

be in motion be in motion

**Commissioning and
Maintenance Instructions**

TAM 00624

DS 100 – 200

Three-phase synchronous motor
Air-cooled

Version: 03 / 2005
English

LEGAL NOTES ON DOCUMENTATION

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With the introduction of this documentation, earlier issues of are superseded.

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BAUMÜLLER NÜRNBERG GmbH
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1 General Safety Instructions

1.1 Safety

This electric motor has been constructed in accordance with the relevant safety standards and underwent an operational safety check before leaving our factory.

To ensure correct commissioning and safe utilisation, please read the following:

- these Commissioning and Maintenance Instructions
- the safety and commissioning notes
- the technical documentation that accompanies the product
- the commissioning and safety notes provided by the manufacturer of the converter
- the national, local and system-specific regulations concerning your finished product.

We draw your attention to the following hazards when using the product:

- Hazards resulting from
- lifting and transport processes
 - electrical current
 - moving parts
 - hot surfaces
 - EMC disturbances
 - mechanical overloads
 - thermal overload

To avoid damages to persons and property and minimize residual risks, please read all of the safety instructions and, in particular, those that are marked with a symbol.



Danger to life through electrical shock

Non-observance can lead to death or a grave injury.



Warning concerning general dangers

Non-observance can lead to serious injury or damage to assets.



Warning concerning dangerous situation

Non-observance can lead to damage of system or peripheral equipment.



Do not touch!

Non-observance can lead to serious injury.



Unpermitted action

Non-observance can lead to serious injury.



Warning concerning hot surface

Non-observance can lead to serious injury.



Electrostatically sensitive components

Non-observance can cause damage to the plant or the environment.

1.2 Designated use

The electric motor must only be used for its designated purpose. In this context, the electric motor must only be used for the applications described in this technical documentation under strict observance of all the notes in these Commissioning and Maintenance Instructions.

All assembly, commissioning, maintenance and operating tasks must be carried out by qualified personnel only.

Within the context of these safety instructions, qualified personnel refers to persons who are trained and authorized in the specialized area, who are authorized to set up, assemble, commission and operate devices, systems and circuits under application of the applicable safety standards (in accordance with IEC 364 / DIN VDE 0105).

Inappropriate action can cause serious damage to persons and property.

The electric motor is designed for use in industrial applications and is subject to the following standards and directives:

Standards

EN 60034-1, EN 60034-5, EN 60034-6, EN 60034-7, EN 60034-9, EN 60204-1

Low Voltage Directive 73/23/EEC

The electric motors in this series fully comply with the requirements of the Low Voltage Directive 73/23/EWG (Conformity).

Machinery Directive 98/37/EC

Electric motors and components for installation in machines in the sense of the Machinery Directive. Commissioning is not permitted until such time as the conformity of the finished product with this directive has been established (refer to EN 60204-1 "Electrical Equipment of Machines").

EMC Directive 89/336/EEC

The operation of the electric motor for its designated use must comply with the protective requirements laid down in the EMC Directive 89/336/EEC. The person setting up the system is responsible for the correct installation (e.g. spatial isolation of signal lines and power cables, screened lines and cables etc.). In the case of systems with converters, the EMC notes of the manufacturer of the converter must also be observed.

All national, local and system-specific regulations must also be observed!

The electric motor is designed for the following ambient conditions:

- Ambient temperature: 0 °C to +40 °C
- Installation height: ≤1,000 m a.m.s.l.
- Relative humidity: 10 % to 80 %

Condensation water must not be allowed to accumulate.


Please take note of any deviating details specified on the nameplate or in the technical documentation. The conditions at the place of utilization must correspond to the details on the rating plate.




Utilization in hazardous areas is **prohibited**, unless the unit is expressly designed for this purpose (refer to additional notes). Furthermore, the area surrounding the electric motor must be free of inflammable gas mixtures and concentrations of dust. Live and hot motor parts are inflammable and may cause serious injury and damage to property.

If, in special cases, greater requirements are placed – for utilization in non-industrial applications – (e.g. protection against contact with a child's fingers), these conditions must be by the customer met when installing the system.

