BECKHOFF

AM8000 + AM8500 Synchronous-servomotor

Operation instructions | EN

10/07/2019 | Version 4.1

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Documentation notes

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In addition, the following are excluded from the liability:

- Failure to comply with this documentation
- Improper use
- Use of untrained personnel
- Use of unauthorized spare parts

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Version numbers

Origin of the document
These operating instructions were originally written in German. All other languages are derived from the German original.

Product features
The product features specified in the latest version of the original operating instructions are always applicable. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

Issue	Comment
4.1	**Chapter update:** Scope of the documentation, For your safety, Product characteristics, Ordering options, Improper use, Technical data, Scope of supply, Long-term storage, Technical description, Mechanical installation, Electrical installation, Fault correction, Disposal by the manufactor
4.0	**Complete revision, new version**
3.5	**Chapter revision:** EC Declaration of Conformity **2.1**; Feedback system **6.4.10**; Connection diagrams **8.4, 8.5**, **8.6**; **8.9** and **8.10**; Dimensional drawing AM806x and AM856x **10.6.1**
3.4	**Chapter revision:** EC Declaration of Conformity **2.1**; Dimensional drawing AM806x and AM856x **10.6.1**
3.3	**Chapter revision:** 1.0; 2.1; 3.0; 4.5; 5.3; 6.4.11; 8.3 to 8.14; 10.1 to 10.7; 10.7.1 **New chapter:** 8.5; 8.10; 10.7.3.1 **Removed chapter:** Documented motors
3.2	**Chapter revision:** 5.2; 5.3
3.1	**Chapter revision:** 5.3; 6.4.10
3.0	**Chapter revision:** 10.1 to 10.7, 10.1.1 to 10.7.1

Scope of the documentation

The complete documentation consists of the following documents:

AM8000 & AM8500	Definition
Translation of the original instructions; this documentation	Description of the mechanical and electrical characteristics as well as all the information required for operating the motors
Motor instruction leaflet	Accompanying document with general instructions for handling the motors. It is included with each product.
Fan cover instruction leaflet [+]	Fan cover installation description [+]

Staff qualification

These operating instructions are intended for trained control and automation specialists with knowledge of the applicable and required standards and directives.

Qualified personnel must have knowledge of drive technology and electrical equipment as well as knowledge of safe working on electrical systems and machines. This includes knowledge of proper setup and preparation of the workplace as well as securing the working environment for other persons.

The documentation published at the time must be used for each installation and commissioning. The products must be used in compliance with all safety requirements, including all applicable laws, regulations, provisions and standards.

Target group	Explanation
Instructed person	This target group has been informed about the possible dangers of improper use. The assigned scope of duties is clearly defined. Training will be provided for any tasks outside this scope. Instructions on the required protective measures and devices were provided.
Trained user	This target group meets all the requirements of an instructed person. In addition, machine- or plant-specific training was provided at the machine manufacturer's facility.
Trained specialists	Users who, based on their training, knowledge and experience, are able to assess the tasks assigned to them and recognize potential hazards, are regarded as trained specialists. Work experience over several years in a relevant field can also be considered as part of the technical training.
Qualified electricians	Qualified electricians are able to work on electrical machines or systems based on their specialist training (university degree, apprenticeship, specialist training). Possible sources of danger are automatically identified and avoided. Qualified electricians are specially trained for the working environment and are familiar with the relevant standards and guidelines. Knowledge of control engineering and automation is required. The provisions of the accident prevention regulations must be complied with.
Customer service	Customer service is provided by technicians who have been demonstrably trained and authorized by Beckhoff or the machine manufacturer to work on the respective machine or plant.

Safety and instruction

Read the contents that refer to the activities you have to perform with the product. Always read the chapter "For your safety", [Page 10] in the operating instructions. Observe the warnings in the chapters, so that you handle the product properly and safely.

Explanation of symbols

Various symbols are used in the interest of clarity:

- ► The triangle indicates instructions that you should execute
- • The bullet point indicates an enumeration
- […] The square parentheses indicate cross-references to other text passages in the document
- [+] The plus sign in square brackets indicates ordering options and accessories

Pictograms

Pictograms are used to indicate different text categories:

The warning triangle indicates warning notes.
The possible consequences of failure to observe these include:
• Damage and/or serious injuries
• Fatal injuries

The warnings are shown at the points in the documentation where it is important to observe them in order to prevent accidents and injuries.

Notes are used for important information on the product!
The possible consequences of failure to observe these include:
• Malfunctions of the product
• Damage to the product
• Damage to the environment

Information
This sign indicates information, tips and notes for dealing with the product or the software.

Example
This symbol shows examples of how to use the product or software.

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Download area

In the download area you will find product information, software updates, the TwinCAT automation suite, documentation and much more.

Web:	www.beckhoff.de/download

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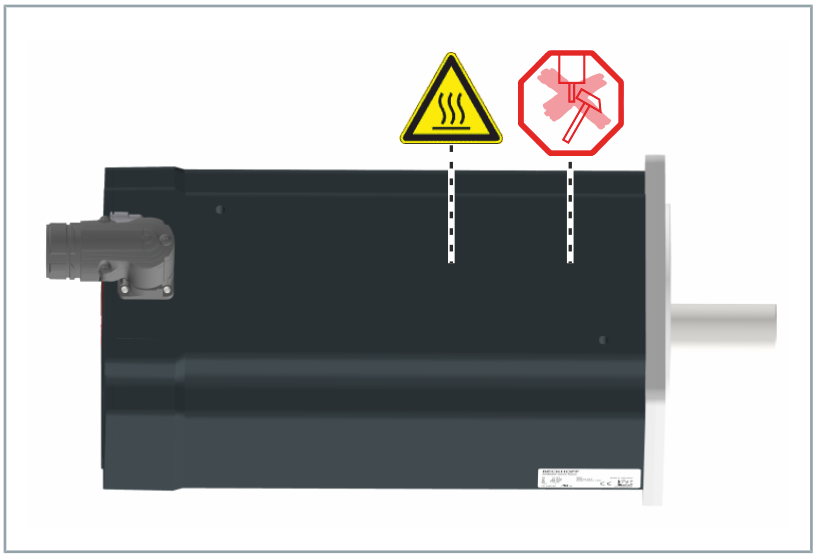
Read this chapter containing general safety information. The chapters in these operating instructions also contain warning notices. Always observe the safety instructions for your own safety, the safety of other persons and the safety of the product.

When working with control and automation products, many dangers can result from careless or incorrect use. Work particularly thoroughly, not under time pressure and responsibly towards other people.

Safety pictograms

On Beckhoff products you will find attached or lasered safety pictograms, which vary depending on the product. They serve to protect people and to prevent damage to the products. Safety pictograms must not be removed and must be legible for the user.



Warning of hot surface
During and after operation there is a risk of burns at the motor housing from hot surfaces above 60 °C. Allow the motor housing to cool down for the specified time, at least 15 minutes.

Avoid shocks to the shaft
Impacts on the shaft may cause the maximum permissible axial and radial values to be exceeded. Optical encoder systems can thus be destroyed.

General safety instructions

In this chapter you will find notes on safety when handling the motors. They cannot run independently. The motors are therefore regarded as incomplete machines. They must be installed in a machine / plant by the machine manufacturer. The documentation created by the machine manufacturer must be read.

Before operation

Keep the surroundings clean
Keep your workplace and the surrounding area clean. Ensure safe working. Prevent dirt from penetrating into the components.

Secure the control cabinet
When working on machines, secure the control cabinet against inadvertent power-up.

Do not use defective motors
Observe the specifications in the technical data during storage, transport and operation. Do not use damaged motors.

Check safety pictograms
Check whether the designated pictograms are on the product. Replace missing or illegible stickers.

Observe the tightening torques
Install connections and components in compliance with the specified tightening torques and check them regularly.

Ground electrical components or assemblies correctly
Do not touch electrical components or assemblies unless you are wearing protective ESD clothing. Only walk on conductive floors.

Only use original packaging for further processing
When shipping, transporting, storing and packing, use the original packaging or conductive materials. Conductive materials are foam or aluminum, for example.

During operation

Avoid contact with DC link capacitors DC+ and DC-
Measure the voltage at the DC link capacitors! Observe the following delay times after disconnecting from the mains supply:

• AX5101 to AX5125 and AX520x	**5 minutes**
• AX5140 / AX5160 / AX5172	**15 minutes**
• AX5190 / AX5191	**30 minutes**
• AX81x8, AX8206 and AX8810	**30 minutes**
• AX8620 to AX8640	**30 minutes**
• AX5192 / AX5193	**45 minutes**

Do not work on live electrical parts
Do not open the motor while it is live. Ensure that the protective conductor is properly connected. Never disconnect electrical connections while they are live. Do not work on the motor until the voltage has dropped below 50 V. Disconnect all components from the mains and secure against reconnection.

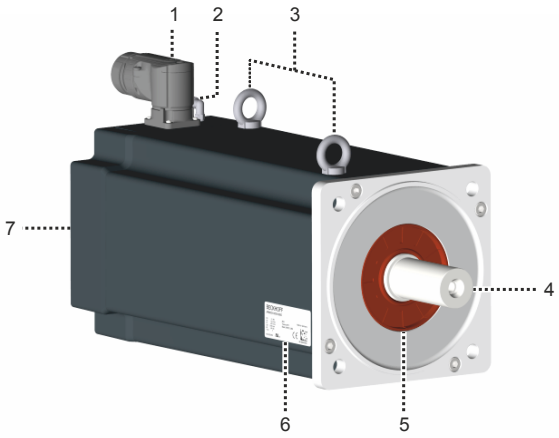
Do not touch hot surfaces
Check cooling of the surfaces with a thermometer! Do not touch the housing during and after operation. Allow the motor to cool down for at least 15 minutes after switching off.

Avoid overheating
Operate the motor according to the technical specifications. Please refer to chapter: "Technical data", [Page 18]. Activate and monitor the temperature contact of the motor. Ensure sufficient cooling and switch off the motor immediately if the temperature is too high.

Do not touch rotating components
Do not touch rotating parts while the motor is in operation. Ensure that all parts / components on the machine / plant are firmly seated.

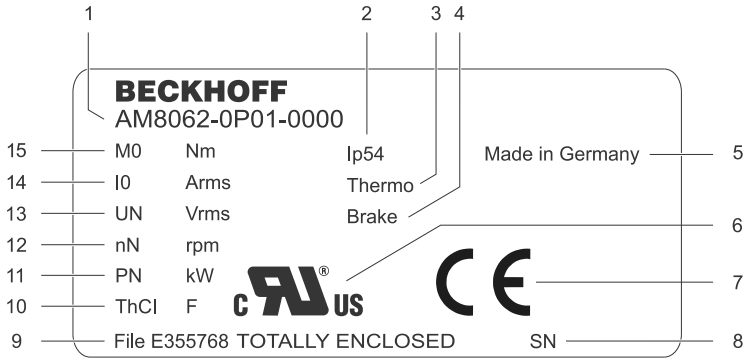
After operation

Before working on components, make sure that they are de-energized
Carry out a voltage test and check all safety-relevant devices for functionality. Secure the working environment and the control cabinet against inadvertent power-up. See chapter: "Decommissioning", [Page 77].



Number	Explanation
1	Power / feedback connection
2	Sealing air connection [+]
3	Eyebolt mounting lugs; only for AM807x
4	Motor shaft
5	Radial shaft-sealing ring [+]
6	Name plate
7	Motor housing

Name plate



Item number	Explanation
1	Motor type
2	Protection class
3	Thermal contact type
4	Brake type
5	Country of manufacture
6	cURus approval
7	CE conformity
8	Serial number
9	UL approval for USA / CAN
10	Insulation class
11	Power rating
12	Nominal speed
13	Nominal voltage
14	Standstill current
15	Standstill torque

Type key

AM8 t u v – w x y z – 0 00 0	Explanation
AM8	Product range Synchronous servo motors
t	Motor series 0 = Standard 5 = Increased mass moment of inertia
u	Flange size 1 = 40 mm 2 = 58 mm 3 = 72 mm 4 = 87 mm 5 = 104 mm 6 = 142 mm 7 = 194 mm
v	Construction length 1 2 3 4
w	Shaft design 0 = Smooth shaft 1 = Shaft with groove and feather key to DIN 6885 2 = Shaft with radial shaft seal IP 65 and smooth shaft 3 = Shaft with radial shaft seal IP 65, groove, feather key 4 = Shaft with radial shaft seal IP 65, smooth shaft and sealing air connection 5 = Shaft with radial shaft seal IP 65, groove, feather key and sealing air connection
x	Winding type A … Z S = Special winding
y	Feedback system 0 = Resolver, two pole 1 = OCT Singleturn 2 = OCT Multiturn 3 = Hiperface Singleturn 128 SinCos from F6 4 = Hiperface Multiturn 128 SinCos from F6 A = OCT Singleturn 23-Bit B = OCT Multiturn 23-Bit G = OCT Singleturn 24-Bit, SIL 2 H = OCT Multiturn 24-Bit, SIL 2 N = without Feedback, “sensorless”
z	Holding brake 0 = without holding brake 1 = 24 V holding brake A = Fan from F5; without holding brake B = Fan from F6; 24 V holding brake
0	Variants 0 = Standard 1 = Special variant 9 = At AM805x, AM855x and AM802x, flange compatible with AM3x5x and AM312x
00	Undefined
0	Connection 0 = Rotatable angled plug or terminal box

Flange sizes

Motor sizes matching the adapter for gear unit mounting

Beckhoff flange size	AM3000	AM3100	AM3500	AM8000	AM8100	AM8500
F1	AM301x	AM311x	-	AM801x	AM811x	-
F2	AM302x	-	-	AM802x	AM812x	-
Exception	-	AM312x	-	AM802x-xxxx-9	-	-
F3	AM303x	-	-	AM803x	AM813x	AM853x
F4	AM304x	-	AM354x	AM804x	AM814x	AM854x
F5	-	-	-	AM805x	-	AM855x
Exception	AM305x	-	AM355x	AM805x-xxxx-9	-	-
F6	AM306x	-	AM356x	AM806x	-	AM856x
F7	AM307x	-	-	AM807x	-	-
Exception	AM308x	-	-	-	-	-

Product characteristics

Brushless three-phase synchronous motors
Brushless three-phase synchronous motors have no electrical contact between rotor and stator. This means that the motor has no slip rings or commutators, which facilitates longer service life of the motor.

Neodymium permanent magnets
The magnets installed in the motor are permanent magnets. Neodymium is a hard magnetic material that enables the precise and highly dynamic positioning of the motors.

Three-phase stator winding
The three-phase winding in the stator reduces the amount of material required while maintaining the same electrical output. All phase angles are 120°.

Electronic commutation in the servo drive
The commutation of the motor is done electronically. The three coil turns are supplied from a bridge circuit.

Holding brake [+]
The motors can optionally be equipped with a permanent magnet holding brake [+]. These operate according to the quiescent current principle and open at a voltage of 24 V_{DC} +6 / -10%.
The holding brake has > 10,000,000 switching cycles.

The built-in holding brake [+] is not suitable for service braking, as there is no monitoring for wear and functionality by the servo drive and the configuration. This applies in particular to vertical axes!

Safety measures for vertical axes must be applied
When operating vertical axes, additional redundancy brake units, mechanical safety devices and interlocks as well as weight compensation must be installed!
Permanent magnet holding brakes [+] are not approved for personal protection! Taking into account EN 954, ISO 13489-1 and 13849-2, additional precautions must be taken for personal protection.

If the voltage is interrupted through emergency stop or power failure, the holding brake [+] is conditionally permissible as a service brake. You can perform a maximum of 2000 emergency stops from a maximum of 3000 rpm with an external inertia/intrinsic inertia of the motor.
These maximum values may vary due to increased load inertia.

The function of the holding brake [+] can be checked using a torque wrench and TwinCAT Scope.

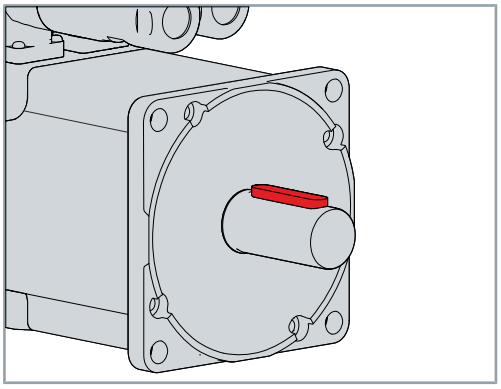
Thermal contacts
A thermal contact "LPTC-600", [Page 59] is installed to monitor and measure the winding temperature and to protect the motor against overheating. This can be read out by the user.

Temperature warning and switch-off:
- Motor warning temperature at 120 °C
- Motor switch-off temperature at 140 °C

Ordering options

Order options are defined by the type key and must be ordered separately. The listed components cannot be retrofitted.

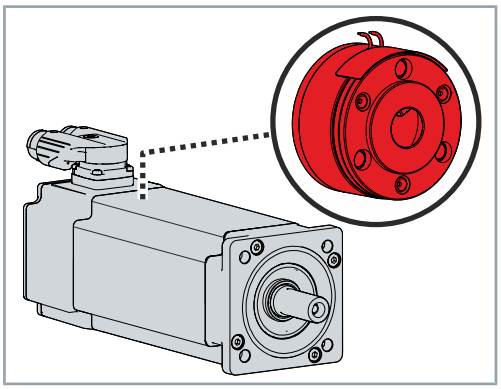
Feather key



A feather key serves to transmit torques to an output element.

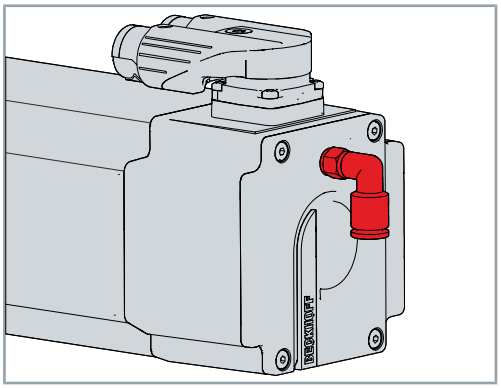
The motors are available with feather key groove and fitted feather key according to DIN6885. The rotor is balanced with half a feather key according to DIN ISO 21940-32:2012-08.

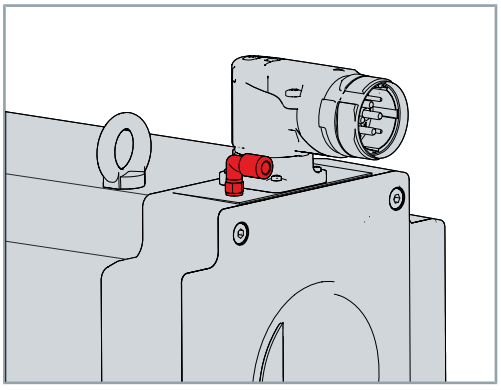
Holding brake



A holding brake blocks the rotor in the de-energized state. The holding brake increases the motor length and the rotor moment of inertia.

Sealing air connection





Ingress of liquids or dust at different temperature ranges can be prevented by a separate sealing air connection. It is installed together with an axial shaft seal ring. A defined overpressure is created during assembly.

A sealing air connection is recommended for:

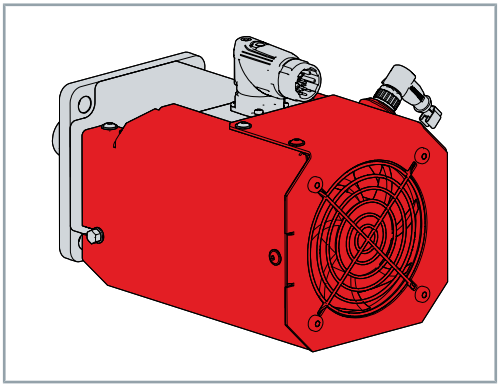
- Critical installation locations with extreme dust exposure
- Motors with permanent and direct fluid contact

Important
In the horizontal mounting position IM V3, liquid can accumulate permanently on the motor flange and penetrate into the motor. Even a sealing air connection cannot completely prevent the liquid from entering.

An air hose provided by the customer must be connected to a suitable regulated pressure reducer. The compressed air must be free of oil and dust.

Minimum requirements and technical data:	
Compressed air requirement	according to DIN ISO 8573-1 Class 3:2010 [A:B:C]
Operating pressure	0.1 ± 0.05 bar
Maximum pressure	0.3 bar
Air connection	Quick-release coupling
Required air line	e.g. PA hose 6 mm x 4 mm

Fan cover



The fan cover is used for external cooling of the motors. It therefore increases the performance data of the motor.

This ordering option is available for motors of the following series:

- AM8x5x and AM8x5x-9000; flange compatible with AM3x5x
- AM8x6x and
- AM807x

Intended use

The synchronous servomotors of the AM8000 & AM8500 series may only be used for the intended activities as defined in this documentation under consideration of the specified environmental conditions. The components are to be installed in electrical systems or machines and only put into operation as integrated components of the system or machine.

The thermal protection contact incorporated in the motor windings must be analyzed and monitored on a regular basis.

Read the entire drive system documentation:
- Original instructions
- Original instructions for the AX5000 servo drives and/or the AX8000 multi-axis servo system
- Complete machine documentation provided by the machine manufacturer

Improper use

Any use exceeding the permissible values specified in the "Technical data", [Page 18] is considered improper and therefore prohibited.

Beckhoff servomotors of the AM8000 & AM8500 series Beckhoff are not suitable for use in the following areas:

- ATEX zones without suitable housing
- Areas with aggressive environments, e.g. aggressive gases or chemicals

The relevant standards and directives for EMC interference emissions must be complied with in residential areas. The servomotors should only be installed in housings with appropriate attenuation of shielding.

Definitions of terms, ambient conditions and operating data as well as technical data for the motors are provided below.

