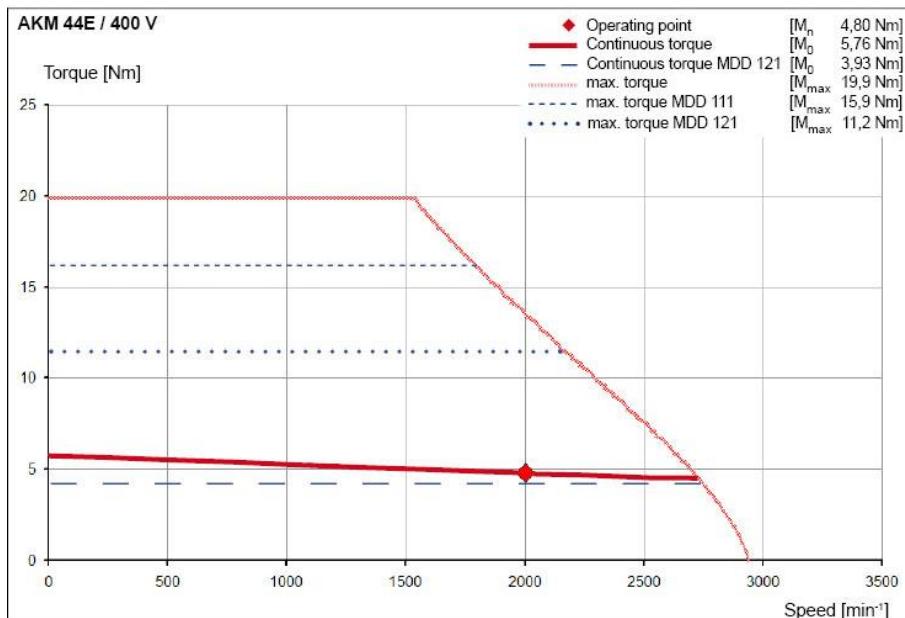
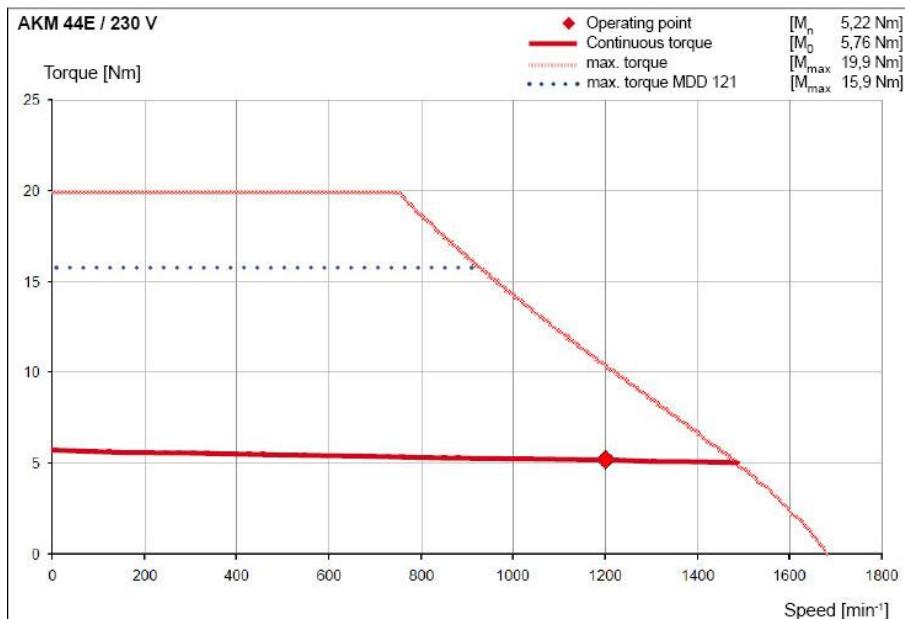


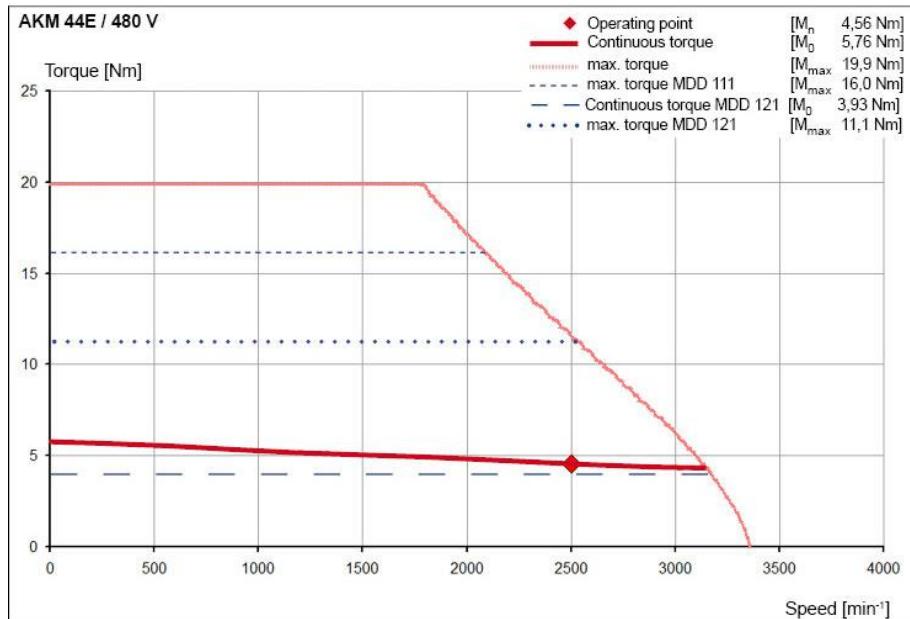


AKM 43K

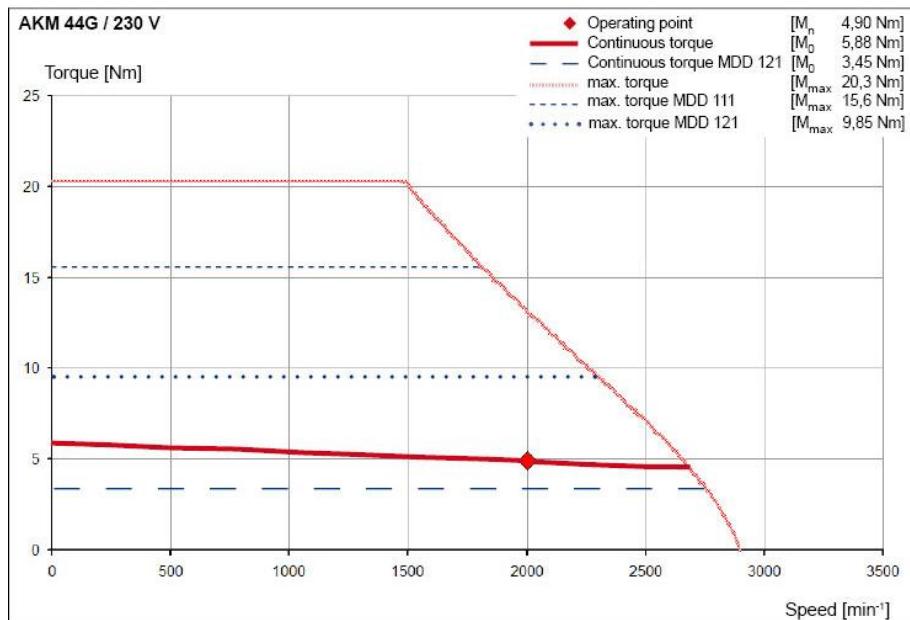


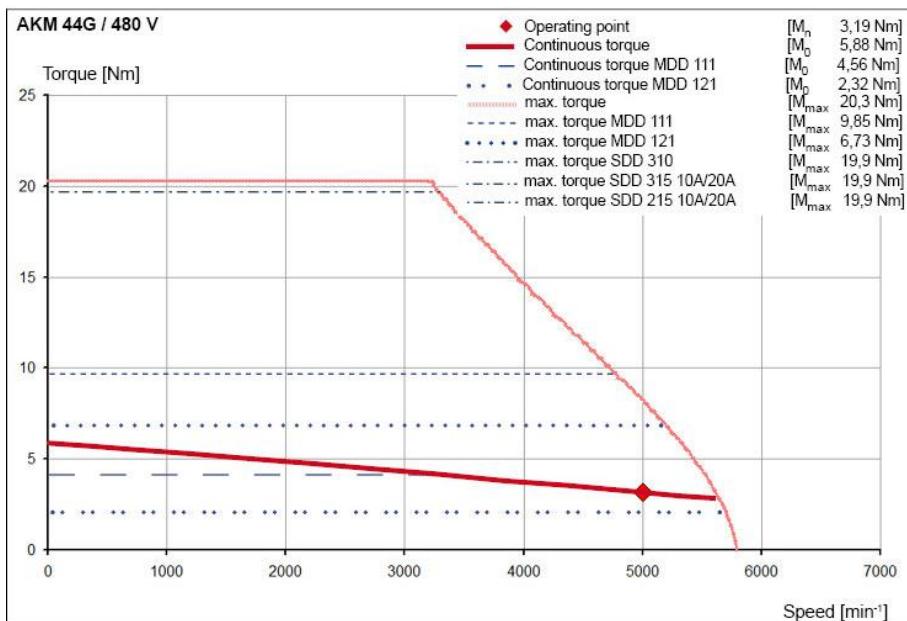
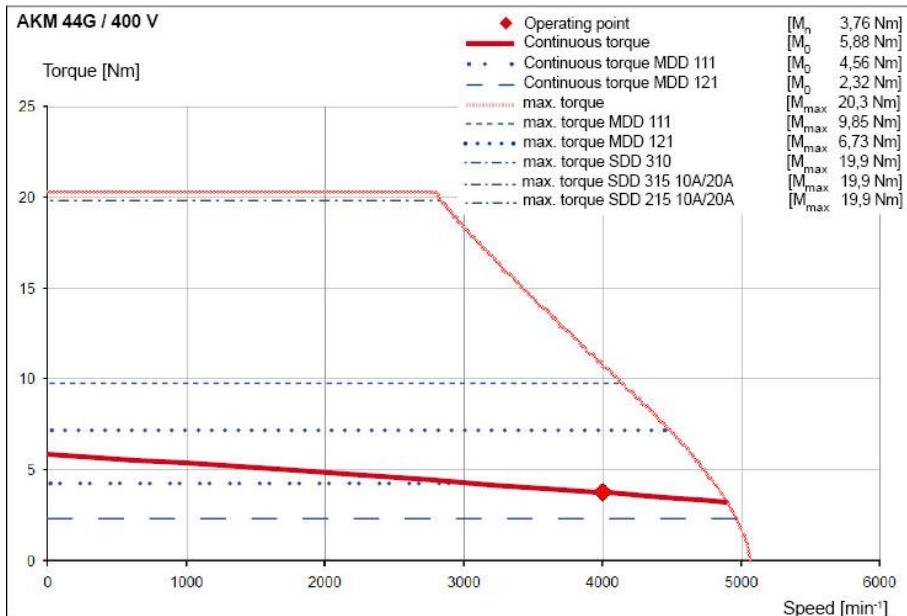
AKM 44E



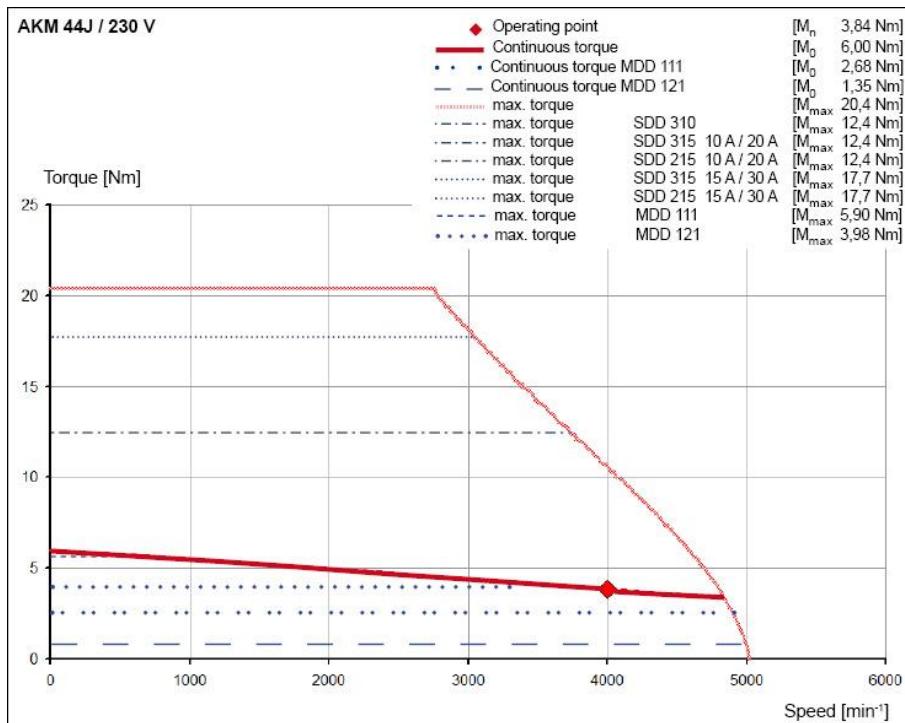


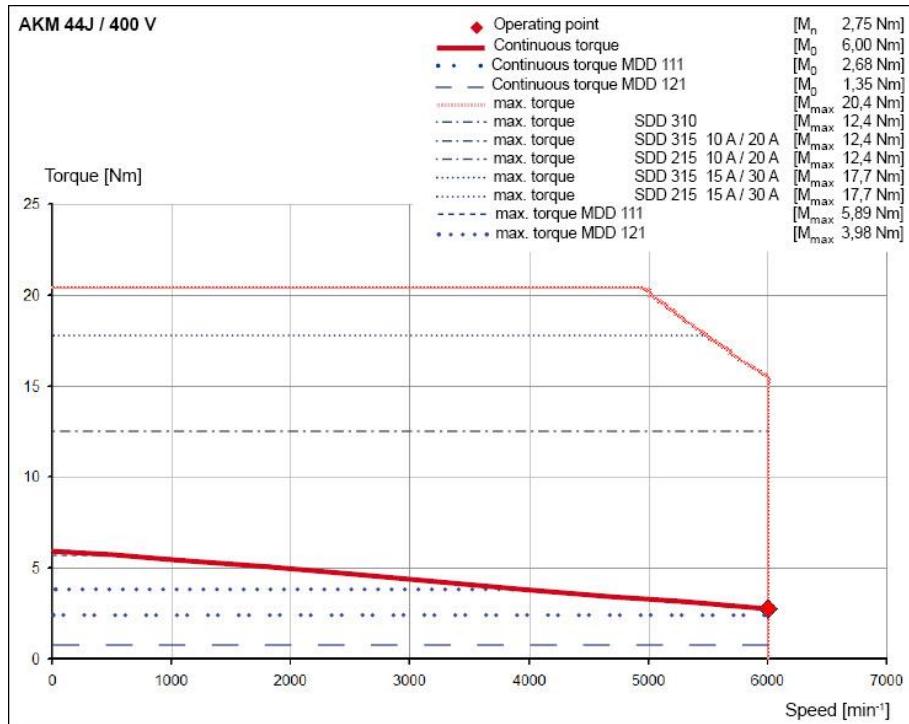
AKM 44G

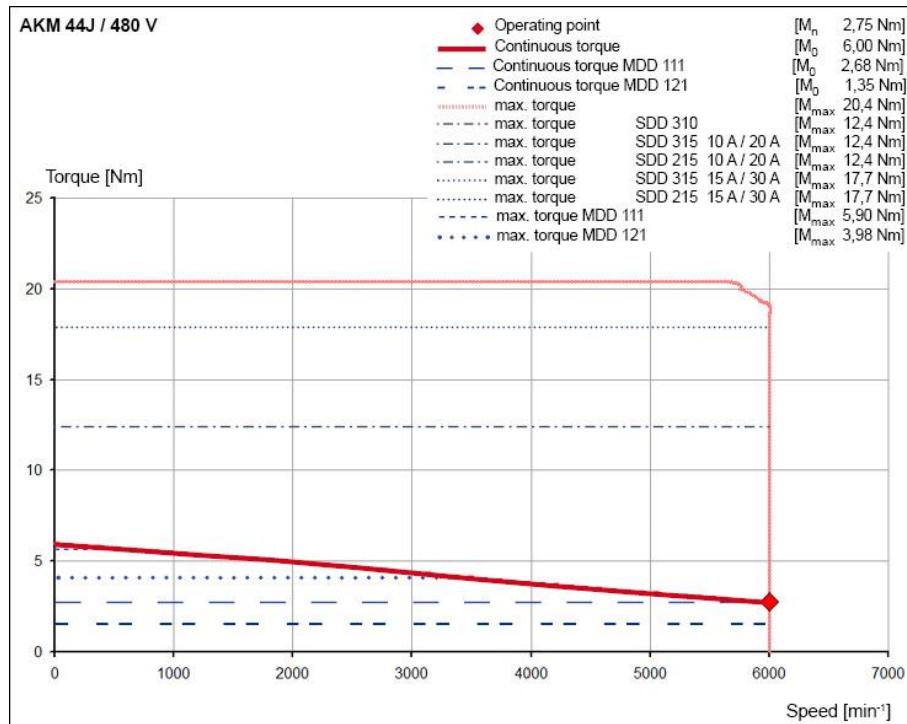




AKM 44J







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} [mV/min]	110	63,6	51,3	33,5	
	Winding resistance Ph-Ph	R ₂₅ [Ω]	8,98	2,87	1,97	0,75	

Mechanical Data			
Rotor inertial torque	J [kgcm ²]		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} [mV/min]	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 [kgcm ²]		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} [mV/min]	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 [kgcm ²]		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} [mV/min]	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 [kgcm ²]		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 [kgcm ²]	0,173
Air delay time	tBRH [ms]	80
Engage 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 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.

10.7.4 Maximum and Continuous Torque

Power supply 1 x 230 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 15A/30A		SDD 120
AKM 51E	M ₀ [Nm]	4,70	4,70	4,70	4,70	4,70	4,70	4,70
	M _n [Nm]	4,41	4,41	4,41	4,41	4,41	4,41	4,41
	M _{max} [Nm]	11,6	11,6	11,6	11,6	11,6	11,6	11,6
AKM 51G	M ₀ [Nm]	4,75	4,75	4,75	4,75	4,75	4,75	4,75
	M _n [Nm]	4,03	4,03	4,03	4,03	4,03	4,03	4,03
	M _{max} [Nm]	11,7	11,7	11,7	11,7	11,7	11,7	11,7
AKM 51H	M ₀ [Nm]	4,79	4,79	4,79	4,79	4,79	4,79	4,79
	M _n [Nm]	3,87	3,87	3,87	3,87	3,87	3,87	3,87
	M _{max} [Nm]	11,7	11,7	11,7	11,7	11,7	11,7	11,7
AKM 51K	M ₀ [Nm]	4,90	4,90	4,90	4,90	4,90	4,90	4,90
	M _n [Nm]	2,35	2,35	2,35	2,35	2,35	2,35	2,35
	M _{max} [Nm]	11,9	11,9	11,9	11,9	11,9	11,9	11,9
AKM 52E	M ₀ [Nm]	-	-	-	-	-	-	-
	M _n [Nm]	-	-	-	-	-	-	-
	M _{max} [Nm]	-	-	-	-	-	-	-
AKM 52G	M ₀ [Nm]	8,43	8,43	8,43	8,43	8,43	8,43	8,43
	M _n [Nm]	7,69	7,69	7,69	7,69	7,69	7,69	7,69
	M _{max} [Nm]	21,5	21,5	21,5	21,5	21,5	21,5	21,5
AKM 52H	M ₀ [Nm]	8,48	8,48	8,48	8,48	8,48	8,48	8,48
	M _n [Nm]	7,53	7,53	7,53	7,53	7,53	7,53	7,53
	M _{max} [Nm]	21,6	21,6	21,6	21,6	21,6	21,6	21,6
AKM 52K	M ₀ [Nm]	8,60	8,60	8,60	8,60	8,60	8,60	8,60
	M _n [Nm]	6,80	6,80	6,80	6,80	6,80	6,80	6,80
	M _{max} [Nm]	21,9	16,1	16,1	21,9	16,1	21,9	21,9
AKM 52M	M ₀ [Nm]	8,60	6,30	6,30	8,60	6,30	8,60	8,60
	M _n [Nm]	5,20	5,20	5,20	5,20	5,20	5,20	5,20
	M _{max} [Nm]	21,9	12,1	12,1	17,4	12,1	17,4	21,9
AKM 52L	M ₀ [Nm]	8,67	7,08	7,08	8,67	7,08	8,67	8,67
	M _n [Nm]	6,40	6,40	6,40	6,40	6,40	6,40	6,40
	M _{max} [Nm]	21,9	13,4	13,4	18,9	13,4	18,9	21,9
AKM 53G	M ₀ [Nm]	11,4	11,4	11,4	11,4	11,4	11,4	11,4
	M _n [Nm]	10,7	10,7	10,7	10,7	10,7	10,7	10,7
	M _{max} [Nm]	29,7	29,7	29,7	29,7	29,7	29,7	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		SDD 215		SDD 120
			10A/20A	15A/30A	10A/20A	15A/30A		
AKM 51E	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,70 3,98 11,6						
AKM 51G	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,75 2,62 11,7						
AKM 51H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,79 1,95 11,7						
AKM 52E	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,34 7,61 21,3						

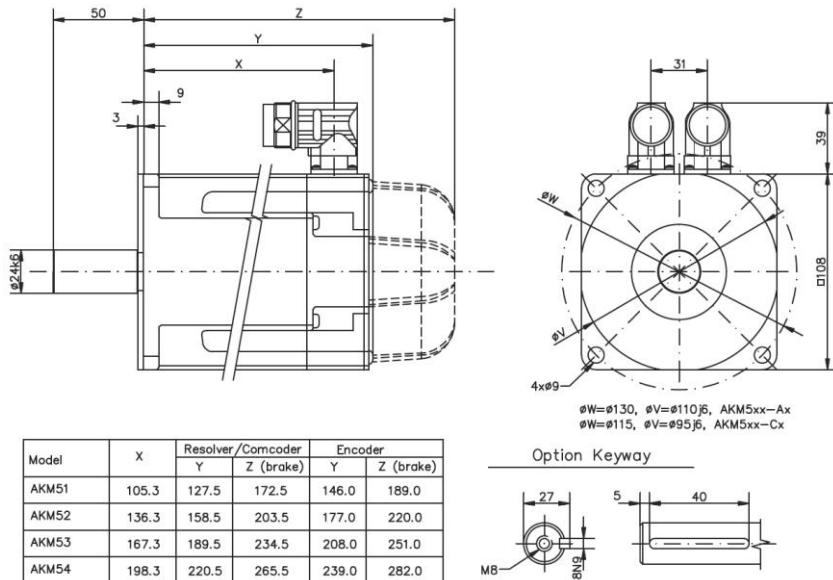
AKM 52G	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,43 7,06 21,5						
AKM 52H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,48 6,26 21,6						
AKM 52K	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,60 3,90 21,9	8,60 3,90 16,1	8,60 3,90 21,9	8,60 3,90 16,1	8,60 3,90 21,9	8,60 3,90 21,9	8,60 3,90 21,9
AKM 52L	M ₀ [Nm] M _n [Nm] M _{max} [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						
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						
AKM 54H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	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

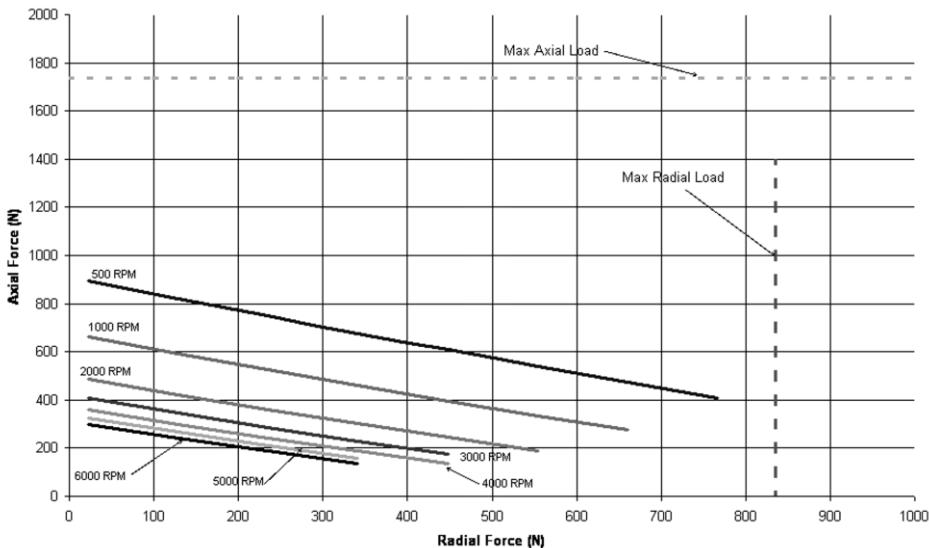
Motor type	Symbol [Unit]	Motor data	Servo amplifier				
			SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 15A/30A	
AKM 51E	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6	4,70 3,80 11,6
AKM 51G	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,75 1,94 11,7	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

AKM 51H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	4,79 1,95 11,7						
AKM 52E	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,34 7,28 21,3						
AKM 52G	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	8,43 6,66 21,5						
AKM 52H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	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						
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						
AKM 54H	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	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)

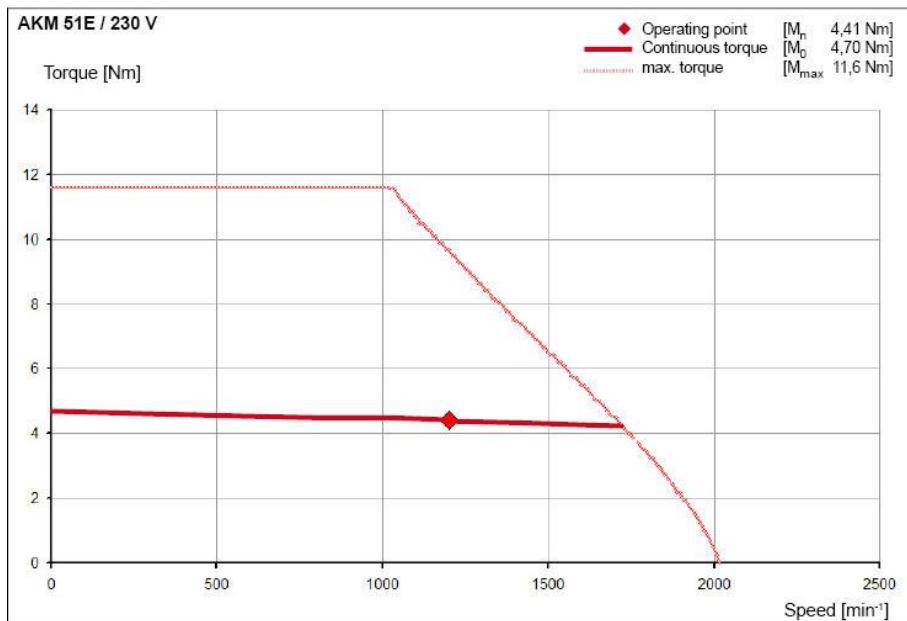


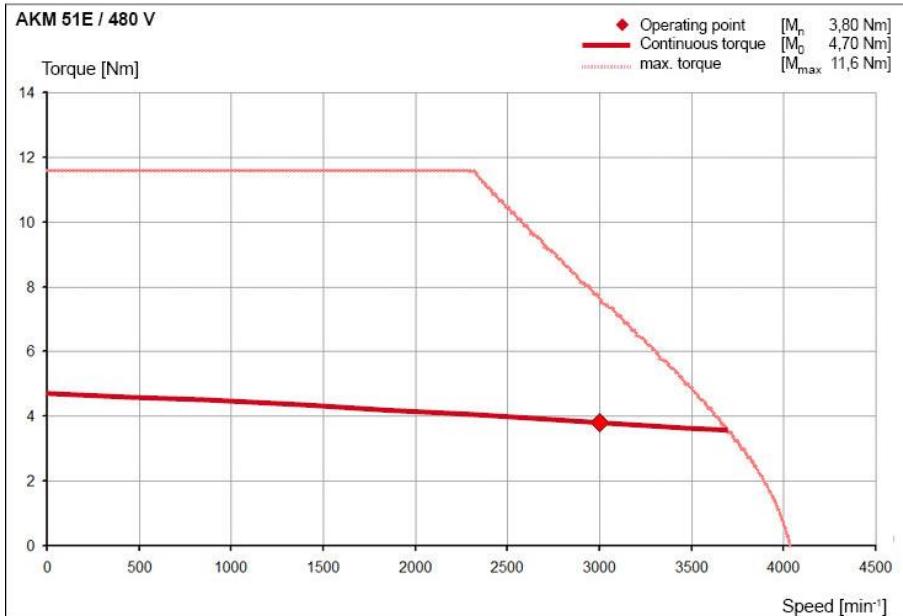
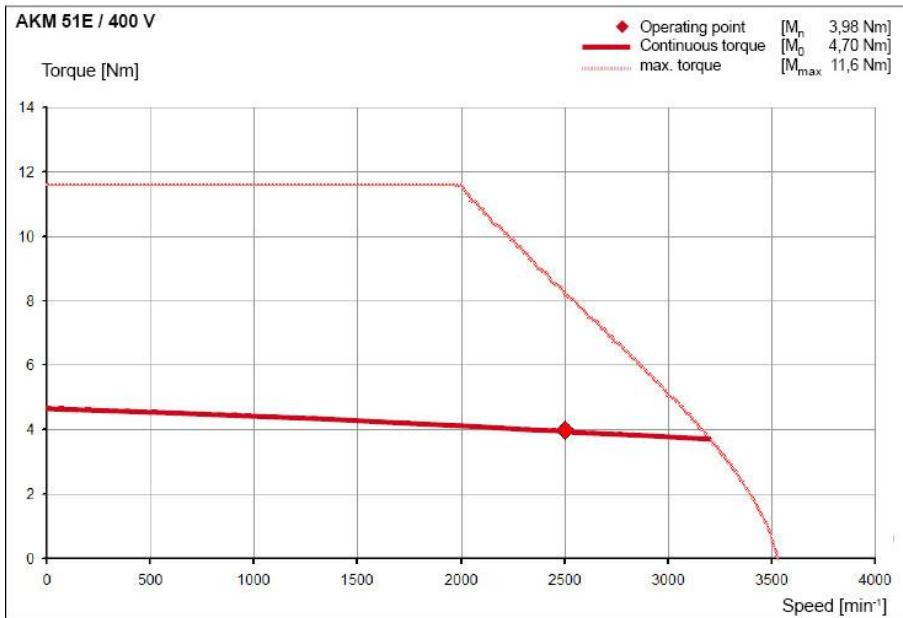
10.7.6 Radial Force on the Shaft End