Motor design with rare-earth magnets:

	The rotors of the DS motors have rare-earth magnets with high magnetic energy densities. High forces of attraction to ferromagnetic components occur near a dismantled rotor, persons with pacemakers are in great danger, data stored on electronic data media could be destroyed. Incorrect handling can result in injury when ferromagnetic parts are attracted by the rotor.
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Thermal hazards:

	<p>Caution! Highly inflammable!</p> <p>Temperatures of over 70°C can build up on the motor surfaces. Touch contact measures should be implemented if necessary!</p> <p>Temperature-sensitive parts, e.g. normal cables or electronic components, must not be placed on or fixed to the hot surfaces.</p> <p>Thermal overloading can destroy the winding and the bearing. A thermal sensor should be used to monitor the temperature.</p>
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1.3 Prohibition of unauthorised modifications and changes



For safety reasons, unauthorised modifications and changes to the electric motor are not permitted. If such modifications / changes are necessary, please contact the manufacturer.

No safety devices may be dismantled or decommissioned prior to the operation of the device.

2 Operating conditions

2.1 Product description

Electric motors of the series "DS..." are permanently excited three-phase synchronous motors with rare-earth magnets. The optimized forced ventilation ensures efficient cooling and allows a high torque and power density.

When operating with a motor-controlled pulse converter, the speed and position of these compact motors can be optimally controlled. Thanks to their high overload capacity and efficiency, these drives are ideally suited for demanding mechanical engineering applications.

2.2 Scope of supplies

The delivery is put together on an order-related basis.

- The carrier must immediately be notified of any damage caused during transport.
- On delivery, please check that the ratings and motor type correspond with the order data. In the event of apparent defects or incomplete delivery, the appropriate Baumüller office or the Baumüller head office in Nuremberg should be notified immediately.

In both of the above cases, commissioning must not take place until the error has been rectified by a specialist.

2.3 Nameplate

The nameplate is used to identify each electric motor. The respective motor number is clearly shown on the nameplate and is essential for internal tracking procedures. It must be possible to read the nameplate at all times. Never remove the nameplate from your motor.

Nameplate data:

Mot. no.:	.....	Motor number
Type:	DS	Motor type / Description
U:	.....V	Rated voltage
I:	.....A	Rated current
n:	.....rpm	Rated speed
P:	.....KW	Rated power
Cos φ	.....	Power factor
f :	..... Hz	Rated frequency
Insul. class:	.....F	Insulation material class
Mode:	.....	Motor operation mode
IP:	.....	Motor protection type

2.4 Technical data

Possible designs / models

Frame size	Protection type (EN 60034-5)	Design (EN 60034-7)
100	IP23	B3 , B35
	IP54	B3 , B5
132	IP23	B3 , B5 , B35
	IP54	B3 , B5
160	IP23	B3 , B35
200	IP23	B3 , B35

Cooling method (EN 60034-6)	IP 23	IC 06	internally cooled motor with fan
	IP 54	IC 0641	surface-cooled motor with fan
	IP 54	IC 0041	surface-cooled motor without fan

Forced ventilation

DS 100 - DS 160

Standard: Radial fan on N-end; mounted standard motor

Air conduction from drive end to non-drive end, lateral air outlet at drive end

DS 200

Standard: Axial fan on N-end; mounted standard motor

Air conduction from non-drive end to drive end, lateral air outlet at N-end

Electrical connections (comp. **Appendix 1**)


Main connection	Terminal box
Control connection	Resolver - 12-pole connector
Fan / built-in fan motor	6-pin connector (unit DA 100)
Fan / added-on standard motor	Terminal box, standard motor (unit DA 132 -280)
Brake (optional)	Separate connection
Thermal sensor	Connection in terminal box
Thermal motor protection (EN60034-11)	Thermal sensor KTY84 in stator winding
Winding insulation (EN 60034-1)	Insulation class F
Ambient temperature	0°C ... +40°C
Installation (EN 60034-1)	= 1.000 m a.m.s.l.
Storage	-30°C...+60°C (+ 85°C, comp. Chap. 2.5)
Bearing	Rolling-contact bearing with grease lubrication for life
Calculated bearing life	20.000h (tentative value)
Vibration severity (EN 60034-14)	Level N
Vibration-resistant to ... (to EN 60068-2-6)	Radial 3g (20Hz to 55 Hz) Axial 0.5g (20Hz to 55 Hz)
Holding brake	Option
Actual speed encoder	Standard: 2-pole Resolver

For further technical values, please refer to the technical documentation that comes with the product.