Definitions

Characteristic torque and speed curves
Detailed information on characteristic curves can be found under:
www.beckhoff.de -> Beckhoff motor curves

External fan performance data
Detailed information on the performance data of the external fan can be found in chapter:
Mechanical installation: "Performance data of the external fan", [Page 64]

All data, with the exception of the voltage constant, are based on 40 °C ambient temperature and 100 K overtemperature of the winding. The data can have a tolerance of +/- 10%.
If a gear unit is attached the power may be reduced by up to 20 %. The flange of the motor used for heat dissipation is fitted with a gear unit that generates heat during operation. The loss in performance therefore has thermal reasons.

Technical term	Symbol [Unit]	Definition
Standstill torque	M0 [Nm]	Torque, also referred to as starting torque, that the motor can generate at standstill. It can be maintained indefinitely at a speed n < 100 min^{-1} and rated ambient conditions.
Nominal torque	Mn [Nm]	The torque that the motor delivers when it is operated at nominal speed and nominal current. Can be output in continuous operation S1 for an unlimited period of time.
Standstill current	I_{0rms} [A]	Sinusoidal current RMS value. This is consumed at a speed of n < 100 min^{-1} in order to generate the standstill torque.
Peak current, pulse current	I_{0max} [A]	Sinusoidal peak current RMS value. Corresponds to approx. five times the standstill current and three times for AM806x, AM856x and AM807x. The configured peak current of the servo drive used must be less or equal.
Torque constant	K_{Trms} [Nm/A]	Indication of the torque in Nm generated by the motor per ampere of standstill current. $M_0 = I_0 \times K_T$ applies
Voltage constant	K_{Erms} [mVmin]	Indication of the induced motor EMF at 20 °C, based on 1000 rpm. This is specified as the sine RMS value between two terminals.
Rotor moment of inertia	J [kgcm²]	Measure of the acceleration capacity of the motor. For example, at J_0 the acceleration time t_b from 0 to 3000 min^{-1} can be calculated based on the following formula: $t_b[S] = \frac{3000 * 2\pi}{M_0 * 60s} * \frac{m^2}{10^4 cm^2} * J$ with M_0 in Nm and J in $kgcm^2$
Thermal time constant	t_{TH} [min]	Specification of the heating time of the cold motor under load with I_0 until an overtemperature of 0.63 x 100 Kelvin is reached. This temperature rise happens in a much shorter time when the motor is loaded with the peak current.
Release delay time / application delay time of the brake	t_{BRH} [ms] / t_{BRL} [ms]	Specification of the response times of the holding brake [+] when operated with the nominal voltage
Winding inductance	L [mH]	Indication of the motor inductance. It is the average value for one motor revolution, with two energized phases, at 1 kHz. Saturation of the motor must be taken into account.

Data for operation and environment

Beckhoff products are designed for operation under certain environmental conditions, which vary depending on the product. The following specifications must be observed for operation and environment in order to achieve the optimum service life of the products.

Operate the motor only under the specified conditions
Operate motors only under the operating and environmental conditions specified in this chapter. This ensures a long service life and proper operation.
Temperatures above 40 °C and encapsulated installation can shorten the service life of the servomotor.

Environmental requirements	
Climate category	2K3 according to EN 60721
Ambient temperature at operation	For installation altitudes up to 1000 m above sea level: +5 to +40 °C, extended temperature range
Ambient temperature at transport and storage	Maximum fluctuation 20 K/hour: -25 °C to +70 °C
Permissible air humidity at operation	95% relative humidity, no condensation
Permissible air humidity at transport and storage	5% to 95% relative humidity, no condensation

Specifications for intended use	
Power reduction, "derating“ currents and torques	For installation altitudes of 1000 m above sea level and 40 °C: 6% at 2000 m above sea level 17% at 3000 m above sea level 30% at 4000 m above sea level 55% at 5000 m above sea level No derating for site altitudes of 1000 m above sea level with temperature reduction of 10K / 1000m.
Insulation material class	F according to IEC 60085, UL1446 class F
Protection class	Listed in the technical data of the motors
Mounting position	See chapter: "Technical description", [Page 58]
Maintenance intervals	See chapter: "Maintenance and cleaning", [Page 71]
Vibration class <= 1800 [rpm]	
Maximum relative vibration displacement	90 µm
Maximum run-out	23 µm
Vibration class > 1800 [rpm]	
Maximum relative vibration displacement	65 µm
Maximum run-out	16 µm
Feedback system	See chapter: "Technical description", [Page 58]
Vibration resistance	50 g, 10...2000 Hz according to EN 60068-2-6
Shock resistance	100 g, 6 ms according to EN 60068-2-27
EMC requirements	conforms to EN 61800-3:2004 + A1:2012
Approvals	CE, cURus EAC See chapter: "Guidelines and Standards", [Page 78]

AM801x

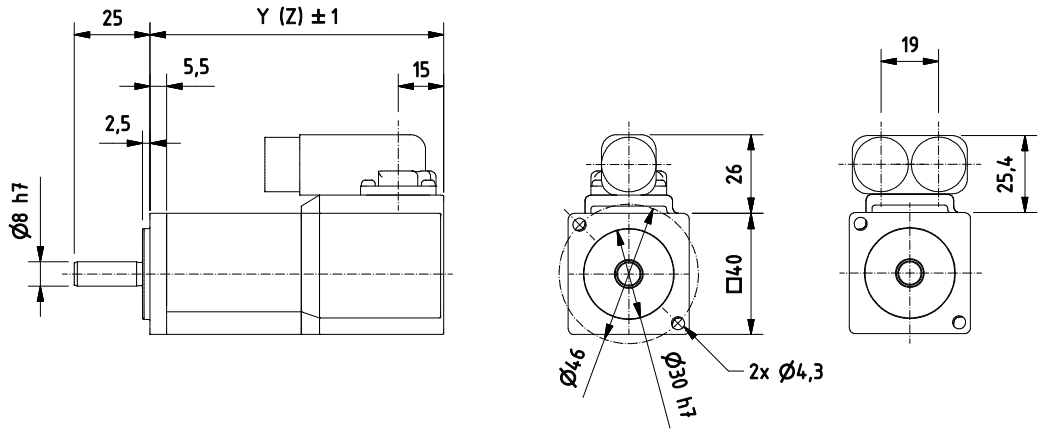
Electrical data	AM80xx		
	11B	12C	13D
Standstill torque* M_0 [Nm]	0.20	0.38	0.52
Standstill current I_{orms} [A]	0.76	1.30	1.65
Maximum mechanical speed N_{max} [min^{-1}]	10,000		
Maximum rated mains voltage U_N [V_{AC}]	250		
Peak current I_{0max} [A]	2.30	4.55	5.90
Peak torque M_{0max} [Nm]	0.68	1.37	2.04
Torque constant K_{Trms} [Nm/A]	0.263	0.292	0.315
Voltage constant K_{Erms} [mVmin]	19.00	19.20	22.70
Winding resistance Ph-Ph R_{20} [Ω]	34.50	15.00	11.50
Winding inductance Ph-Ph measured at 1 kHz L [mH]	21.00	10.50	9.00
Power supply U_N= 115 V			
Nominal speed N_n [min-1]	3500	4000	3500
Nominal torque* M_n [Nm]	0.19	0.35	0.49
Rated output P_n [kW]	0.07	0.15	0.18
Power supply U_N= 230 V			
Nominal speed Nn [min-1]	8000	8000	8000
Nominal torque* M_n [Nm]	0.18	0.33	0.45
Rated output P_n [kW]	0.15	0.28	0.38
Nominal current I_n [A]	0.73	1.20	1.30
Motor connector	iTec		
** reference flange aluminum 230 mm x 130 mm x 10 mm*			

Mechanical data	AM80xx		
	11	12	13
Rotor moment of inertia without brake J [$kgcm^2$]	0.0339	0.0527	0.0715
Rotor moment of inertia with brake J [$kgcm^2$]	0.0566	0.0754	0.0942
Number of poles	6	6	6
Static friction torque M_R [Nm]	0.0009	0.0018	0.0027
Thermal time constant t_{TH} [min]	9	9	10
Weight without brake [kg]	0.55	0.64	0.79
Weight with brake [kg]	0.74	0.86	0.98
Flange	**IEC standard / DIN 42955**		
Fit	h7		
Tolerance class	N		
Protection class			
Standard housing version	IP54		
Standard shaft feed through version	IP54		
Paint finishes			
Properties	acrylic powder-coated		
Color	dark gray / RAL 7016		

Optional holding brake [+]	AM801x
Holding torque at 120 °C M_{BR} [Nm]	0.6
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %
Electrical power P_{BR} [W]	10
Current I_{on} [A]	0.3
Release delay time t_{BRH} [ms]	14
Application delay time t_{BRL} [ms]	8

Dimensional drawing

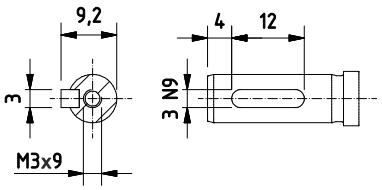
- All figures in millimeters



Motor	Y	Z - Brake
AM8011	97	129
AM8012	117	149
AM8013	137	169

Feather key [+]

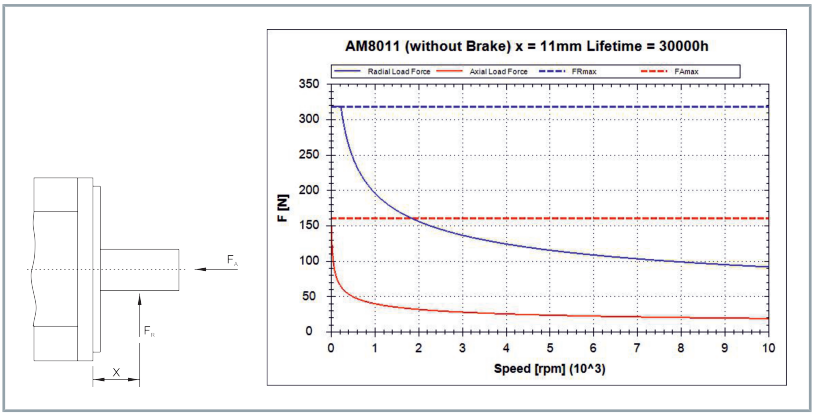
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8011 without holding brake.

• Download load / force calculator



AM802x

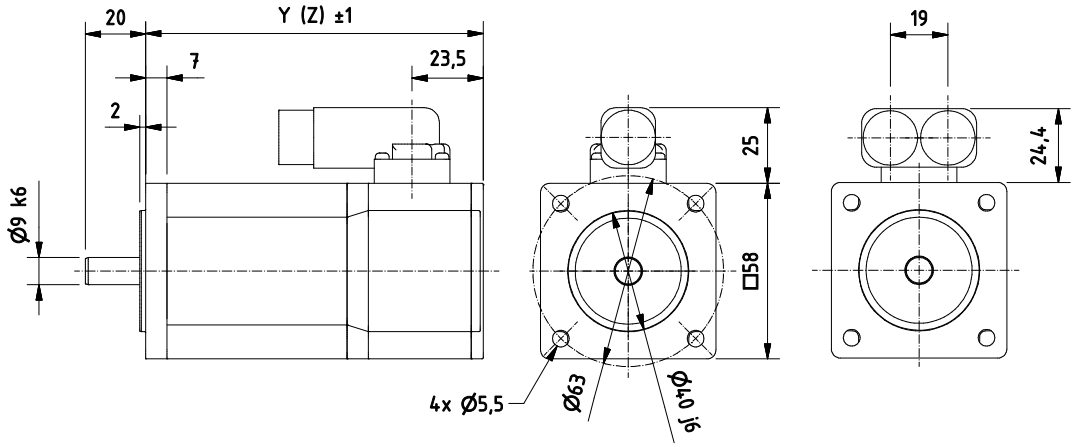
Electrical data	AM80xx					
	21B	21D	22D	22E	23E	23F
Standstill torque* M_0 [Nm]	0.50	0.50	0.80	0.80	1.20	1.20
Standstill current I_{orms} [A]	0.85	1.60	1.50	2.44	2.20	3.40
Maximum mechanical speed N_{max} [min^{-1}]	12000					
Maximum rated mains voltage U_N [V_{AC}]	480					
Peak current I_{0max} [A]	4.90	8.60	7.70	12.60	11.40	17.70
Peak torque M_{0max} [Nm]	2.68	2.67	4.18	4.18	6.36	6.37
Torque constant K_{Trms} [Nm/A]	0.588	0.313	0.533	0.328	0.545	0.353
Voltage constant K_{Erms} [mVmin]	42	23	41	25	43	25
Winding resistance Ph-Ph R_{20} [Ω]	39.40	12.80	13.20	5.10	8.50	3.60
Winding inductance Ph-Ph measured at 1 kHz L [mH]	67.00	21.60	30.10	11.20	20.80	8.70
Power supply U_N= 115 V						
Nominal speed Nn [min-1]	1500	3500	2000	4000	2000	3500
Nominal torque* M_n [Nm]	0.50	0.50	0.78	0.76	1.15	1.16
Rated output P_n [kW]	0.08	0.18	0.16	0.32	0.24	0.43
Power supply U_N= 230 V						
Nominal speed Nn [min-1]	4000	8000	4500	8000	4500	8000
Nominal torque* M_n [Nm]	0.50	0.50	0.75	0.70	1.10	1.00
Rated output P_n [kW]	0.21	0.42	0.35	0.59	0.52	0.84
Power supply U_N= 400 V						
Nominal speed Nn [min-1]	8000	9000	8000	9000	8000	9000
Nominal torque* M_n [Nm]	0.50	0.50	0.70	0.65	1.00	0.90
Rated output P_n [kW]	0.42	0.47	0.59	0.61	0.84	0.85
Nominal current I_n [A]	0.85	1.60	1.30	1.95	1.85	2.85
Power supply U_N= 480 V						
Nominal speed Nn [min-1]	9000	9000	9000	9000	9000	9000
Nominal torque* M_n [Nm]	0.50	0.50	0.65	0.65	0.90	0.90
Rated output P_n [kW]	0.47	0.47	0.61	0.61	0.85	0.85
Motor connector	iTec					
** reference flange aluminum 230 mm x 130 mm x 10 mm*						

Mechanical data	AM80xx		
	21	22	23
Rotor moment of inertia without brake J [$kgcm^2$]	0.139	0.258	0.378
Rotor moment of inertia with brake J [$kgcm^2$]	0.208	0.328	0.448
Number of poles	6	6	6
Static friction torque M_R [Nm]	0.002	0.004	0.006
Thermal time constant t_{TH} [min]	10	13	16
Weight without brake [kg]	1.00	1.30	1.70
Weight with brake [kg]	1.16	1.66	1.96
Flange	**IEC standard / DIN 42955**		
Fit	J6		
Tolerance class	N		
Protection class			
Standard housing version	IP65		
Standard shaft feed through version	IP54		
Shaft bushing with shaft sealing ring	IP65		
Paint finishes			
Properties	acrylic powder-coated		
Color	dark gray / RAL 7016		

Optional holding brake [+]	AM802x
Holding torque at 120 °C M_{BR} [Nm]	2.0
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %
Electrical power P_{BR} [W]	10
Current I_{on} [A]	0.3
Release delay time t_{BRH} [ms]	25
Application delay time t_{BRL} [ms]	8

Dimensional drawing

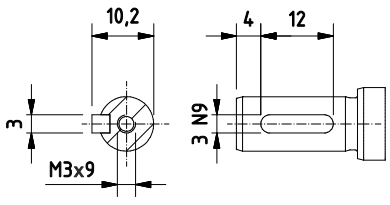
- All figures in millimeters



Motor	Y	Z - Brake
AM8021	111,5	146
AM8022	133,5	168
AM8023	155,5	190

Feather key [+]

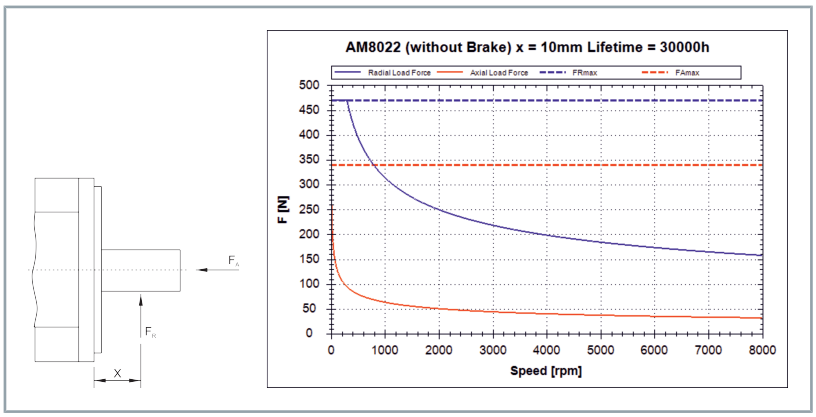
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8022 without holding brake.

• Download load / force calculator



AM803x & AM853x

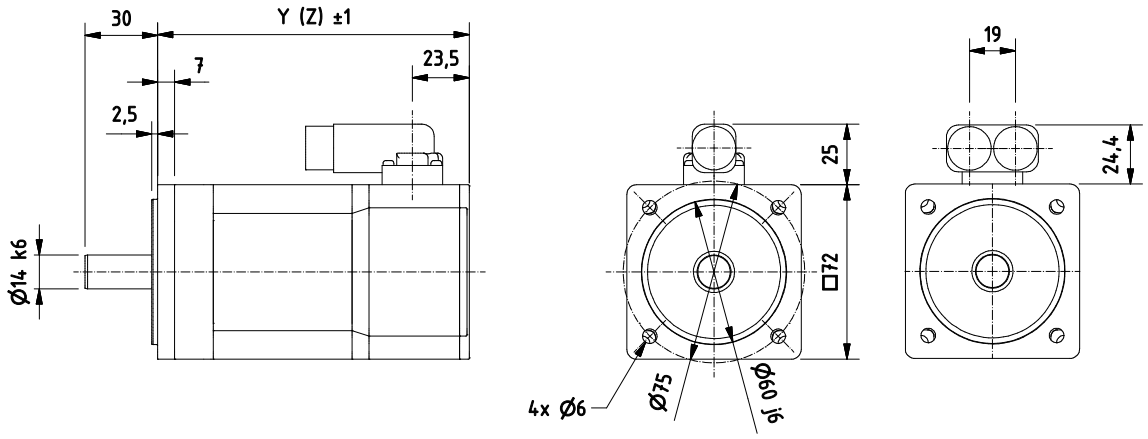
Electrical data	AM80xx / AM85xx								
	31C	31D	31F	32D	32E	32H	33E	33F	33J
Standstill torque* M_0 [Nm]	1.37	1.38	1.40	2.38	2.37	2.37	3.20	3.22	3.22
Standstill current I_{orms} [A]	1.00	1.95	3.20	1.70	2.95	5.10	2.10	4.10	6.80
Maximum mechanical speed N_{max} [min^{-1}]	10000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	5.5	10.7	17.6	9.6	17.2	29.5	12.9	24.6	39.8
Peak torque M_{0max} [Nm]	6.1	6.07	6.07	11.66	11.66	11.65	17.19	17.71	17.22
Torque constant K_{Trms} [Nm/A]	1.37	0.71	0.44	1.4	0.8	0.46	1.52	0.78	0.47
Voltage constant K_{Erms} [mVmin]	99	50	30	100	56	32	106	57	34
Winding resistance Ph-Ph R_{20} [Ω]	51.0	12.6	5.0	21.0	6.5	2.2	13.2	3.9	1.35
Winding inductance Ph-Ph measured at 1 kHz L [mH]	134	36	13.3	71.9	22.6	7.7	46.3	14	4.9
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	400	1400	2700	600	1400	2700	600	1400	2700
Nominal torque* M_n [Nm]	1.36	1.38	1.37	2.37	2.34	2.29	3.15	3.10	3.05
Rated output P_n [kW]	0.06	0.20	0.39	0.15	0.34	0.65	0.20	0.45	0.86
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	1400	3300	6000	1500	3000	6000	1500	3000	5900
Nominal torque* M_n [Nm]	1.35	1.36	1.34	2.34	2.30	2.10	3.10	3.00	2.70
Rated output P_n [kW]	0.20	0.47	0.84	0.37	0.76	1.32	0.49	1.00	1.67
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	3000	6000	9000	3000	6000	9000	3000	6000	9000
Nominal torque* M_n [Nm]	1.34	1.33	1.30	2.30	2.20	1.85	2.98	2.70	2.30
Rated output P_n [kW]	0.42	0.84	1.23	0.72	1.38	1.74	0.94	1.70	2.17
Nominal current I_n [A]	0.95	1.90	3.00	1.60	2.75	4.10	2.00	3.60	5.10
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	3400	6800	9000	3400	6800	9000	3400	6800	9000
Nominal torque* M_n [Nm]	1.33	1.32	1.3	2.26	2.1	1.85	2.95	2.6	2.3
Rated output P_n [kW]	0.47	0.94	1.23	0.8	1.5	1.74	1.05	1.85	2.17
Motor connector	iTec								
** reference flange aluminum 230 mm x 130 mm x 10 mm*									

Mechanical data	AM80xx / AM85xx					
	AM8031	AM8531	AM8032	AM8532	AM8033	AM8533
Rotor moment of inertia without brake J [$kgcm^2$]	0.467	1.67	0.847	2.05	1.23	2.440
Rotor moment of inertia with brake J [$kgcm^2$]	0.546	1.76	0.926	2.15	1.46	---
Number of poles	8	8	8	8	8	8
Static friction torque M_R [Nm]	0.009	0.009	0.015	0.015	0.020	0.020
Thermal time constant t_{TH} [min]	24	24	26	26	28	28
Weight without brake [kg]	1.80	2.40	2.40	3.00	3.00	3.60
Weight with brake [kg]	2.20	2.60	2.80	3.30	3.60	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP65					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM8031	AM8531	AM8032	AM8532	AM8033
Holding torque at 120 °C M_{BR} [Nm]	2.0	2.0	2.0	2.0	3.5
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %				
Electrical power P_{BR} [W]	11	11	11	11	12
Current I_{on} [A]	0.33	0.33	0.33	0.33	0.36
Release delay time t_{BRH} [ms]	25	25	25	25	35
Application delay time t_{BRL} [ms]	8	8	8	8	15

Dimensional drawing

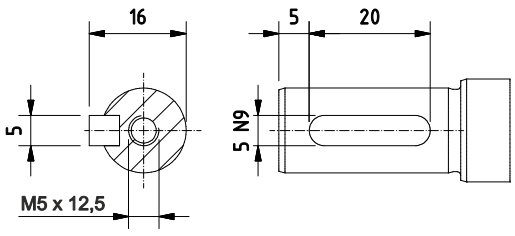
- All figures in millimeters



Motor	Y	Z – Brake
AM8031	129	168
AM8032	154	194
AM8033	180	229
AM8531	168	194
AM8532	194	229
AM8533	229	--

Feather key [+]

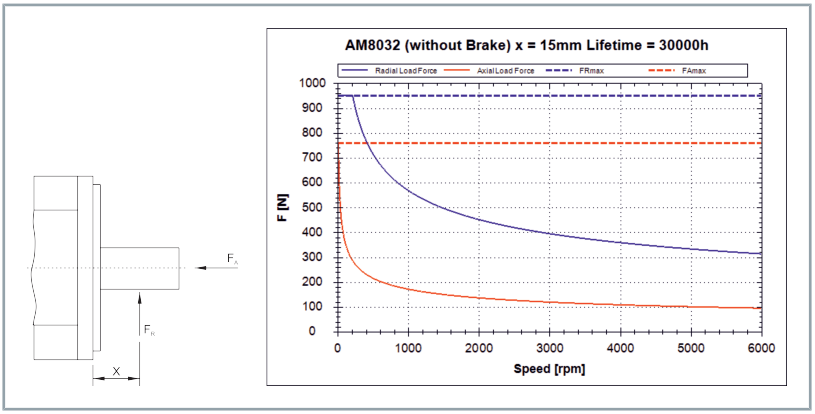
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8032 without holding brake.