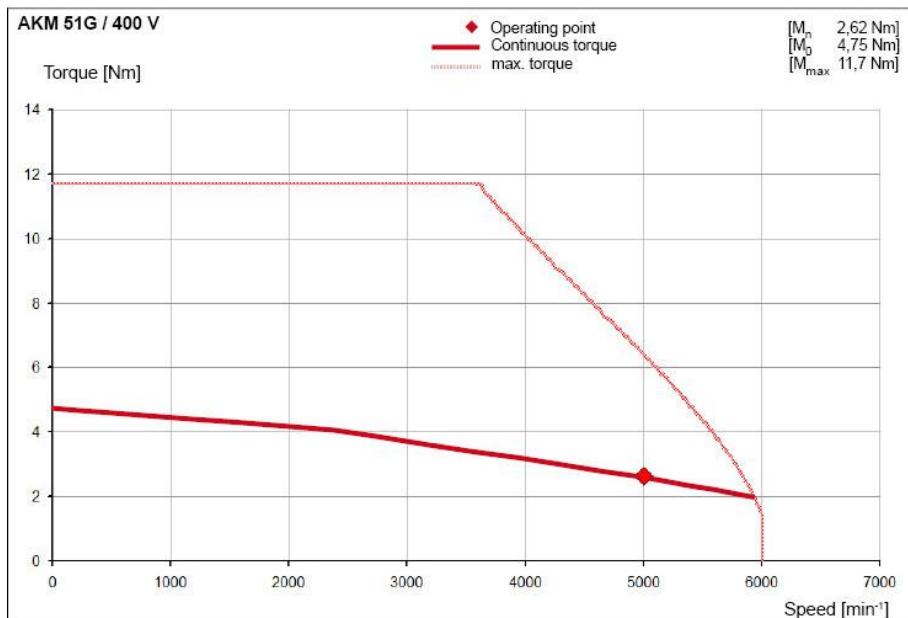
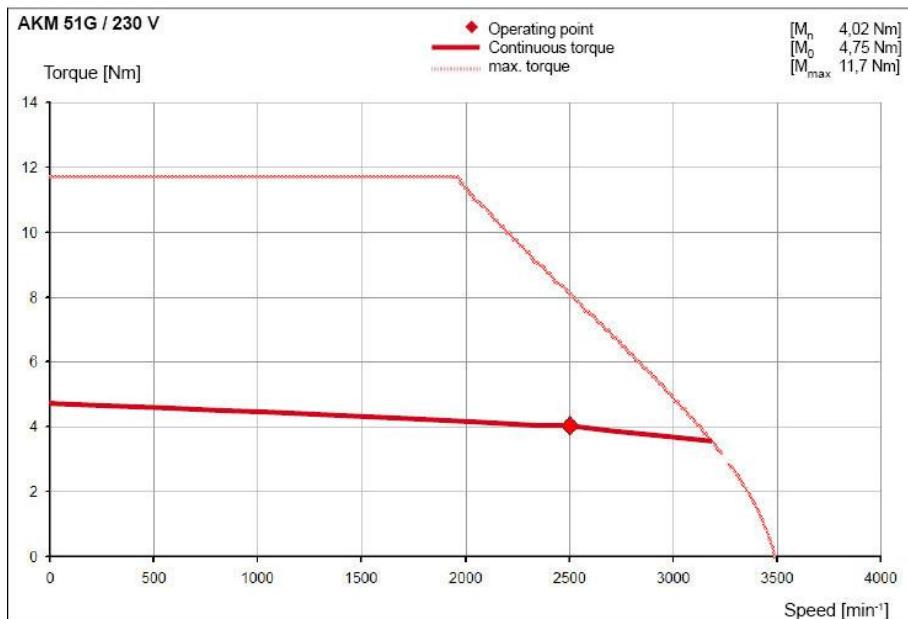
10.7.7 Motor Characteristics

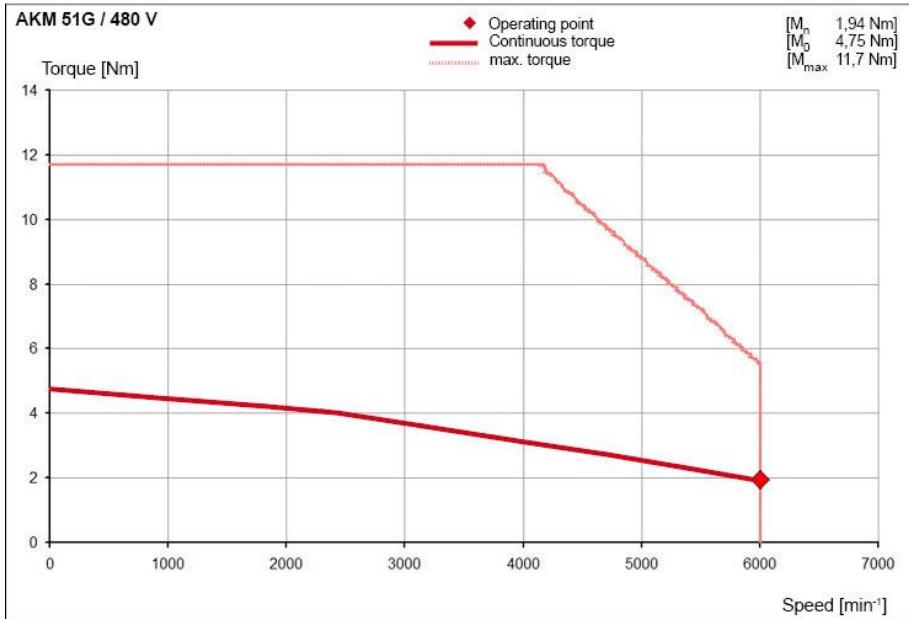
AKM 51E



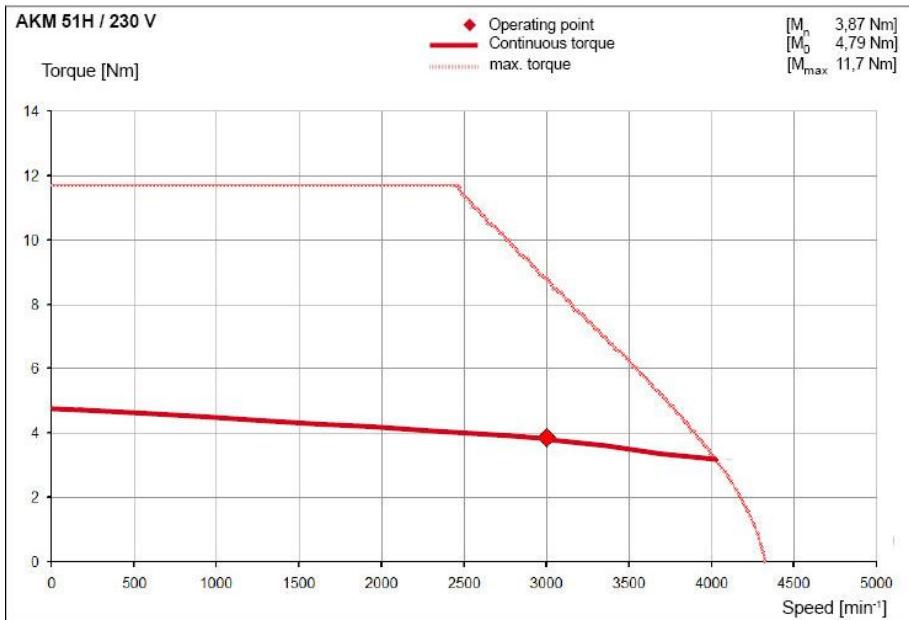


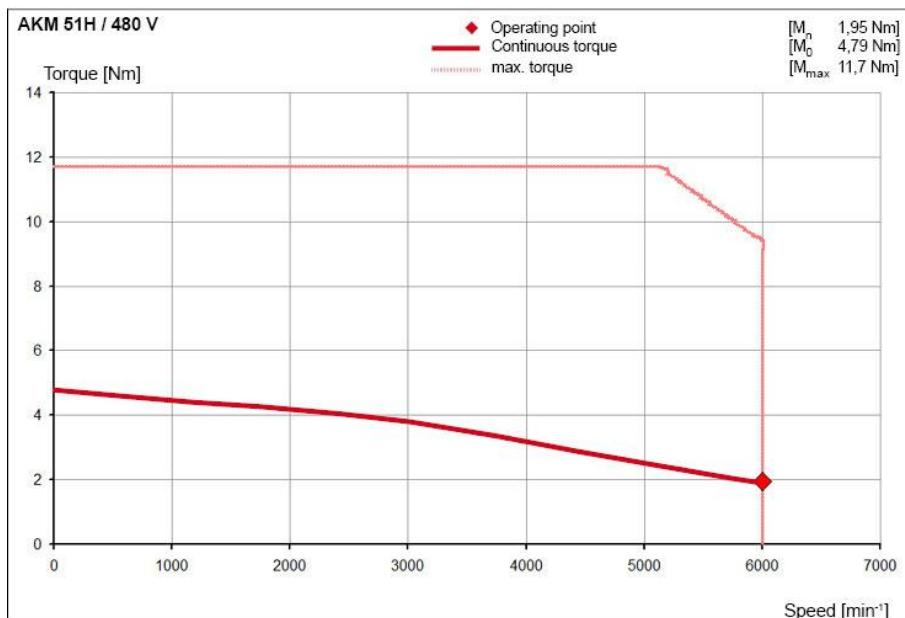
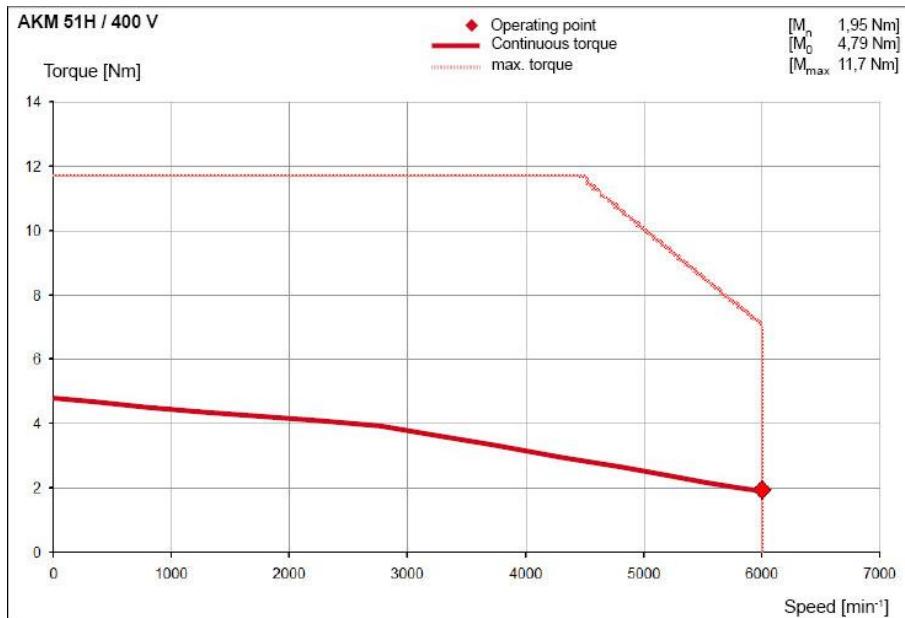
AKM 51G



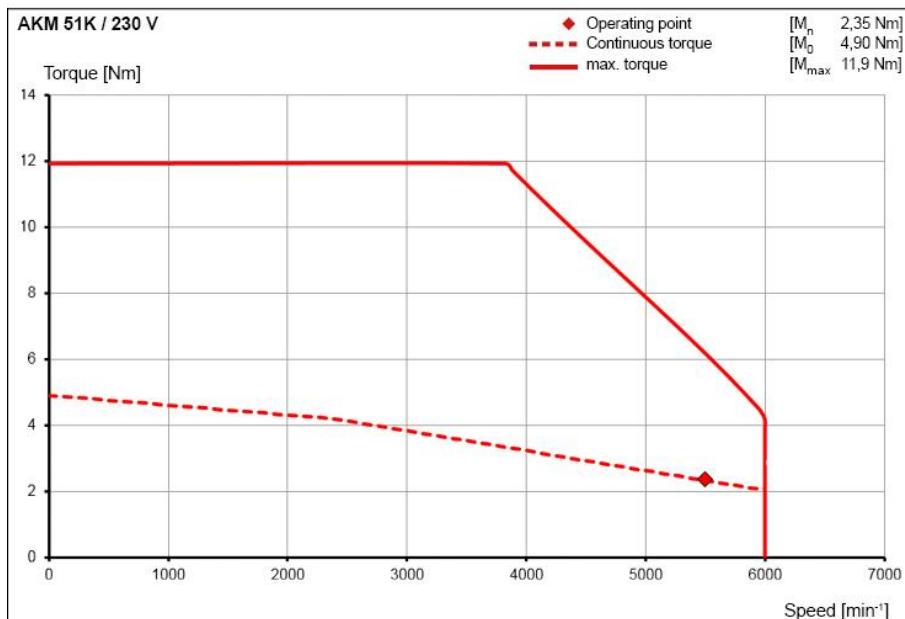


AKM 51H

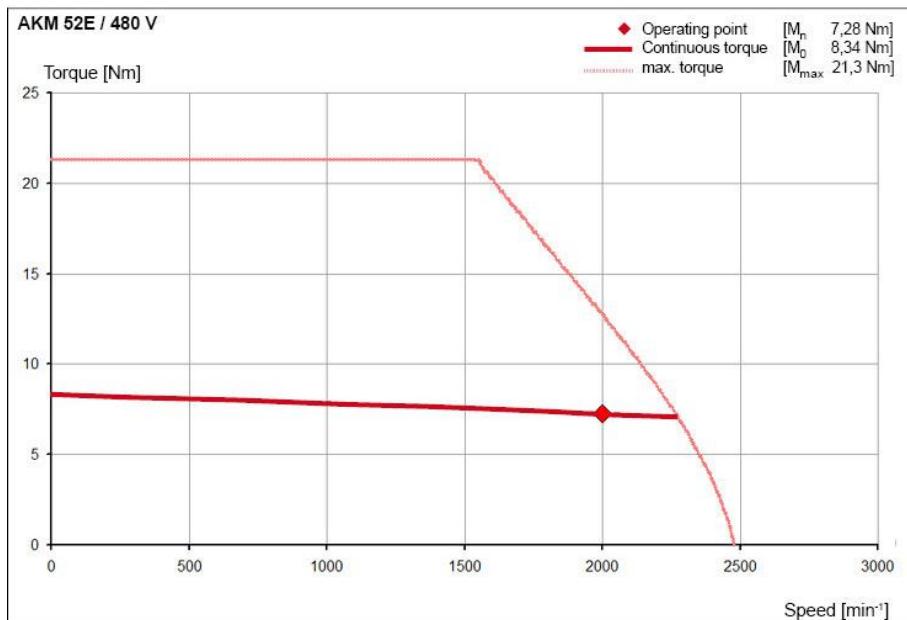
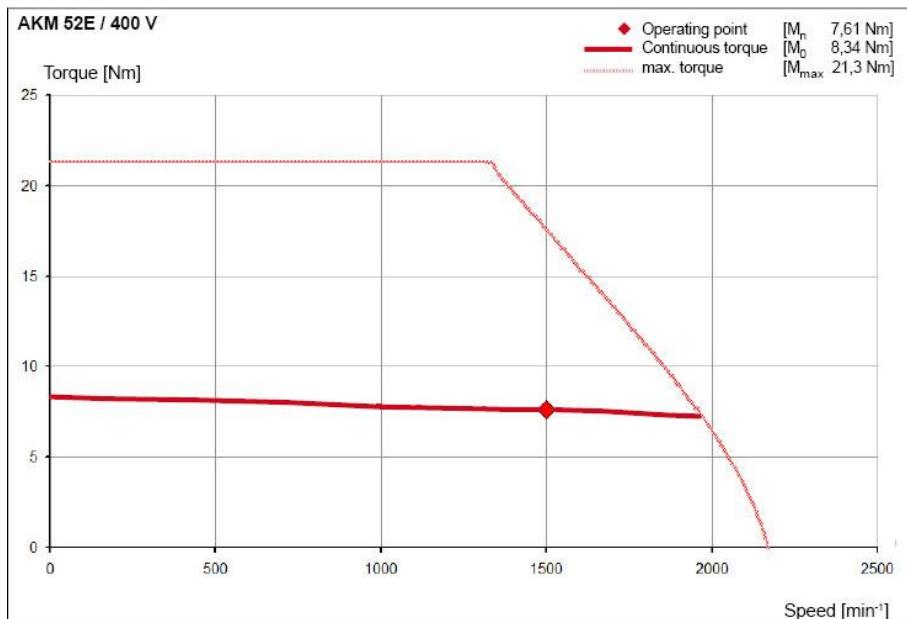




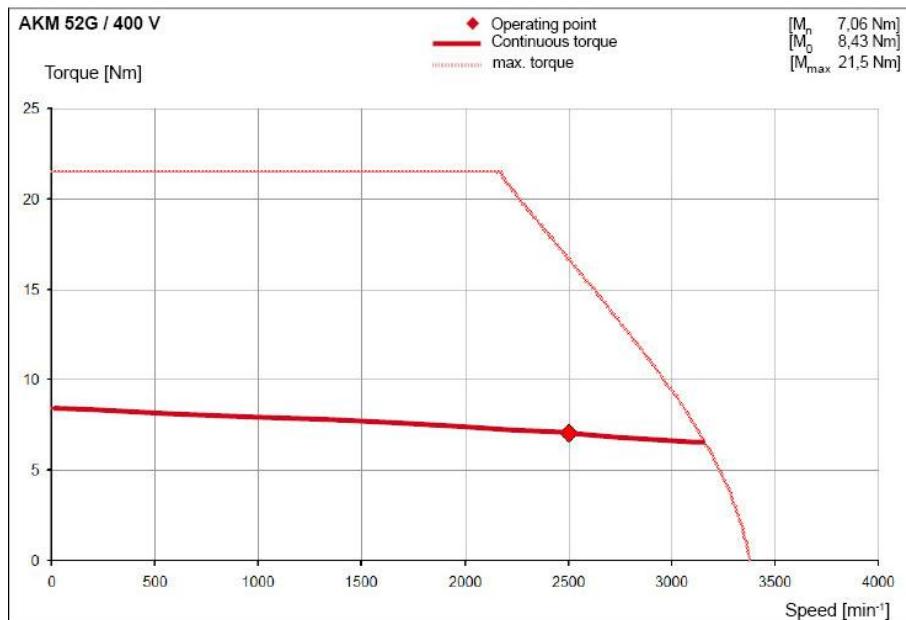
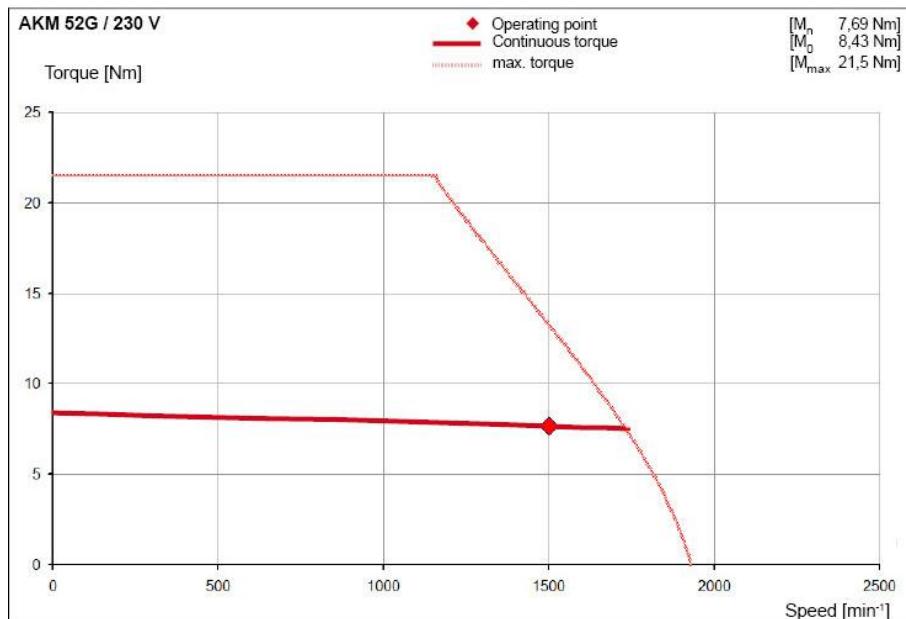
AKM 51K

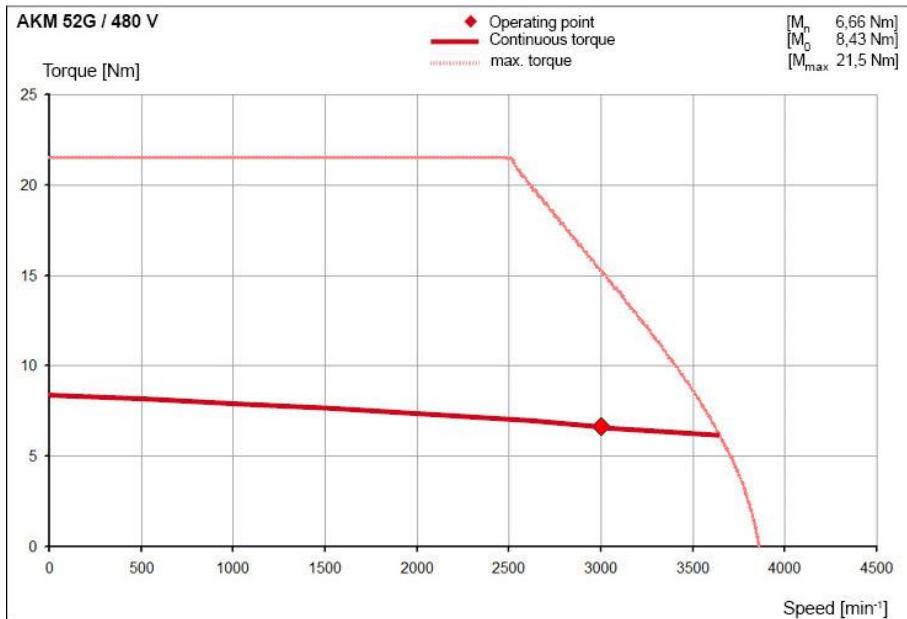


AKM 52E

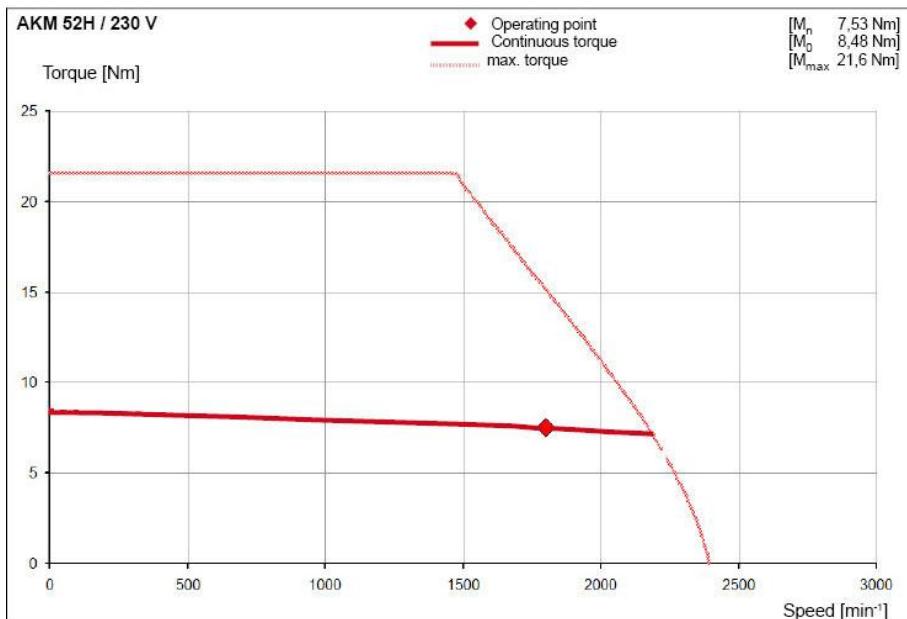


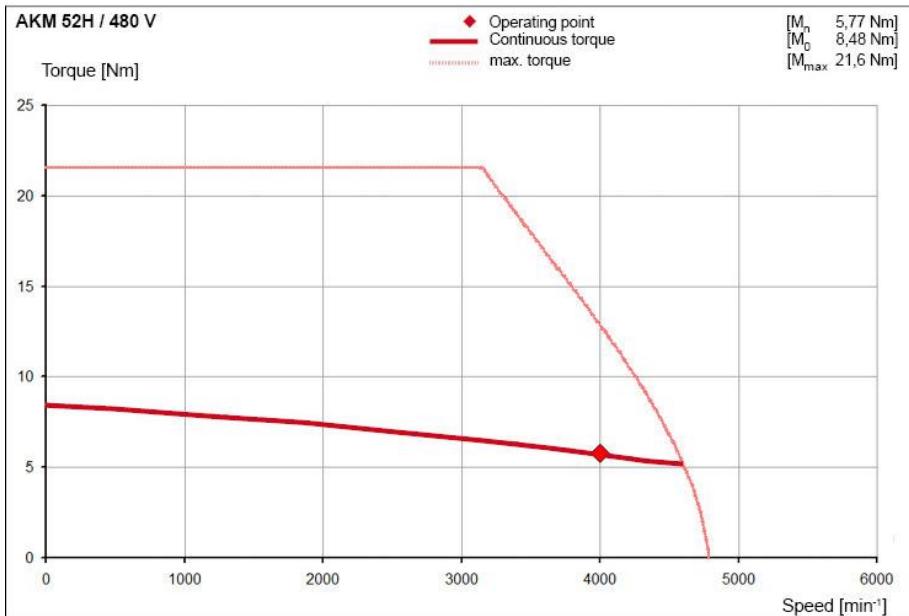
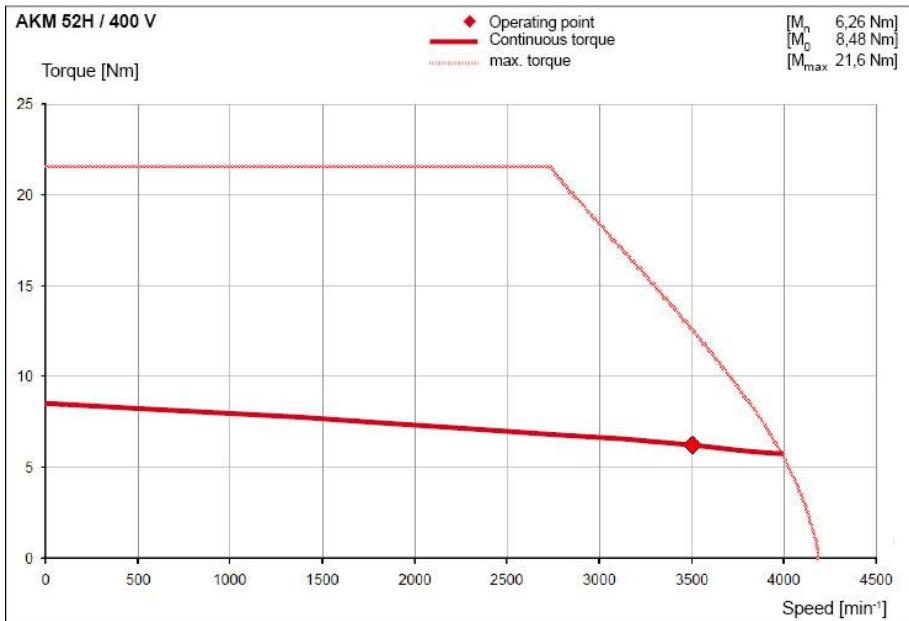
AKM 52G