Attention! If the electric motor supplied is not a standard version in accordance with the technical documentation or if special arrangements were contractually agreed, the technical data may differ to the values stated in these Commissioning and Maintenance Instructions. The supplementary technical details are available on request.

2.5 Transport, intermediate storage

Transport:

	<p>Suitable load suspension material must be used, e.g. belt webbing, loop belts etc. If provided, the lifting lugs of the motor can be used for lifting.</p> <p>The terminal boxes or motor connectors must not be used as shipping braces or lifting lugs.</p> <p>The regulations in the respective countries must be adhered to during transport. Lifting devices, transport and load suspending devices must comply with the regulations.</p>
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The Baumüller electric motors of the "DS..." series weigh up to approx. **600 kg**. Precise details relating to the weight of the respective decices can be found in the technical documantation that comes with the product. The motor shaft and the connection surfaces must be protected against corrosion. The motor must be transported with motor shaft covering to prevent unnecessary damage to the shaf

Air inlet and outlet openings must be covered to prevent any foreign matter ingress into the fan during transport.

Intermediate storage:

If a motor is not to be commissioned immediately after delivery, it should be stored inside a building in a dry, dust-free and low-vibration room ($V_{\text{eff}} = 0.2\text{mm/s}$).

The electric motors can be stored for a maximun of two years at -30°C to $+60^{\circ}\text{C}$. High storage temperatures up to a max. of $+85^{\circ}\text{C}$ are permitted, but this can, however, lead to the ageing of the gaskets. Direct exposure to incident solar radiation, UV light and ozone can also lead to an ageing of the gaskets and must be avoided !

Please note that the warranty periods commence from the date of delivery. For this reason, we recommend that storage periods be reduced to a minimum.

2.6 Installation conditions, cooling details

Surroundings:

The motor can be installed in roofed over rooms with dusty or damp ambient conditions and normal climatic conditions. The motor must not be brought into contact with aggressive, corrosive, abrasive or plastic-dissolving solutions. Dust filters with micro-filter mats must be interposed where air containing dust particles is used as cooling air.

The warmed-up motor exhaust air – even of adjacent units – must not be taken in again.

Consultation with the motor manufacturer is essential in the case of outside installation.

Ambient conditions comp. **Chap. 2.4** and the technical documentation that comes with the product.

Information on required cooling quantities

The following cooling amounts are required to cool the DS motors:.

DS frame size	100	132	160	200
Min. air quantity [m ³ /min]	≥ 2.4	≥ 5.8	≥ 9.5	≥ 16.5
Min pressure [Pa]	≥ 180	≥ 370	≥ 640	≥ 850

2.7 Balancing, drive elements and vibration



The shaft and bearing must not be exposed to knocks.
No axial forces are permitted when mounting or dismantling the output elements.
The generally required measures to prevent contact with the output elements must be observed.
If the motor is commissioned without the output element, the featherkey must be secured to ensure that it is not thrown out.

Balancing

In the standard version, the rotors are balanced dynamically with half the featherkey inserted.
(In accordance with DIN EN 60034-14 / ISO 1940)

NOTE: The balancing method is marked on the shaft end face:
H = Balancing with half featherkey - standard version
F = Balancing with full featherkey - special version

Output elements:

When assembling the output element, make sure that the correct balancing method is used. The output elements must be balanced in accordance with ISO 1940.

Suitable devices should always be used to push on or pull off the output elements (e.g. coupler disk, gear wheel or belt pulley).

- Use tapped hole at end of shaft.
- When pulling off, use spacer washer for mechanical protection of shaft.
- If necessary, heat the output element.

Caution:

- If the shaft does not have a featherkey, the output elements are fixed to the drive shaft using appropriate clamping bushes.
- In the case of shafts with a featherkey, make sure that the output elements lie against **the shoulder of the shaft**. Note: The chamfer or radius at the output element and the shaft radius at the shoulder (in accordance with DIN748-E) must be harmonised.