• Download load / force calculator



AM804x & AM854x

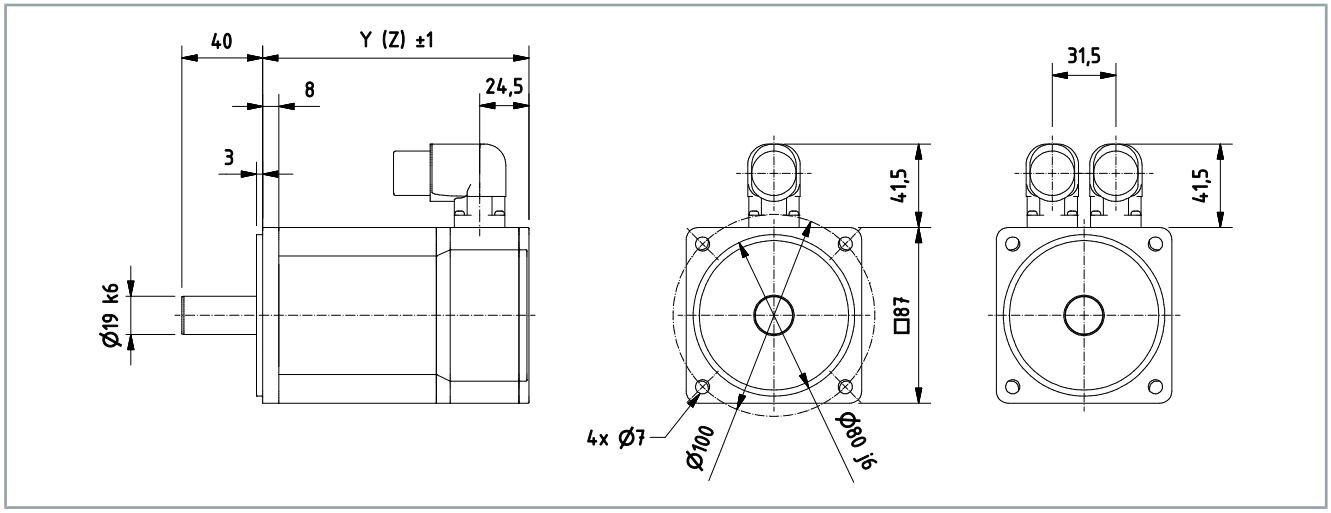
Electrical data	AM80xx / AM85xx								
	41D	41E	41H	42E	42F	42J	43E	43H	43K
Standstill torque* M_0 [Nm]	2.37	2.45	2.40	4.10	4.10	4.10	5.65	5.65	5.60
Standstill current I_{orms} [A]	1.65	3.00	5.25	2.15	4.10	6.90	2.90	5.40	9.30
Maximum mechanical speed N_{max} [min^{-1}]	9000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	8.30	13.6	23.30	11.80	22.70	37.60	16.60	31.00	53.90
Peak torque M_{0max} [Nm]	9.67	9.14	9.14	18.94	18.90	18.89	29.33	29.25	29.25
Torque constant K_{Trms} [Nm/A]	1.43	0.81	0.45	1.90	1.00	0.59	1.94	1.04	0.60
Voltage constant K_{Erms} [mVmin]	101.0	56.00	33.00	128.0	68.00	41.00	131.0	73.00	42.00
Winding resistance Ph-Ph R_{20} [Ω]	22.50	6.10	2.21	14.20	3.70	1.40	8.90	2.40	0.83
Winding inductance Ph-Ph measured at 1 kHz L [mH]	83.1	25.0	8.5	64.9	17.4	6.3	42.0	11.7	3.9
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	600	1300	2600	500	1200	2200	500	1200	2200
Nominal torque* M_n [Nm]	2.35	2.43	2.34	4.05	3.97	3.90	5.58	5.50	5.27
Rated output P_n [kW]	0.15	0.33	0.64	0.21	0.50	0.90	0.29	0.69	1.21
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	1500	3000	6000	1200	2800	5000	1200	2700	5000
Nominal torque* M_n [Nm]	2.33	2.39	2.27	3.97	3.90	3.70	5.50	5.30	4.90
Rated output P_n [kW]	0.37	0.75	1.43	0.50	1.14	1.94	0.70	1.50	2.57
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	3000	6000	8000	2500	5000	8000	2500	5000	8000
Nominal torque* M_n [Nm]	2.30	2.31	2.10	3.90	3.70	3.10	5.30	4.90	4.10
Rated output P_n [kW]	0.72	1.45	1.76	1.02	1.94	2.60	1.39	2.57	3.43
Nominal current I_n [A]	1.60	2.90	4.60	2.05	3.80	5.20	2.70	4.75	6.90
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	3400	6800	8000	2800	5700	8000	2800	5700	8000
Nominal torque* M_n [Nm]	2.29	2.27	2.10	3.87	3.64	3.10	5.30	4.88	4.10
Rated output P_n [kW]	0.82	1.62	1.76	1.13	2.17	2.60	1.55	2.91	3.43
Motor connector	M23-speedtec								
** reference flange aluminum 230 mm x 130 mm x 10 mm*									

Mechanical data	AM80xx / AM85xx					
	AM8041	AM8541	AM8042	AM8542	AM8043	AM8543
Rotor moment of inertia without brake J [$kgcm^2$]	1.09	4.62	1.98	5.51	2.87	6.41
Rotor moment of inertia with brake J [$kgcm^2$]	1.73	5.27	2.63	6.17	3.52	---
Number of poles	8	8	8	8	8	8
Static friction torque M_R [Nm]	0.020	0.020	0.027	0.027	0.035	0.035
Thermal time constant t_{TH} [min]	30	30	33	33	36	36
Weight without brake [kg]	2.80	3.80	3.80	4.90	4.90	6.00
Weight with brake [kg]	3.60	4.50	4.70	5.70	5.80	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP65					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM804x	AM854x
Holding torque at 120 °C M_{BR} [Nm]	9	
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %	
Electrical power P_{BR} [W]	18	
Current I_{on} [A]	0.54	
Release delay time t_{BRH} [ms]	40	
Application delay time t_{BRL} [ms]	20	

Dimensional drawing

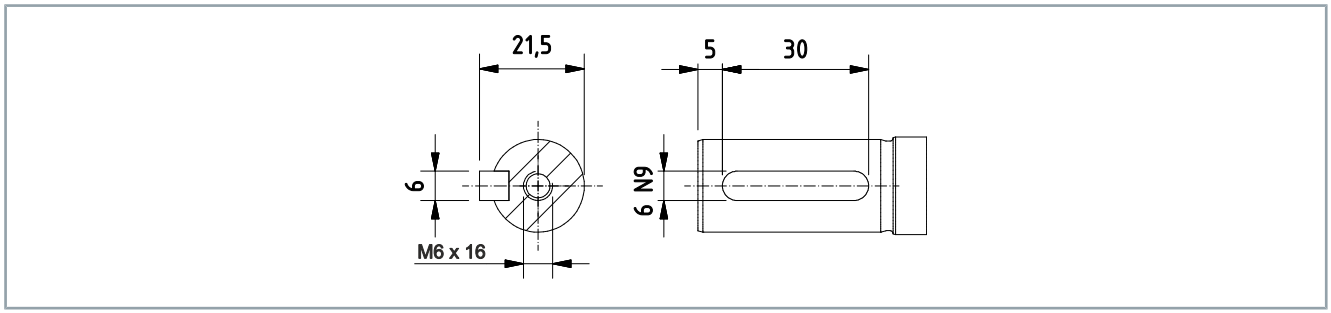
- All figures in millimeters



Motor	Y	Z - Brake
AM8041	132	179,5
AM8042	162	209,5
AM8043	192	239,5
AM8541	179,5	209,5
AM8542	209,5	239,5
AM8543	239,5	--

Feather key [+]

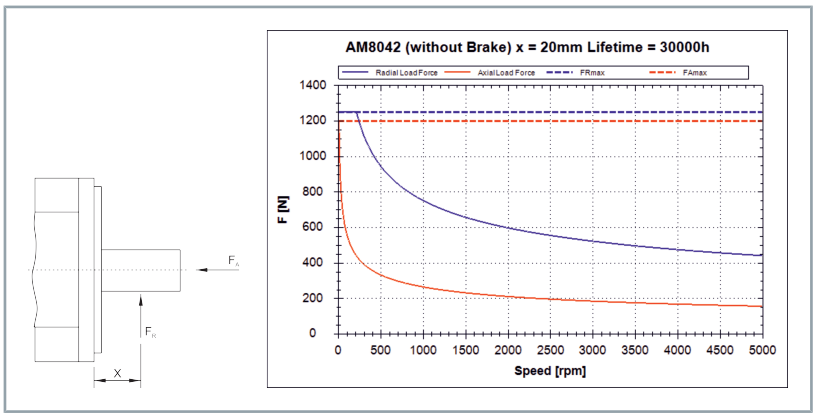
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8042 without holding brake.

• Download load / force calculator



AM805x & AM855x

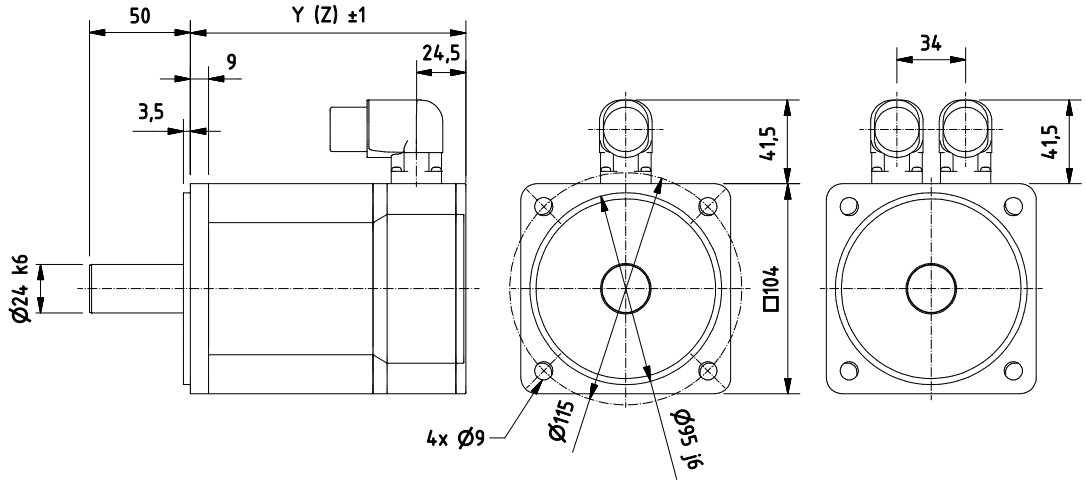
Electrical data	AM80xx / AM85xx								
	51E	51G	51K	52F	52J	52L	53G	53K	53N
Standstill torque* M_0 [Nm]	4.80	4.90	4.90	8.20	8.20	8.20	11.40	11.40	11.40
Standstill current I_{orms} [A]	2.70	4.75	8.50	3.30	6.30	11.30	4.70	8.80	15.60
Maximum mechanical speed N_{max} [min^{-1}]	9000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	12.10	20.90	37.70	17.90	33.60	60.70	26.90	50.90	89.70
Peak torque M_{0max} [Nm]	17.74	17.76	17.78	35.32	35.34	35.34	53.13	53.13	53.14
Torque constant K_{Trms} [Nm/A]	1.77	1.03	0.57	2.48	1.30	0.72	2.42	1.29	0.73
Voltage constant K_{Erms} [mVmin]	125.0	73.00	40.00	167.0	89.00	49.00	168.0	89.00	51.00
Winding resistance Ph-Ph R_{20} [Ω]	11.40	3.60	1.14	8.50	2.30	0.70	5.10	1.40	0.45
Winding inductance Ph-Ph measured at 1 kHz L [mH]	42.7	14.4	4.6	36.9	10.5	3.2	23.7	6.6	2.1
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	500	1200	2300	400	1000	1900	400	1000	1900
Nominal torque* M_n [Nm]	4.80	4.80	4.65	8.00	7.90	7.55	11.10	10.80	10.00
Rated output P_n [kW]	0.25	0.60	1.12	0.34	0.83	1.50	0.46	1.13	2.00
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	1400	2700	5000	1100	2200	4000	1100	2200	4000
Nominal torque* M_n [Nm]	4.70	4.65	4.40	7.80	7.50	6.90	10.70	9.90	8.35
Rated output P_n [kW]	0.69	1.31	2.30	0.90	1.73	2.89	1.23	2.28	3.50
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	2500	5000	8000	2000	4000	7300	2000	4000	7000
Nominal torque* M_n [Nm]	4.60	4.40	3.90	7.50	6.90	5.40	10.00	8.35	4.50
Rated output P_n [kW]	1.20	2.30	3.27	1.57	2.89	4.13	2.09	3.50	3.30
Nominal current I_n [A]	2.55	4.20	6.70	3.10	5.20	7.50	4.10	6.30	4.50
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	3000	5700	8000	2300	4500	7500	2400	4500	7000
Nominal torque* M_n [Nm]	4.50	4.30	3.90	7.40	6.70	5.40	9.70	7.85	4.50
Rated output P_n [kW]	1.41	2.57	3.27	1.78	3.16	4.24	2.44	3.70	3.30
Motor connector	M23-speedtec								
** reference flange aluminum 305 mm x 305 mm x 10 mm*									

Mechanical data	AM80xx / AM85xx					
	AM8051	AM8551	AM8052	AM8552	AM8053	AM8553
Rotor moment of inertia without brake J [$kgcm^2$]	2.25	8.75	4.09	10.6	5.93	12.4
Rotor moment of inertia with brake J [$kgcm^2$]	2.91	9.41	4.75	11.3	7.04	---
Number of poles	8	8	8	8	8	8
Static friction torque M_R [Nm]	0.021	0.021	0.036	0.036	0.050	0.050
Thermal time constant t_{TH} [min]	31	31	38	38	40	40
Weight without brake [kg]	4.10	5.50	5.70	7.00	7.40	8.80
Weight with brake [kg]	4.90	6.30	6.60	7.90	8.40	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP65					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM8051	AM8551	AM8052	AM8552	AM8053
Holding torque at 120 °C M_{BR} [Nm]	9	9	9	9	13
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %				
Electrical power P_{BR} [W]	18	18	18	18	17
Current I_{on} [A]	0.54	0.54	0.54	0.54	0.51
Release delay time t_{BRH} [ms]	40	40	40	40	45
Application delay time t_{BRL} [ms]	20	20	20	20	20

Dimensional drawing

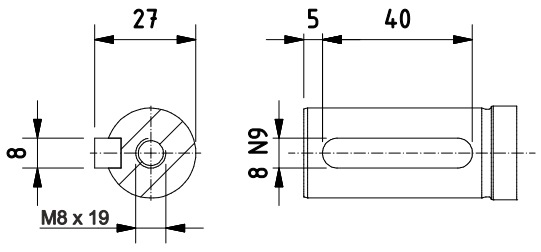
- All figures in millimeters



Motor	Y	Z – Brake
AM8051	136,5	183,5
AM8052	169,5	216,5
AM8053	202,5	251,5
AM8551	183,5	216,5
AM8552	216,5	251,5
AM8553	251,5	284,5

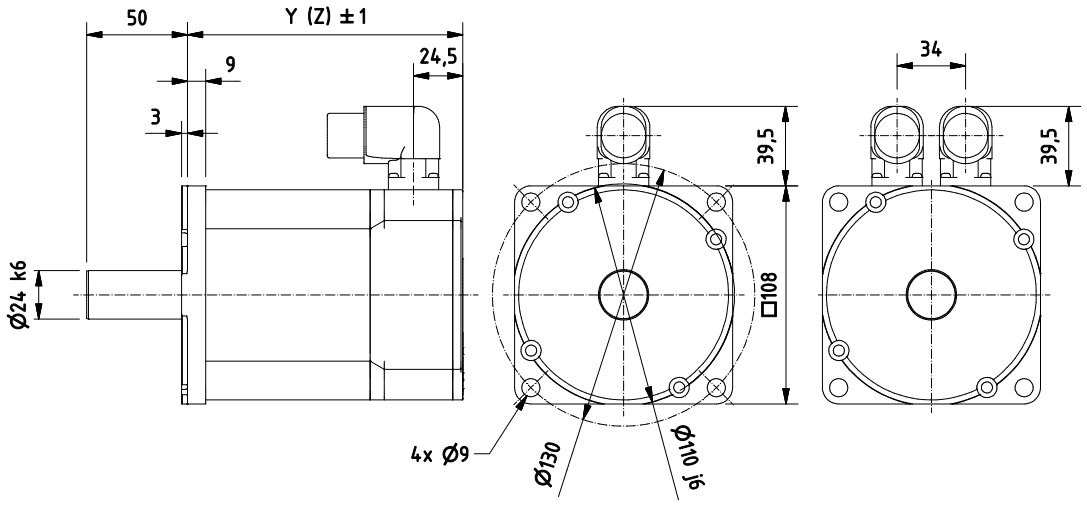
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

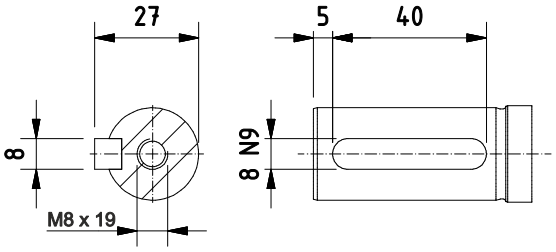
- The flange of version AM8x5x-xxxx-9000 is compatible with AM3x5x
- All figures in millimeters



Motor	Y	Z – Brake
AM8051-xxxx-9000	136,5	183,5
AM8052-xxxx-9000	169,5	216,5
AM8053-xxxx-9000	202,5	251,5
AM8551-xxxx-9000	183,5	216,5
AM8552-xxxx-9000	216,5	251,5
AM8553-xxxx-9000	251,5	284,5

Feather key [+]

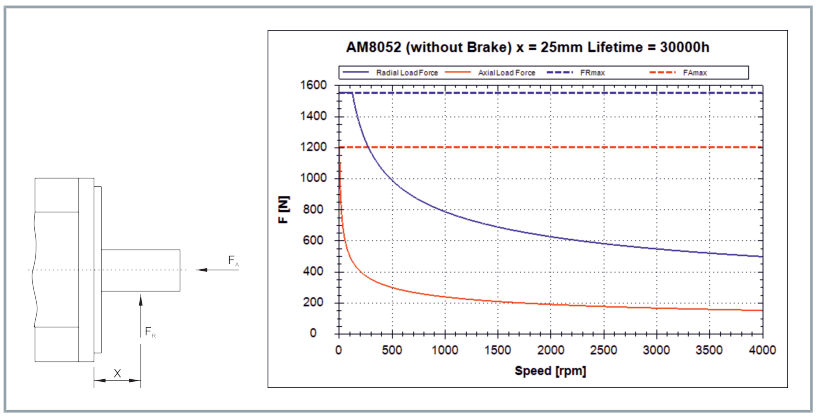
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8052 without holding brake.