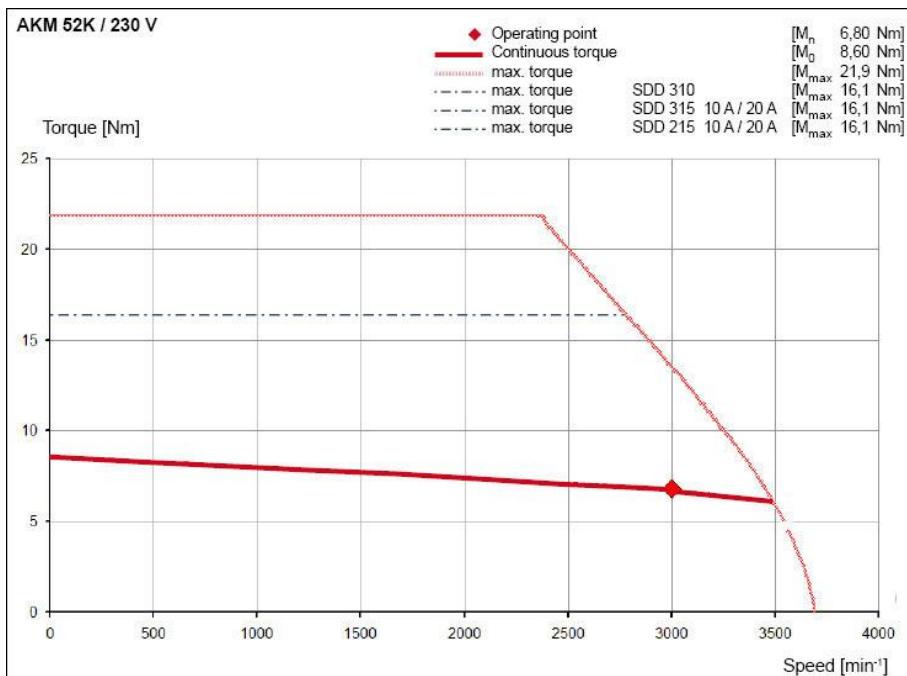


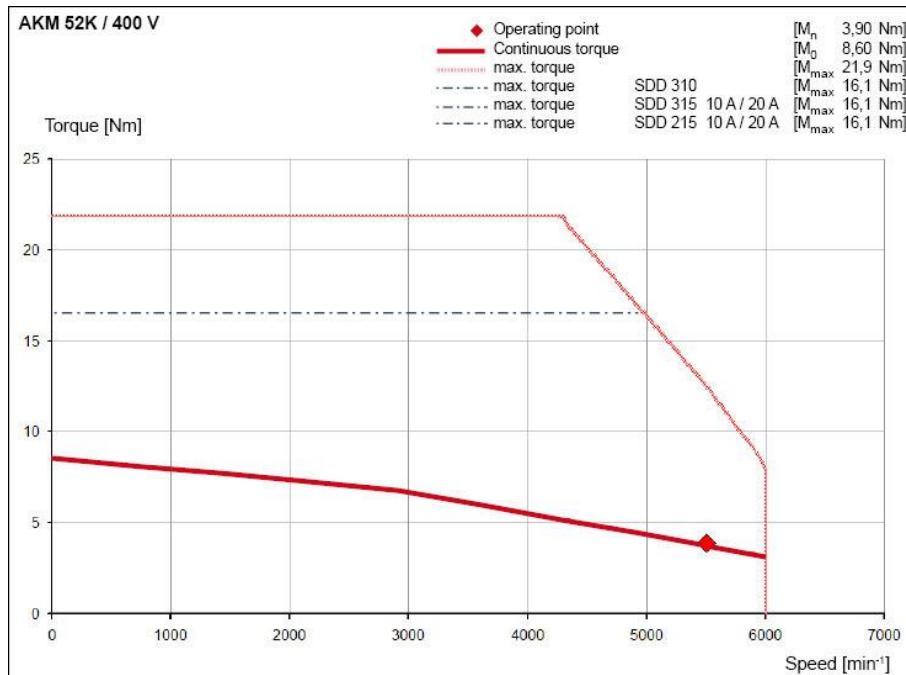
AKM 52H

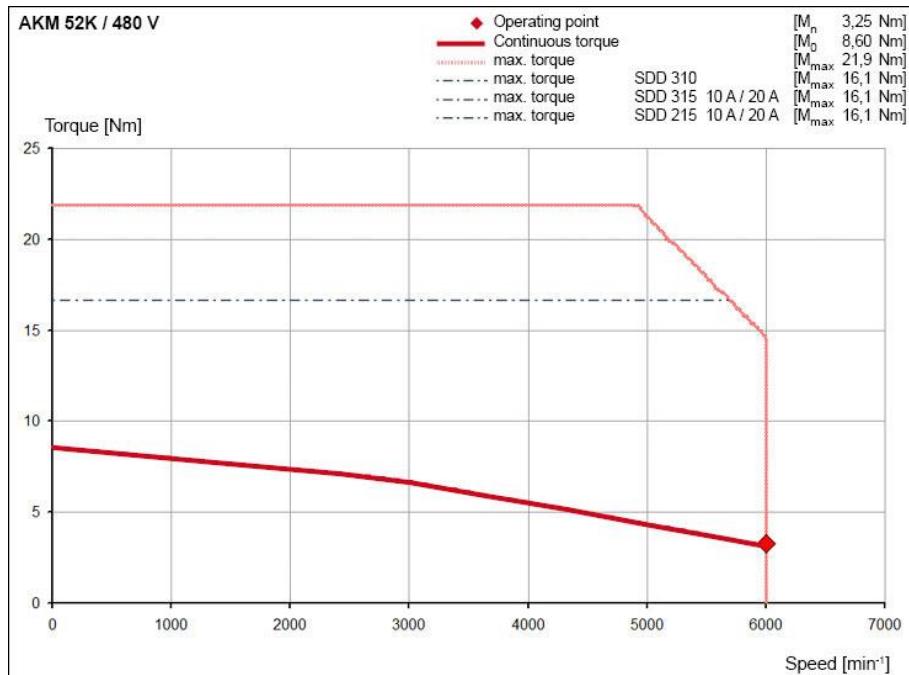




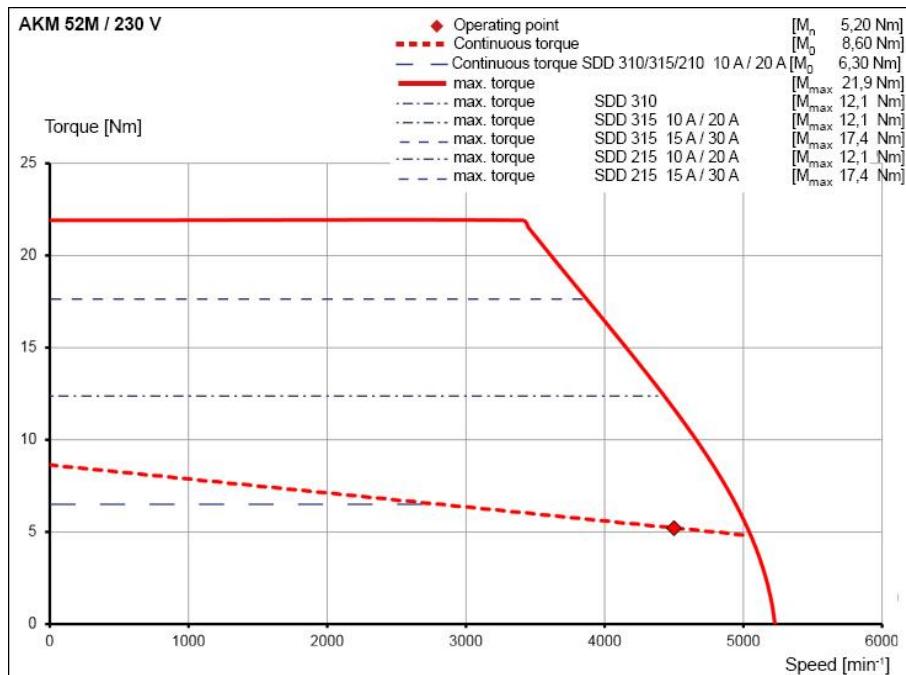
AKM 52K



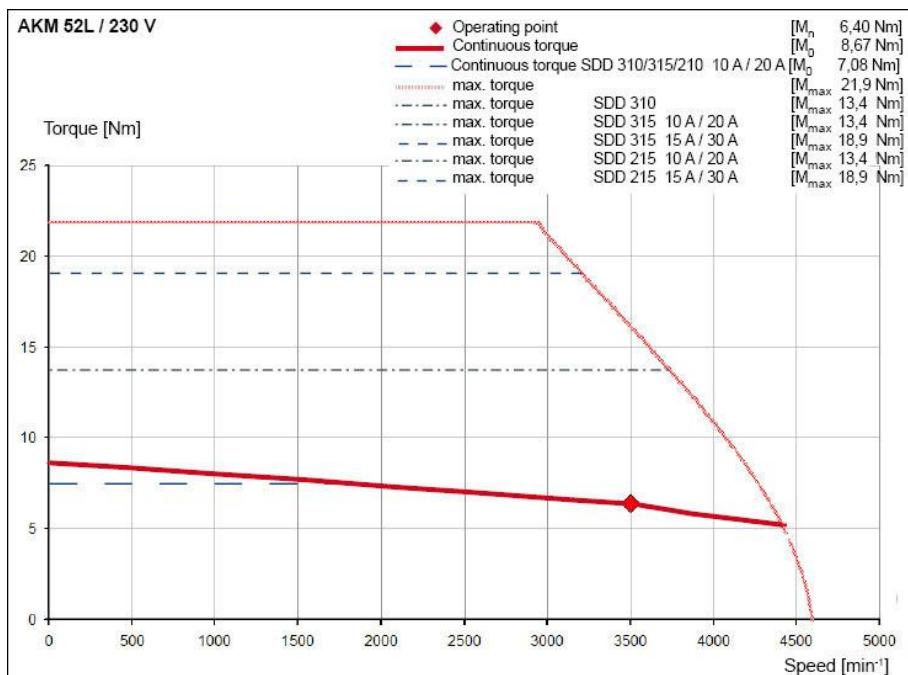


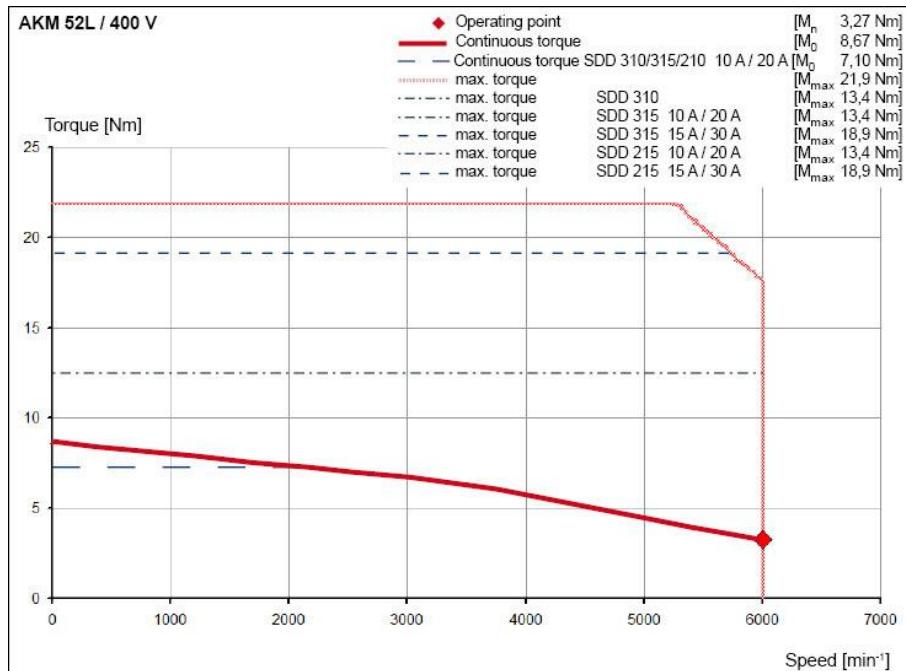


AKM 52M

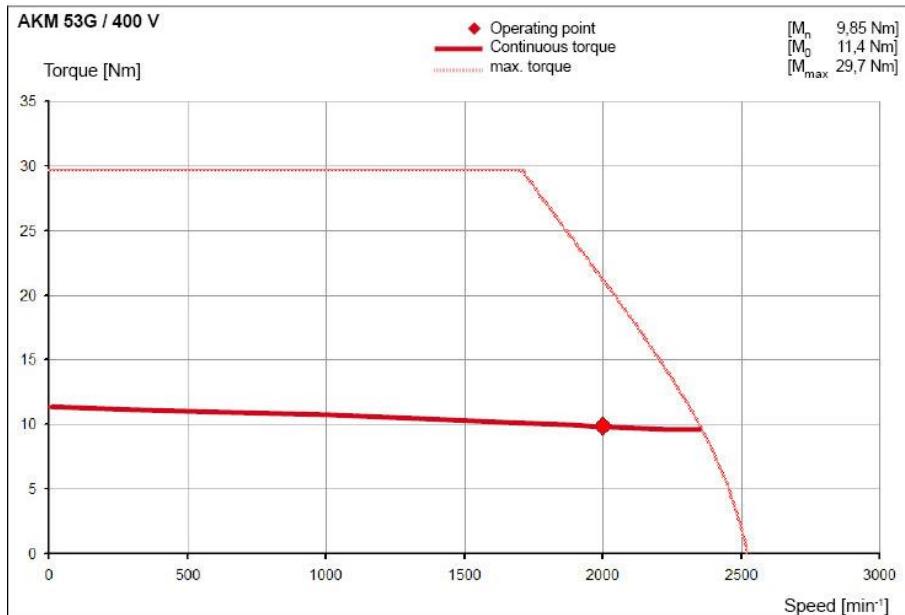
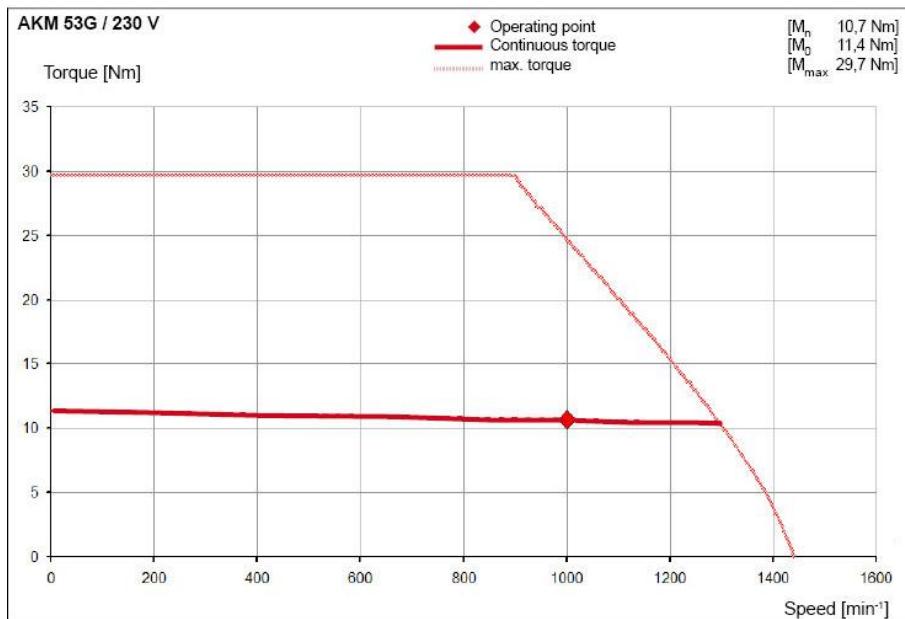