Vibration:



The site vibration response of the system, which is determined by the output elements, the mounting conditions, the alignment, the installation and the effects of external vibrations, may cause the vibration values at the motor to increase.

In the interest of reliable motor operation and a long bearing service life, the permitted vibration values in accordance with EN 60034-14 should not be exceeded. Under certain circumstances, the rotor may need to be fully balanced with the output element (in accordance with ISO 140).


The vibration value after assembly must not exceed the permitted rates of acceleration (comp. **Chap. 2.4**)

In the event of deviations from normal operation – e.g. rise in temperature, noises, vibration – disable the motor. Identify the cause and, if necessary, contact the manufacturer.


3 Mounting

3.1 Safety instructions

Before mounting:

	<p>Never mount or commission a damaged electric motor.</p> <p>Never install the electric motor in a damaged machine.</p> <p>Before mounting the electric motor, make sure that it is suitable for your machine.</p>
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During mounting:

	<p>Only mount the motor on the fixing possibilities provided.</p> <p>The motor should not be exposed to knocks, e.g. with a hammer, or shocks when mounting.</p> <p>Make sure that all covers and safety devices are mounted. All safety devices must comply with the latest regulations (e.g. EN 60204).</p> <p>Air cooling:</p> <p>Protective covers must be attached to the air inlet and outlet openings where there is a possibility during operation of foreign matter falling into the fan.</p>
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3.2 Installation, fixing

Prior to and during mounting, check that


- the motor is not damaged (e.g. the shaft sealing ring should not be damaged in any way by sharp objects).
- the motor is not mounted in the danger zone of other facilities.
- the motor is used for the designated purpose. (see chapters 1.2 and 2.4)
(observe nameplate details, warning labels and signs.)
- anti-corrosive agents are fully removed from the shaft ends.
When using standard solvents such as Acetone or benzine, the shaft sealing ring must not be moistened!
- the motor is designed for the ambient conditions and environmental influences on site. (see chapter 2.4)
- the compartment in the machine is suitable for the cooling method employed by the electric motor. (see chapter 2.6)
The motor must be installed in such a way that the coolant lines can definitely be connected.
- the motor can be mounted and operated with the connection data and fixing possibilities provided.
The mounting dimensions of the motor and the tolerance details are provided in the technical documentation.
When mounting the flanges on the motor, make sure that the flange surface rests well and evenly. The supports and bearing surface must be clean and undamaged. They must be precisely aligned with the connecting shafts to prevent the bearing, shafts and housing being exposed to damaging loads through misalignment. When tightening the flange fixing screws, (min. property class 8.8) make sure that the flange connection is not twisted.
- no liquid can penetrate the upper bearing when installing vertically with the shaft end facing upwards.
- the permitted radial forces in accordance with the operating characteristics in the technical documentation are not exceeded. If necessary, contact Baumüller.
The motor manufacturer must always be contacted in the case of axial forces.

(Prior to and during mounting, check that..)

- the brake (optional) can be released after feeding the operating voltage (audible creaking sound).
- the rotor rotates smoothly without making a scraping sound.
If the motor is equipped with a brake, the brake should be released previously.
- the design of the motor and encoder cables complies with the details in the technical documentation.
- the output and input elements are secured.
- the cooling system is functional and protected against any foreign matter that might fall into it
- there is sufficient free space for filter replacement.



3.3 Electrical connections

Important notes:

	<p>All work must be carried out by specially trained personnel.</p> <p>Work must only be carried out when the system has been de-energized and secured against unintentional restarting (also auxiliary circuits).</p> <p>Work may only be carried out once the machine has come to a standstill. In the case of three-phase synchronous motors with permanent-magnet excitation, a voltage of > 60 V can occur at the motor terminals when the rotor is turning.</p> <p>Regulations for working in electrical plants must be adhered to!</p>
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The safety regulations for work in electrotechnical plants in accordance with EN 50110-1 (DIN VDE 0105-100) must be observed:

- Disconnect the system
- Secure against unintentional restarting
- Verify safe isolation from supply
- Earth and short
- Safeguard or cover adjacent live parts