• Download load / force calculator



AM805x & AM855x with fan cover [+]

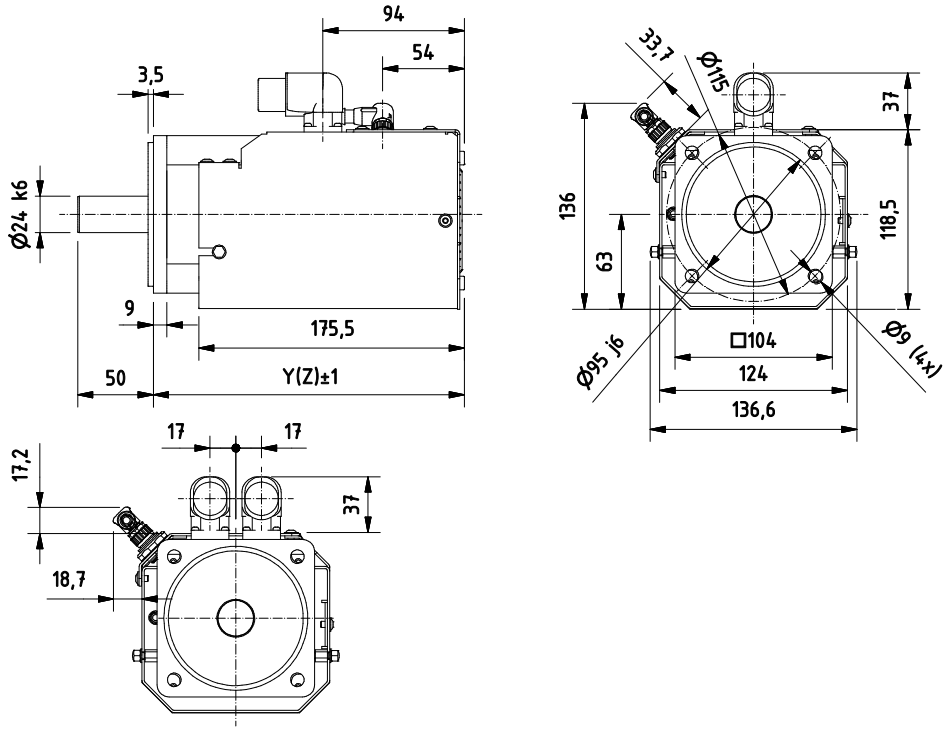
Electrical data	AM80xx / AM85xx								
	51F	51J	51L	52G	52K	52N	53J	53L	53P
Standstill torque* M_0 [Nm]	6.20	6.30	6.30	10.70	10.70	9.60	15.40	15.40	13.30
Standstill current I_{orms} [A]	3.50	5.80	11.10	4.30	8.50	13.60	6.40	11.90	18.60
Maximum mechanical speed N_{max} [min^{-1}]	9000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	12.10	20.90	37.70	17.90	33.60	60.70	26.90	50.90	89.70
Peak torque M_{0max} [Nm]	17.74	17.76	17.78	35.32	35.34	35.34	53.13	53.13	53.14
Torque constant K_{Trms} [Nm/A]	1.77	1.09	0.57	2.48	1.30	0.72	2.42	1.29	0.73
Voltage constant K_{Erms} [mVmin]	125.0	73.00	40.00	167.0	89.00	49.00	168.0	89.00	51.00
Winding resistance Ph-Ph R_{20} [Ω]	11.40	3.60	1.14	8.50	2.30	0.70	5.10	1.40	0.45
Winding inductance Ph-Ph measured at 1 kHz L [mH]	42.7	14.4	4.6	36.9	10.5	3.2	23.7	6.6	2.1
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	500	1100	2300	400	900	1900	400	1000	1900
Nominal torque* M_n [Nm]	6.10	6.20	5.90	10.50	10.30	9.50	15.30	15.10	12.30
Rated output P_n [kW]	0.32	0.71	1.42	0.44	0.97	1.90	0.65	1.58	2.45
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	1400	2600	4900	1000	2100	4000	1000	2200	4000
Nominal torque* M_n [Nm]	6.00	5.80	5.30	10.30	9.60	8.10	15.10	14.80	8.40
Rated output P_n [kW]	0.88	1.58	2.72	1.08	2.11	3.40	1.58	3.40	3.52
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	2500	4750	8000	2000	4000	6000	2000	4000	5000
Nominal torque* M_n [Nm]	5.80	5.50	3.60	9.70	9.10	5.40	14.90	12.90	7.10
Rated output P_n [kW]	1.52	2.74	3.02	2.03	3.77	4.08	3.12	5.41	3.72
Nominal current I_n [A]	3.20	5.20	6.30	4.00	7.10	9.00	6.10	10.00	6.00
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	3000	5000	8000	2300	4500	7000	2300	4500	7000
Nominal torque* M_n [Nm]	5.70	5.40	3.60	9.20	8.80	4.50	14.70	12.10	4.10
Rated output P_n [kW]	1.79	3.22	3.01	2.21	4.14	4.24	3.54	5.84	3.00
Motor connector	M23-speedtec								
** reference flange aluminum 305 mm x 305 mm x 10 mm*									

Mechanical data	AM80xx / AM85xx					
	AM8051	AM8551	AM8052	AM8552	AM8053	AM8553
Rotor moment of inertia without brake J [$kgcm^2$]	2.24	8.75	4.080	10.600	5.920	12.500
Rotor moment of inertia with brake J [$kgcm^2$]	2.90	9.41	4.74	11.20	7.04	---
Number of poles	8	8	8	8	8	8
Static friction torque M_R [Nm]	0.021	0.021	0.036	0.036	0.050	0.050
Thermal time constant t_{TH} [min]	31	31	38	38	40	40
Weight without brake [kg]	5.20	6.60	6.80	8.10	8.50	9.90
Weight with brake [kg]	6.00	7.40	7.70	9.00	9.50	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP20					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM8051	AM8551	AM8052	AM8552	AM8053	AM8553
Holding torque at 120 °C M_{BR} [Nm]	9	9	9	9	13	13
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %					
Electrical power P_{BR} [W]	18	18	18	18	17	17
Current I_{on} [A]	0.54	0.54	0.54	0.54	0.51	0.51
Release delay time t_{BRH} [ms]	40	40	40	40	45	45
Application delay time t_{BRL} [ms]	20	20	20	20	20	20

Dimensional drawing

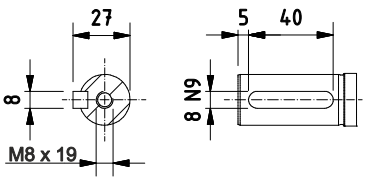
- Illustration with fan cover [+]
- All figures in millimeters



Motor	Y / Z
AM8051-xxxA-xxx0	205,5
AM8051-xxxB-xxx0	252,5
AM8052-xxxA-xxx0	238,5
AM8052-xxxB-xxx0	285,5
AM8053-xxxA-xxx0	271,5
AM8053-xxxB-xxx0	320,5
AM8551-xxxA-xxx0	252,5
AM8551-xxxB-xxx0	285,5
AM8552-xxxA-xxx0	285,5
AM8552-xxxB-xxx0	320,5
AM8553-xxxA-xxx0	320,5
AM8553-xxxB-xxx0	353,5

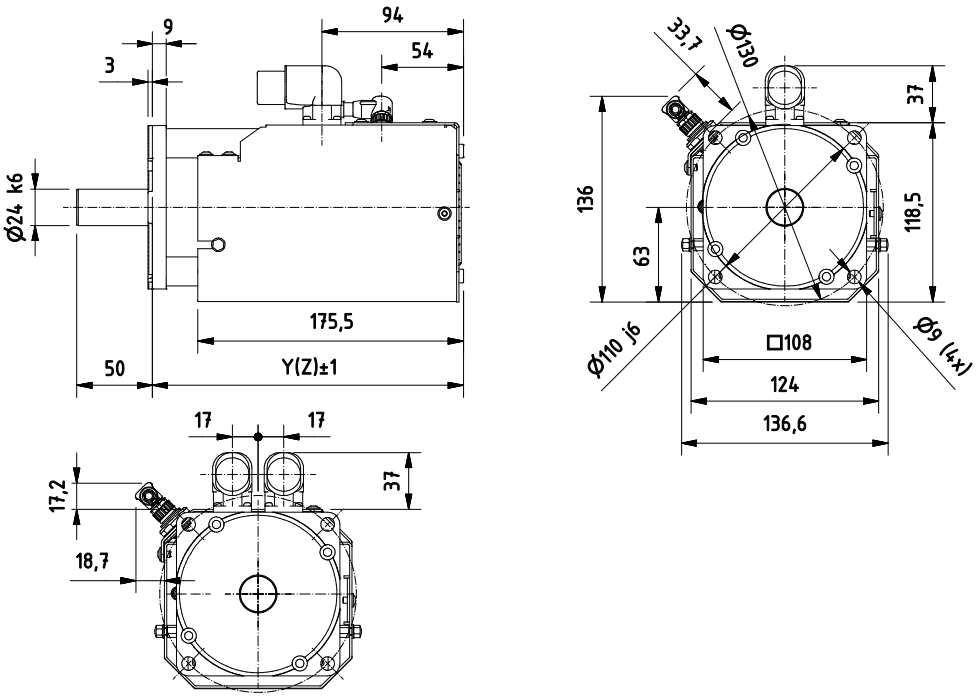
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

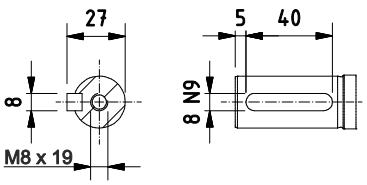
- The flange of version AM8x5x-9000 is compatible with AM3x5x
- Illustration with fan cover [+]
- All figures in millimeters



Motor	Y / Z
AM8051-xxxA-9000	205,5
AM8051-xxxB-9000	252,5
AM8052-xxxA-9000	238,5
AM8052-xxxB-9000	285,5
AM8053-xxxA-9000	271,5
AM8053-xxxB-9000	320,5
AM8551-xxxA-9000	252,5
AM8551-xxxB-9000	285,5
AM8552-xxxA-9000	285,5
AM8552-xxxB-9000	320,5
AM8553-xxxA-9000	320,5
AM8553-xxxB-9000	353,5

Feather key [+]

- Centring hole according to DIN 332-D



AM806x & AM856x

Electrical data	AM80xx / AM85xx								
	61G	61J	61M	62J	62L	62P	63K	63N	63R
Standstill torque* M_0 [Nm]	12.80	12.80	12.80	21.10	21.10	21.10	29.00	29.00	29.00
Standstill current I_{orms} [A]	4.00	7.80	13.10	6.20	12.40	20.30	8.70	17.20	29.50
Maximum mechanical speed N_{max} [min^{-1}]	6000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	13.90	27.00	45.20	27.00	54.00	88.40	38.90	80.90	130.0
Peak torque M_{0max} [Nm]	37.10	37.08	37.07	74.16	74.16	74.17	110.9	110.8	111.1
Torque constant K_{Trms} [Nm/A]	3.20	1.64	0.97	3.40	1.70	1.03	3.33	1.68	0.98
Voltage constant K_{Erms} [mVmin]	223.0	115.0	69.00	234.0	117.0	71.00	240.0	116.0	72.00
Winding resistance Ph-Ph R_{20} [Ω]	7.00	1.85	0.66	2.95	0.75	0.28	1.95	0.45	0.18
Winding inductance Ph-Ph measured at 1 kHz L [mH]	53.7	14.2	5.1	27.0	6.8	2.5	18.0	4.2	1.6
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	300	750	1300	300	800	1400	300	800	1400
Nominal torque* M_n [Nm]	12.60	12.40	12.20	20.70	20.10	18.60	28.20	25.90	22.80
Rated output P_n [kW]	0.40	0.97	1.66	0.65	1.68	2.73	0.89	2.17	3.34
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	800	1600	2800	800	1700	2800	800	1700	3000
Nominal torque* M_n [Nm]	12.40	12.00	11.10	20.10	18.20	15.30	25.90	21.10	13.20
Rated output P_n [kW]	1.04	2.01	3.25	1.68	3.24	4.49	2.17	3.76	4.15
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	1500	3000	5000	1500	3000	5000	1500	3000	4000
Nominal torque* M_n [Nm]	12.10	11.00	9.00	18.50	15.20	6.50	22.30	13.20	6.10
Rated output P_n [kW]	1.90	3.46	4.71	2.91	4.78	3.40	3.50	4.15	2.56
Nominal current I_n [A]	3.90	6.80	9.10	5.60	9.40	6.60	6.70	8.10	6.00
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	1700	3400	5000	1700	3400	5000	1700	3400	4000
Nominal torque* M_n [Nm]	12.00	10.40	9.00	18.20	13.90	6.50	21.10	11.00	6.10
Rated output P_n [kW]	2.14	3.70	4.71	3.24	4.95	3.40	3.76	3.92	2.56
Motor connector	M23-speedtec								M40-speedtec
** reference flange aluminum 380 mm x 170 mm x 10 mm*									

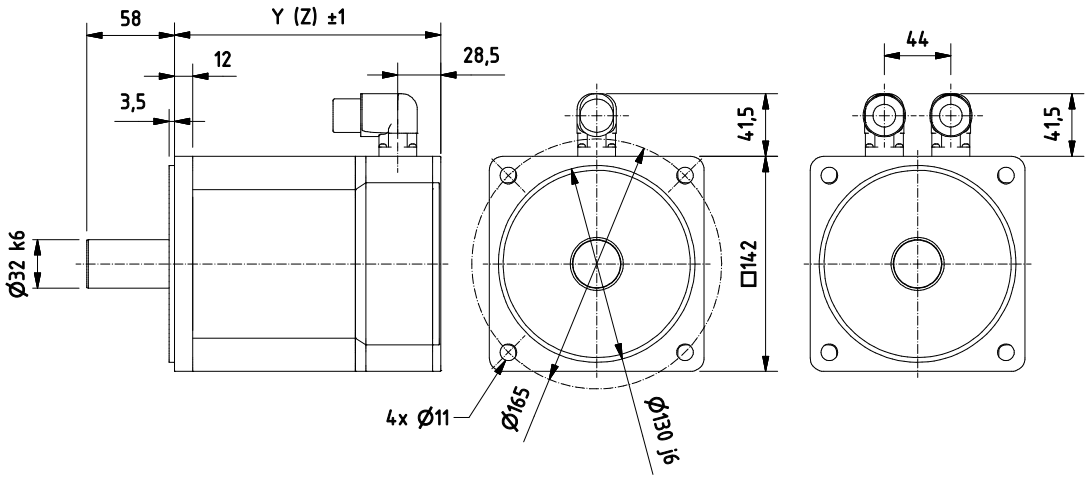
Mechanical data	AM80xx / AM85xx					
	AM8061	AM8561	AM8062	AM8562	AM8063	AM8563
Rotor moment of inertia without brake J [$kgcm^2$]	11.10	48.20	20.00	57.10	29.00	66.10
Rotor moment of inertia with brake J [$kgcm^2$]	13.40	50.60	22.30	59.60	34.90	---
Number of poles	10	10	10	10	10	10
Static friction torque M_R [Nm]	0.045	0.045	0.102	0.102	0.150	0.150
Thermal time constant t_{TH} [min]	35	35	38	38	41	41
Weight without brake [kg]	9.80	13.20	13.60	17.00	17.40	20.90
Weight with brake [kg]	11.60	14.80	15.40	18.70	20.10	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP65					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM8061	AM8561	AM8062	AM8562	AM8063
Holding torque at 120 °C M_{BR} [Nm]	20	20	20	20	36
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %				
Electrical power P_{BR} [W]	24	24	24	24	26
Current I_{on} [A]	0.72	0.72	0.72	0.72	0.79
Release delay time t_{BRH} [ms]	60	60	60	60	120
Application delay time t_{BRL} [ms]	40	40	40	40	45

Servomotor AM8064 in preparation:
The mechanical and electrical data of the AM8064 servomotor are updated in Version 4.1.
Further information can be found under the following link:
www.beckhoff.com

Dimensional drawing

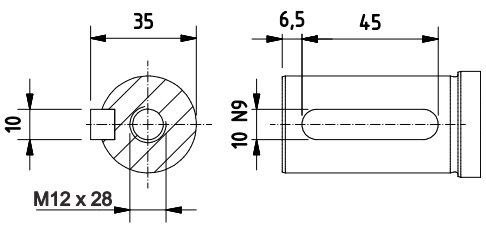
- All figures in millimeters



Motor	Y	Z – Brake
AM8061	176	228
AM8062	216	268
AM8063	256	315
AM8064	296	355
AM8561	228	268
AM8562	268	315
AM8563	315	--
AM8564	355	--

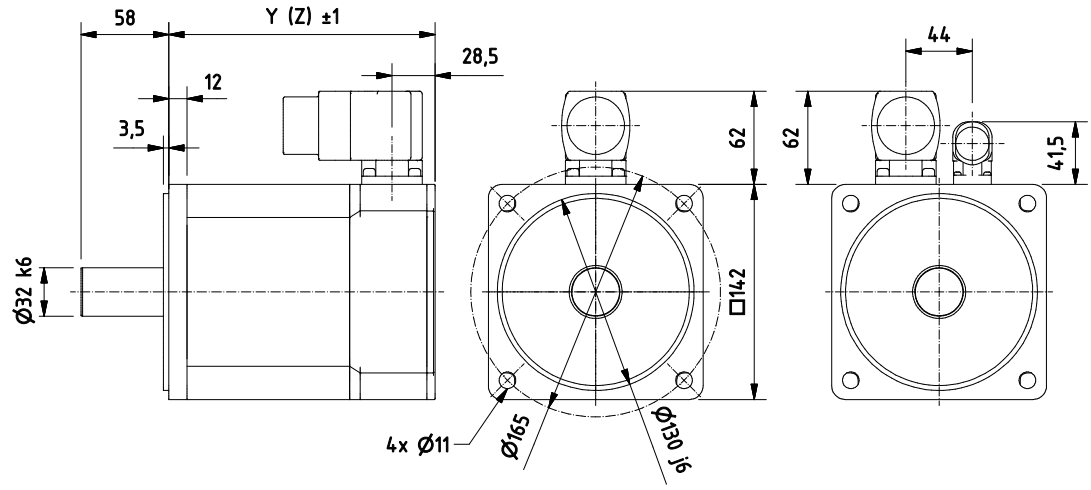
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

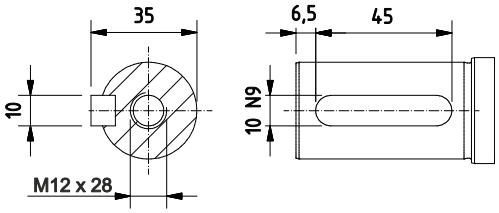
- Illustration with R and T winding
- All figures in millimeters



Motor	Y	Z – Brake
AM8063-xRxx	256	315
AM8563-xRxx	315	--
AM8064-xTxx	296	355
AM8564-xTxx	355	--

Feather key [+]

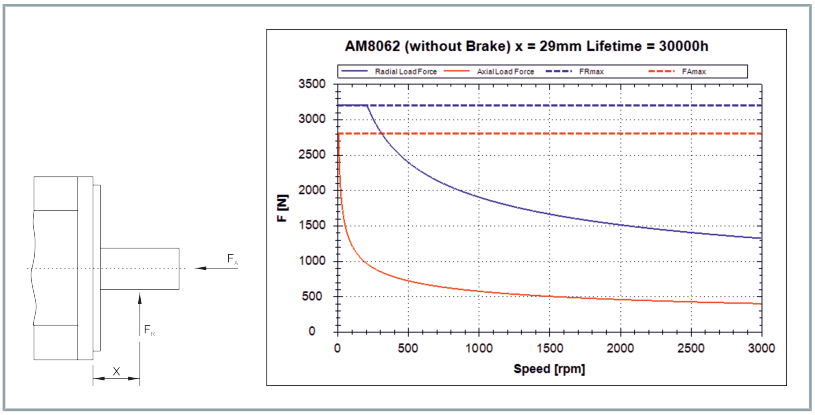
- Centring hole according to DIN 332-D



Force diagram

Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8062 without holding brake.