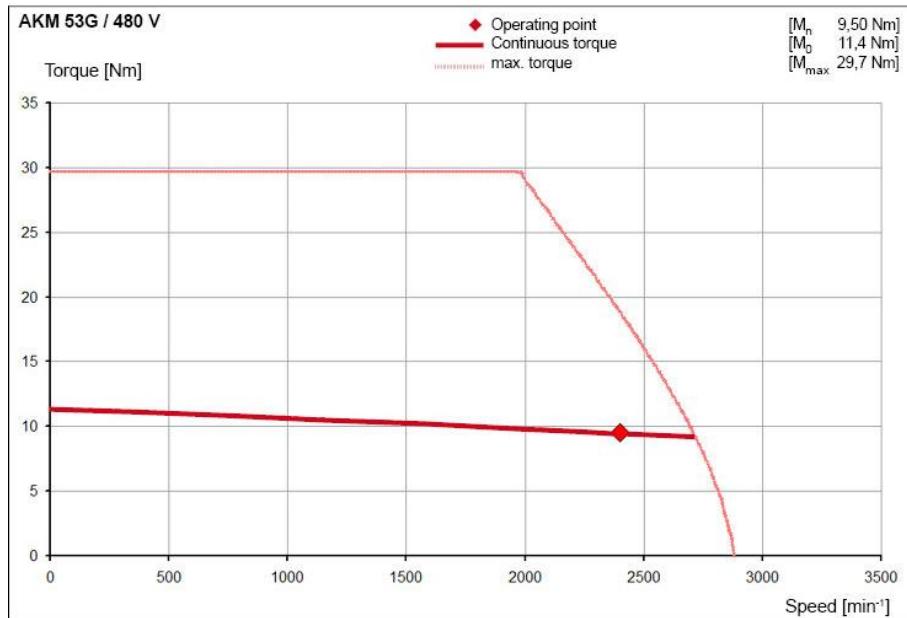
AKM 52L



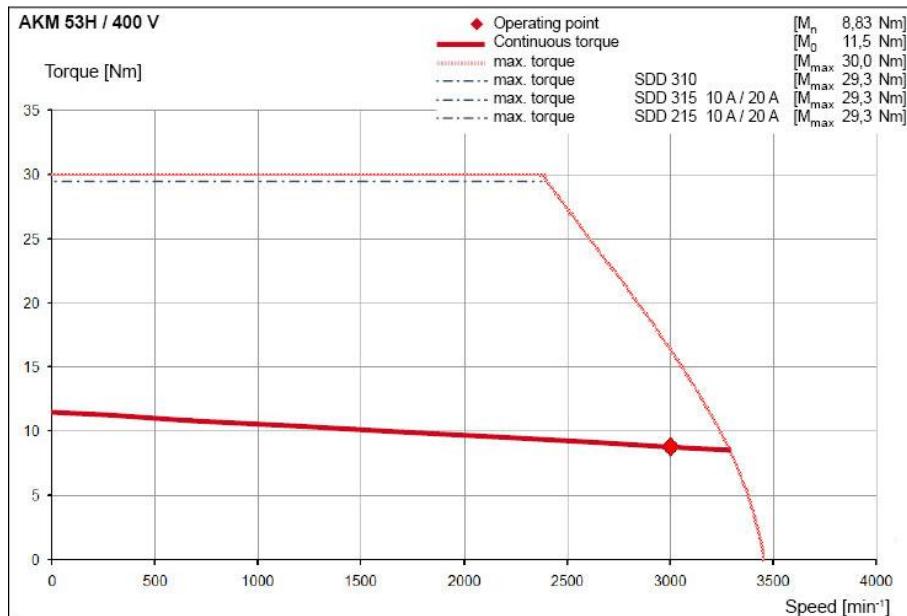


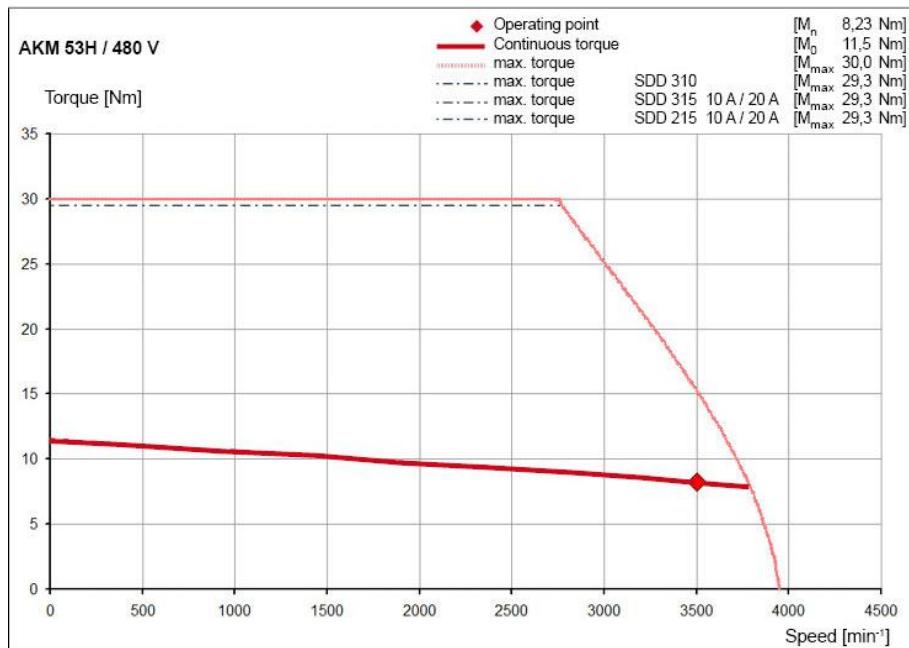
AKM 53G



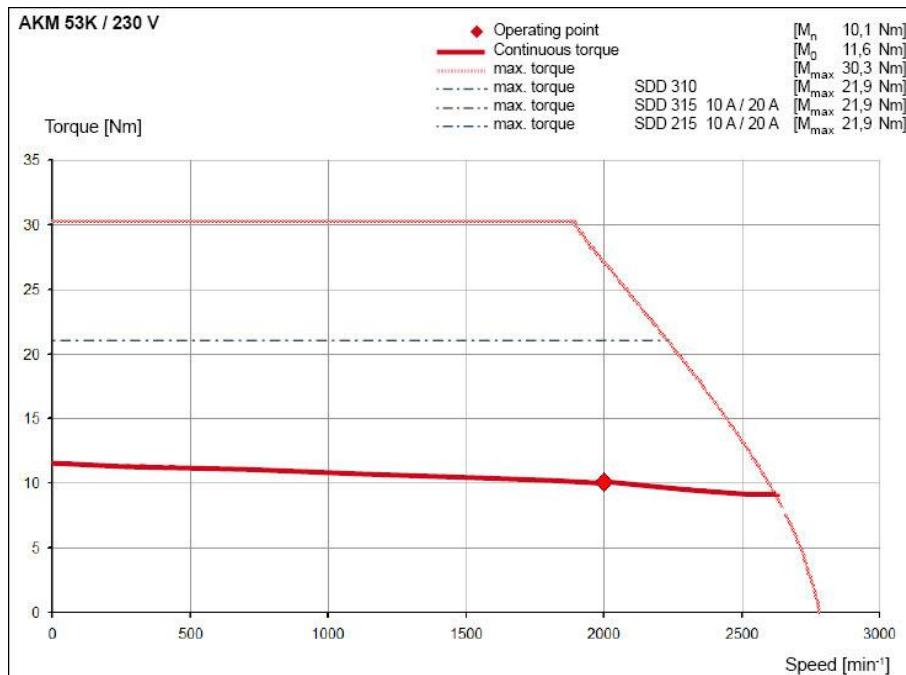


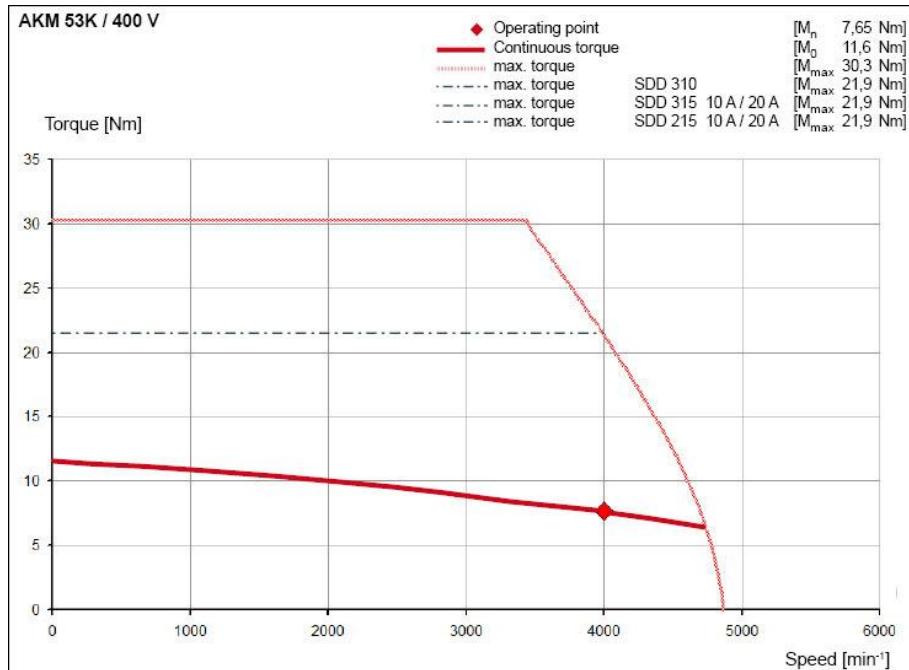
AKM 53H

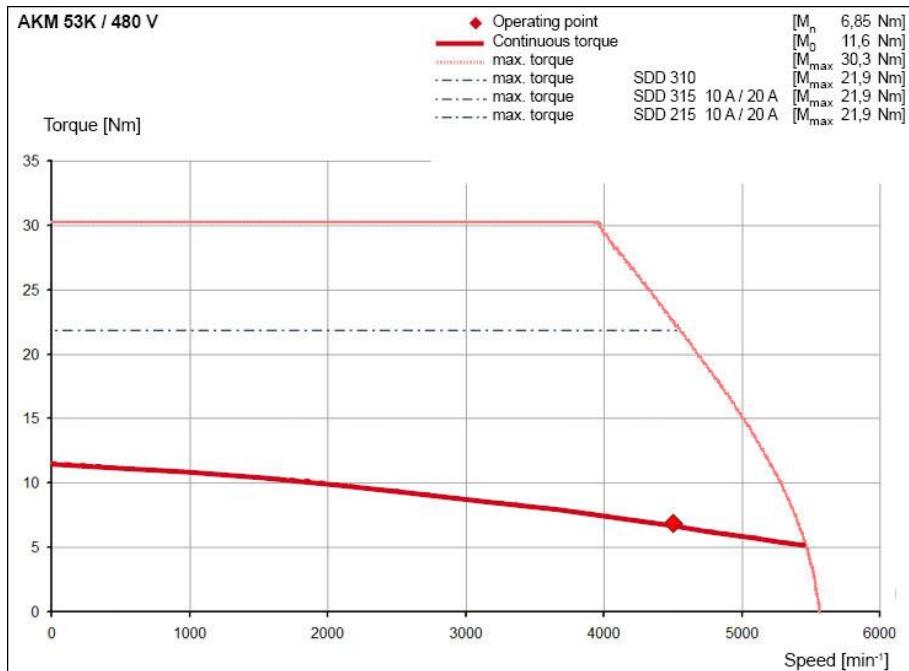




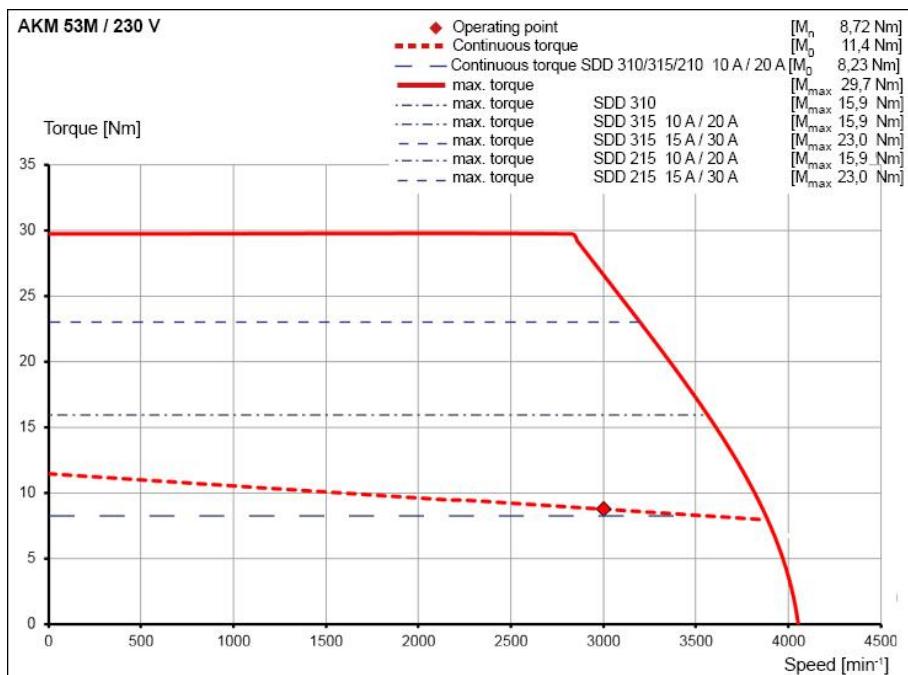
AKM 53K



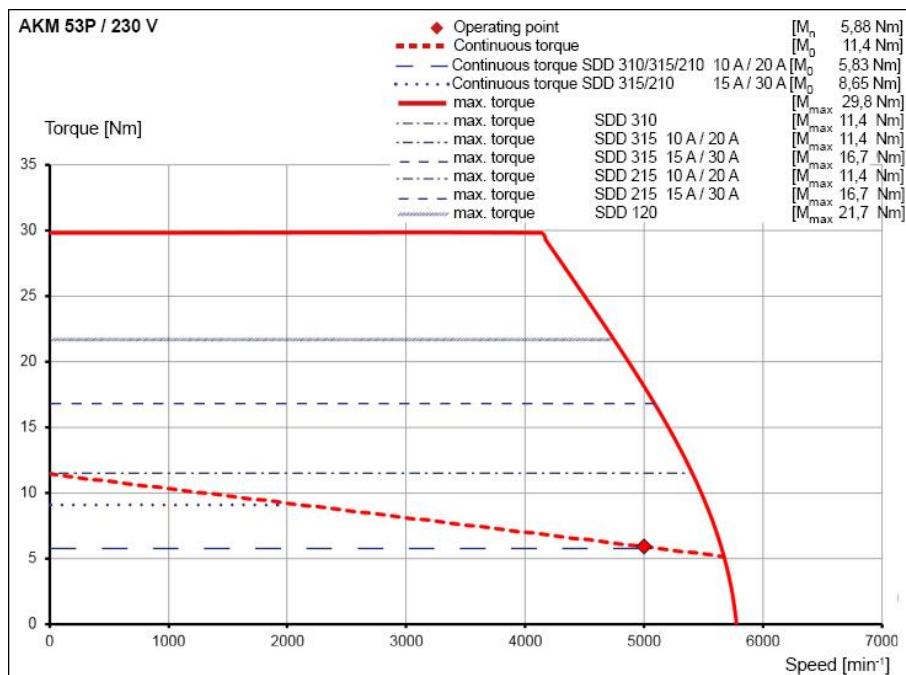


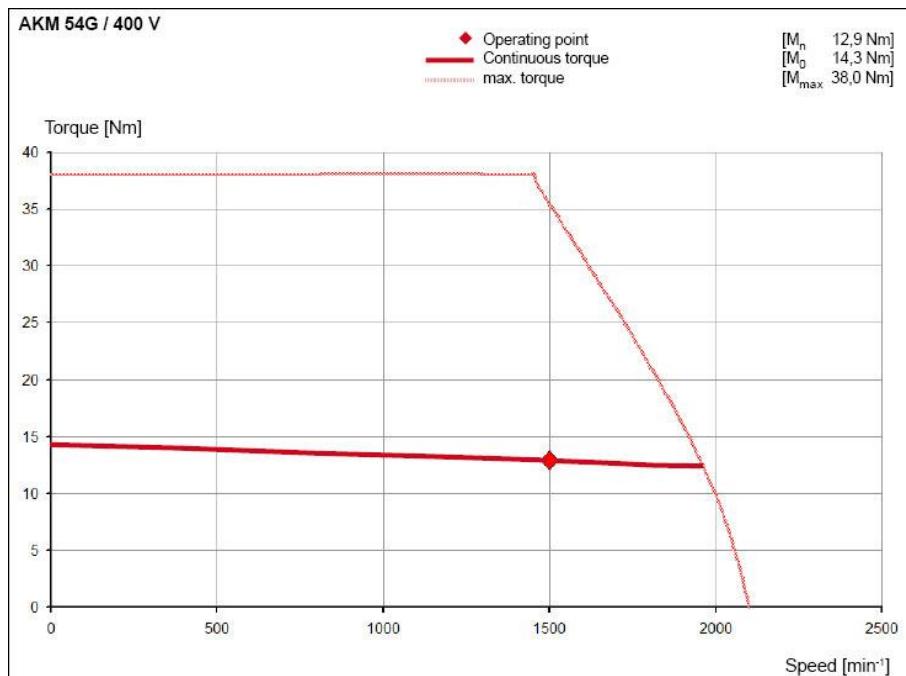


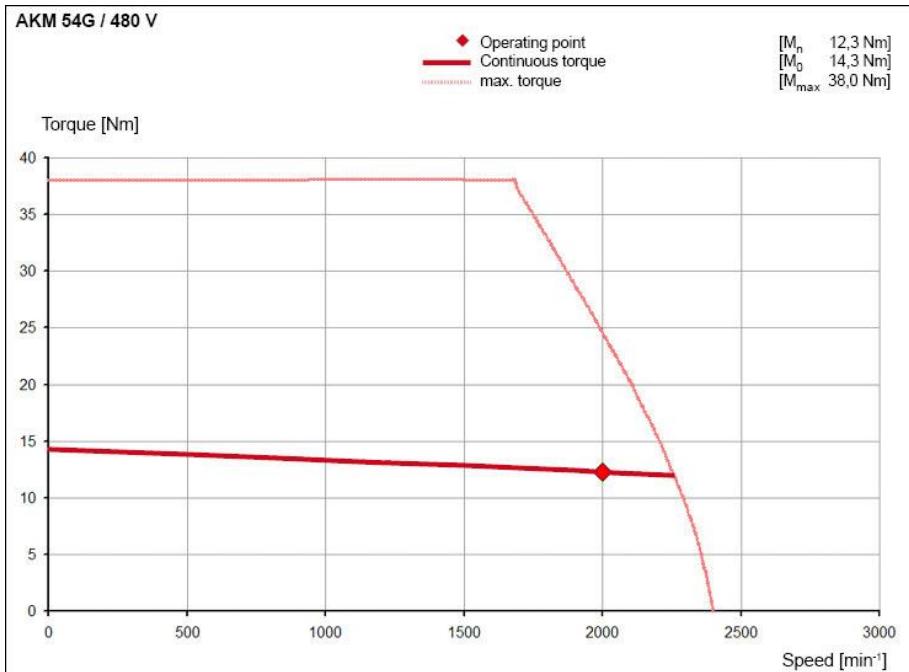
AKM 53M



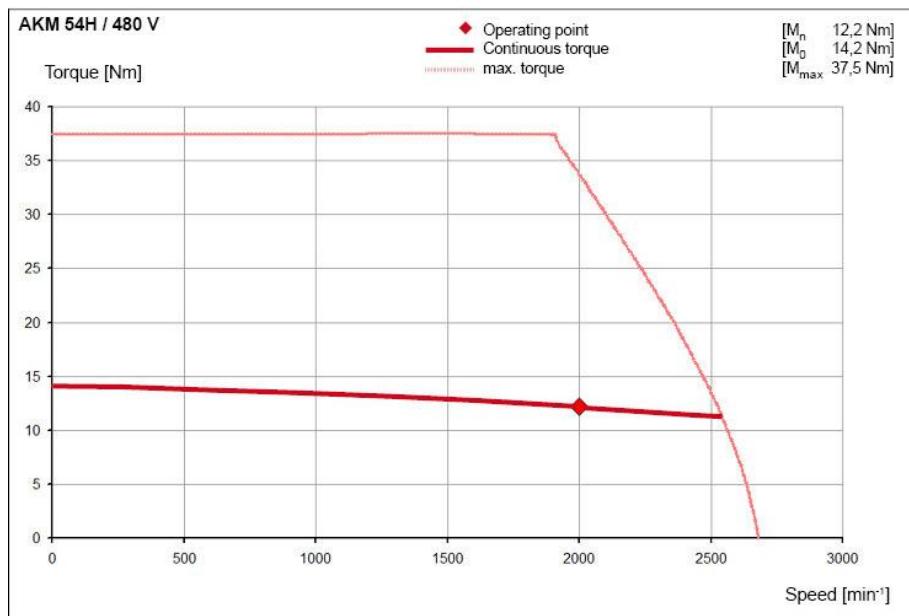
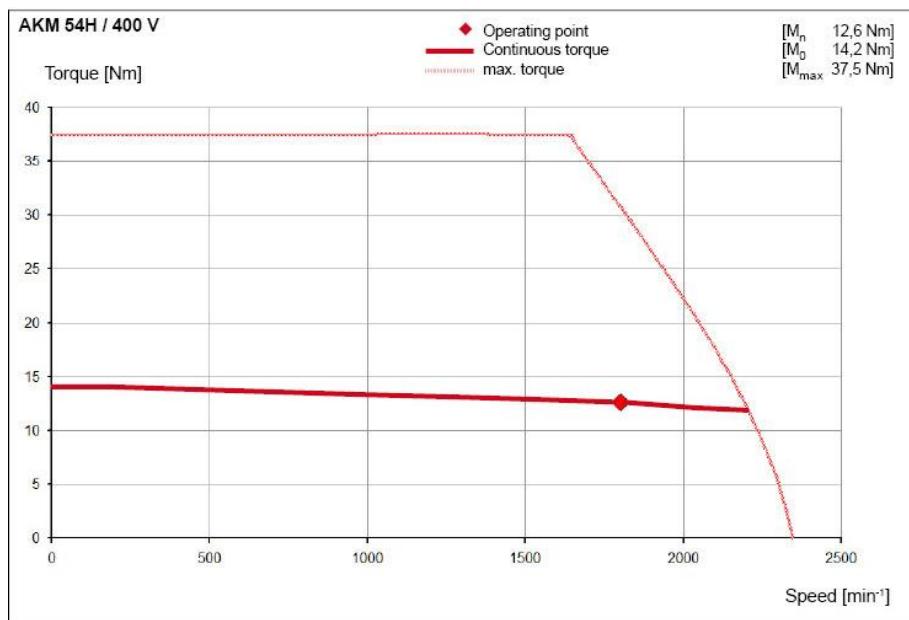
AKM 53P



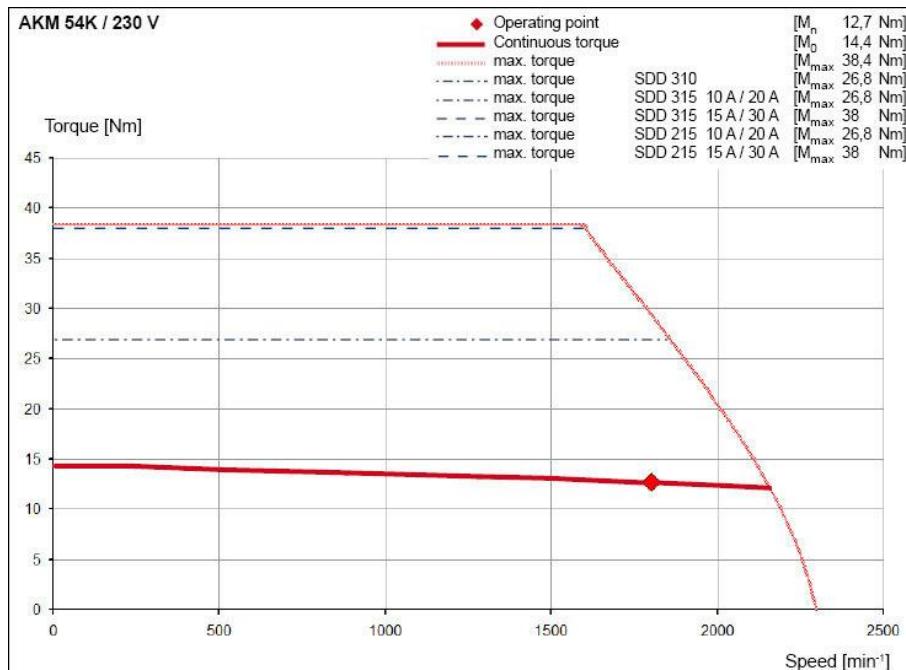
AKM 54G

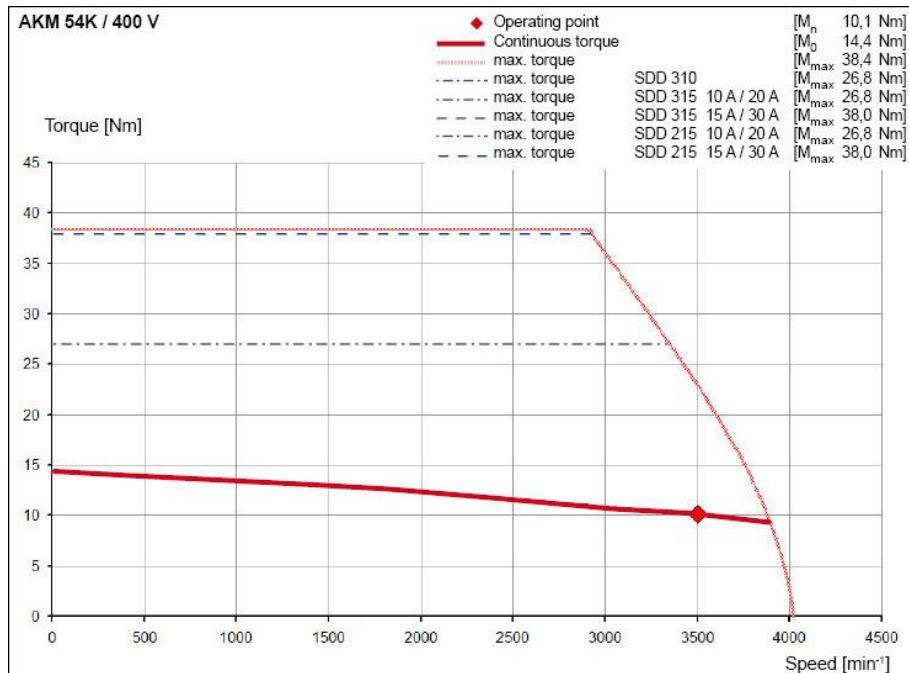


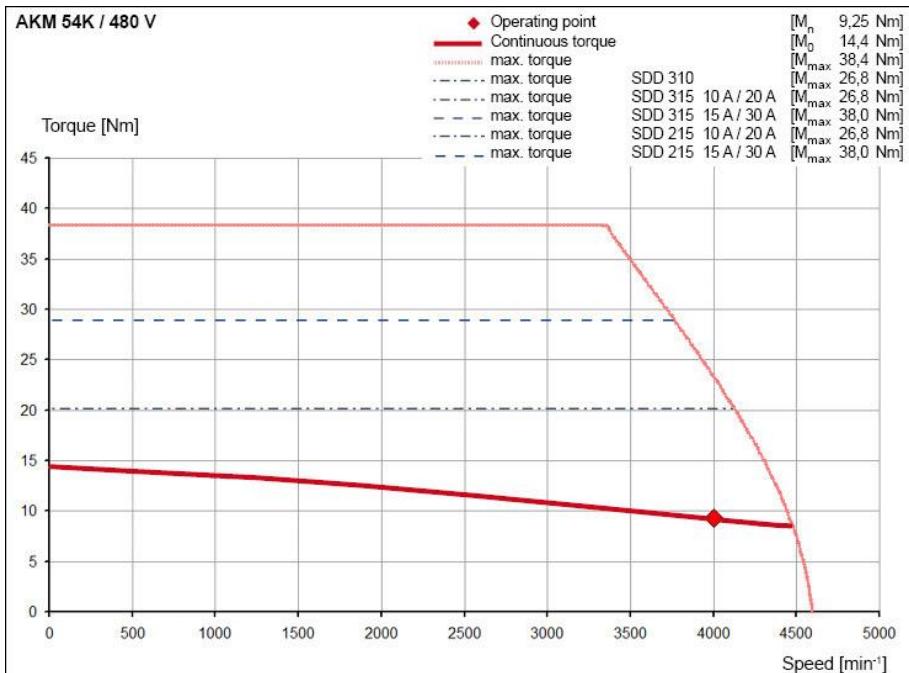
AKM 54H



AKM 54K

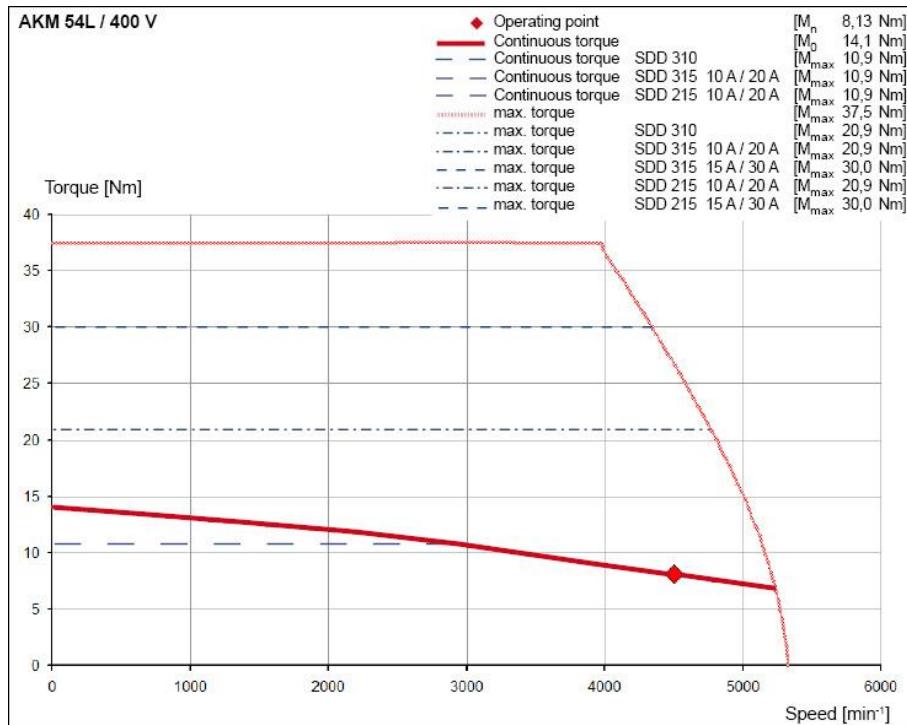




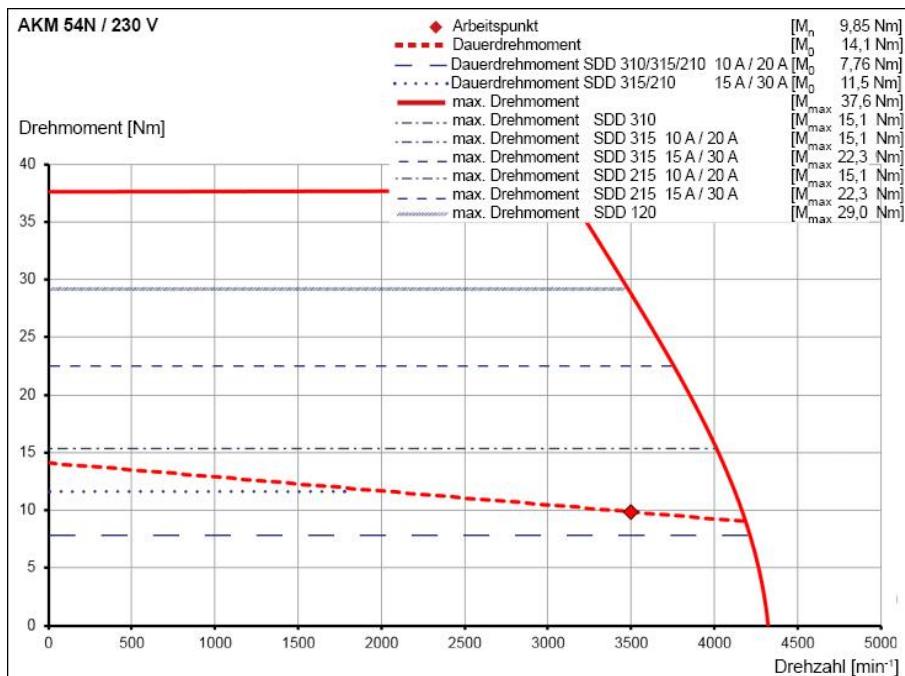


AKM 54L





AKM 54N



10.8 AKM6

10.8.1 Technical Data

Data		Symbol [Unit]	AKM				
			62G	62K	62M	62P	
Electrical data							
UN = 230V	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				
	Nominal rotation speed	n _n [min ⁻¹]	—	2000	3000	4500	
UN = 400V	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	
	Nominal rotation speed	n _n [min ⁻¹]	1800	3500	6000	—	
UN = 480V	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	—	
	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} [mV/min]	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 [kgcm ²]		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						
UN = 230V	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 = 400V	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 = 480V	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
	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} [mV/min]	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 [kgcm ²]	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										
U _N = 230V	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 = 400V	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 = 480V	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
	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} [mV/min]	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 [kgcm ²]	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 [kgcm ²]	0,61
Air delay time	tBRH [ms]	105
Engage 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 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.

10.8.4 Maximum and Continuous Torque

Power supply 1 x 400 V

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

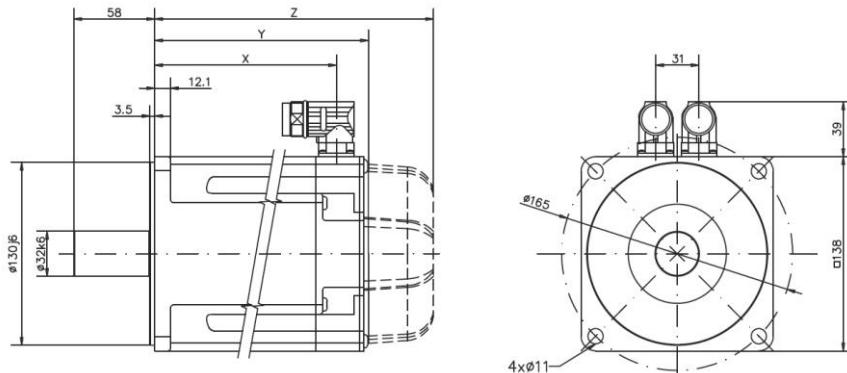
AKM 65M	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	25,0 19,2 65,2	17,7 19,2 34,0	17,7 19,2 34,0	25,0 19,2 48,9	17,7 19,2 34,0	25,0 19,2 48,9	25,0 19,2 62,5
AKM 65N	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	24,3 16,0 63,7	13,3 16,0 25,8	13,3 16,0 25,8	19,6 16,0 37,6	13,3 16,0 25,8	19,6 16,0 37,6	24,3 16,0 48,6
AKM 65P	M 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

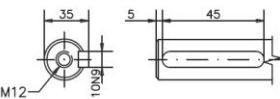
AKM 64Q	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	20,0 7,4 53,2	9,43 7,4 18,4	9,43 7,4 18,4	13,9 7,4 26,9	9,43 7,4 18,4	13,9 7,4 26,9	18,4 7,4 35,0
AKM 65K	M ₀ [Nm] M _n [Nm] M _{max} [Nm]	24,8 19,7 64,5	24,0 19,7 45,3	24,0 19,7 45,3	24,8 19,7 64,1	24,0 19,7 45,3	24,8 19,7 64,1	24,8 19,7 64,5
AKM 65M	M ₀ [Nm] 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)

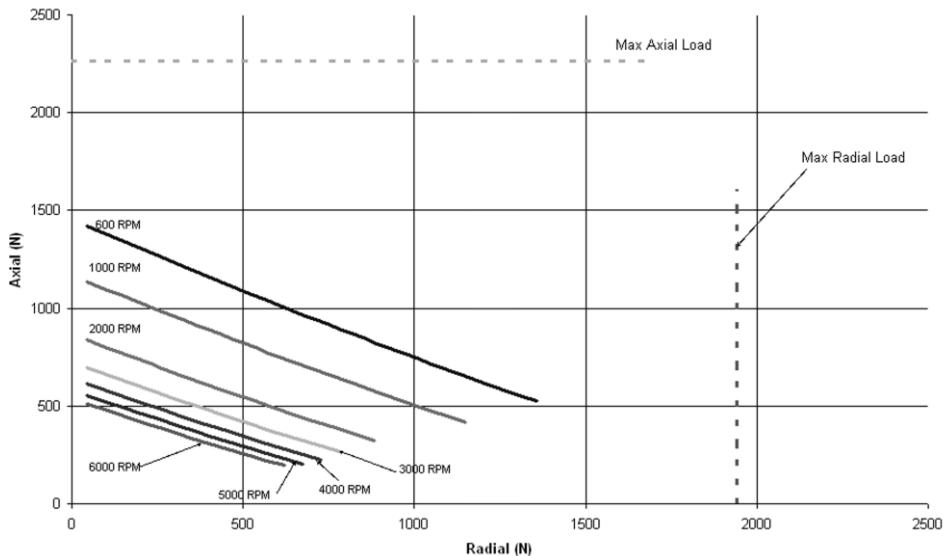


Model	X	Resolver/Comcoder		Encoder	
		Y	Z (brake)	Y	Z (brake)
AKM62	130.5	153.7	200.7	172.2	219.7
AKM63	155.5	178.7	225.7	197.2	244.7
AKM64	180.5	203.7	250.7	222.2	269.7
AKM65	205.5	228.7	275.7	247.2	294.7