	<p>The electric motor must be operated via a correspondingly designed converter. A direct connection to the three-phase mains can destroy the motor.</p> <p>Ensure that the phase sequence and the pin assignment are correct!</p>
	<p>Electrical connections, protective conductor connections and screening connections (when using screened cables) must be permanently secure!</p> <p>Never touch the contacts of the encoder or thermal sensor with your hands or with tools that are electrostatically charged. The encoder and the thermal sensor are electrostatically sensitive components.</p>

Electrical installation:

- The supplier of the system is responsible for the correct electrical installation.
- The motor data on the nameplate must be observed.
- Connection cables and plug connections must be checked for any occurring voltages and current intensity and must be suitable for the method of installation employed.
- The motor and the modules (brake, encoder, fan etc.) must be connected in accordance with the details in the wiring diagrams (comp. enclosed wiring diagrams / **Appendix 1**).
- Screened power and encoder cables must be used to protect against electromagnetic EMC interference from motor cables and their effect on the encoder and control system. Please refer to the EMC notes provided by the supplier of the converter.
- To enhance operational safety, we recommend that the ready-made connection cables from Baumüller be used.
- Prior to connection, the female connectors, connectors and terminal box must be checked for damage, corrosion, dirt and dampness.
- Make sure that the screwed connections are correct and tight. Check gaskets and faces of connectors and terminal boxes to guarantee protection type.
- Connectors and terminal box connections must not be exposed to mechanical stress. If necessary, provide strain, shearing, twist and antikink relief.

When the power cable is connected via the terminal box, make sure that


- the insulation is not over stripped, i.e. that the insulation extends right up to the cable lugs or terminals. The ends of the cables must not protrude.
- the cable lugs that are used are suitable for the dimensions and cross-sections of the terminals and cables.
- the screwed electrical connections are tightened in accordance with the specified tightening torque. (comp. **Appendix 1** and technical documentation on the product)
- the protection type is maintained.

Note: All lead-ins that are not used must be closed off with the sealing caps. The sealing elements must be fully functional and undamaged when closing the terminal box.



4 Commissioning, operation

4.1 Safety instructions


Working on the electric motor:

	<p>Work must not be carried out on the electric motor until the motor had come to a standstill and is de-energized. All connections, such as screw connections, that were loosened must be tightened again prior to commissioning.</p> <p>When carrying out work on the motor, please observe the technical instructions and notes in the respective chapters in these Commissioning and Manitenance Instructions.</p>
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Danger to life through electrical shock:

 	<p>Make sure that the motor is disconnected and de-energized.</p> <p>Never disconnect the motor connections while in operation.</p> <p>Only connect measuring device when motor is disconnected from power supply and de-energized.</p> <p>Only commence work on the motor connections when you are sure that the motor is de-energized and that there is no electric potential.</p> <p>When in operation, electric potential can be found at the motor terminals/contacts and at the motor windings. Never touch these modules/elements while the motor is in operation.</p>
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Dismantling the safety devices:

	<p>The electric motor must not be commissioned without first mounting the safety devices.</p> <p>When dismantling safety equipment during commissioning, ensure that the machine is taken out of commission.</p> <p>Remount the safety devices immediately after completing commissioning.</p>
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Danger on contact:


 	<p>Make sure that the electric motor has come to a standstill and is secured against accidental restarting before you touch it.</p> <p>Only touch the drive shaft when it is de-energised and the motor has come to a standstill. Otherwise, danger through rotating rotor.</p> <p>Danger of burns! Never touch the motor housing when motor is running at rated load. Surface temperatures can rise up to 70°C.</p>
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4.2 Checks prior to commissioning

- The drive is undamaged and is not located within the danger zone of other equipment
- The motor is correctly aligned and fixed. All screwed connections are correctly tightened.
- All the appropriate safety devices (mechanical, thermal and electrical) are mounted.
- The motor connections have been carried out correctly.
- The protective conductor system is correct and its functionality has been checked.
- The lines and cables do not come into contact with the motor surface.
- The drive does not block (release brake, if applicable).
- Emergency OFF functions have been checked.
- The fan has been properly connected and its functioning checked.
- The direction of fan wheel rotation is identical to the identified direction of arrow.

4.3 Commissioning, operation

Note on the brake functions (if brake is fitted):

	<p>The brake is a holding brake with an emergency STOP function. (power cut, emergency stop)</p> <p>The brake must not be used as a working brake.</p>
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Commissioning must be carried out exclusively by qualified personnel

Please refer to the commissioning instructions for the converter and the cooling system.