• Download load / force calculator



AM806x & AM856x with fan cover [+]

Electrical data	AM80xx / AM85xx								
	61H	61L	61N	62K	62N	62R	63L	63Q	63T
Standstill torque* M_0 [Nm]	17.10	17.10	15.50	29.90	29.90	28.10	41.40	41.40	40.10
Standstill current I_{orms} [A]	5.20	10.10	15.80	8.70	17.40	28.70	11.60	24.00	39.80
Maximum mechanical speed N_{max} [min^{-1}]	6000								
Maximum rated mains voltage U_N [V_{AC}]	480								
Peak current I_{0max} [A]	13.90	27.00	45.20	27.00	54.00	88.40	38.90	80.90	130.0
Peak torque M_{0max} [Nm]	37.10	37.08	37.07	74.16	74.16	74.17	110.9	110.8	111.1
Torque constant K_{Trms} [Nm/A]	3.20	1.64	0.97	3.40	1.70	1.03	3.33	1.68	0.98
Voltage constant K_{Erms} [mVmin]	223.0	115.0	69.00	234.0	117.0	71.00	240.0	116.0	72.00
Winding resistance Ph-Ph R_{20} [Ω]	7.00	1.85	0.66	2.95	0.75	0.28	1.95	0.45	0.18
Winding inductance Ph-Ph measured at 1 kHz L [mH]	53.7	14.2	5.1	27.0	6.8	2.5	18.0	4.2	1.6
Power supply U_N= 115 V									
Nominal speed Nn [min-1]	300	750	1300	300	800	1400	300	800	1400
Nominal torque* M_n [Nm]	17.00	16.80	14.40	29.00	28.00	24.00	40.40	38.20	32.50
Rated output P_n [kW]	0.50	1.00	2.00	0.90	2.30	3.50	1.30	3.20	4.80
Power supply U_N= 230 V									
Nominal speed Nn [min-1]	700	1600	2800	750	1700	2800	750	1700	2900
Nominal torque* M_n [Nm]	16.80	16.00	12.70	28.20	25.80	19.90	38.50	32.30	23.70
Rated output P_n [kW]	1.40	2.70	3.70	2.40	4.60	5.80	3.00	5.80	7.20
Power supply U_N= 400 V									
Nominal speed Nn [min-1]	1400	3000	5000	1400	3000	5000	1400	3000	4000
Nominal torque* M_n [Nm]	16.10	14.70	10.70	26.40	22.20	13.40	33.90	25.50	15.10
Rated output P_n [kW]	2.36	4.60	5.60	3.87	7.00	7.00	4.97	8.00	6.30
Nominal current I_n [A]		9.00	11.20		13.40	13.60	9.50	15.60	16.20
Power supply U_N= 480 V									
Nominal speed Nn [min-1]	1500	3400	5500	1600	3400	5500	1600	3400	5000
Nominal torque* M_n [Nm]	16.00	14.30	10.70	25.80	21.10	11.80	33.00	23.20	6.80
Rated output P_n [kW]	2.50	5.10	6.20	4.30	7.50	6.80	5.50	8.30	3.60
Motor connector	M23-speedtec					M40-speedtec	M23-speedtec	M40-speedtec	
** reference flange aluminum 380 mm x 170 mm x 10 mm*									

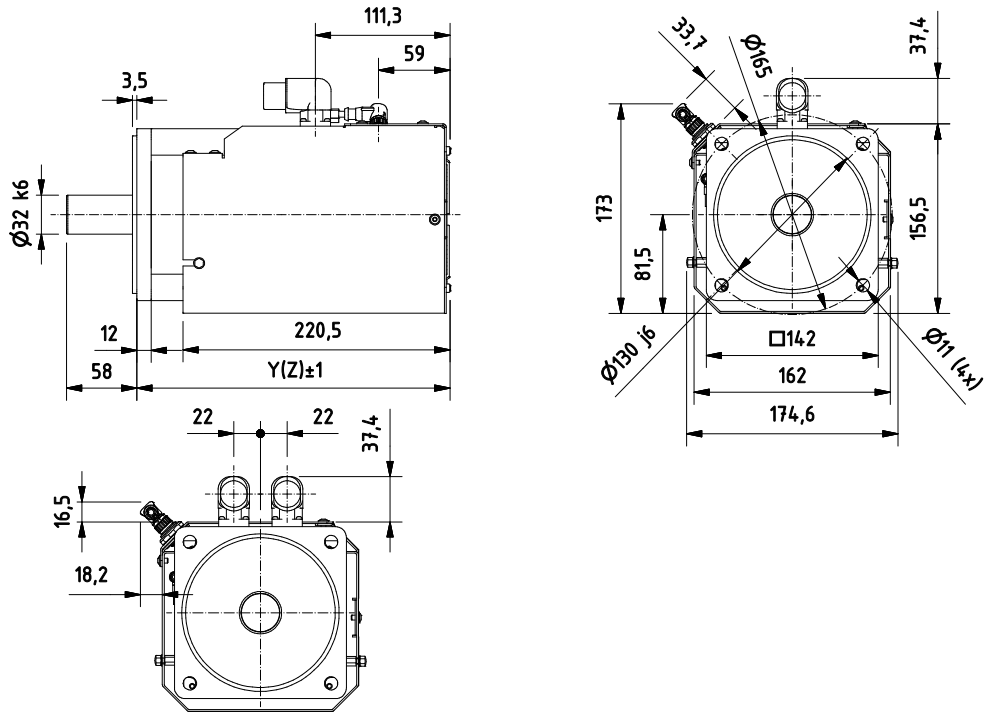
Mechanical data	AM80xx / AM85xx					
	AM8061	AM8561	AM8062	AM8562	AM8063	AM8563
Rotor moment of inertia without brake J [$kgcm^2$]	11.10	48.20	20.00	57.10	29.00	66.10
Rotor moment of inertia with brake J [$kgcm^2$]	13.40	50.60	22.30	59.60	34.90	---
Number of poles	10	10	10	10	10	10
Static friction torque M_R [Nm]	0.045	0.045	0.102	0.102	0.150	0.150
Thermal time constant t_{TH} [min]	35	35	38	38	41	41
Weight without brake [kg]	11.90	15.40	15.80	19.20	19.60	23.10
Weight with brake [kg]	13.50	17.00	17.60	20.90	22.30	---
Flange	**IEC standard / DIN 42955**					
Fit	J6					
Tolerance class	N					
Protection class						
Standard housing version	IP20					
Standard shaft feed through version	IP54					
Shaft bushing with shaft sealing ring	IP65					
Paint finishes						
Properties	acrylic powder-coated					
Color	dark gray / RAL 7016					

Optional holding brake [+]	AM8061	AM8561	AM8062	AM8562	AM8063	AM8563
Holding torque at 120 °C M_{BR} [Nm]	20	20	20	20	36	36
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %					
Electrical power P_{BR} [W]	24	24	24	24	26	26
Current I_{on} [A]	0.72	0.72	0.72	0.72	0.79	0.79
Release delay time t_{BRH} [ms]	60	60	60	60	120	120
Application delay time t_{BRL} [ms]	40	40	40	40	45	45

Servomotor AM8064 with fan cover [+] in preparation:
The mechanical and electrical data, as well the dimensional drawings of the AM8064 servomotor with fan cover [+] are updated in Version 4.1.
Further information can be found under the following link:
www.beckhoff.com

Dimensional drawing

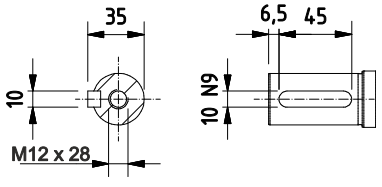
- Illustration with fan cover [+]
- All figures in millimeters



Motor	Y / Z
AM8061-xxxA-xxx0	259
AM8061-xxxB-xxx0	311
AM8561-xxxA-xxx0	311
AM8561-xxxB-xxx0	351

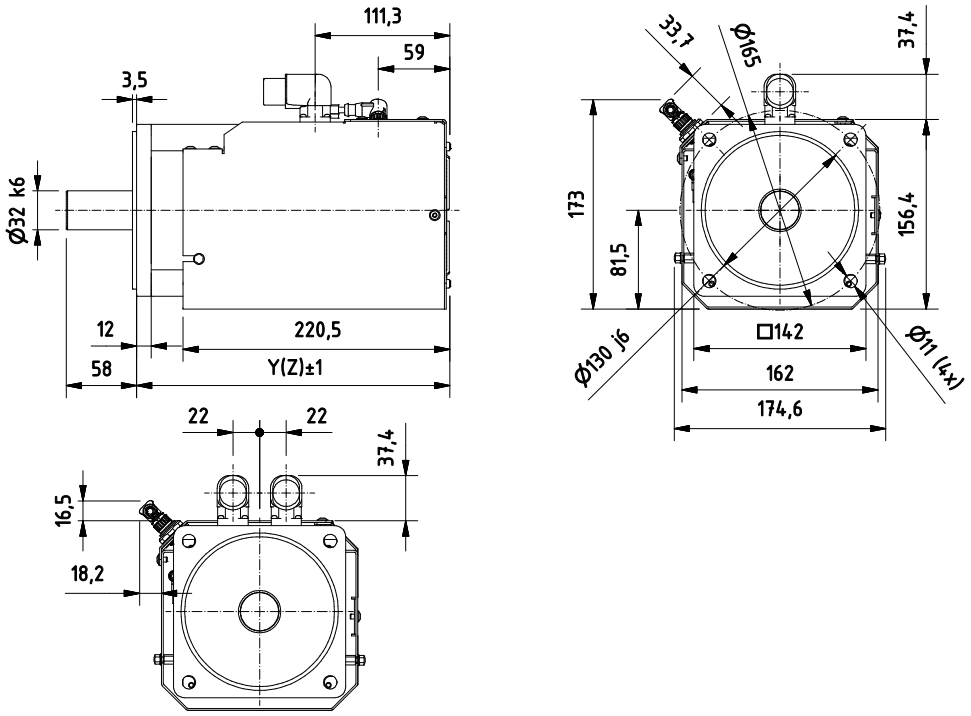
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

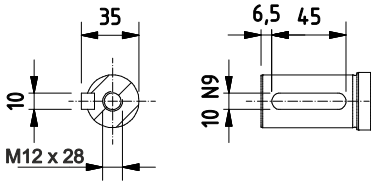
- Illustration with fan cover [+] and K-N-L winding
- All figures in millimeters



Motor	Y / Z
AM8062-xKxA-xxx0	299
AM8062-xKxB-xxx0	351
AM8062-xNxA-xxx0	299
AM8062-xNxB-xxx0	351
AM8063-xLxA-xxx0	339
AM8063-xLxB-xxx0	398
AM8562-xKxA-xxx0	351
AM8562-xNxA-xxx0	351
AM8562-xKxB-xxx0	398
AM8562-xNxB-xxx0	398
AM8563-xLxA-xxx0	398

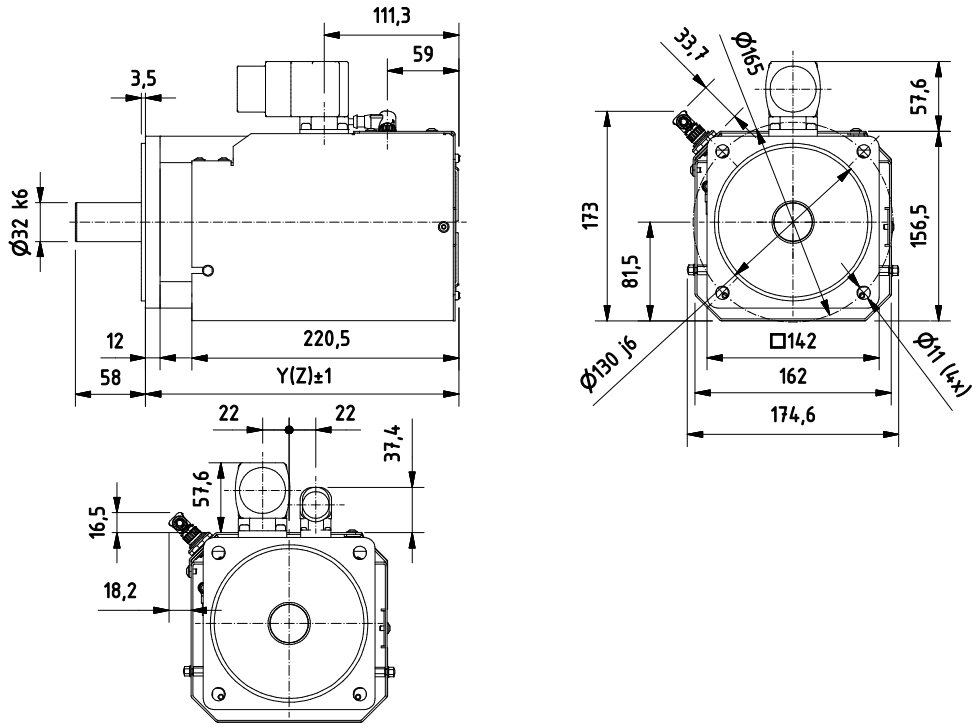
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

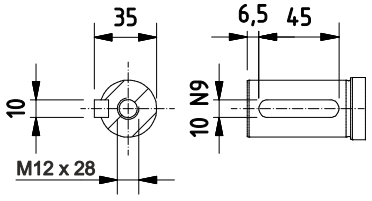
- Illustration with fan cover [+] and R-Q-T winding
- All figures in millimeters



Motor	Y / Z
AM8062-xRxA-xxx0	299
AM8062-xRxB-xxx0	351
AM8063-xQxA-xxx0	339
AM8063-xQxB-xxx0	398
AM8063-xTxA-xxx0	339
AM8063-xTxB-xxx0	398
AM8562-xRxA-xxx0	351
AM8562-xRxB-xxx0	398
AM8563-xQxA-xxx0	398
AM8563-xTxA-xxx0	398

Feather key [+]

- Centring hole according to DIN 332-D



AM807x

Electrical data	AM80xx											
	71K	71N	71R	72L	72P	72T	73N	73Q	73T	74N	74R	74T
Standstill torque* M_0 [Nm]	31.8	31.8	29.0	54.6	54.6	50.0	72.6	72.6	70.0	92.0	92.0	92.0
Standstill current I_{orms} [A]	9.6	17.8	28.2	11.1	20.6	39.0	14.7	27.9	45.6	17.9	34.9	49.8
Maximum mechanical speed N_{max} [min^{-1}]	5000											
Maximum rated mains voltage U_N [V_{AC}]	480											
Peak current I_{0max} [A]	25.9	49.0	81.8	36.3	66.1	120	51.3	97.4	180	66.7	129	180
Peak torque M_{0max} [Nm]	80.0	79.9	78.0	172.5	172.4	169.0	275.0	275.3	268.0	355	356	355
Torque constant K_{Trms} [Nm/A]	3.31	1.78	1.02	4.91	2.65	1.33	4.93	2.60	1.53	5.1	2.6	1.85
Voltage constant K_{Erms} [mVmin]	231	122	70	328	180	92	347	183	104	343	177	127
Winding resistance Ph-Ph R_{20} [Ω]	1.60	0.45	0.16	1.22	0.39	0.12	0.85	0.25	0.07	0.65	0.17	0.08
Winding inductance Ph-PH measured at 1 kHz L [mH]	23.4	6.5	2.2	21.4	6.45	1.85	14.6	4.07	1.11	10.8	2.9	1.48
Power supply U_N= 115 V												
Nominal speed Nn [min-1]	350	700	1400	200	400	1000	200	500	1000	250	500	750
Nominal torque* M_n [Nm]	30.6	29.2	28.1	54.5	53.5	41.0	70.5	66.5	48.0	85.0	82.5	75.0
Rated output P_n [kW]	1.12	2.14	4.12	1.14	2.24	4.29	1.48	3.48	5.03	2.30	4.32	5.89
Power supply U_N= 230 V												
Nominal speed Nn [min-1]	800	1500	3000	500	1000	2000	500	1000	2000	500	1000	1500
Nominal torque* M_n [Nm]	29.0	26.4	22.1	53.1	48.9	28.0	66.7	58.5	27.4	82.0	67.0	47.8
Rated output P_n [kW]	2.43	4.15	6.94	2.78	5.12	5.86	3.49	6.13	5.74	4.30	7.01	7.51
Power supply U_N= 400 V												
Nominal speed Nn [min-1]	1500	3000	4000	1000	2000	3000	1000	2000	3000	1000	2000	2500
Nominal torque* M_n [Nm]	26.5	19.5	18.0	48.9	38.2	13.0	58.5	38.8	10.8	67.0	34.0	19.1
Rated output P_n [kW]	4.16	6.13	7.54	5.12	8.00	4.08	6.13	8.13	3.39	7.02	7.12	5.0
Nominal current I_n [A]	7.90	11.6	17.6	10.3	15.3	10.7	12.0	15.8	11.3			12.1
Power supply U_N= 480 V												
Nominal speed Nn [min-1]	1700	3300	4500	1100	2200	3300	1100	2200	3300	1200	2300	2800
Nominal torque* M_n [Nm]	25.7	18.2	13.4	47.6	35.9	8.0	57.0	35.4	6.2	61.0	24.0	9.80
Rated output P_n [kW]	4.58	6.29	6.31	5.48	8.27	2.76	6.57	8.16	2.14	7.65	5.78	2.9
Motor connector	M40-speedtec											K **
** Reference flange steel 375 mm x 601 mm x 10 mm | ** terminal box*												

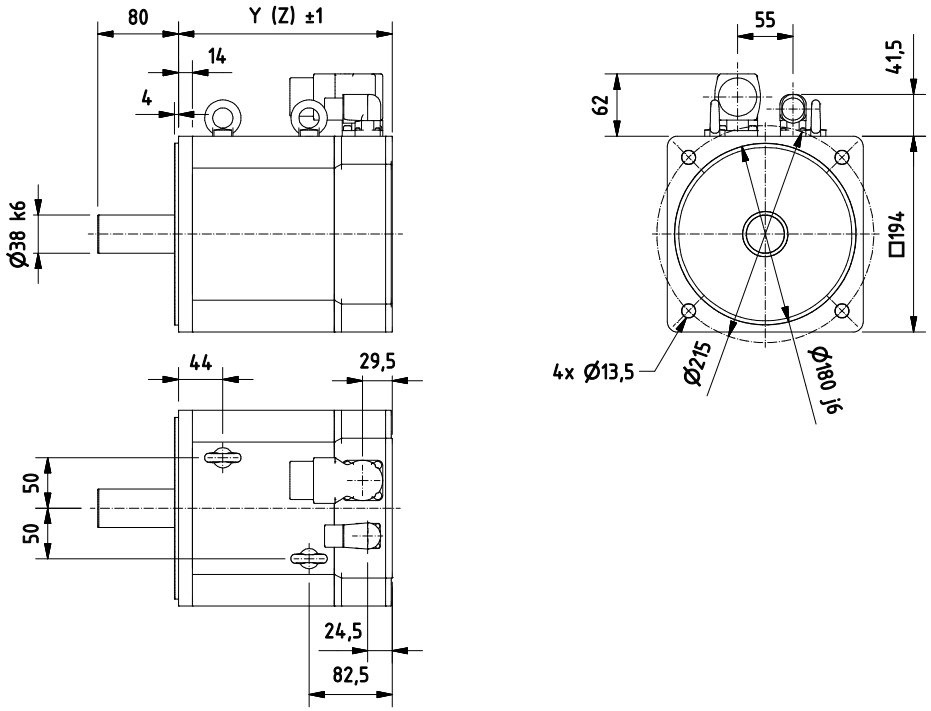
Mechanical data	AM80xx			
	AM8071	AM8072	AM8073	AM8074
Rotor moment of inertia without brake J [$kgcm^2$]	49.600	92.200	135.000	180.000
Rotor moment of inertia with brake J [$kgcm^2$]	68.300	110.900	154.000	---
Number of poles	10	10	10	10
Static friction torque M_R [Nm]	0.14	0.22	0.30	0.38
Thermal time constant t_{TH} [min]	70	80	90	100
Weight without brake [kg]	23.80	33.20	44.80	55
Weight with brake [kg]	29.30	38.70	50.30	---
Flange	**IEC standard / DIN 42955**			
Fit	J6			
Tolerance class	N			
Protection class				
Standard housing version	IP65			
Standard shaft feed through version	IP54			
Shaft bushing with shaft sealing ring	IP65			
Paint finishes				
Properties	acrylic powder-coated			
Color	dark gray / RAL 7016			

Technical data

Optional holding brake [+]	AM807x
Holding torque at 120 °C M_{BR} [Nm]	70
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %
Electrical power P_{BR} [W]	40
Current I_{on} [A]	1.21
Release delay time t_{BRH} [ms]	200
Application delay time t_{BRL} [ms]	50

Dimensional drawing

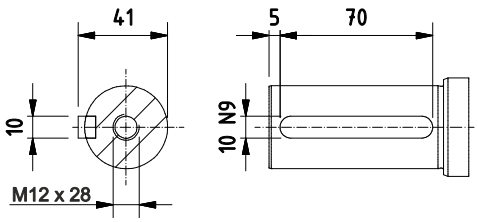
- All figures in millimeters



Motor	Y	Z - Brake
AM8071	212	284,5
AM8072	269	341,5
AM8073	326	398,5
AM8074	398,5	--

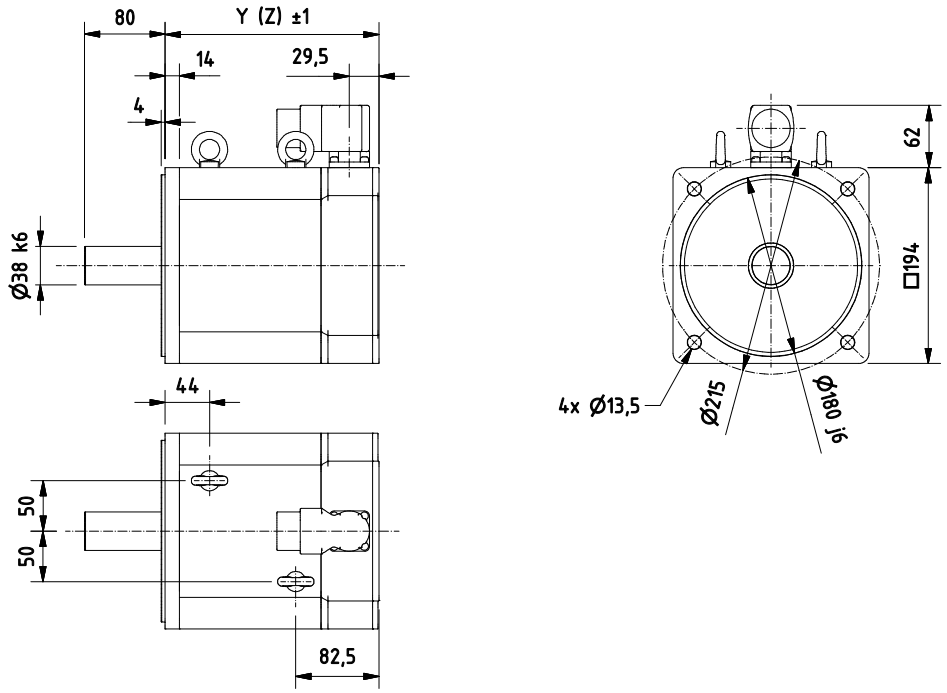
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

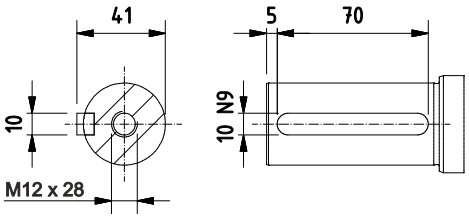
- Illustration with OCT feedback
- All figures in millimeters



Motor	Y	Z - Brake
AM8071	212	284,5
AM8072	269	341,5
AM8073	326	398,5
AM8074	398,5	--

Feather key [+]