Option Keyway

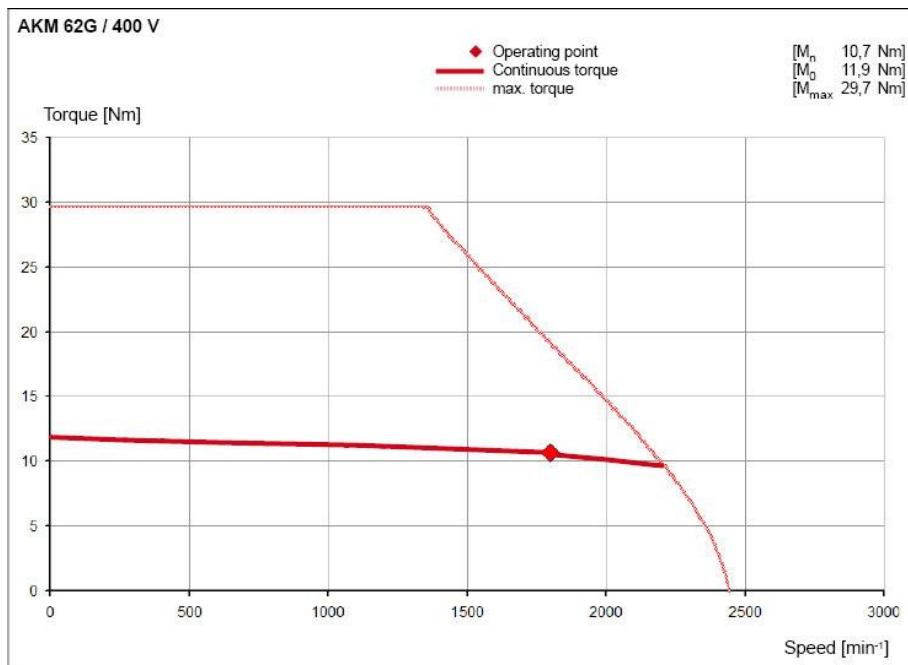


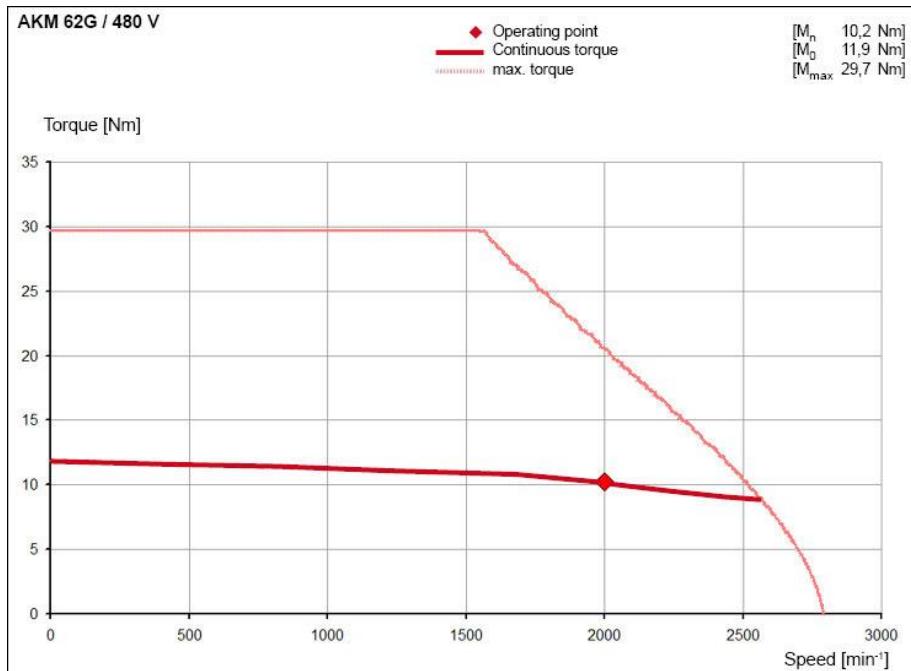
10.8.6 Radial Force on the Shaft End



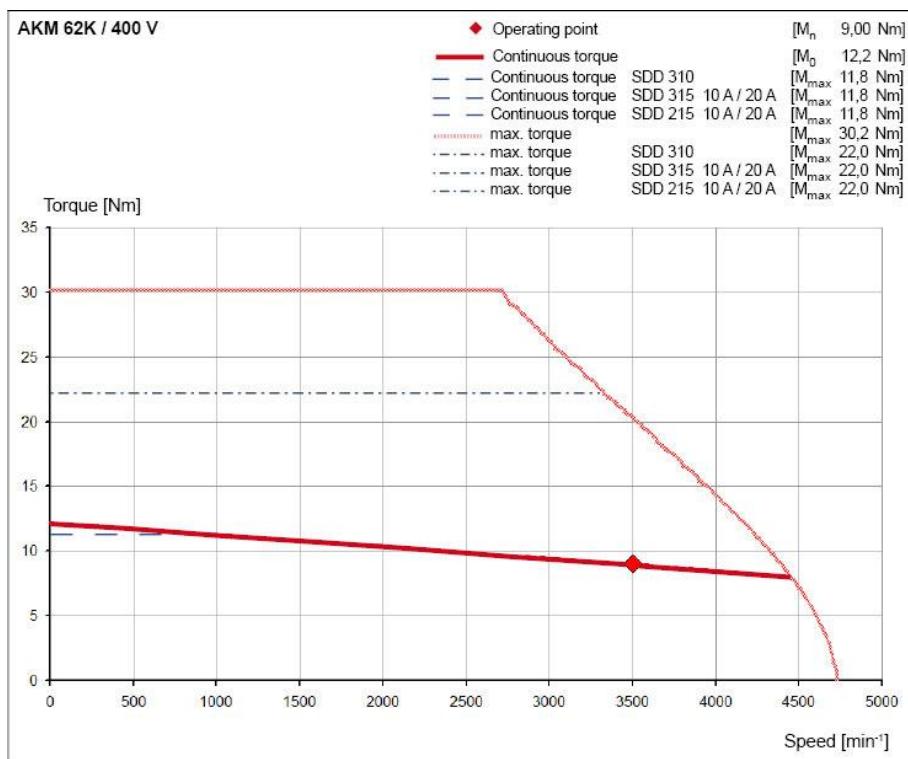
10.8.7 Motor Characteristics

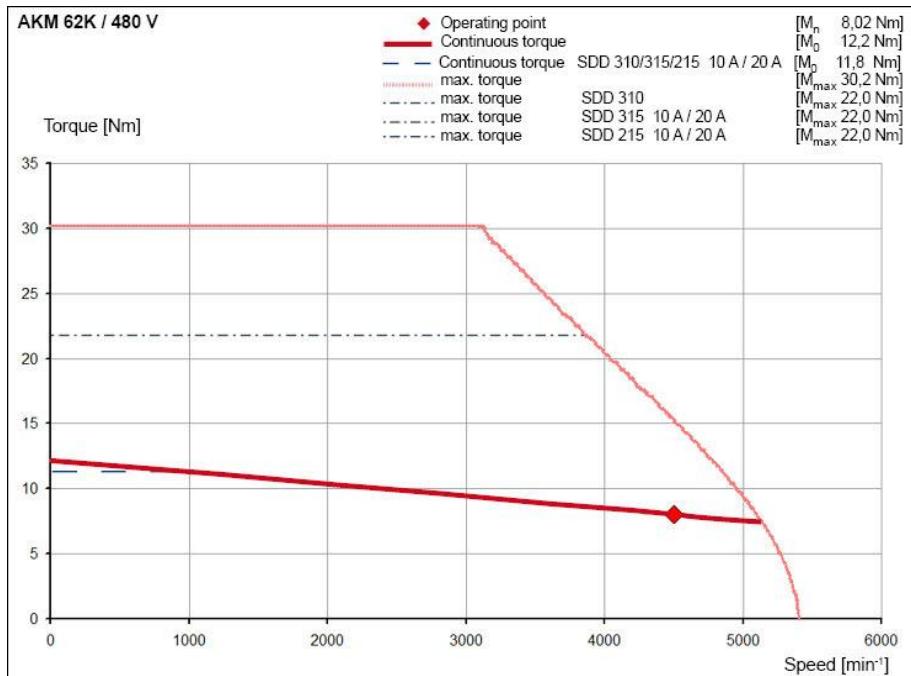
AKM 62G



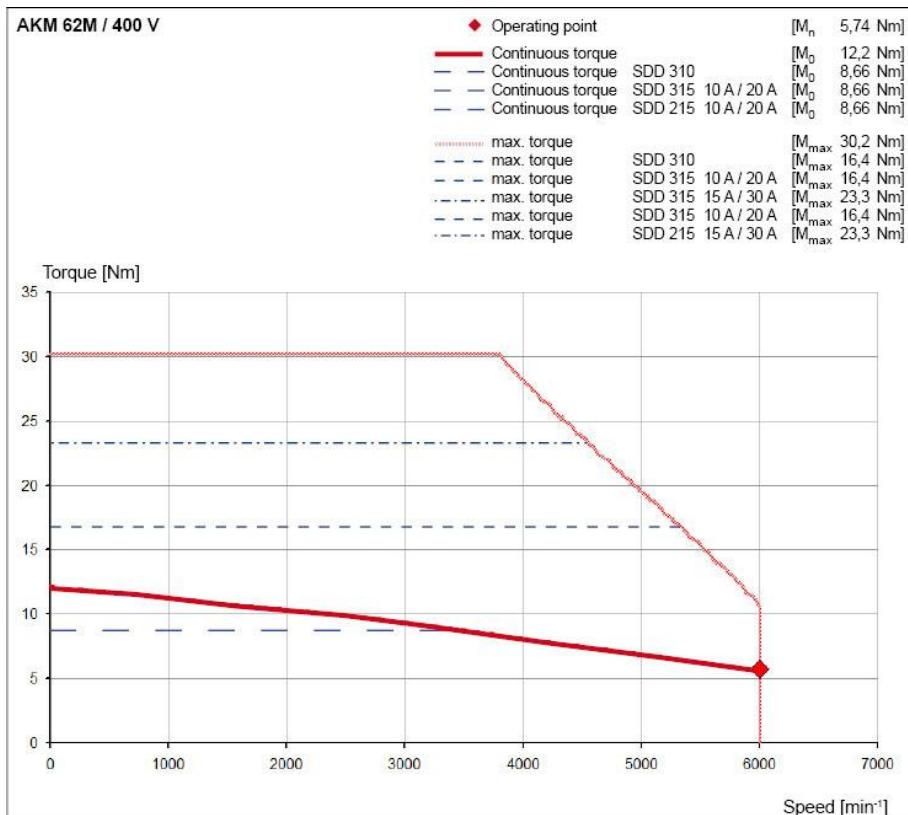


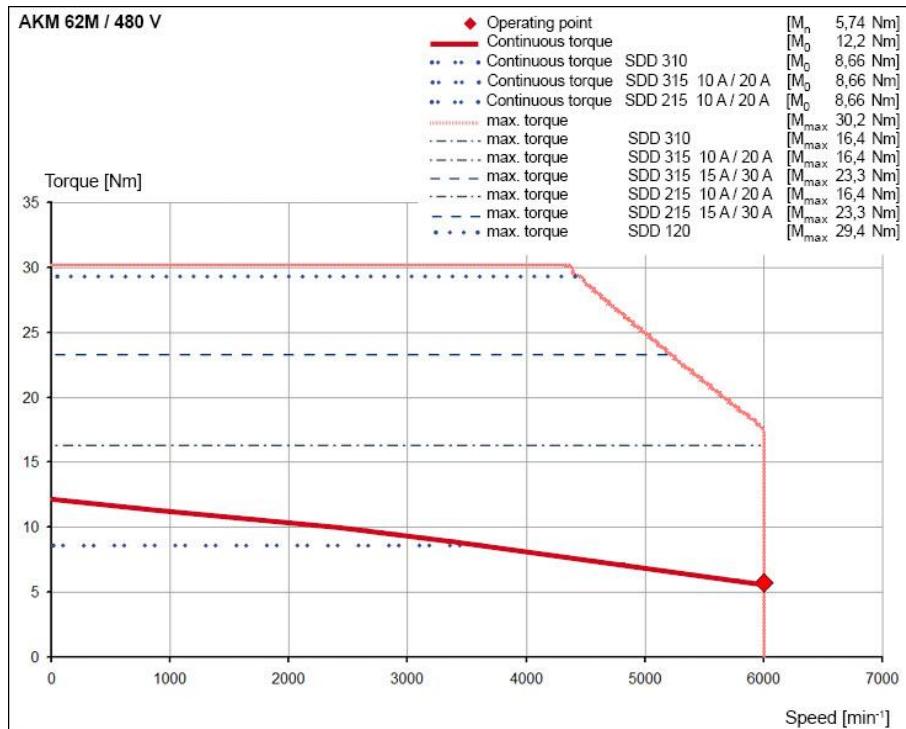
AKM 62K



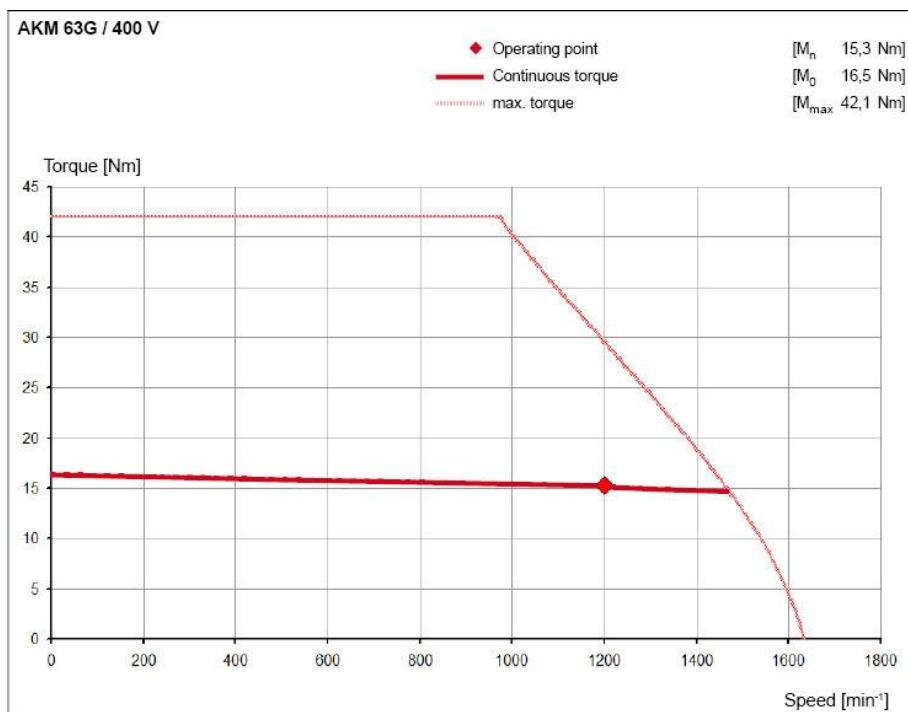


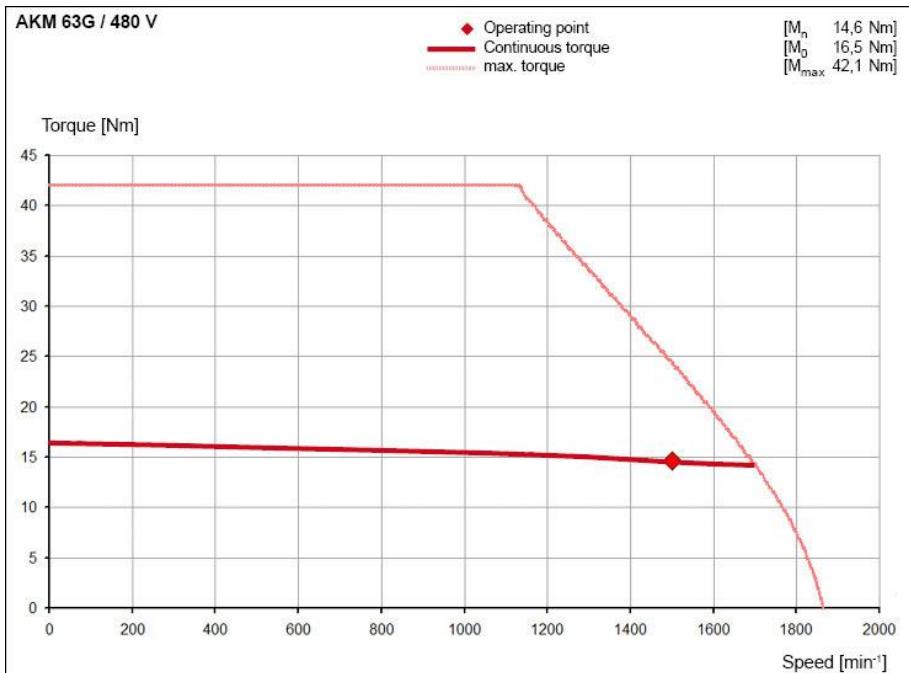
AKM 62M



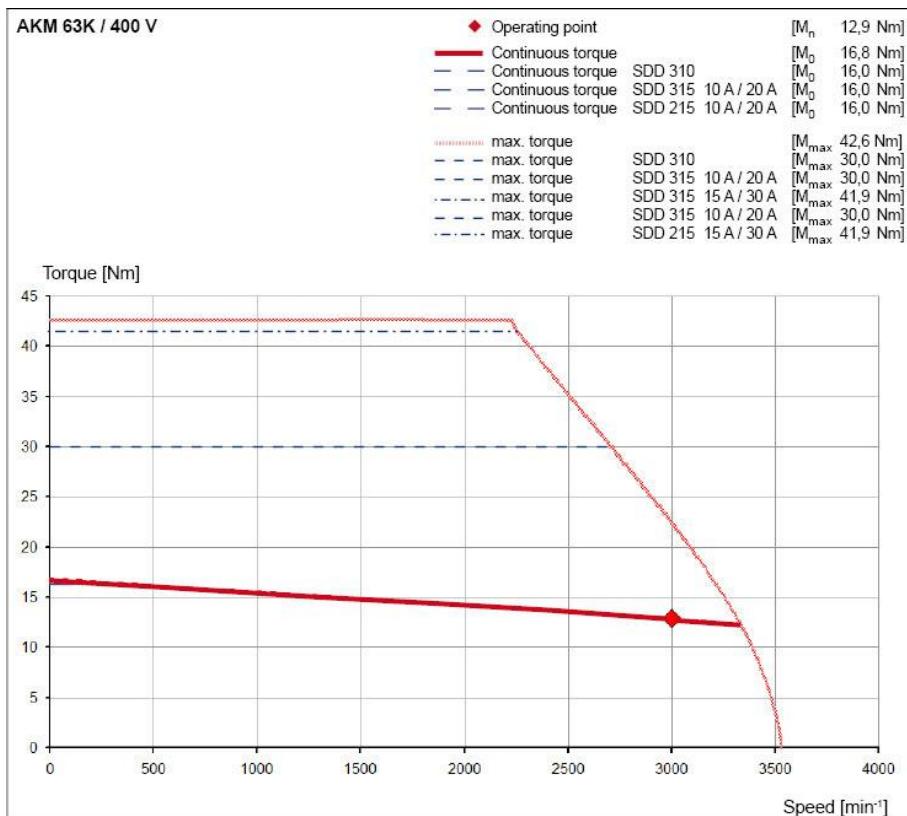


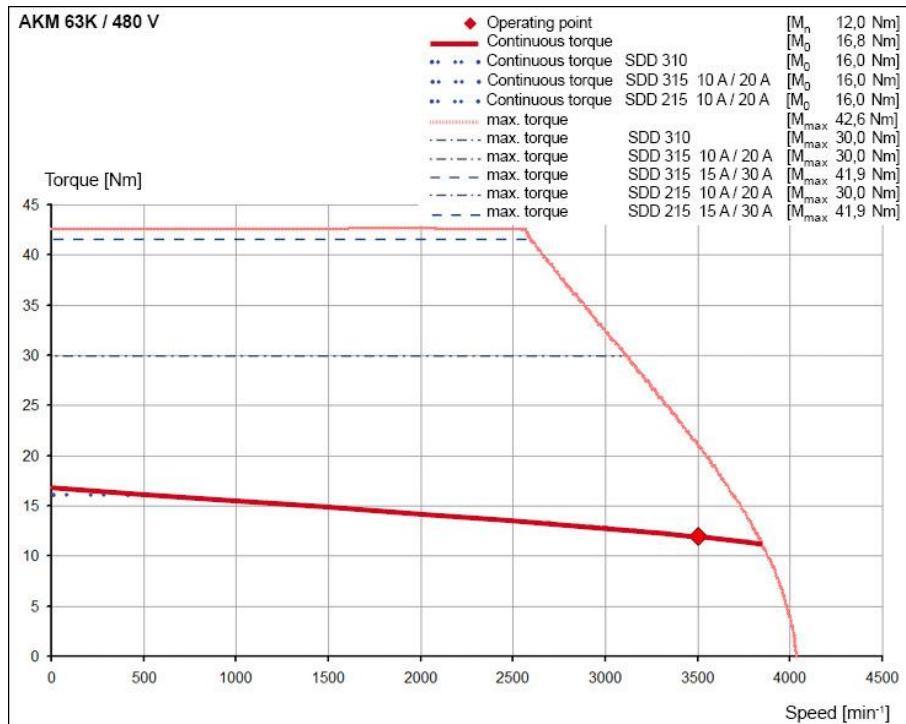
AKM 63G



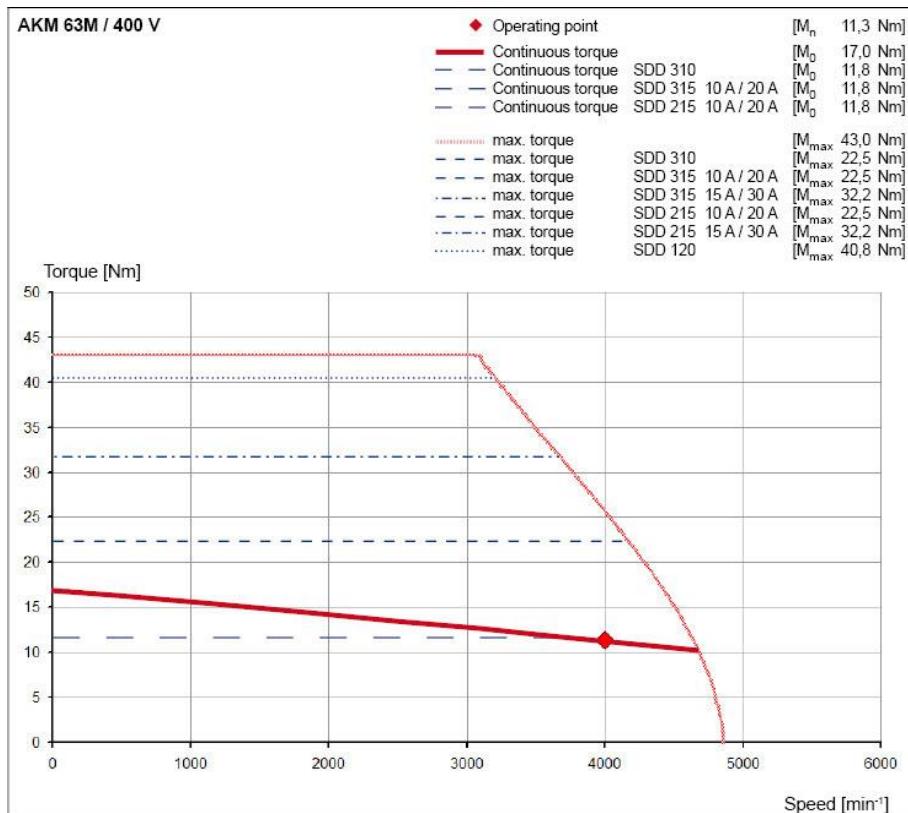


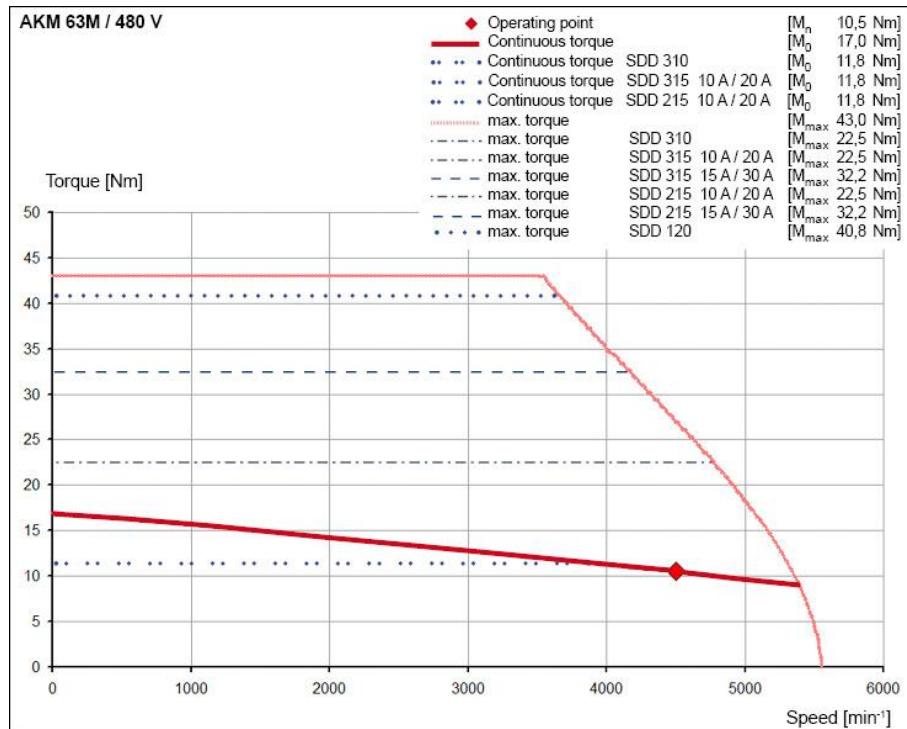
AKM 63K



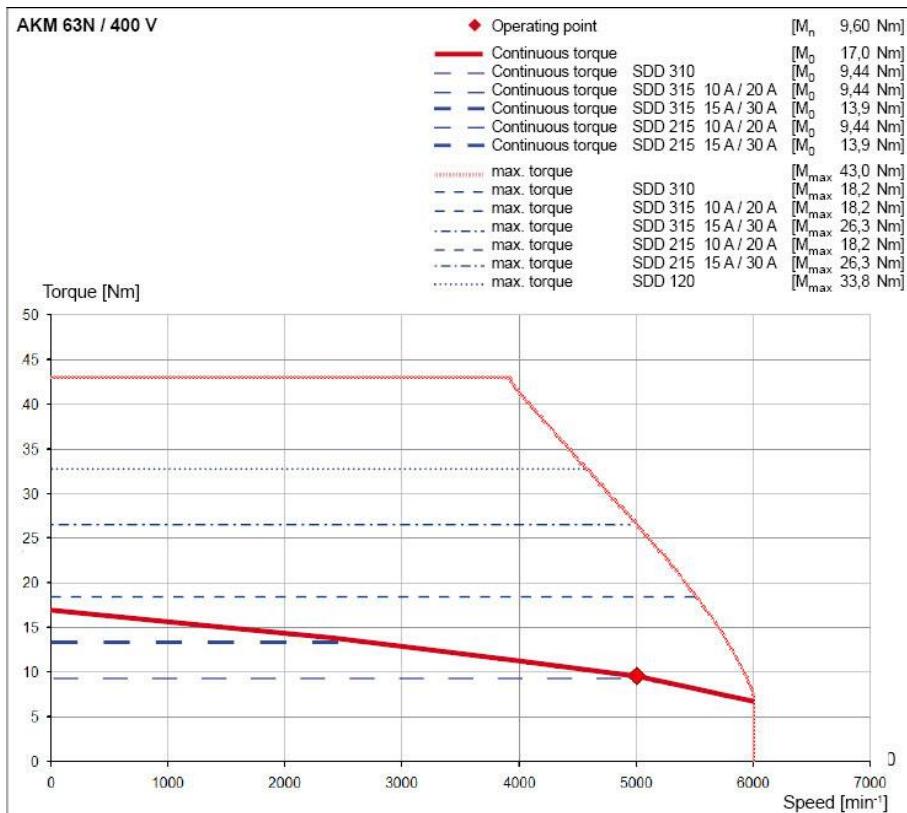


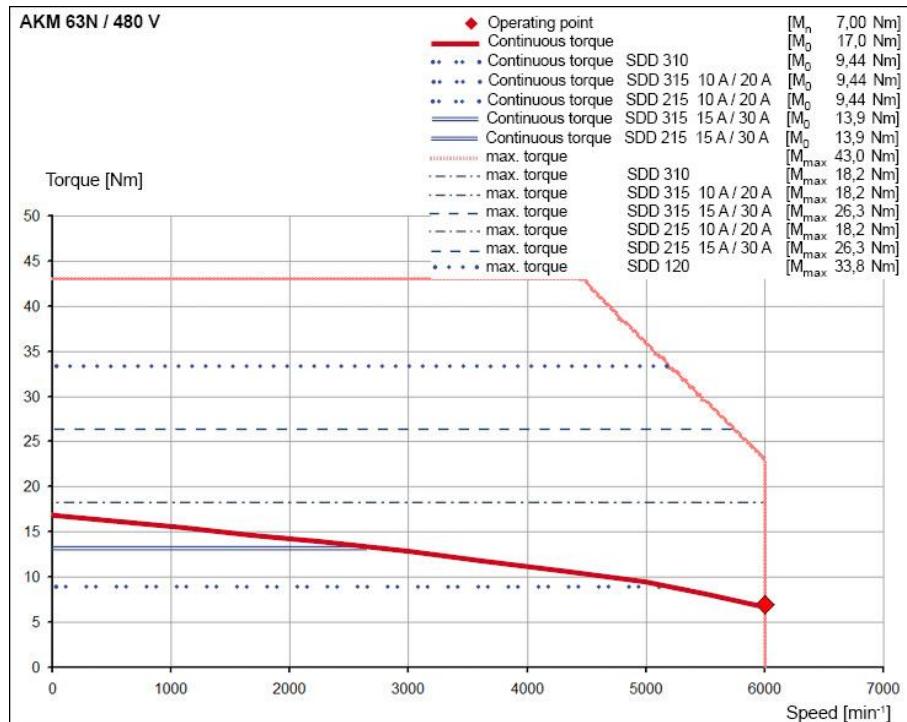
AKM 63M



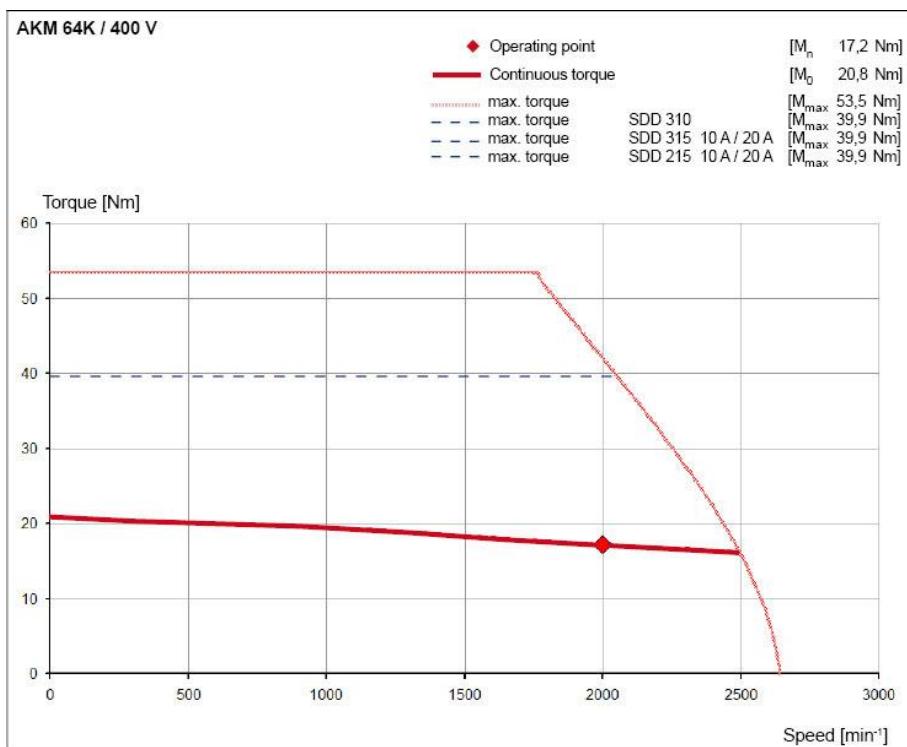


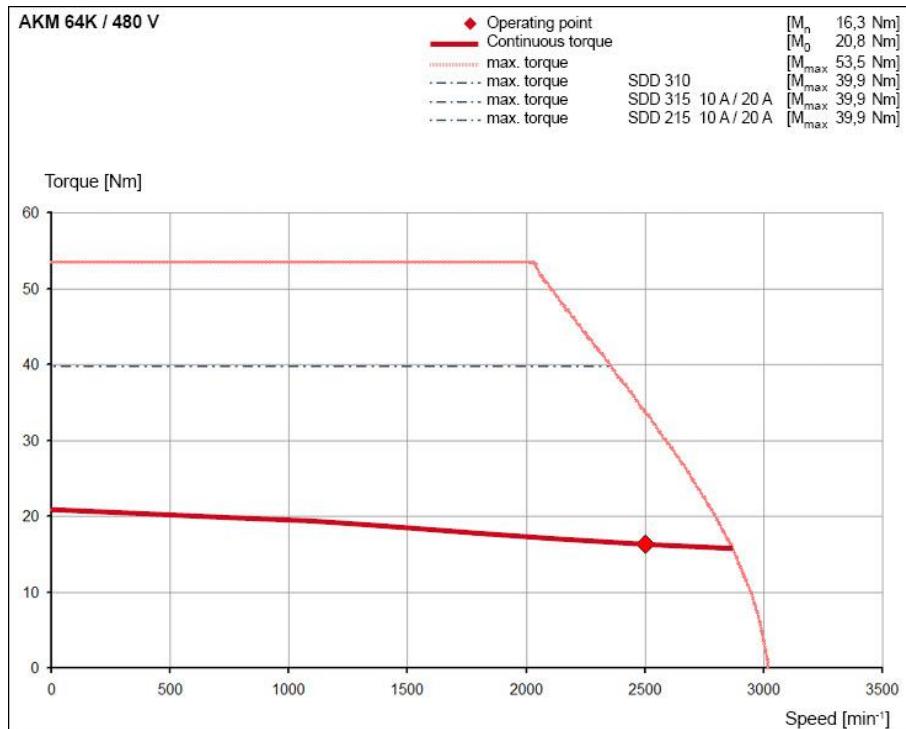
AKM 63N



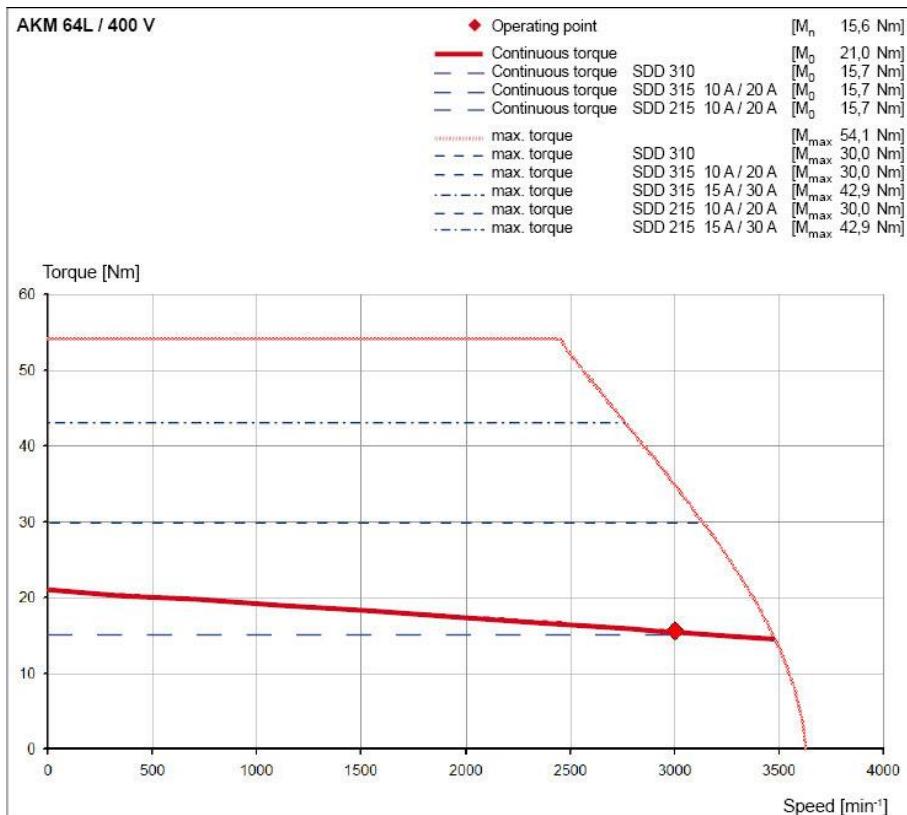


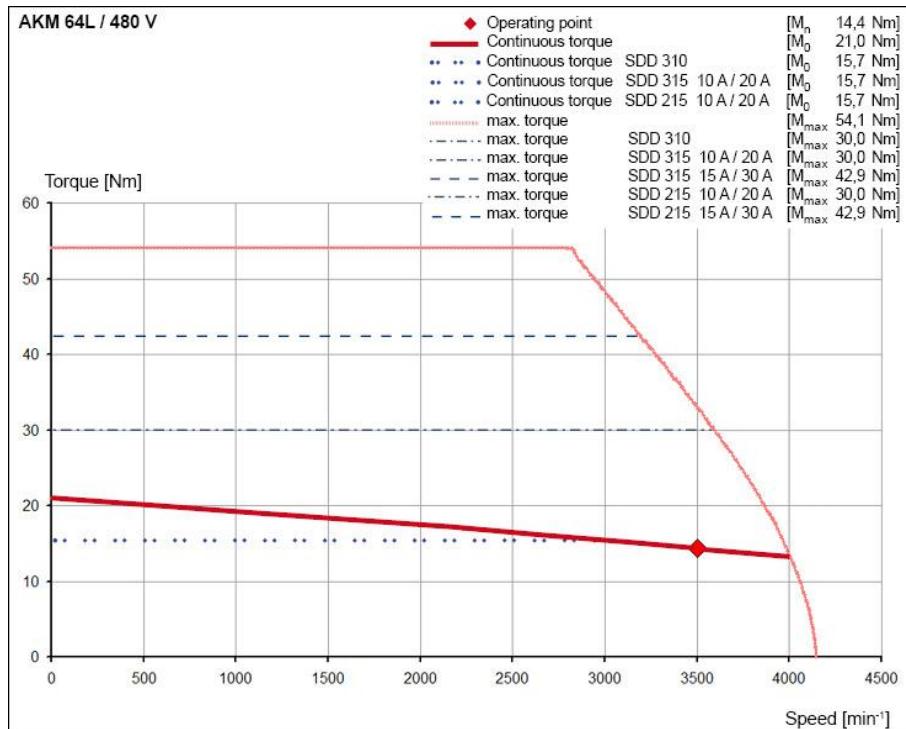
AKM 64K



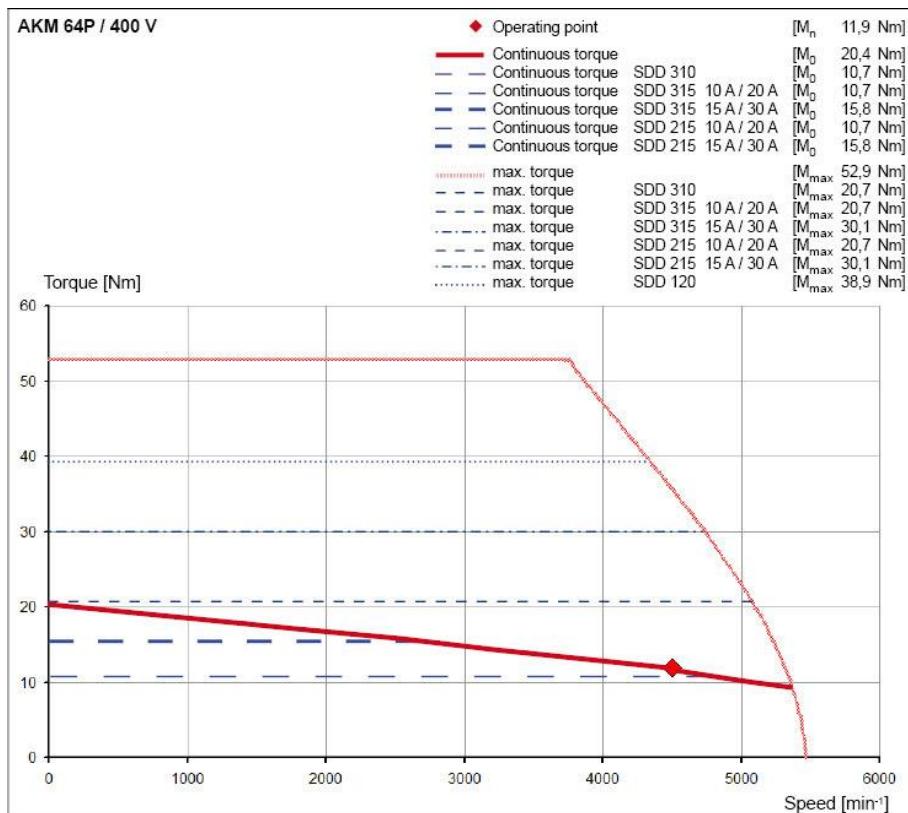


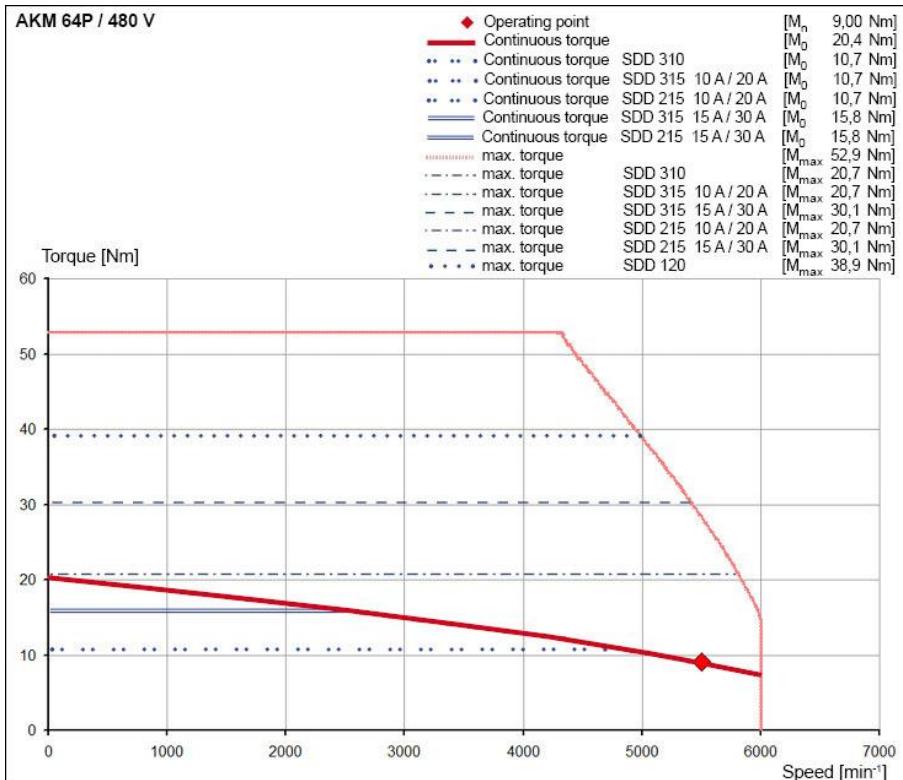
AKM 64L



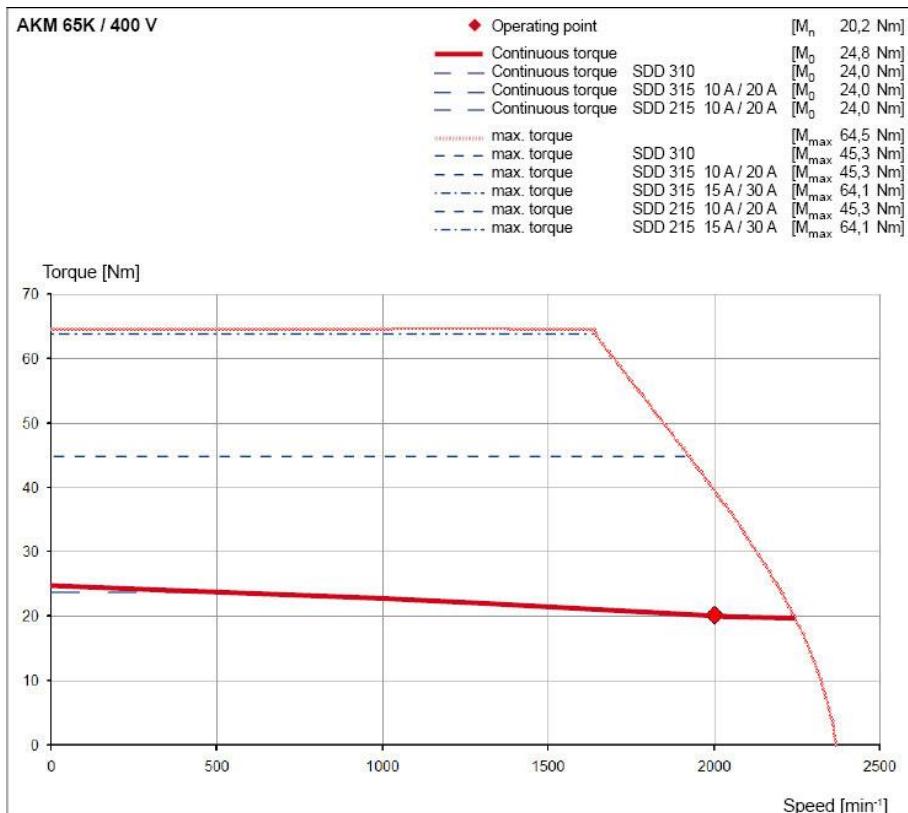


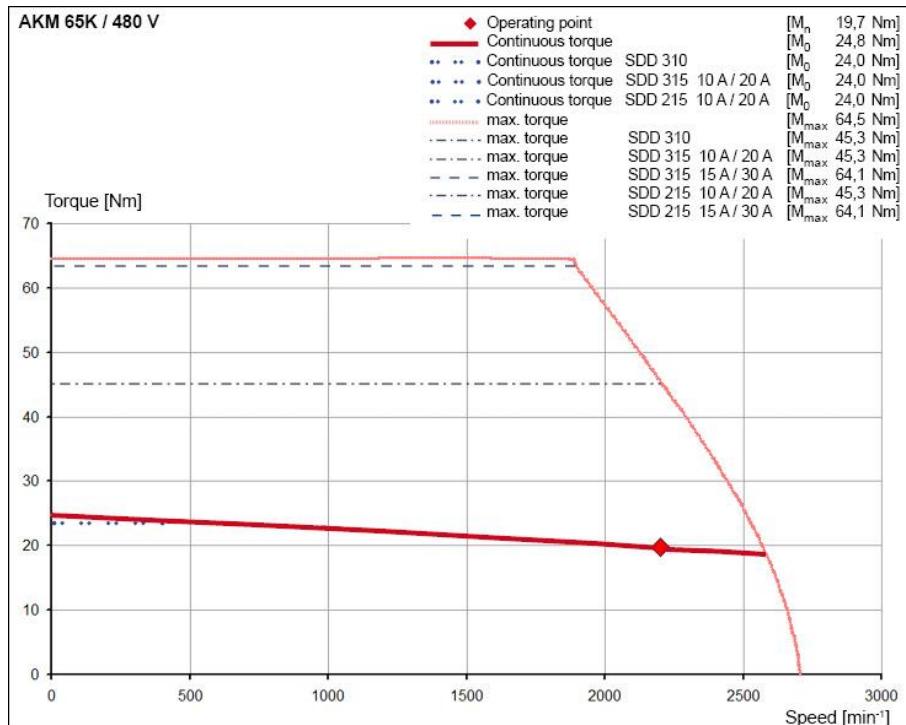
AKM 64P



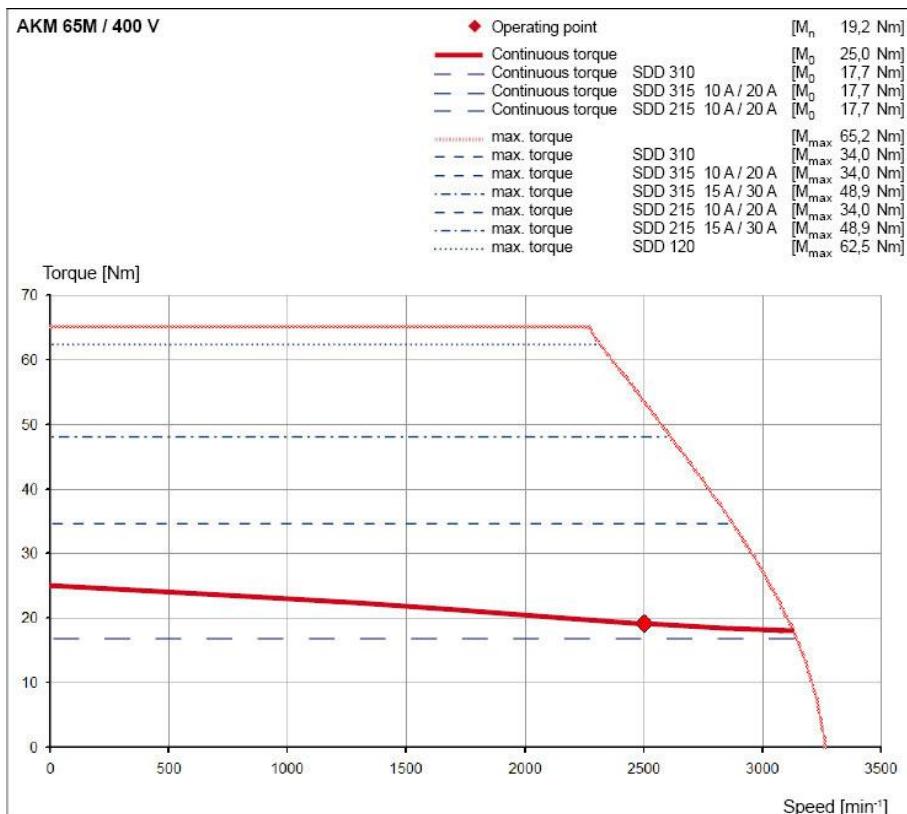


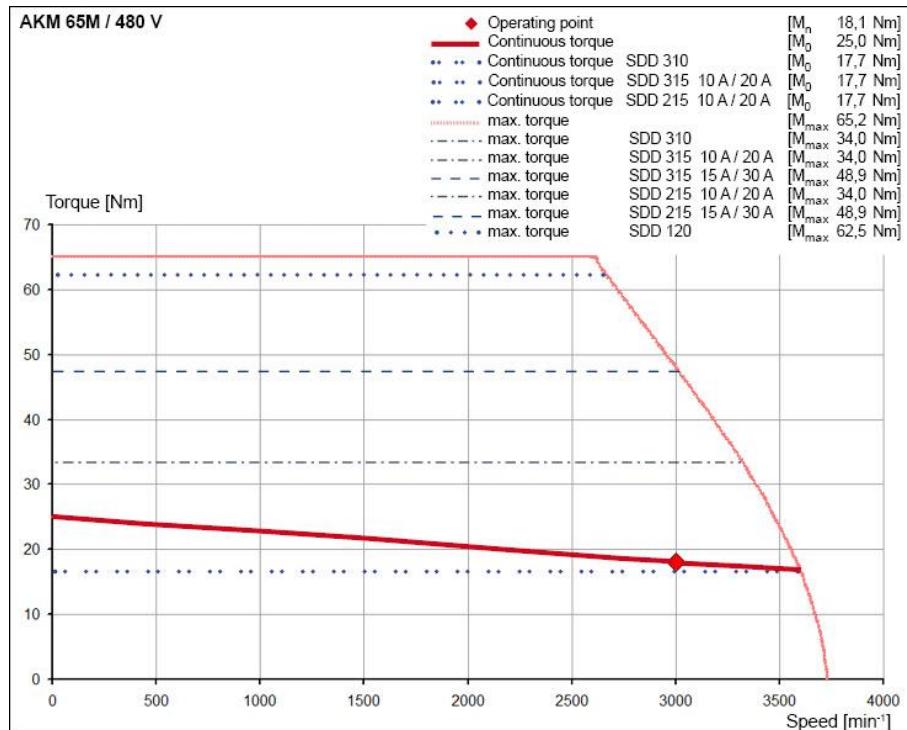
AKM 65K



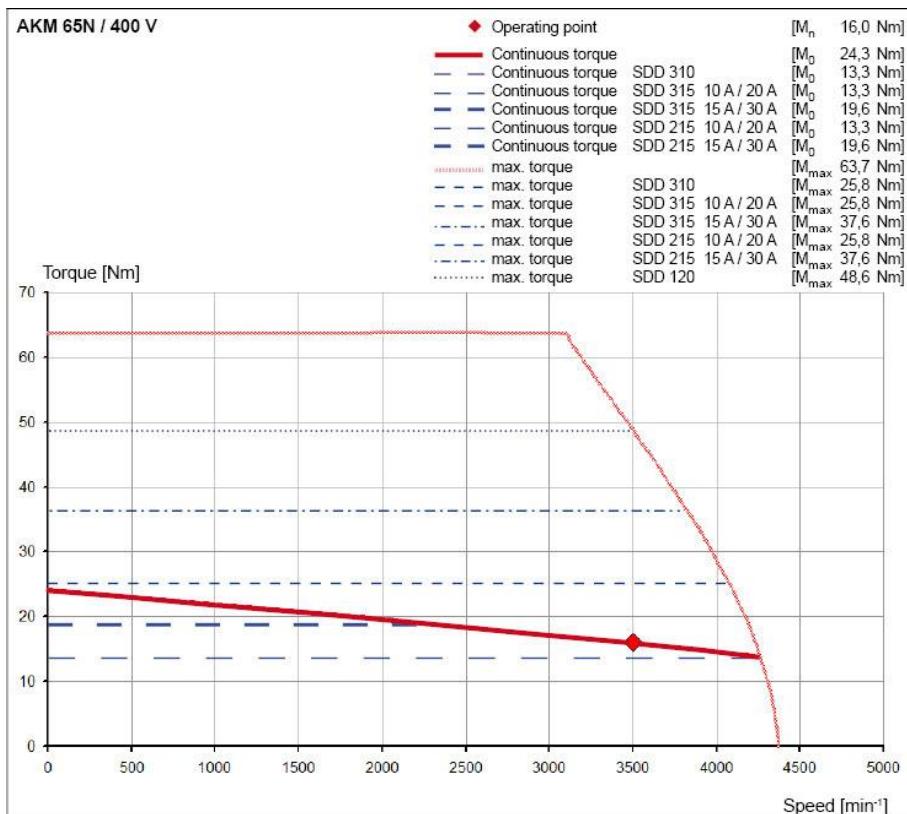


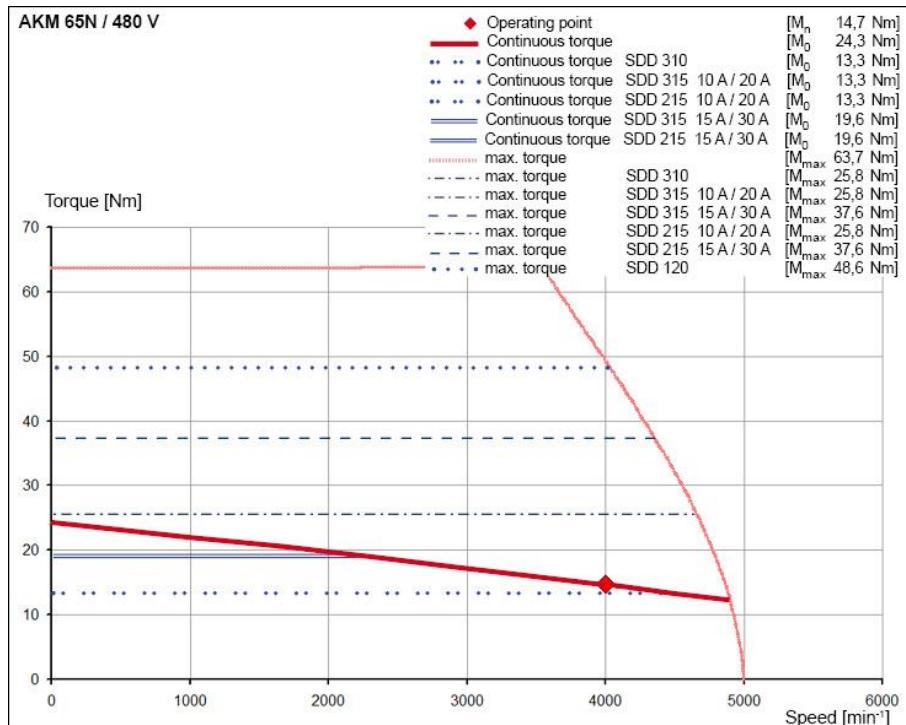
AKM 65M



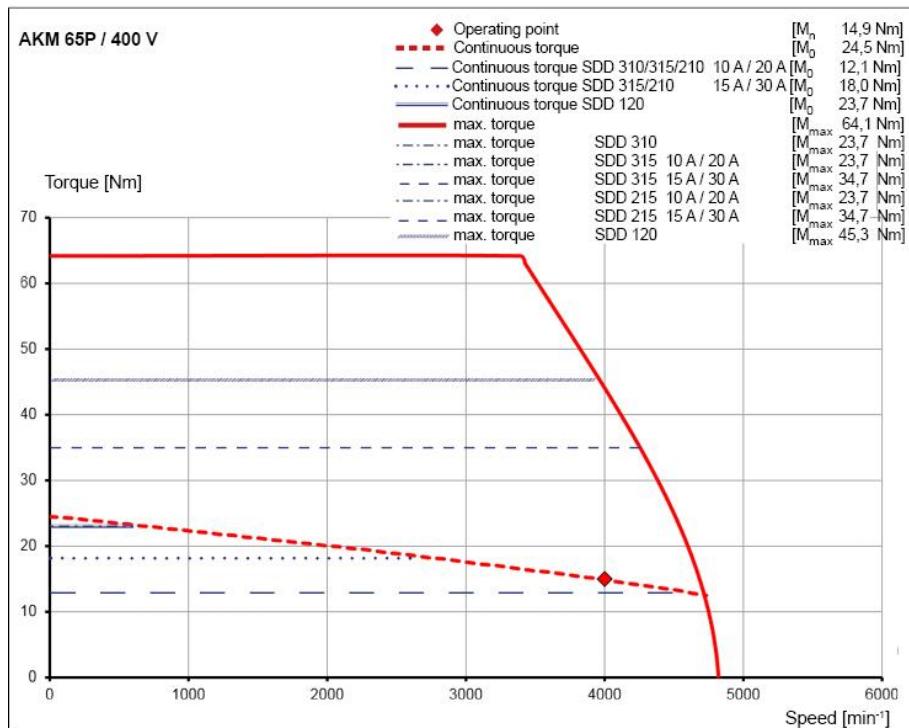


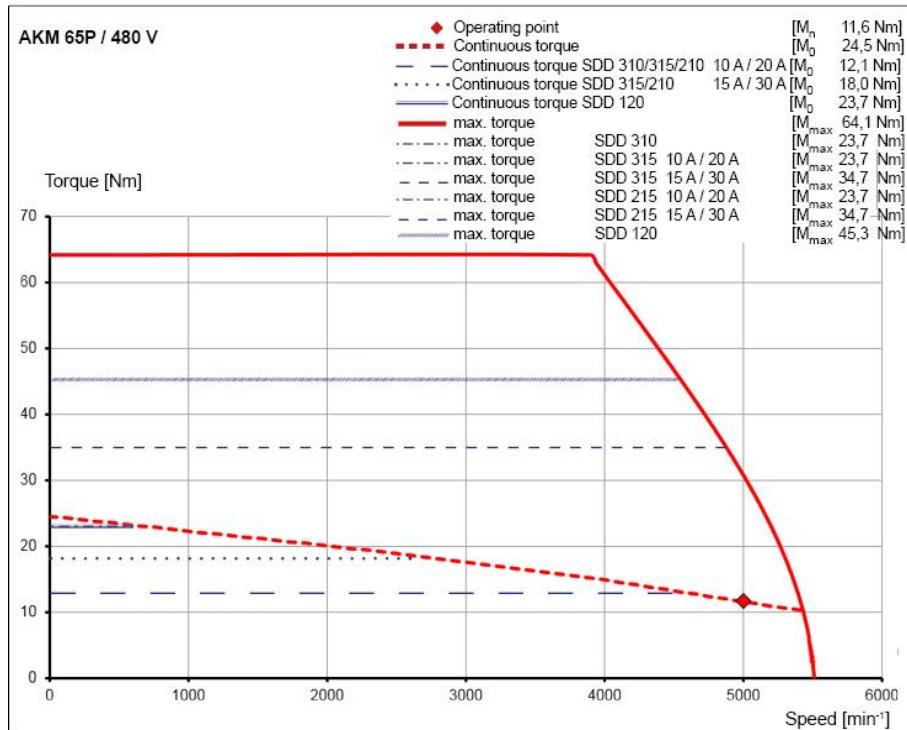
AKM 65N





AKM 65P





10.9 AKM7

10.9.1 Technical Data

Data	Symbol [Unit]	AKM							
		72K	72M	72P	72Q	73M	73P	73Q	
Electrical data									
UN = 230V	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 = 400V	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 = 480V	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 _{max} [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 [kgcm ²]	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							
UN = 230V	Standstill torque*	M ₀ [Nm]**	53,0	52,5	52,2		
	Standstill current	I _{rms} [A]**	12,9	18,5	26,1		
	Max. Nominal supply voltage	U _N [VAC]	480				
UN = 400V	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 = 480V	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		
	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 _{max} [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 [kgcm ²]		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 [kgcm ²]	1,64
Air delay time	tBRH [ms]	110
Engage 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