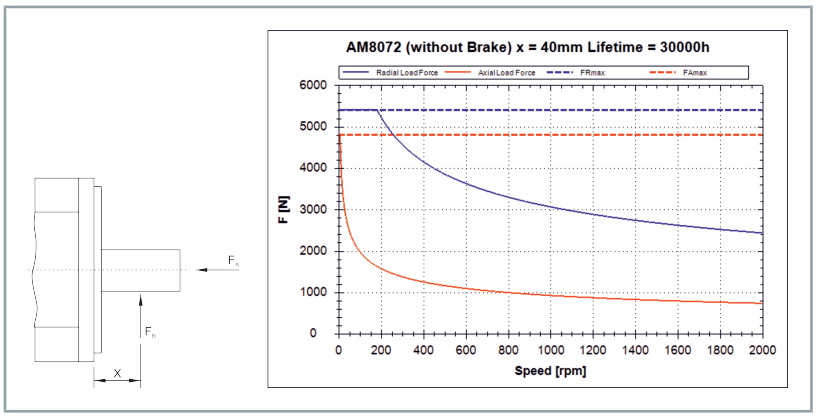
- Centring hole according to DIN 332-D



Force diagram

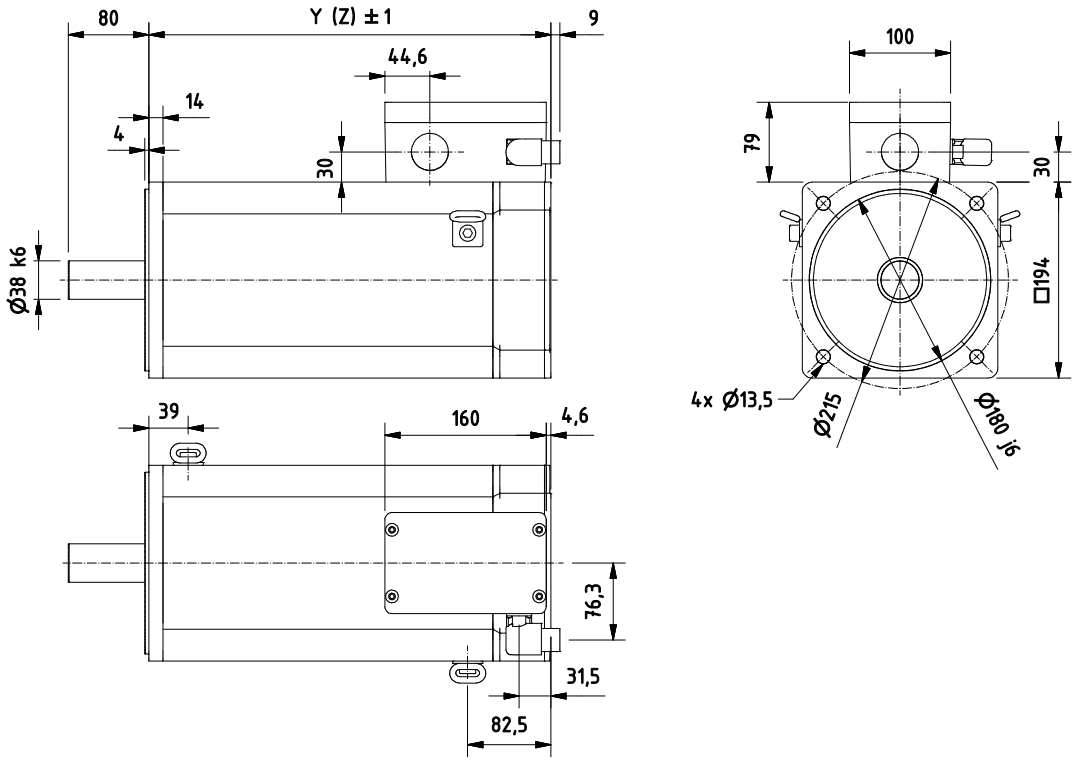
Beckhoff load / force calculator
The software is used to display axial and radial forces on the motor shaft. These are shown in the following example for an AM8072 without holding brake.

• Download load / force calculator



Dimensional drawing

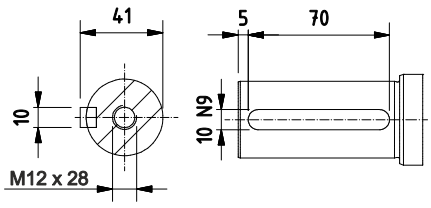
- Illustration with terminal box and T winding
- All figures in millimeters



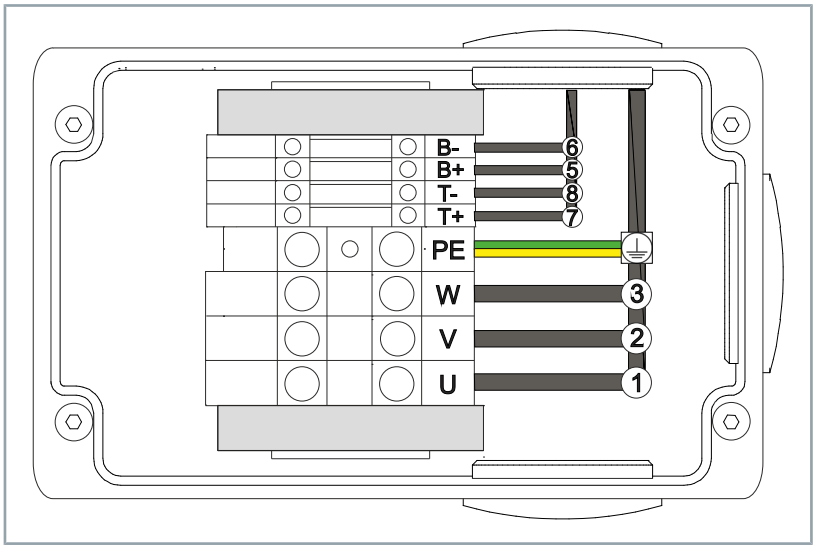
Motor	Y	Z – Brake
AM8071	212	284,5

Feather key [+]

- Centring hole according to DIN 332-D



Terminal box assignment



Power and feedback		Temperature and brake	
Wire	**Slot**	**Wire**	**Slot**
1	U	5	B+
2	V	6	B-
3	W	7	T-
4	PE	8	T+

AM807x with fan cover [+]

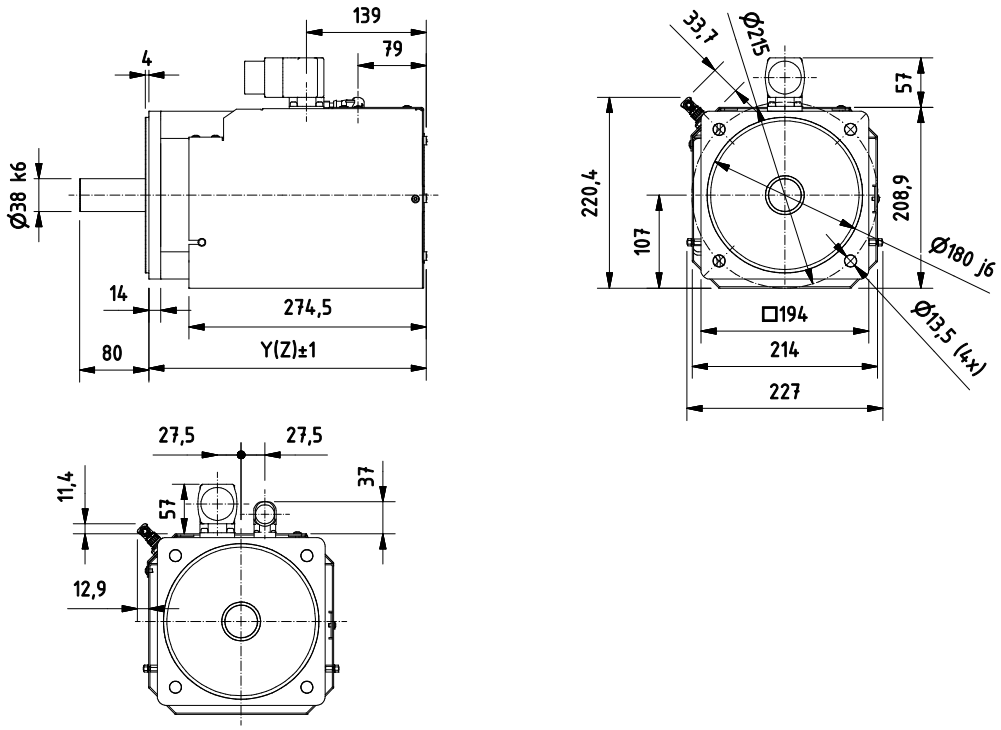
Electrical data	AM80xx											
	71M	71P	71T	72N	72R	72U	73P	73R	73U	74R	74T	74U
Standstill torque* M_0 [Nm]	42.8	42.8	41.2	80.7	80.7	74.0	104	104	95.0	129	129	129
Standstill current I_{orms} [A]	12.6	23.8	41.1	16.1	29.2	53.0	19.8	37.4	66.5	25.8	49.4	69.2
Maximum mechanical speed N_{max} [min^{-1}]	5000											
Maximum rated mains voltage U_N [V_{AC}]	480											
Peak current I_{0max} [A]	25.9	49.0	81.8	36.3	66.1	120	51.3	97.4	180	66.7	129	180
Peak torque M_{0max} [Nm]	80.00	79.91	78	172.5	172.4	168.7	274.7	275.3	267.9	355	356	355
Torque constant K_{Trms} [Nm/A]	3.4	1.8	1.0	5.0	2.76	1.4	5.25	2.78	1.43	4.99	2.61	1.86
Voltage constant K_{Erms} [mVmin]	231	122	70	328	180	92	347	183	104	343	177	127
Winding resistance Ph-Ph R_{20} [Ω]	1.60	0.45	0.16	1.22	0.39	0.12	0.85	0.25	0.07	0.65	0.17	0.08
Winding inductance Ph-PH measured at 1 kHz L [mH]	23.4	6.5	2.2	21.4	6.45	1.85	14.6	4.1	1.1	10.8	2.9	1.48
Power supply U_N= 115 V												
Nominal speed Nn [min-1]	350	700	1400	200	400	1000	200	400	1000	250	500	750
Nominal torque* M_n [Nm]	41.1	39.2	36.6	79.9	78.3	62.3	98.2	96.8	76.5	122	115	106
Rated output P_n [kW]	1.50	2.90	5.40	1.70	3.30	6.50	2.10	5.00	8.00	3.20	6.02	8.32
Power supply U_N= 230 V												
Nominal speed Nn [min-1]	800	1500	2900	500	1000	2000	500	1000	2000	500	1000	1500
Nominal torque* M_n [Nm]	39.1	36.2	27.5	77.7	72.6	47.9	93.9	83.7	57.5	115	93.3	73.0
Rated output P_n [kW]	3.30	5.70	8.00	4.10	7.60	10.0	5.00	8.80	12.0	6.02	9.77	11.46
Power supply U_N= 400 V												
Nominal speed Nn [min-1]	1500	2900	4000	1000	2000	3000	1000	2000	3000	1000	2000	3000
Nominal torque* M_n [Nm]	36.2	29.2	18.1	72.6	60.1	33.8	83.7	63.3	17.8	93.3	51.7	24.5
Rated output P_n [kW]	5.70	8.90	7.60	7.60	12.6	10.6	8.80	13.3	5.60	9.77	10.83	7.70
Nominal current I_n [A]	10.8	17.1	17.6	14.7	23.3	26.4	12.0	25.4	12.7	18.8	22.9	15.0
Power supply U_N= 480 V												
Nominal speed Nn [min-1]	1700	3300	4500	1100	2200	3300	1100	2200	3000	1200	2200	3200
Nominal torque* M_n [Nm]	35.4	27.2	13.6	71.3	57.8	29.2	80.1	58.5	17.8	84.6	41.9	17.6
Rated output P_n [kW]	6.35	9.33	6.40	8.20	13.3	10.1	9.30	13.6	4.50	10.63	9.65	5.90
Motor connector	M40-speedtec										T **	
** Reference flange steel 375 mm x 601 mm x 10 mm | ** terminal box*												

Mechanical data	AM80xx			
	AM8071	AM8072	AM8073	AM8074
Rotor moment of inertia without brake J [$kgcm^2$]	49.600	92.200	135.000	180.000
Rotor moment of inertia with brake J [$kgcm^2$]	68.300	110.900	154.000	---
Number of poles	10	10	10	10
Static friction torque M_R [Nm]	0.14	0.22	0.30	0.38
Thermal time constant t_{TH} [min]	70	80	90	100
Weight without brake [kg]	27.20	36.60	48.20	
Weight with brake [kg]	32.70	42.10	53.70	
Flange	**IEC standard / DIN 42955**			
Fit	J6			
Tolerance class	N			
Protection class				
Standard housing version	IP20			
Standard shaft feed through version	IP54			
Shaft bushing with shaft sealing ring	IP65			
Paint finishes				
Properties	acrylic powder-coated			
Color	dark gray / RAL 7016			

Optional holding brake [+]	AM807x
Holding torque at 120 °C M_{BR} [Nm]	70
Supply voltage U_{BR} [V_{DC}]	24; +6 % to -10 %
Electrical power P_{BR} [W]	40
Current I_{on} [A]	1.21
Release delay time t_{BRH} [ms]	200
Application delay time t_{BRL} [ms]	50

Dimensional drawing

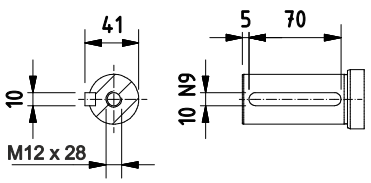
- Illustration with fan cover [+]
- All figures in millimeters



Motor	Y / Z
AM8071-xxxA-xxx0	321
AM8071-xxxB-xxx0	393,5
AM8072-xxxA-xxx0	378
AM8072-xxxB-xxx0	450,5
AM8073-xxxA-xxx0	435
AM8073-xxxB-xxx0	507,5
AM8074-xR0A-xxx0	507,5

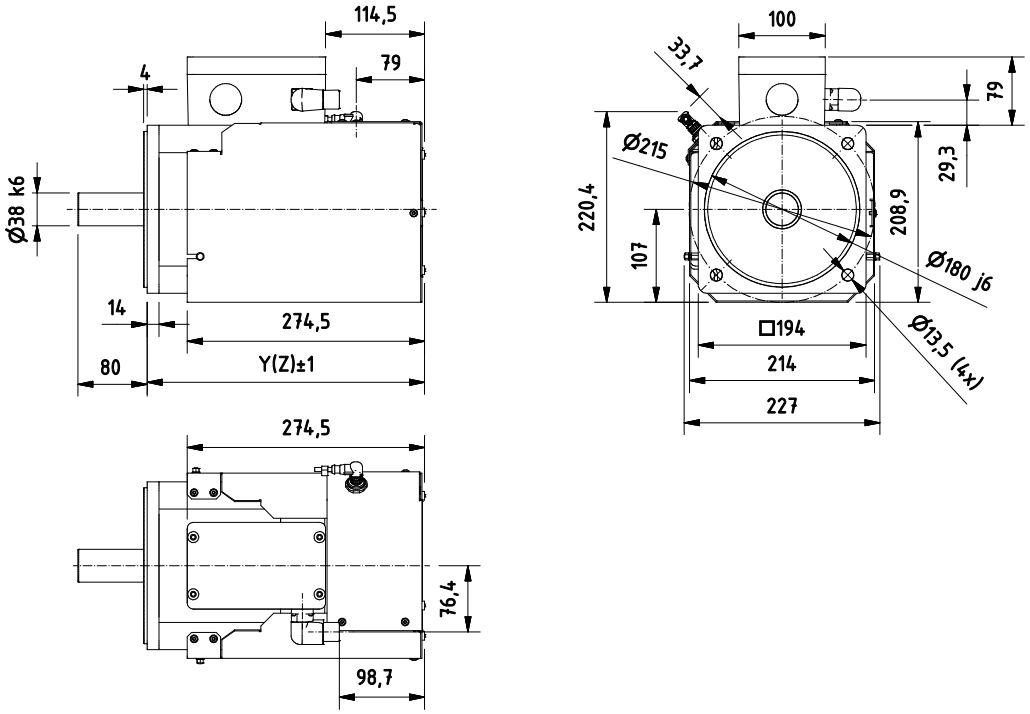
Feather key [+]

- Centring hole according to DIN 332-D



Dimensional drawing

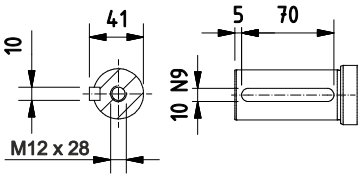
- Illustration with fan cover [+], terminal box and T-U winding
- All figures in millimeters



Motor	Y / Z
AM8074-xT0A-xxxx	507,5
AM8074-xU0A-xxxx	507,5

Feather key [+]

- Centring hole according to DIN 332-D



Check missing or damaged parts
Check your delivery for completeness. If any parts are missing or became damaged during transport, contact the carrier, manufacturer or our service department immediately.

Please check that the delivery includes the following items:

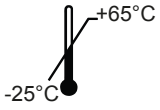
- AM8000 or AM8500 series motor with yellow protective cap
- Instruction leaflet, short info

When ordering a motor with external fan:

- Fan cover [+] with fittings

Packaging

Instructions for handling are printed on the packaging:

Symbol	Explanation
	These are the permitted maximum and minimum temperatures at which the device may be stored and transported.
	This is the correct position for the packaging.
	The packaging must be protected from moisture.
	The contents are fragile.

Avoid damage to the motors and resulting loss of warranty
Observe the conditions specified in the following chapters for Transport and Storage.
Failure to observe the conditions may result in damage to the motors and void the warranty.

Do not remove the yellow protective cap
Do not remove the yellow protective cap on the drive shaft.
The protective cap protects against mechanical damage and environmental influences. If you remove the protective cap, the shaft may be damaged.

Conditions

During transport and storage ensure that the motors and individual components are not damaged. Observe the specifications in the following chapters and comply with the following conditions:

- Climate category: 2K3 according to EN 60721
- Temperature: -25 °C to +70 °C, maximum fluctuation 20 K/hour
- Air humidity: 5% to 95% relative humidity, no condensation
- Use of suitable means of transport
- The device should be transported and stored in a horizontal position
- Use of the manufacturer's original packaging

The table shows the maximum stacking height at which you may store and transport the motors on a pallet in the original packaging:

Motor type	Stacking height of original packaging [items]
AM801x	10
AM802x	10
AM803x / AM853x	6
AM804x / AM854x	6
AM805x / AM855x	5
AM806x / AM856x	2
AM807x	1

Transport

Do not enter the area below suspended motors
Use suitable means of transport and secure the motor against falling.
Dropping the motor could lead to fatal accidents.

Avoid hard impacts on the motor
Use suitable means of transport and secure the motor against falling.
Falling and hard impacts will damage the motor and motor components.

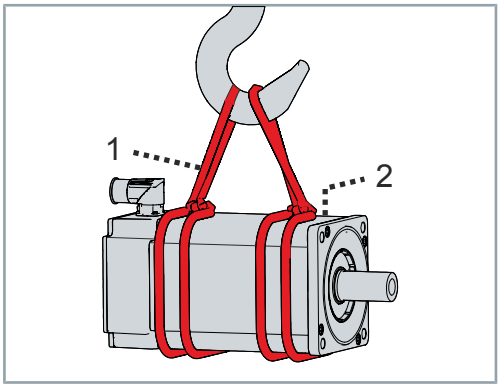
AM801x to AM8x5x

Transport of the AM801x to AM8x5x series without tools.

AM8x6x

Transport of the AM8x6x series with loop belts.

Fasten loop belt correctly
Only attach the loop belt to the motor housing. Make sure the load is balanced. Do not attach the loop strap to the shaft.
Lifting with an unbalanced strap can lead to slipping of the motor and fatally injure people and damage the motor.

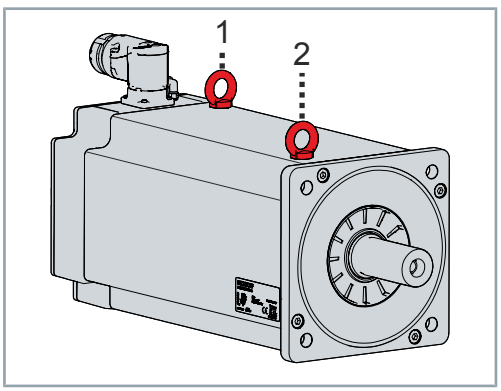


► Attach loop belt 1 to motor housing 2
► Ensure that the loop belt is balanced at both ends of the motor
► Lift the servomotor with a suitable hoist

AM807x

AM807x series is equipped with eyebolts as standard. Use only these eyebolts to attach lifting equipment.

Use the eyebolts correctly
Make sure the load is balanced. Do not attach lifting gear to the shaft.
Attaching the lifting gear unbalanced can lead to slipping of the motor and fatally injure people and damage the motor.



► Attach suitable lifting equipment to eyebolts 1 and 2
► Lift the servomotor with a suitable hoist

Long-term storage

Observe the maximum storage time
Do not exceed the maximum storage time of two years.
Exceeding the specified maximum storage time can lead to changes in the properties of the lubricant used and damage the motor during subsequent operation.

Perform recurring inspections
Check the motor for proper condition every six months.
Damage to the motor or maintenance work not carried out will affect the service life of the installed components and parts.

Prevent the formation of condensation
Keep the ambient temperature constant. Avoid solar radiation and high humidity.
Condensation water can lead to damage during subsequent operation or to rust formation.

The motors can be stored for shorter or longer periods. For storage we always recommend the original packaging. Observe the conditions specified in chapter: "Transport and storage", [Page 55].