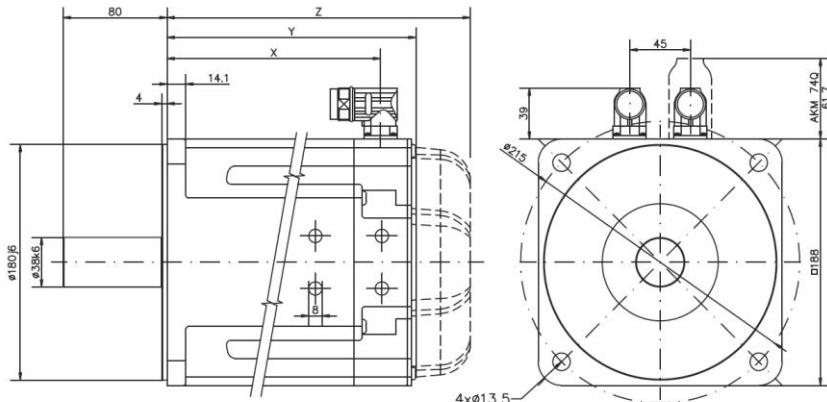
Power supply 1 x 400 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 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
AKM 72Q	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

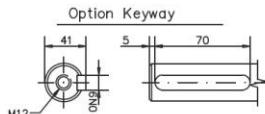
Power supply 1 x 480 V

Motor type	Symbol [Unit]	Motor data	Servo amplifier					
			SDD 310	SDD 315 10A/20A 15A/30A		SDD 215 10A/20A 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]	24,0	24,0	24,0	24,0	24,0	24,0	24,0
	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]	22,1	22,1	22,1	22,1	22,1	22,1	22,1
	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]	18,2	18,2	18,2	18,2	18,2	18,2	18,2
	M _{max} [Nm]	78,5	30,1	30,1	44,1	30,1	44,1	57,5
AKM 72Q	M ₀ [Nm]	29,5	12,3	12,3	18,4	12,3	18,4	24,3
	M _n [Nm]	14,1	14,1	14,1	14,1	14,1	14,1	14,1
	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]	32,1	32,1	32,1	32,1	32,1	32,1	32,1
	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]	26,3	26,3	26,3	26,3	26,3	26,3	26,3
	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]	22	22	22	22	22	22	22
	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]	41,5	41,5	41,5	41,5	41,5	41,5	41,5
	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]	35,9	35,9	35,9	35,9	35,9	35,9	35,9
	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]	27,3	27,3	27,3	27,3	27,3	27,3	27,3
	M _{max} [Nm]	141	39,0	39,0	57,7	39,0	57,7	76,0

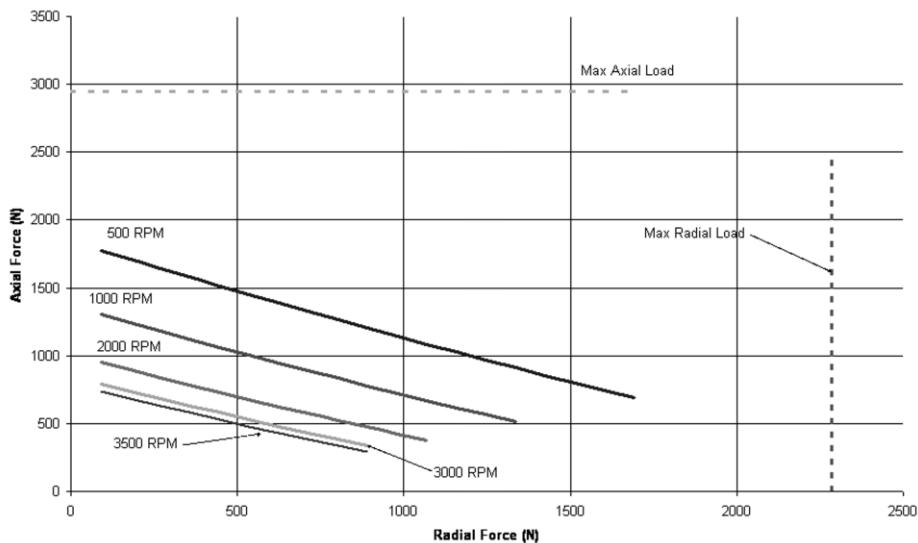
10.9.5 Dimensional Drawing (schematic diagram)