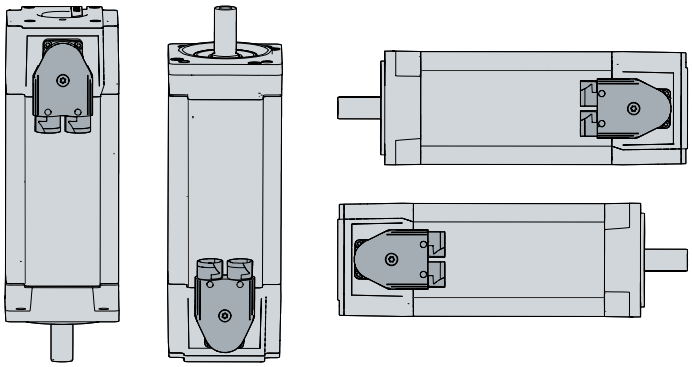
The motors are protected against chemical and aggressive substances, class 1C2 chemical substances and 1B2 biological conditions.

Ensure the storage space is vibration-free.

Mounting position

Observe the maintenance intervals and mounting positions
Carry out maintenance at regular intervals.
In the horizontal IM V3 mounting position, liquid which has been left on the flange for a longer period can penetrate the motor through capillary action. In mounting position IM V1 liquid can escape.
If you do not observe the maintenance intervals, the motor may overheat depending on the mounting position. Ingress and leakage of liquids may damage the motor.

The standard mounting position of the motors is IM B5 according to DIN EN 60034-7.



IM V1 (V1) IM V3 (V3) IM B5 (B5)

Feedback

The following table provides information about system accuracies and resolutions of the motor feedback systems:

Feedback	Resolution	System accuracy	Comment
OCT, single-turn OCT, multi-turn	18-bit	± 120 angular seconds ~ 0.03°	Standard: AM801x – AM8x6x Standard fan: AM805x – AM8x6x
Hiperface, single-turn Hiperface, Multi-turn	18-bit	± 120 angular seconds ~ 0.03°	Standard: AM807x
OCT, single-turn OCT, multi-turn	23-bit	± 45 angular seconds ~ 0.0125°	From firmware v2.10
Resolver	14-bit	± 600 angular seconds ~ 0.17°	Option

Feedback exchange
The feedback system installed can only be replaced with an identical system. It is not possible to change the feedback system retrospectively.

Protection equipment

With the exception of the AM801x series, temperature sensor LPTC-600 is installed in the standard version of all motors.
The LPTC-600 is integrated into the monitoring system of the servo drive when using the pre-assembled motor cable. Configure the servo drive taking note of the motor temperature warning of 120 °C and the switch-off temperature of 140 °C.

The LPTC-600 is identical to the KTY 84.130 used previously.

LPTC-600 sensor

The following table shows the resistance values of the temperature sensor:

Temperature [°C]	T/°C [%/K]	LPTC-600 Resistance [Ω]			Temperature error [K]
		minimum	Nominal value	maximum	
-40	0.84	340	359	379	± 6.48
-30	0.83	370	391	411	± 6.36
-20	0.82	403	424	446	± 6.26
-10	0.80	437	460	483	± 6.16
0	0.79	474	498	522	± 6.07
10	0.77	514	538	563	± 5.98
20	0.75	555	581	607	± 5.89
25	0.74	577	603	629	± 5.84
30	0.73	599	626	652	± 5.79
40	0.71	645	672	700	± 5.69
50	0.70	694	722	750	± 5.59
60	0.68	744	773	801	± 5.47
70	0.66	797	826	855	± 5.34
80	0.64	852	882	912	± 5.21
90	0.63	910	940	970	± 5.06
100	0.61	970	1000	1030	± 4.90
110	0.60	1029	1062	1096	± 5.31
120	0.58	1089	1127	1164	± 5.73
130	0.57	1152	1194	1235	± 6.17
140	0.55	1216	1262	1309	± 6.63
150	0.54	1282	1334	1385	± 7.10
160	0.53	1350	1407	1463	± 7.59
170	0.52	1420	1482	1544	± 8.10
180	0.51	1492	1560	1628	± 8.62

Shaft end A

The A-side is used for force transmission via a backlash-free and frictional connection. This is achieved by means of a coupling and a cylindrical shaft end according to DIN 748-3 with a centering bore at the front according to DIN 332-2. Alternatively, forces can be transmitted via a frictional connection and a feather key groove according to DIN 6885 / ISO 2491.

Radial forces	Axial forces
• Motors driven via pinion / toothed belt	• Pinion or pulley mounted on the shaft
• Permissible values depend on the speed	• For example, when operating angular gear units

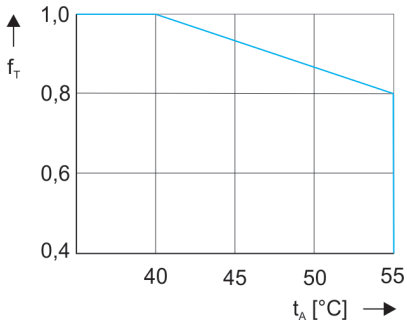
Calculation of the exact radial and axial forces
The calculation tool
Beckhoff AM8000 motors radial forces / axial forces, service life
is available via www.beckhoff.de.

Preferred backlash-fress coupling elements:

- Double-coned collets and metal bellows couplings

Power derating

Power reduction may be required at high ambient temperatures or for operation at high altitudes. In addition, some motors may experience power reductions depending on the feedback system installed or the holding brake [+]. The reduction affects the standstill current and the standstill torque.



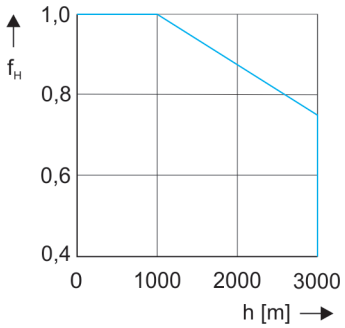
Ambient temperature

fT = Temperature utilization factor

tA = Ambient temperature in °C

Calculation of the performance data if the specified temperature limit > 40 °C to 55 °C is exceeded:

M0_red = M0 x fT



Installation altitude

fH = Altitude utilization factor

h = Altitude in meters

Calculation of the performance data if the specified installation altitude is exceeded > 1000 m to 3000 m:

M0_red = M0 x fH

Ambient temperature and installation altitude

Calculation of the power data when exceeding the specified limits:

Ambient temperature > 40 °C, altitude > 1000 m and < 3000 m:

M0_red = M0 x fT x fH

Carry out all work with great care and without time pressure.

Flange mounting

The following table provides information on components for mounting the motor on the machine / system:

Motor	Bore dia. [mm]	Cheese-head screw DIN EN ISO 4762; 8.8	Tightening torque [Nm]	Washer DIN EN ISO 7089
AM801x	4.3	M4 x 16	3	4.3
AM802x	5.5	M5 x 16	5.5	5.3; DIN 7980
AM8x3x	6.0	M5 x 16	5.5	5.3; DIN 7980
AM8x4x	7.0	M6 x 20	10.0	6.4
AM8x5x	9.0	M8 x 25	25.0	8.3
AM8x6x	11.0	M10 x 30	50.0	10.5
AM807x	13.5	M12 x 40	85.0	13.0; DIN 7980

Output elements

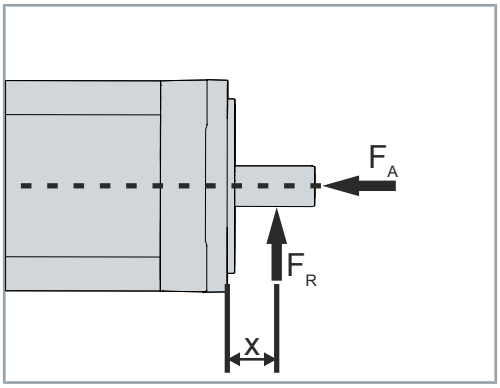
Secure moving parts against ejection
Make sure there are no moving parts on or in the machine during operation. Feather keys [+] are only secured during transport.
Unsecured parts can be ejected from the machine during operation and cause serious or fatal injuries.

Protect the motor from inadmissible load
Avoid bending components during transport or handling and do not change any insulation distances. Avoid hard shocks to the shaft end, the ball bearings or the feedback system. Furthermore, note vibration qualities and vibration resistance. If necessary, provide additional support for the motor.
An impermissible load on the components can have a negative effect on the performance of the motor! Impacts on the motor shaft impair the concentricity of the motor.

Ensure adequate grounding via the protective conductor
The thermal connection of the motor flange determines the power dissipation.
Ensure adequate grounding via the protective conductor or the motor flange.

Bearing load during installation

Avoid mechanically overdetermined support of the motor shaft through rigid coupling and additional external support.



When mounting output elements, ensure that the load on the shafts and bearings due to transverse forces by radial force F_R and axial force F_A is low. Axial loads shorten the service life and can lead to malfunctions of the holding brake [+].

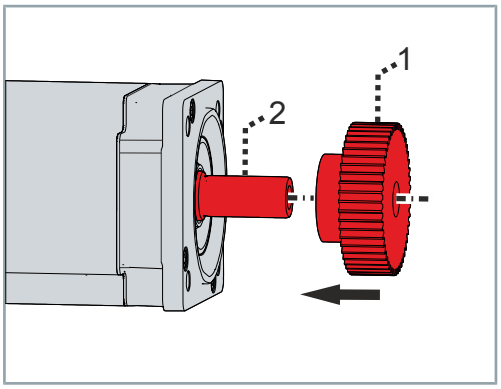
Special features when using toothed belt drives:
When using a toothed belt drive, the radial and axial loads on the shaft must not be exceeded. Excessive load can lead to fatigue fracture of the motor shaft. Please pay attention to chapter: "Technical data", [Page 18].

Mounting

Do not touch hot output elements without personal protective equipment
Only handle hot output elements, such as couplings or pulleys, with special thermal gloves. Avoid prolonged contact with hot components.
Hot components can cause severe burns to body parts and limbs.

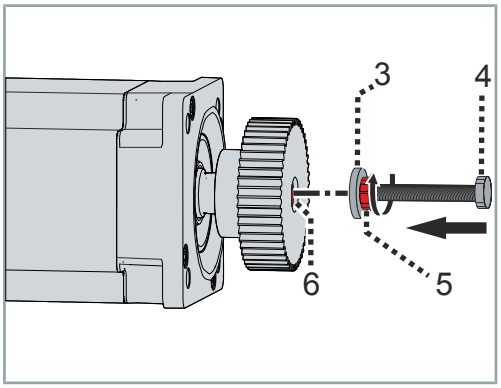
Do not mount the drive element offset
Place the drive element centered and straight on the motor shaft.
An offset will cause unacceptable vibration and the destruction of the ball bearings and the coupling.

- ► Warm up the output elements according to manufacturer's instructions
- ► Remove the protective cap
- ► Degrease and clean the motor shaft
- ► Remove the output element from the oven and transport it to the workstation
- ► Place output element 1 centered and straight on the motor shaft 2

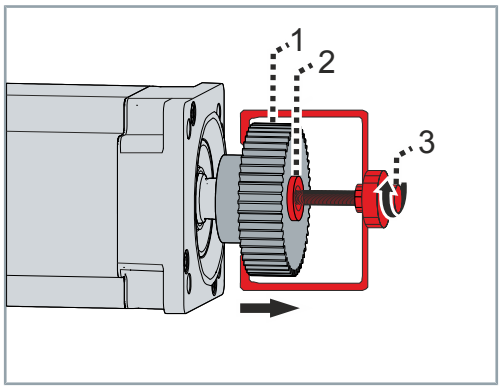


- ► Insert washer 3 with screw 4 of strength class 8.8 and nut 5 into the locking thread 6 of the motor shaft
- ► Tighten nut 5

The output element is pulled onto the motor shaft by the nut.



Dismantling



Only use backlash-free, friction-locked collets, pullers or suitable couplings for dismantling the output elements.

- ► Degrease the motor shaft
- ► Screw puller 3 and intermediate disc 2 into the locking thread of the motor shaft
- ► Place the puller fully on the drive element 1
- ► Pull the output element 1 with the puller 3 from the motor shaft

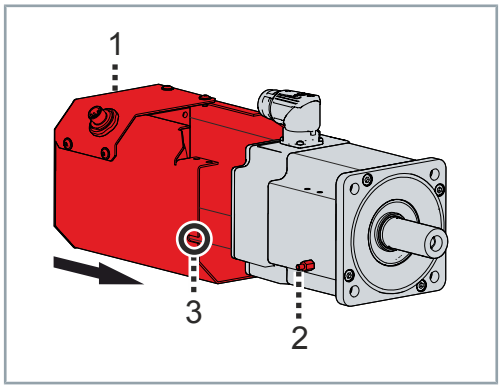
Fan cover [+]

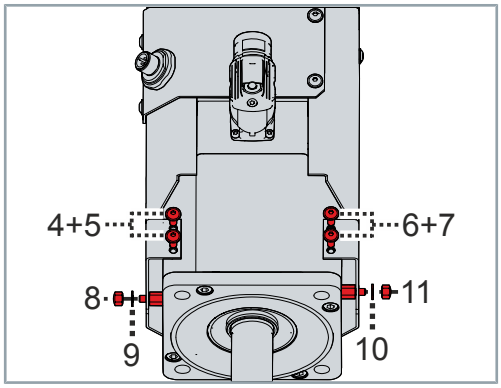
A motor is cooled by an external device using forced ventilation. This facilitates higher performance. The air flow passes through the fan cover [+] over the motor housing.

Mounting

Clean the working environment
Workplaces and their immediate surroundings must be tidy and dust-free. Avoid dirt in tapped holes.
Dirt in the tapped holes can damage screws and threads during mounting. Dirty and foreign objects in the working environment can damage the motor and the fan cover [+]. Furthermore, the performance characteristics and performance of the motor can be impaired.

- ► Attach the motor to the machine
- ► For AM807x series: release and remove the eyebolts on the motor housing
- ► Slide fan cover [+] 1 up to the mechanical stop
- ► Make sure that on both sides of the motor the elongated holes 3 are aligned with the screw connection devices 2

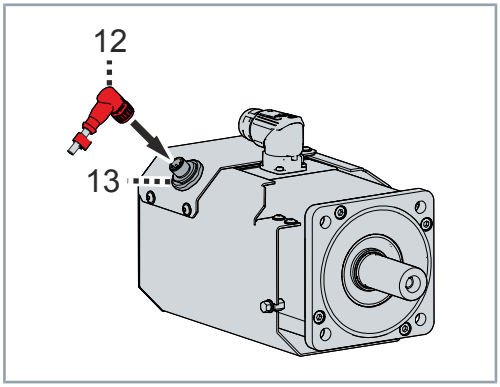




- ► Fit screws 4 to 7
- ► Fit nuts 8 and 11 with washers 9 and 10
- ► Observe the tightening torques:

Screws	Nuts
3 Nm; size 2.5	2.5 Nm; size 7

Use Beckhoff control cable!
Use the pre-assembled control cable ZK4054-6400-0xxx to connect the fan cover [+]



► Plug the power connector 12 into the power box 13 of the motor
► Hand-tighten power connector 12 and check for tight fit

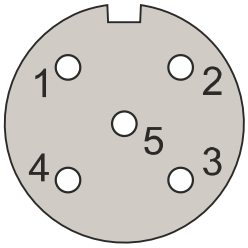
Performance data of the external fan

The following table shows electrical and mechanical data for the external fan:

Technical data	Symbol [Unit]	AM8x5x	AM8x6x	AM8x7x
Supply voltage	U_{LA} [V_{DC}]	24		
Electrical power	P_{LA} [W]	4.6	9.8	31.2
Current	I [A]	0.19	0.41	1.3
Protection class		IP20		

Assignment plan of the power connector

The following table shows the assignment of the power connector of the external fan:

Socket configuration	Contact in the connector	Assignment on the cable
	1	PE: green / yellow
	2	+24 V_{DC}: brown
	3	not used
	4	GND: blue
	5	not used

Additional documentation for control cable ZK4054-6400-0xxx
The data sheet of the control cable can be found under:
www.beckhoff.com → Download → Data sheets → Cables and wires

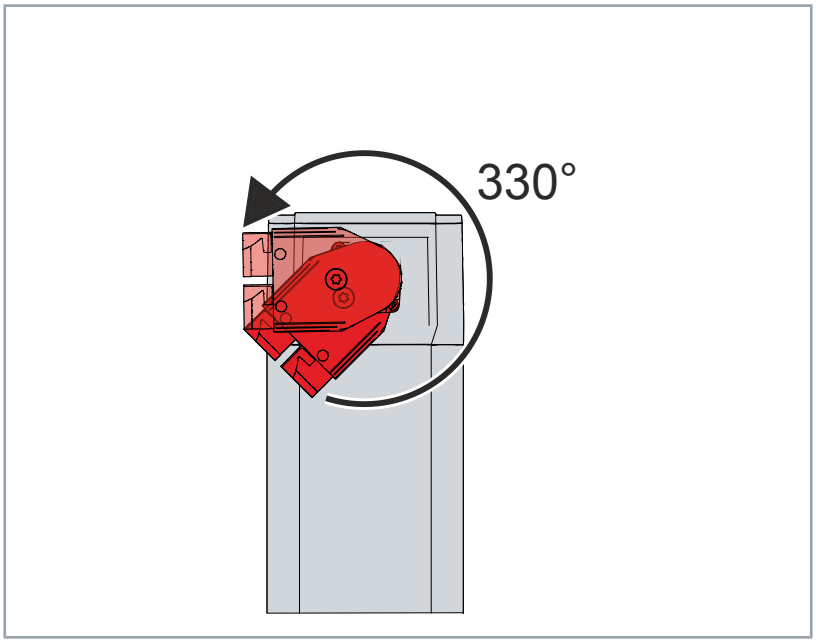
Connection technology

Beckhoff supplies pre-assembled power cables and feedback cables. Mating connectors are not included in the scope of supply. To select the necessary cables, refer to the Beckhoff documentation for connecting cables [+]. In the documentation you will find a complete overview of the available cables and information on the technical data.

For interference-free data transmission, please note:
• Maximum number of mating cycles for the connectors: 500 cycles
• Maximum number of rotations of the power box: 10
If the maximum number of mating cycles or rotations is exceeded, clean data transmission can no longer be guaranteed. This results in signs of wear.

Power box

The motors are equipped with angled, rotatable power boxes for power supply and feedback signals. Only for resolver and Hiperface. The power box can be rotated by 330°.



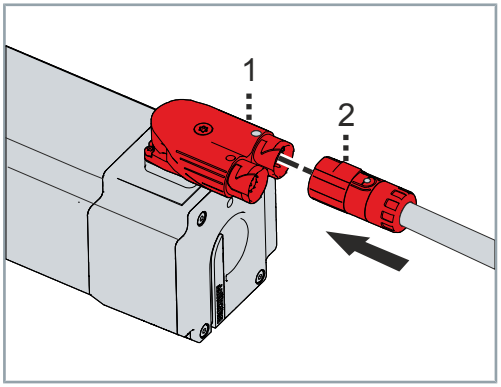
Cables

Avoid soiling and damage
When connecting the socket and connector, make sure that the poles and the inside of the component are not soiled or damaged. *Failure to do so may adversely affect the function of the connections.*

For proper application and assembly we recommend:
• Wiring in accordance with applicable regulations and standards
• Pre-assembled and shielded Beckhoff cables

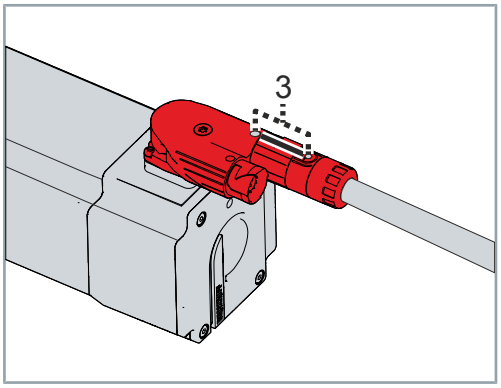
Beckhoff offers pre-assembled cables for faster and flawless installation of the motors. These cables are tested with regard to the material used, shielding and connection type. Perfect functioning and compliance with legal regulations, such as EMC and UL, are guaranteed. The use of other cables can cause unexpected malfunctions and result in exclusion of warranty.

Connectors



► Push iTec connector 2 straight onto power box 1 of the motor

► Make sure that the marking points face each other



► Pay attention to the "click" sound

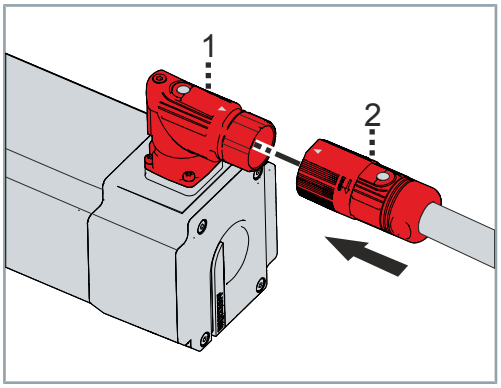
► Make sure that all marking points 3 are in alignment

The iTec connector is then fully engaged.