Model	X	Resolver/C编码器		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

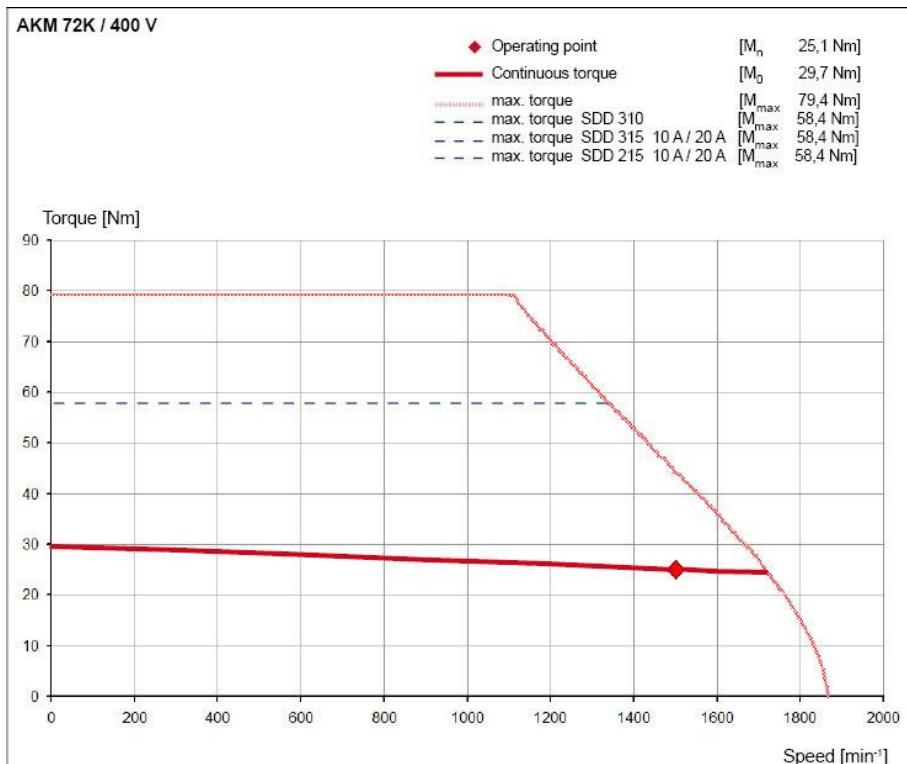


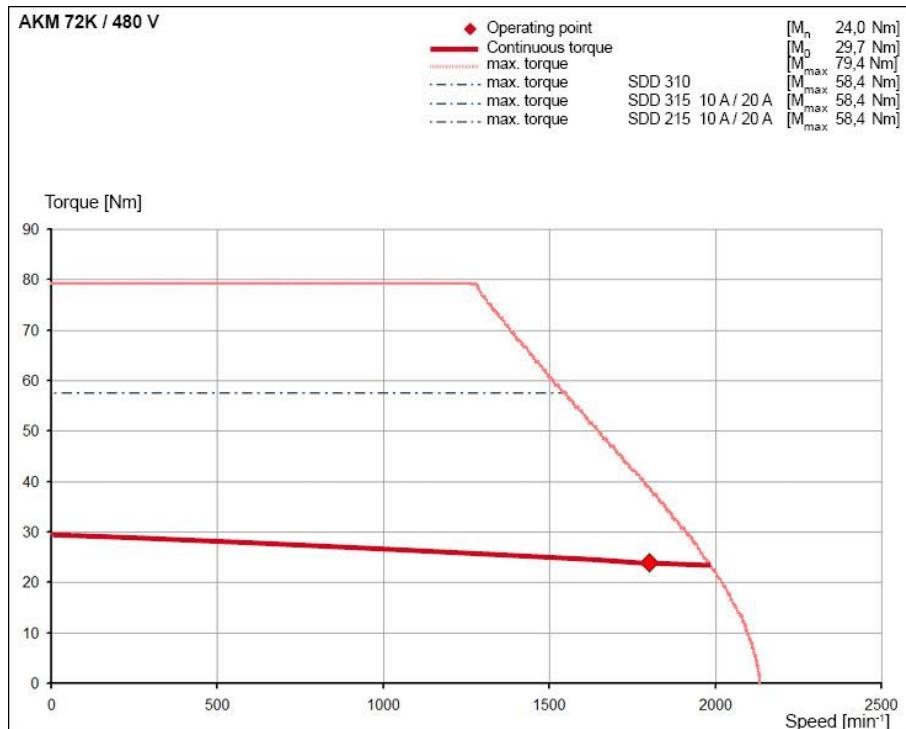
10.9.6 Radial Force on the Shaft End



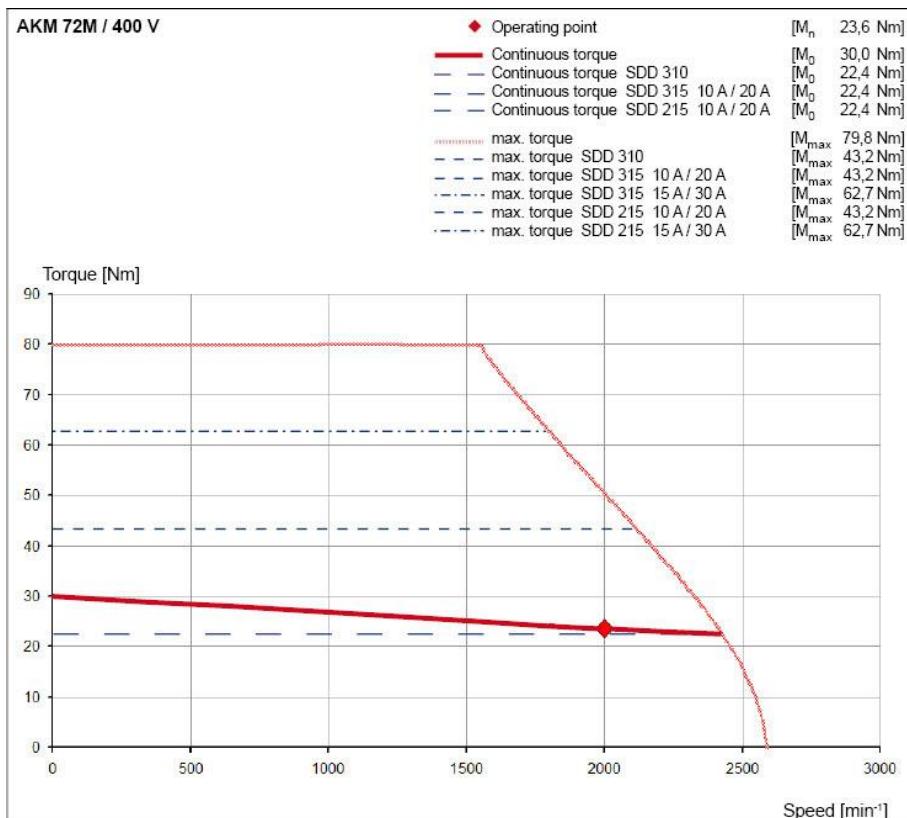
10.9.7 Motor Characteristics

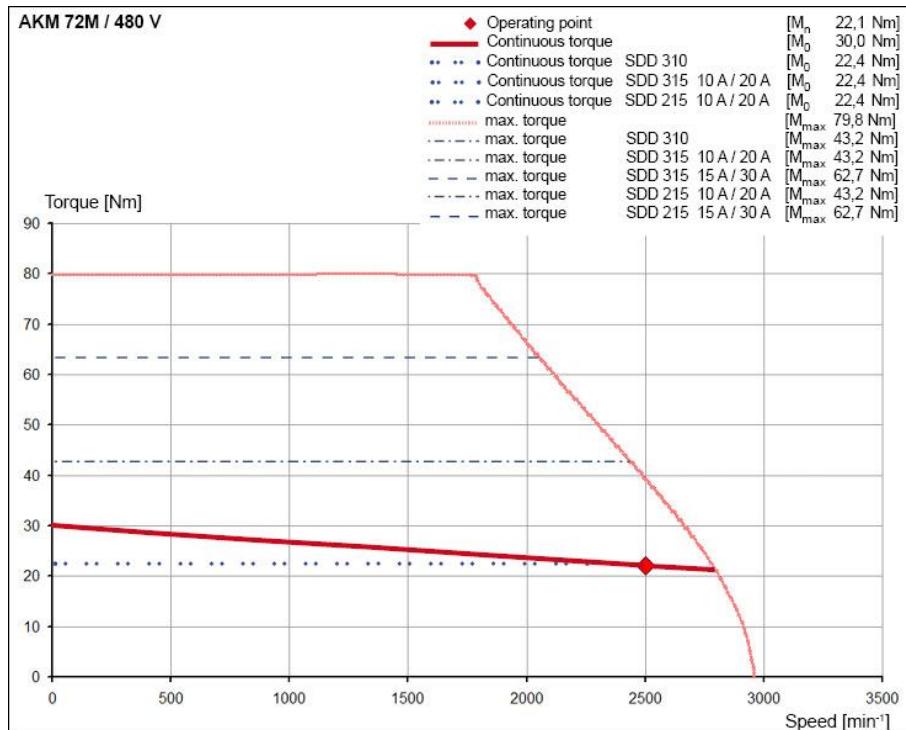
AKM 72K



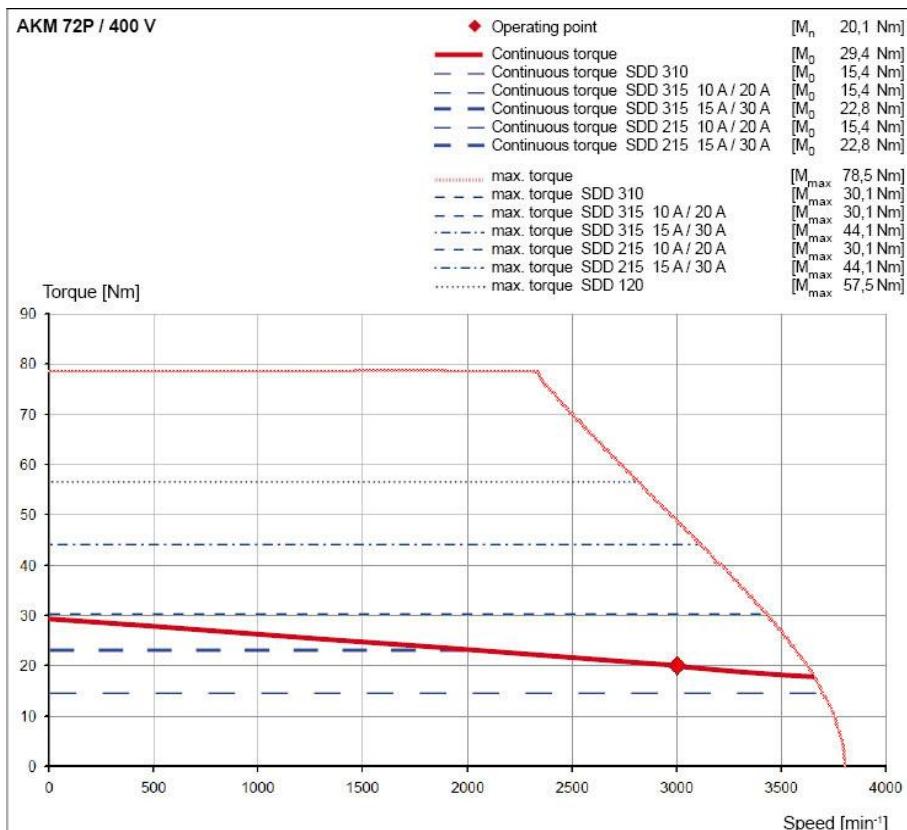


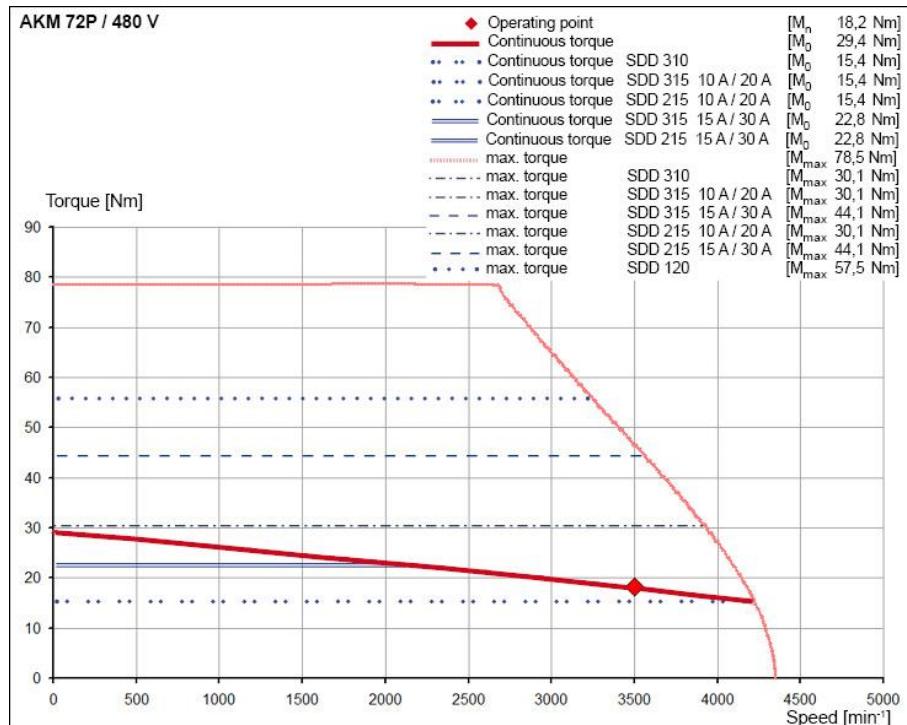
AKM 72M



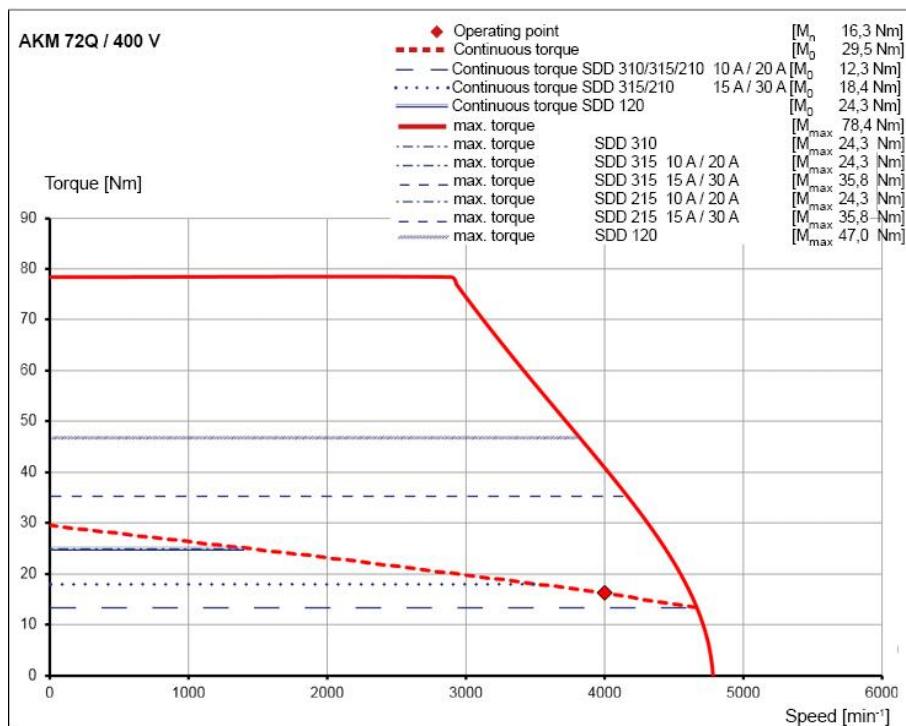


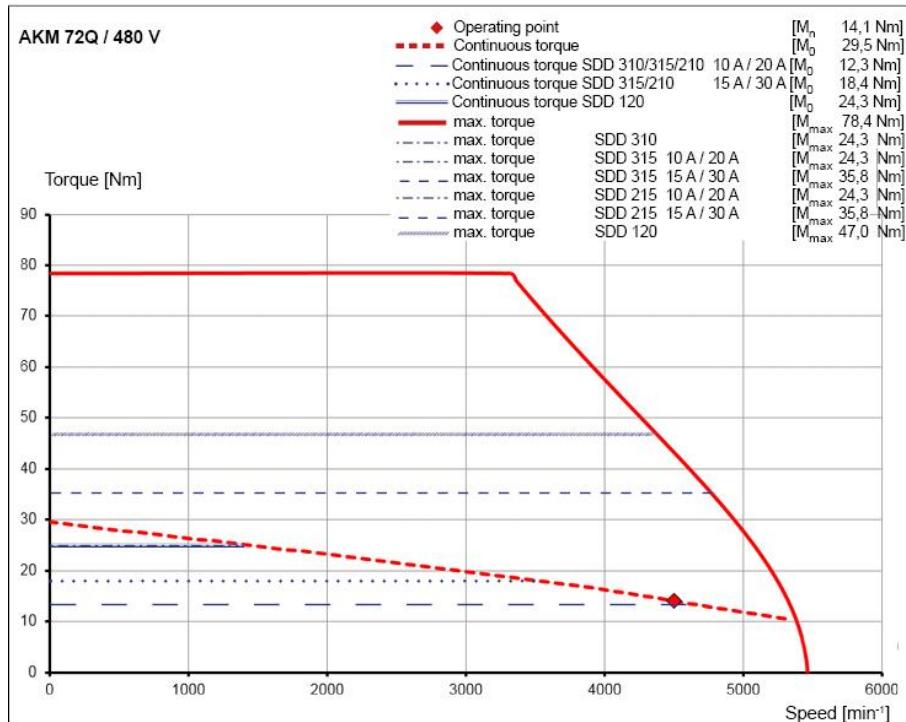
AKM 72P



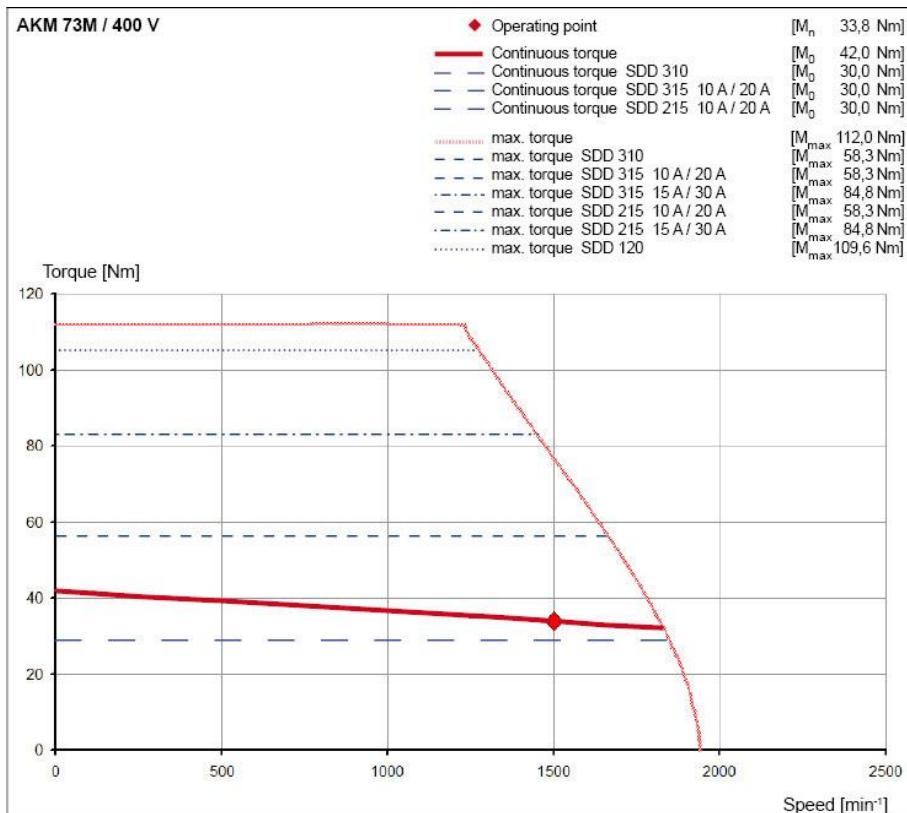


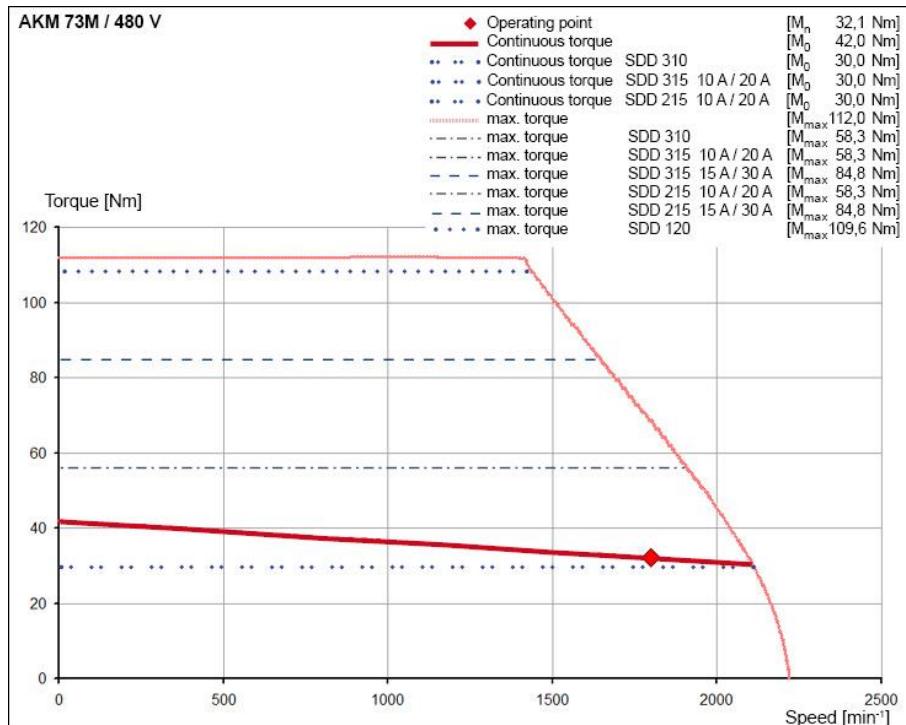
AKM 72Q



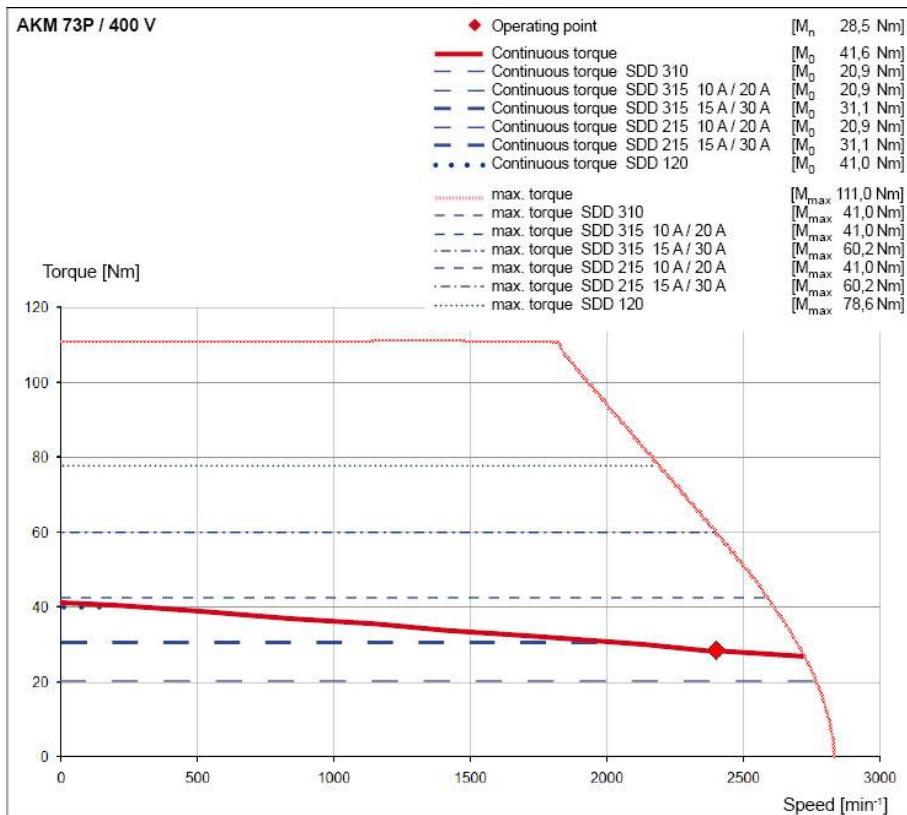


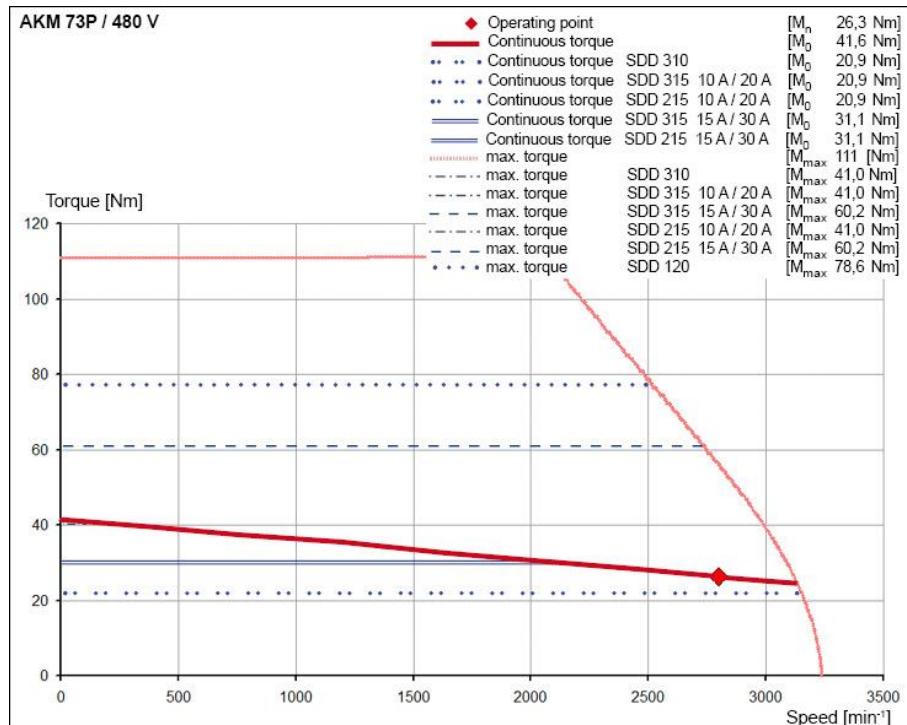
AKM 73M



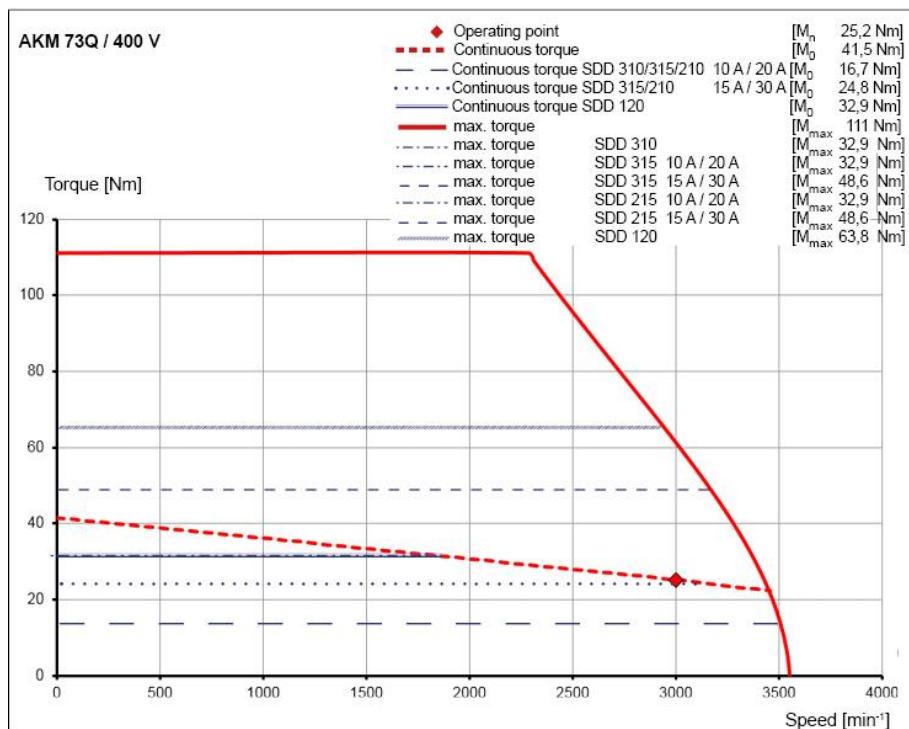


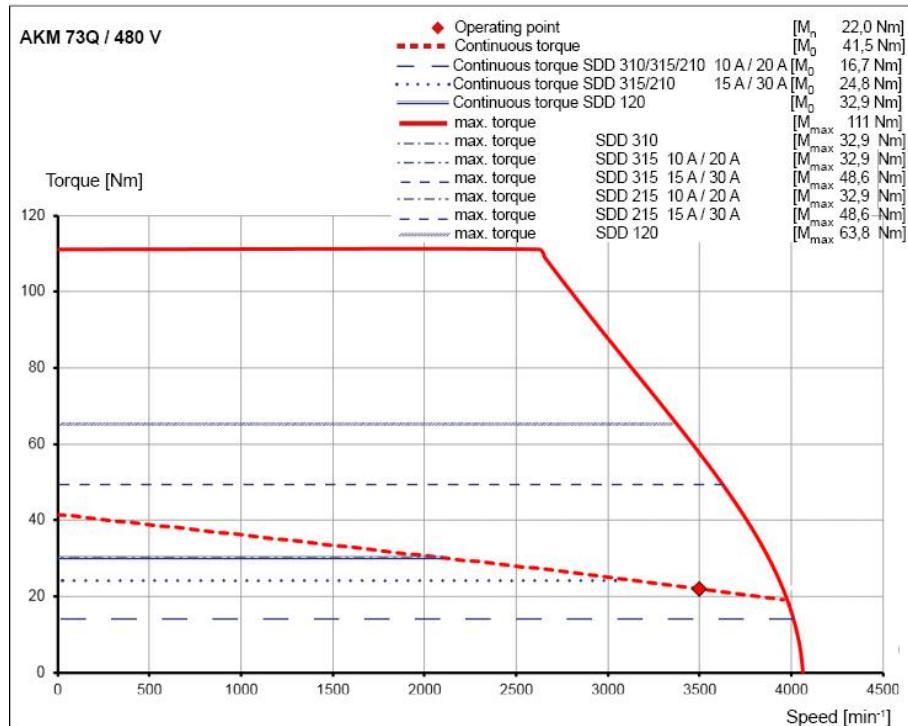
AKM 73P



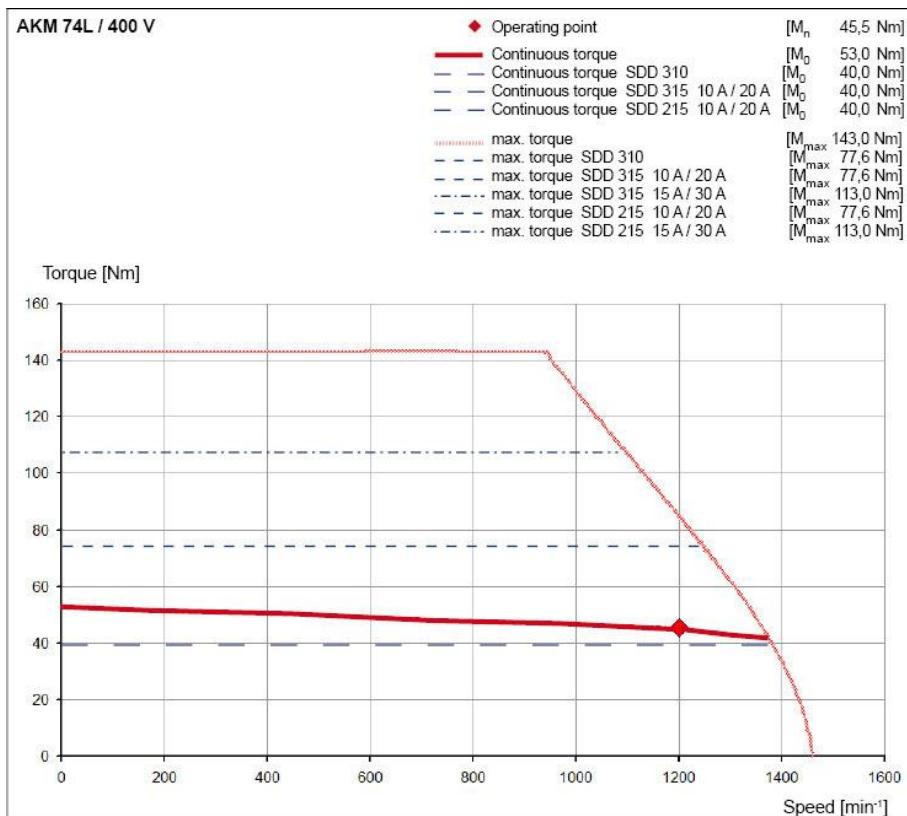


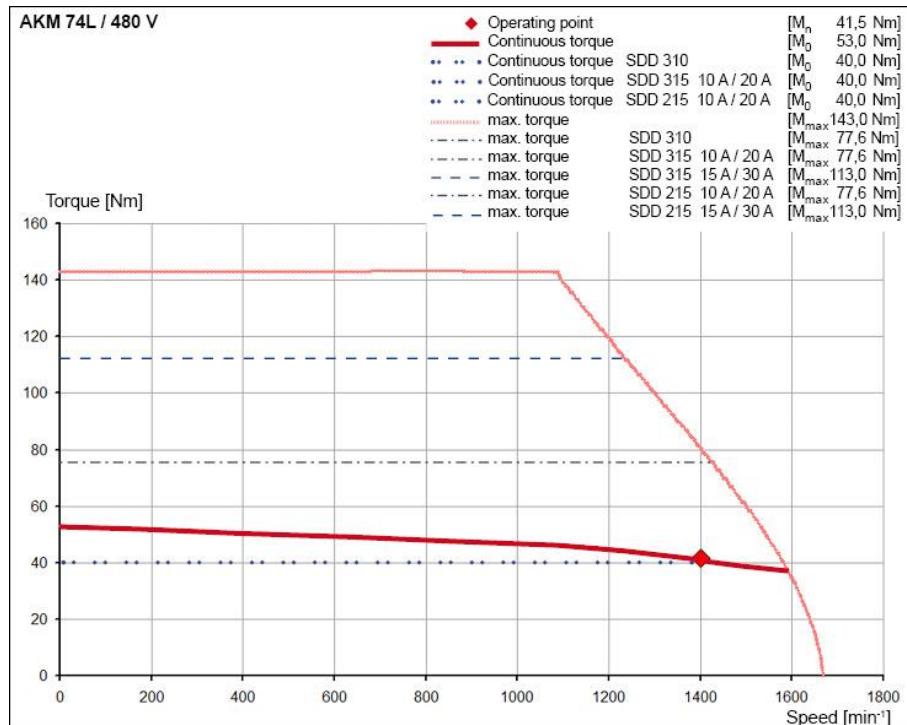
AKM 73Q



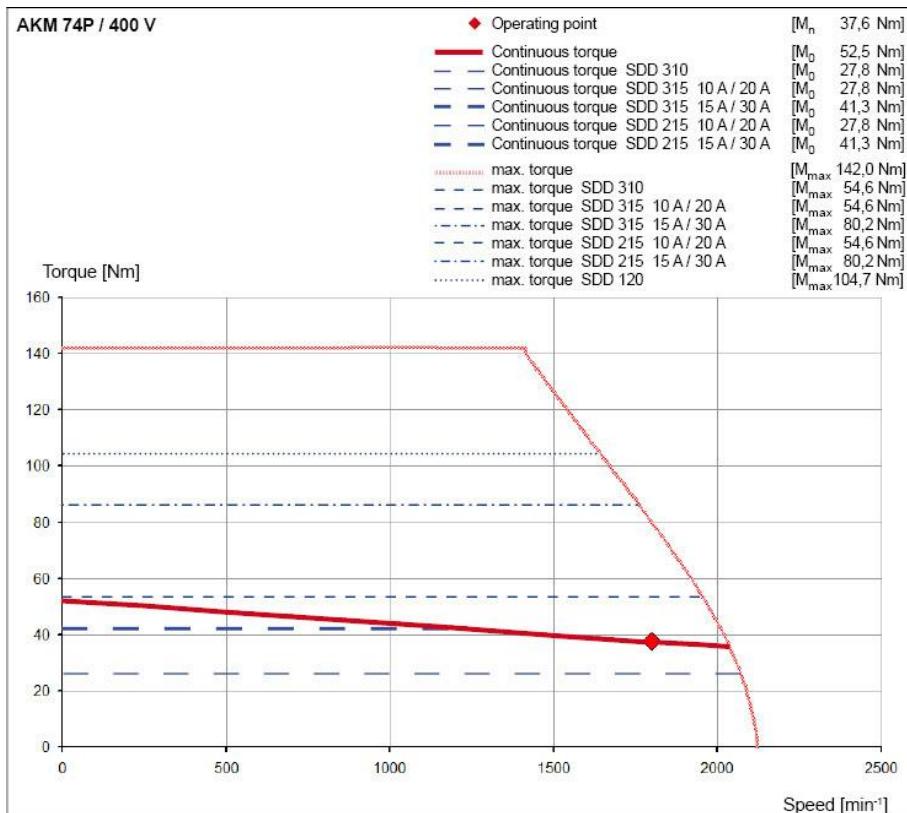


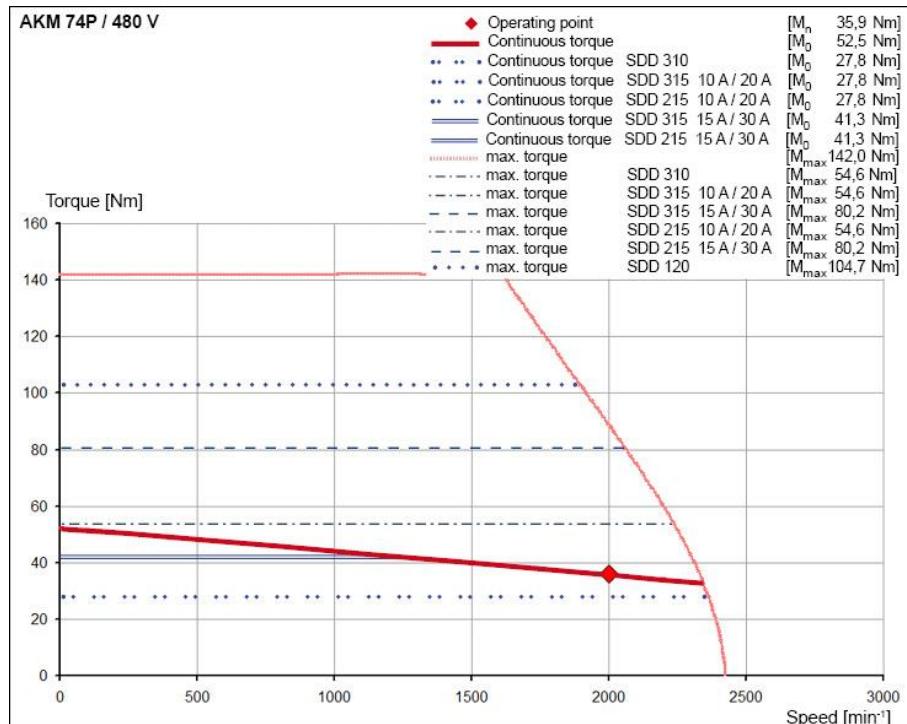
AKM 74L



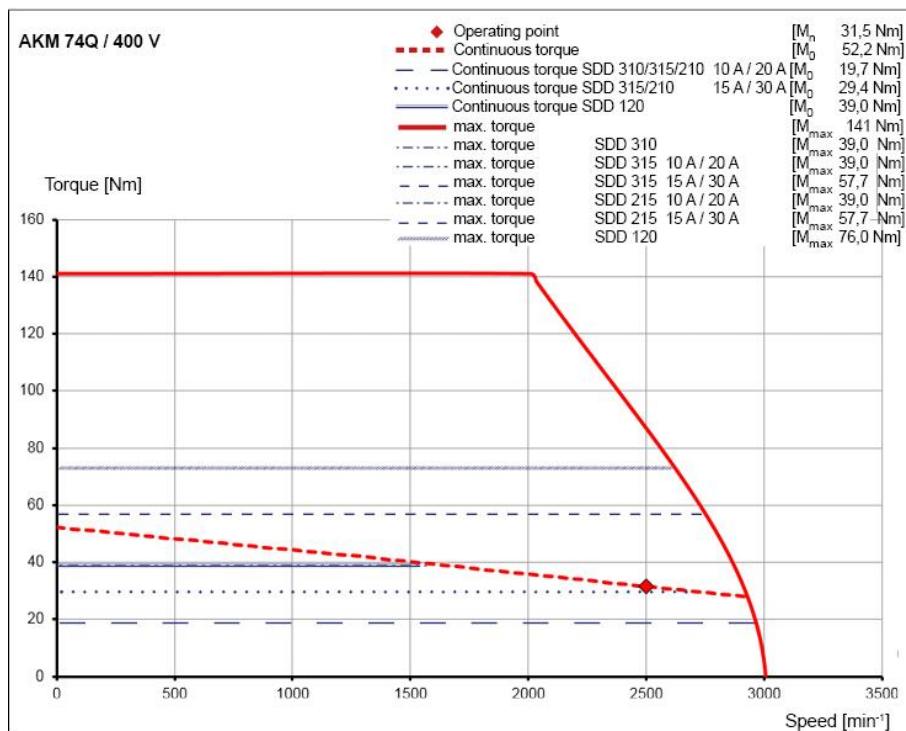


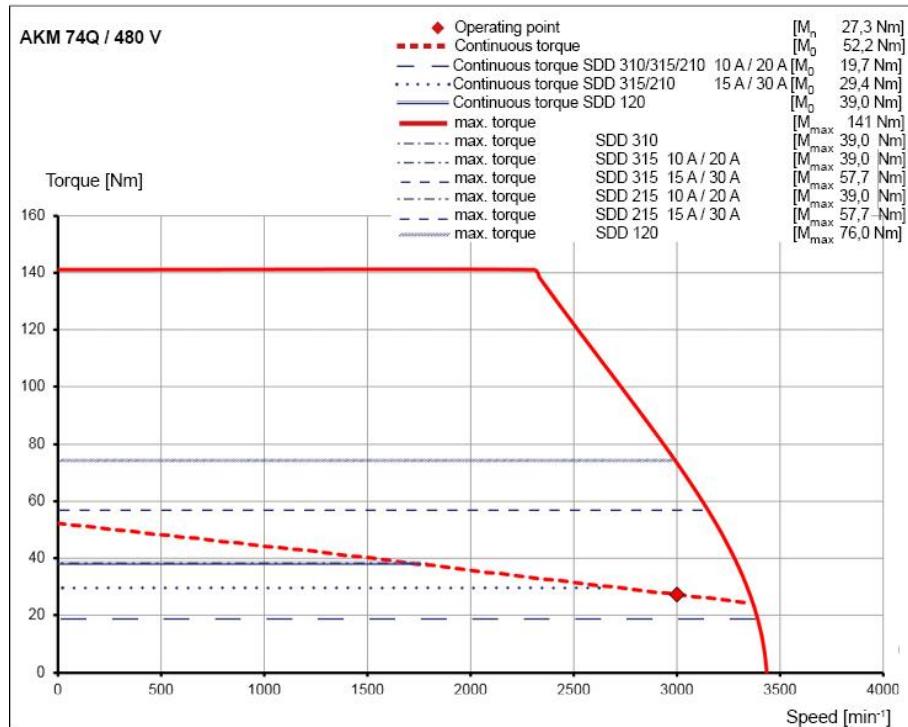
AKM 74P





AKM 74Q





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



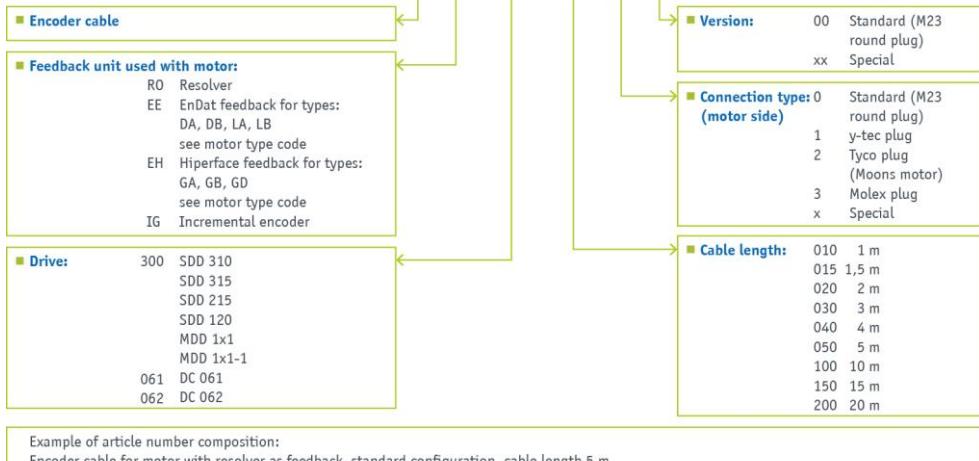
Sensor cables, shielded, preassembled on both ends, drag chain suitable and highly flexible (5 million bend cycles) cables with round plugs on the motor side and module connectors.

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
<hr/>			
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-RO-300-050-0-00	Resolver	5 meters	approx. 6.4 mm
F-RO-300-100-0-00	Resolver	10 meters	approx. 6.4 mm
F-RO-300-150-0-00	Resolver	15 meters	approx. 6.4 mm
F-RO-300-200-0-00	Resolver	20 meters	approx. 6.4 mm
<hr/>			
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

F-R0-300-050-0-00



11.3 Motor Cables



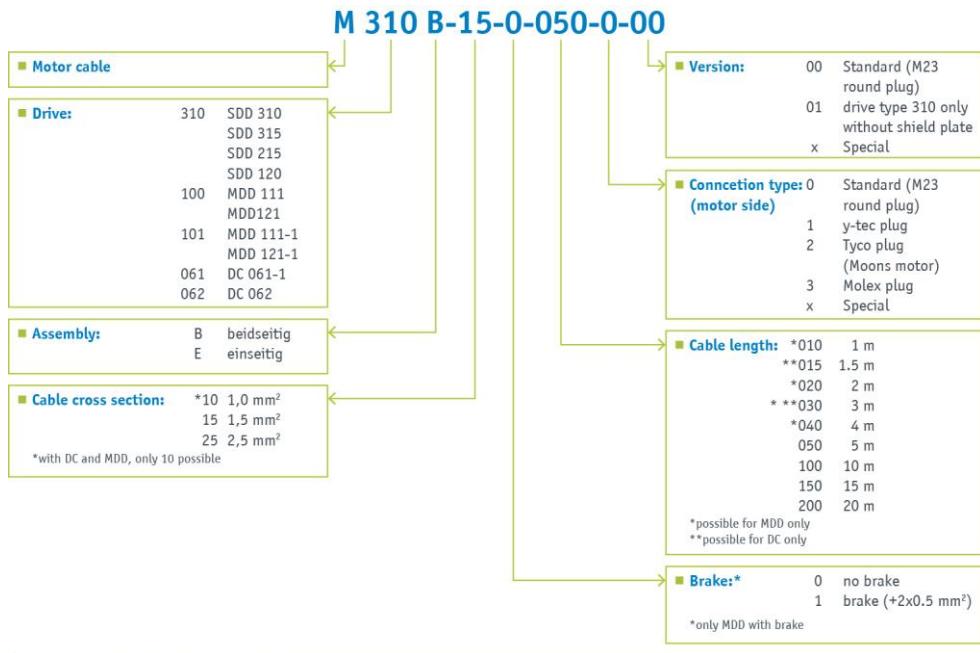
For motors with or without holding brakes, shielded, preassembled on both sides, can be used is a power cable carrier and highly flexible (5 million bend cycles) cables with round plugs on the motor side and module connectors.

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
<hr/>				
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
<hr/>				
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
<hr/>				
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
<hr/>				
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



Example of article number composition:

Motor cable for SDD type 310, assembled on both sides, wire cross section 1.5 mm², without brake, cable length 5 m, Standard configuration

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