Important
If the iTec connector does not automatically lock into place on the power box during the rotational movement:

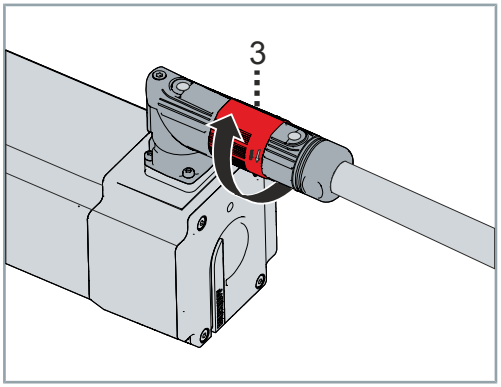
► turn the iTec connector by hand into the correct position so that the marking points 3 are aligned

Rotary joints

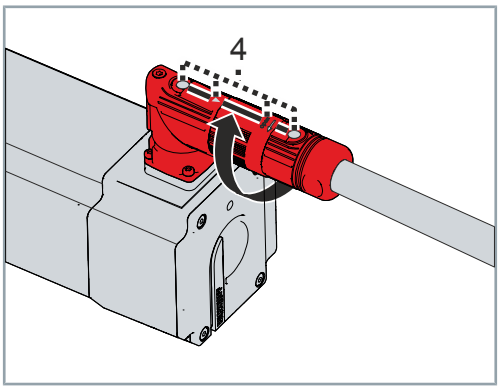


► Push the speedtec connector 2 straight onto the power box of the motor 1

► Make sure that the marking arrows face each other



► Turn the cap nut 3 clockwise



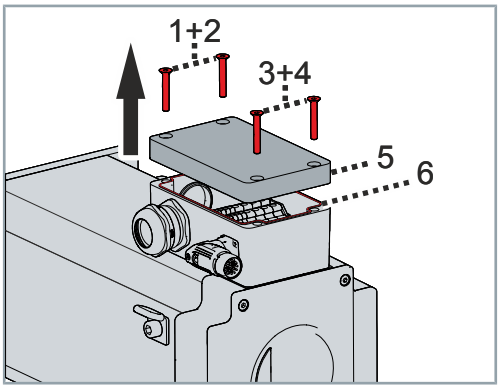
► Make sure that all markings and the lettering "open" 4 are aligned

The speedtec connector is then fixed properly.

Terminal box

Avoid soiling and damage
When dismantling the cover and connecting the terminal box and cables, make sure that no foreign objects or dirt particles enter the terminal box, the clamping ring or the M40 thread on the terminal box.
Failure to do so may adversely affect the function of the connections.

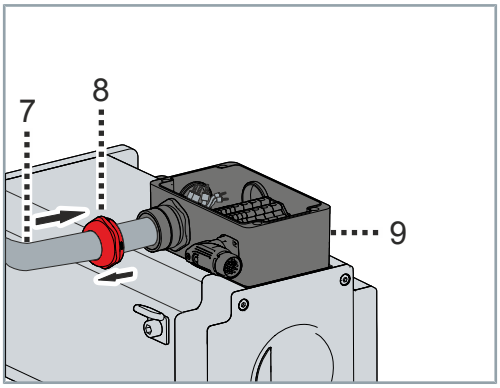
Assembly of the power cable and feedback cable
When assembling the cables, note that the size of the three blind plug thread in the terminal box is M40.



► Make sure that the rubber seal 6 in the cover 5 is not lost or damaged

► Loosen and remove screws 1 to 4

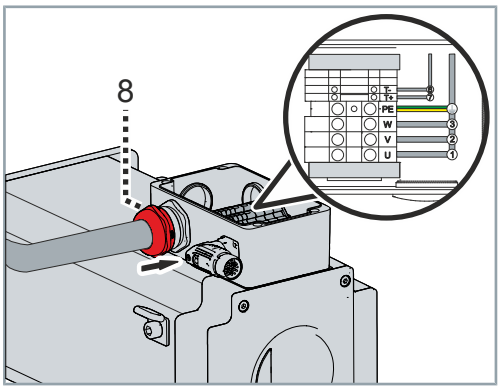
► Remove cover 5



► Loosen clamping ring 8

► Insert motor cable 7 through clamping ring 8 into terminal box 9

Motor cable	Order details
10 mm² for motors with terminal box	ZK4506-8027-xxxx
16 mm² for motors with terminal box	ZK4506-8018-xxxx



► Fasten clamping ring 8 to the terminal box

► Connect the cable ends to the terminal according to the assignment diagram

Important
The assignment diagram of the terminal box can be found below: "Technical data AM807x", [Page 50].

► Make sure that the seal is correctly placed on the terminal box

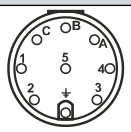
► Re-install the cover 5

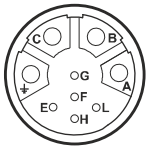
Connector assignment

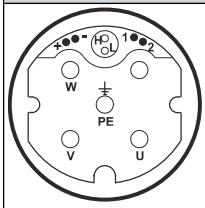
Beckhoff offers various power connectors and feedback connectors. All connectors are IP65 rated. A protective conductor connection according to VDE 0627 is provided on the housing.

OneCableTechnology

The following tables show the connector assignment on the motor side:

Pin assignment iTec connector			
iTec connector	**Contact**	**Function**	**Core identification**
	A	U	black / 1
	B	W	black / 3
	C	V	black / 2
	1	Brake +	5
	2	Brake -	6
	3	Temperature + / OCT +	white
	4	Temperature - / OCT -	blue
	5	---	---
	PE	PE	green / yellow

Pin assignment M23 connector			
M23 connector	**Contact**	**Function**	**Core identification**
	A	U	black / 1
	B	V	black / 2
	C	W	black / 3
	D	PE	green / yellow
	E	Temperature - / OCT -	blue
	F	Shield	Shield
	G	Brake +	black / 5
	H	Temperature + / OCT +	white
	L	Brake -	black / 6

Pin assignment M40 connector			
M40 connector	**Contact**	**Function**	**Core identification**
	U	U	black / 1
	V	V	black / 2
	W	W	black / 3
	PE	PE	green / yellow
	N	---	---
	+	Brake +	black / 5
	-	Brake -	black / 6
	1	---	---
	2	---	---
	H	Temperature + / OCT +	white
	L	Temperature - / OCT -	blue

Observe the operating instructions for the servo drives
For commissioning, read the operating instructions for the servo drives and carry out the steps according to the commissioning instructions. With multi-axis systems, each drive unit is commissioned individually.

Exemplary commissioning
The procedure for commissioning is described as an example. A different method may be appropriate or necessary, depending on the application of the components.

Before commissioning

- Check drive for damage
- Check installation and alignment
- Tighten screw connections correctly
- Installing mechanical, thermal and electrical protective devices
- Check the wiring, connection and proper grounding of the drive and servo drive

For motors with holding brake [+]
- Check the function of the holding brake [+]
- In case of malfunction: Apply 24 V_{DC}, the brake must release
- Check emergency stop functions

For motors with fan cover [+]
- Check connection and function
- Fan must rotate freely, pay attention to grinding noises
- Check the direction of rotation of the fan

During commissioning

- Make sure that all fittings were checked for function and adjustment
- Observe information for environment and operation
- Check protective measures against moving and live parts

Configuration
Beckhoff recommends the use of servo drives and motors from Beckhoff in combinations, and configuration in the Beckhoff TwinCAT DriveManager.

Carry out the instructions in the operating manual for servo drives:
- Build Project and Choose Target System
- Implement devices by scanning or manually
- Configure devices, determine and set motor type
- Create axis configuration
- Set scaling factor and speeds
- Check status and activate control system

Prerequisites during operation

- Pay attention to atypical noise development
- Pay attention to smoke development
- Always check drive surfaces and cables for dirt, leaks, moisture or dust

- Check temperature development
- Check for lubricant leakage
- Observe recommended maintenance intervals
- Check function of safety devices

For motors with fan cover [+]:

- Check air intakes for contamination
- Check that the motor and fan cover [+] are firmly seated
- Observe tightening torques

After operation

Ensure safe condition of the machine / system
Make sure that the rotor comes to a complete stop.
When the holding brake [+] is released, the rotor moves without remanent torque. Rotating components can lead to serious injuries.

Ensure safe condition for cleaning work
Basically, electronic devices are not fail-safe. The condition is always safe when the unit is switched off and not energized. For cleaning work, bring the connected motors and the machine into a safe condition.
Carrying cleaning work during operation can lead to serious or fatal injuries.

Do not submerge or spray the motor
Only wipe the motor with a cleaner and a cloth.
Cleaning by immersion may result in surface and motor damage and leakage problems as a result of impermissible solutions.

Contamination, dust or chips can have a negative effect on the function of the components. In the worst case, contamination can lead to failure. The components should therefore be cleaned and serviced at regular intervals.

Cleaning materials

Carefully clean the components with a damp cloth or brush.

For cleaning, we provide an overview of cleaning agents to which the motors may be exposed up to a maximum concentration of 3%. You will also receive information about non-approved cleaning agents.

Non-approved cleaning agents

Non-approved cleaning agents	Chemical formula
Aniline hydrochloride	$C_6H_5NH_2HCl$
Bromine	Br_2
Sodium hypochlorite; bleaching solution	NaClO
Mercury II chloride	$HgCl_2$
Hydrochloric acid	HCl

Approved cleaning agents

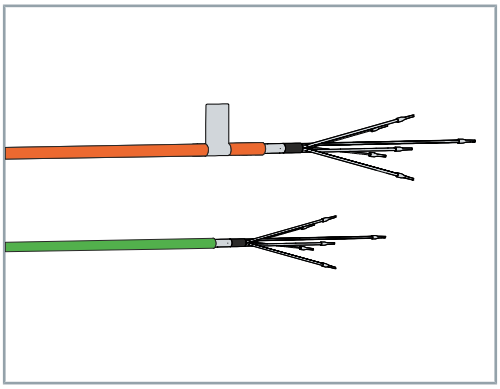
Approved cleaning agents	Chemical formula
Acetyl chloride	CH_3COCl
Aluminum chloride	$AlCl_3$-$6H_2O$
Ammonium chloride	NH_4Cl
Antimony trichloride	$SbCl_3$
Barium chloride	$BaCl_2$-$2H_2O$
Chlorine; also chlorine water, chlorinated lime and chlorobenzene	Cl_2
Chlorosulfuric acid	HSO_3Cl
Hydrogen chloride gas	HCl
Chromic acid	CrO_3
Iron III chloride	$FeCl_3$
Hydrogen fluoride	HF
Carnallite	$KClMgCl_2$-$6H_2O$
Aqua regia	HCL + HNO_3
Magnesium chloride	$MgCl_2$-$6H_2O$
Monochloroacetic acid	CH2ClCOOH
Sodium chloride; common salt	NaCl
Sodium hydroxide	NaOH
Sodium peroxide	Na_2O_2
Sulfuric acid	H_2SO_4
Tartaric acid	COOH; $CHOH_2$ COOH
Tin II IV chloride	$SnCl_2$-$2H_2O$ $SnCl_4$

Intervals

Under nominal conditions, the motor components have different operating hours. The following table provides a list of maintenance work and intervals for various components:

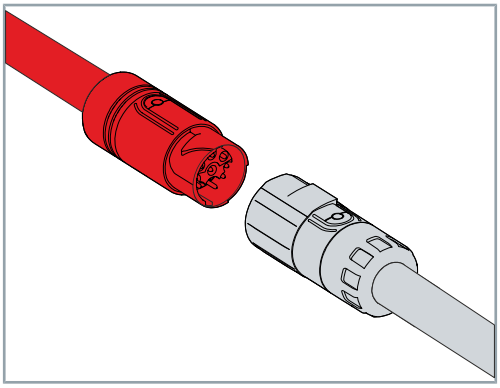
Component	Interval	Maintenance
Ball bearing	30,000 operating hours	Replace bearing
Motor	2,500 operating hours / annually	Check motor for bearing noises **If noises are detected:** do not continue to operate motor; replace bearing
Shaft seal	5000 operating hours	Perform visual inspection Lubricate the shaft seal *Recommended lubricants:* *“MobilgreaseTM FM22" from Mobil* **In case of damage and pressure drop:** Replace shaft seal
Cables	regular intervals	Perform visual inspection and check for damage **As required**: Replace cables
	5 million bending cycles	Replace cables
Fan cover [+]	half-yearly	Perform visual inspection and check for damage **In the event of unbalance:** Clean fan Contact Beckhoff Service **In case of damage:** Contact Beckhoff Service
Power box	500 mating cycles	**In case of damage:** Contact Beckhoff Service
Connector	10 turning cycles	**In case of damage:** Contact Beckhoff Service

Connecting cables



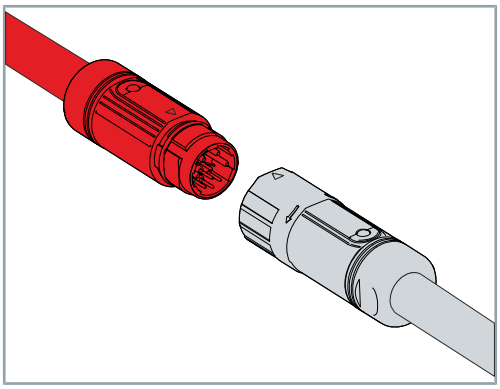
Orange power cables and green feedback cables are used for the connection between motor and servo drive.
Information on connecting a motor with a servo drive or the multi-axis servo system can be found in chapter: "Electrical installation", [Page 65].

iTec extension



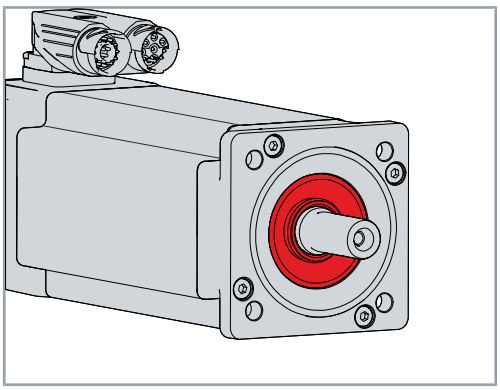
Motor cables can be extended using an iTec extension cable.

speedtec extension



Motor cables can be extended using an speedtec extension cable.

Shaft seal

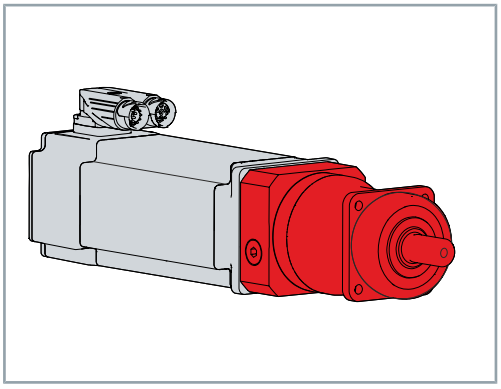


The radial shaft-sealing ring FKM is used for sealing against splash water and protects the motor shaft against dust or dirt. This increases the protection class of the shaft feed through to IP65.

The radial shaft-sealing ring can be replaced at any time. Please note, however, that the exchange may lead to a reduction in the nominal values.

Gear unit

Axial load due to thermal expansion of the motor shaft
To avoid displacement of the motor shaft at high temperatures, use couplings as length compensation.
Directly mounted bevel gears or helical gear wheels can exceed the axial load of the floating bearing on the shaft end A.



A gear unit serves to transmit a force moment or torque and is used on the motor as an output element. Information on flange sizes for motor and gear unit combinations can be found in section: Type key.

The following table describes selected malfunctions. Depending on the application, other causes may be responsible for the malfunction.
Conspicuous control behavior is the result of incorrect parameterization of the servo drive.

With multi-axis systems such as the AX8000, malfunctions may have different causes.

Error	Cause																			
Motor standstill (no starting)	1	2			5															
Motor runs sluggishly	1		3		5	6														
Start-up noises			3		5	6					11									
Noises during operation	1		3		5	6					11									
High temperature at idling speed				4			7	8	9											
High temperature under load	1		3				7	8	9											
Untrue running behavior										10	11									
Grinding noises												12								
Brake fault													13	14						
Output stage fault					5										15	16				
Feedback error																	17	18		
Lack of braking effect					5	6														
Leakages																			19	

Cause	Error	Solution
1	Servo drive not enabled	Set ENABLE signal and enable servo drive
	Motor overload	Check load and reduce if necessary, then restart and enable the servo drive and set the ENABLE signal
	Mechanical blockage of the motor	Check mechanics and release blockage
	Holding brake [+] not released	Check the control configuration of the holding brakes [+] and reconfigure if necessary
2	Phase interruption in the power supply or reversed motor phases	Check servo drive and supply lines, power and feedback and replace defective cables
3	Phase interruption after switching on the power supply	Check servo drive and supply lines, power and feedback and replace defective cables
	Power cable or feedback cable with defective shield	Check ground connection and shielding
4	Short-circuit in the voltage supply cable for the holding brake [+]	Replace defective cable, measure and check cable after replacement
	Output voltage of the servo drive too low	Check the settings in the configuration and read out the electronic type plate of the motor again
	Defective holding brake [+]	Replace motor, then measure and check
5	Short circuit or earth leakage in the motor cable	Replace defective motor cable, then measure and check
6	Power connector not fitted correctly	Check the connectors on the power connector and on the motor
	Interruption in the feedback or motor cable	Check cables for broken wire or crushing. Replace defective cables, then measure and check.
7	Required holding torque too high	Check design configuration and adjust if necessary

Cause	Error	Solution
	Defective holding brake [+]	Replace holding brake [+], then measure and check
8	Inlet temperature too high	Lower and adjust the inlet temperature
	No more cooling water available	Replenish cooling water and check regularly
9	Motor heat dissipation system not functioning	Clean the surface of the motors and the servo drive as well as the heat sinks and exhaust air slots. Check the installation depths of the servo drives and motors.
10	Power cable or feedback cable with defective or insufficient shielding	Check ground connection and shielding
11	Servo drive gain set too high.	Reconfigure the parameters of the servo drive and adjust them if necessary
12	Contamination or foreign bodies inside the motor	Send in motor. The repair is carried out by the manufacturer.
	Rotating parts chafing on the housing or motor components	Inspect chafing parts and readjust if necessary
	Defective bearings by irreparable bearing damage	Send in motor. The repair is carried out by the manufacturer.
13	Short-circuit in the supply voltage cable to the motor holding brake [+]	Replace defective cable, then measure and check
14	Inadequate power supply of the holding brake [+]	Check the settings in the configuration and read out the electronic type plate of the motor again
15	Short circuit or earth leakage in the motor	Replace defective motor, then measure and check
16	Insufficient power supply	Check the settings in the configuration and read out the electronic type plate of the motor again
17	Interruption or crushing in the feedback cable	Check cables for broken wire or crushing. Replace defective cables, then measure and check.
18	Feedback connector not fitted correctly	Check the position of the feedback connector
	Loose fit of the feedback connector or no contact of the plug contacts with the power socket of the motor.	Check the connector assembly. Contact Beckhoff Service if necessary.
19	Cooling water pipes and / or water connections leaky / defective	Determine leakage and seal if necessary

Disassembly may only be carried out by qualified and trained personnel. For more information please refer to Chapter: "Documentation notes", [Page 4].
When disposing of electronic waste, make sure that you dispose of it in accordance with the regulations applicable in your country.
Read and follow the instructions for proper disposal.

Disassembly

Risk of injury from leaking oil
Prevent oil from leaking. Let it cool down before starting work. Soak up any leaked oil with approved binding agents. Mark the danger spot.
Leaking oil can cause slips and falls, resulting in serious or fatal injury. Hot oil can cause severe burns.

Unauthorized removal of servomotor components
The motors have permanent magnets in the rotor. These motors may only be dismantled by Beckhoff Automation GmbH & Co. KG.
Contact Beckhoff Service for further information.

Removing the motor from the machine

- Remove cables and electrical connections
- Cool and drain liquids, then remove
- Remove supply lines and water hoses
- Loosen and remove the fixing screws of the motor
- Transport the motor to the work area or store it

Disposal

If you dispose of your motor, observe the following instructions for proper disposal of the components:

Cast iron and metal
Cast and metal parts can be handed over to scrap metal recycling.

Plastics and hard plastics
Plastic and hard plastic parts can be recycled via the waste management center or reused in accordance with the component regulations and labels.

Oils and lubricants
All oils and lubricants used in the motor and the machine / system must be collected in separate containers and disposed of at a waste oil collection point.

Disposal by the manufacturer

In accordance with the WEEE 2012/19/EU Directives we take old devices and accessories back for professional disposal, provided the transport costs are taken over by the sender.

Send the devices with the note “For disposal” to:

Beckhoff Automation GmbH & Co. KG
Huelshorstweg 20
D-33415 Verl

Alternatively, you can contact a certified specialist disposal company for waste electrical and electronic equipment in your area. Dispose of the old components in accordance with the regulations applicable in your country.

Test procedures and certifications vary by product. Beckhoff products are certified and tested according to the following directives and standards.

Standards

- Product standard EN 61800-3:2004+A1:2012
  "Adjustable speed electrical drives - EMC requirements and specific test methods".
- Product standard EN 60034-1:2010+Corr.:2010
  "Rotating electrical machines – Rating and performance".
- RoHS: EN 50581:2012
  "Technical documentation regulating electrical and electronic equipment with regard to the restriction of hazardous substances".

Guidelines

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU

Test centers

CE	The motors do not fall within the scope of the Machinery Directive. However, Beckhoff products are designed and evaluated in full compliance with all relevant regulations for personal safety and use in a machine or system.
EAC	The motors meet all the requirements of the Eurasian Economic Union. These include Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan. The EAC logo can be found on the "name plate", [Page 13].
c UL us	The motors comply with UL requirements and are certified as cURus components for the US and Canadian markets in accordance with the standards applicable in the USA and Canada. The cURus logo can be found on the "name plate", [Page 13].

EU conformity

Placing at disposal
Beckhoff Automation GmbH & Co KG will be pleased to provide you with EU declarations of conformity and manufacturer's declarations for all products on request.
Please send your request to: *info@beckhoff.com*

CCC conformity

Export to Chinese Economic Area
Beckhoff synchronous servomotors of the AM8000 & AM8500 series are not subject to the **C**hina **C**ompulsory **C**ertificate; CCC. The products are exempt from this certification and can be exported to the Chinese economic area.

UL conformity

Certification for USA and Canada
Beckhoff synchronous servomotors of the AM8000 & AM8500 series are approved as certified cURus components; E355768, for the American and Canadian economic area. The motors may be used as components in a system with UL listing approval mark.

BECKHOFF

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More Information: www.beckhoff.com/am8000