Checks during commissioning




- Release brake, if applicable.
- Has the functionality of all motor modules such as the brake, encoder, cooling system been checked and are the utilization conditions being adhered to?
- Have all electrical connections been carried out and fixed as required by the regulations. (Refer to wiring diagrams / Appendix 1)
- Have all protection measures that eliminate the possibility of contact with live parts, hot surfaces, rotating and moving parts been observed and are these measures fully functional.
- Have all output elements been mounted and set in accordance with the manufacturer's instructions.
- Are measures in place to ensure that the max. permitted speed n_{max} of the motor cannot be exceeded. The max. permitted speed n_{max} is the highest permitted operating speed for short-time duty.

Checks during operation

- Watch out for unusual noises.
- If scraping, scratching or grinding noises occur, stop the motor immediately and locate the cause.
- Check the motor surface and connection cables for dirt, e.g. layers of dust, oil deposits, dampness and leaks etc.
- Check air inlet and outlet openings and any interposed filters for dirt accumulation
- Check the maintenance intervals.

4.4 Malfunctions

Safety instructions:

	Troubleshooting and error recovery may only be carried out by qualified personnel. Do not disconnect any of the safety devices – even during test operations Only disconnect coolant pipes when depressurized
	Only disconnect and connect electrical connection cables when in de-energized and protected condition Observe the 5 safety rules for “Disconnecting” (comp. Section 3.3).
	Beware of hot surfaces!

In the event of a malfunction

- refer to the operating instructions of the machine/system
- refer to the operating instructions for the converter
- If necessary, contact the manufacturer of the motor or converter

Have the following parameters ready:

nameplate data
type and scope of malfunction
circumstances leading up to the malfunction
application data (torque cycle, speed and forces over time; ambient conditions)


The following selection possible causes can be helpful in the fault correction process:

Fault	Cause	Recovery
Motor does not start	No controller enable Controller error, encoder error Brake does not release Brake defect No power supply Rotating field	Activate controller enable Read out error list at converter or controller, rectify error Check connections and power supply Repair by manufacturer Check connections and power supply Check phase sequence, if necessary, replace connecting cables
Uneven running	Insufficient screening on connecting cables Controller parameters too high	Check screening connection and grounding Optimise controller parameters
Vibrations	Coupling element or work machine poorly balanced Inadequate alignment of the drive train Fixing screws loose	Rebalance Realign machine set Check and tighten screwed connections

Fault	Cause	Recovery
Running noises	Foreign matter in motor Damaged bearing	Repair by motor manufacturer Repair by motor manufacturer
Temperature rise in motor Motor temperature monitoring unit responds	Drive overloaded Brake does not release fully - scraping brake Air cooling not active. Fan wheel blocked Air supply inadequate due to ... - Shortcircuit in air flow (exhaust air taken in again) - Filter urgently requires cleaning - Deposits in cooling channels	Check motor load and compare with nameplate Repair by motor manufacturer Check and, if necessary, switch on Remove foreign matter Check air circuit and... - change air flow arrangement - check and, if necessary, clean - check and, if necessary, clean
Current consumption too high, motor torque too low	Indexing angle incorrect	Check indexing angle and adjust if necessary

5 Inspection and maintenance

Working on the electric motor:

	<p>Work must not be carried out on the electric motor until the motor has come to a standstill, is de-energized, depressurised and has cooled. All connections, such as screw connections, that were loosened must be tightened again after the inspection or maintenance work.</p> <p>When carrying out work on the motor, please observe the technical instructions and notes in the respective chapters in these Commissioning and Maintenance Instructions.</p> <p>When carrying out maintenance work, observe all safety instructions which also apply for the commissioning of the motor (comp. Section 4.1)</p> <p>Attention: the optional holding brake does not have a securing function when work is being carried out on the motor (e.g. holding loads)!</p>
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5.1 Inspection

Depending on the pollution severity on site, cleaning will have to be carried out regularly on surfaces, air channels and filters to guarantee the continuous dissipation of heat loss.

If equipped with the optional brake, certain abrasion limits are specified (e.g. max. permitted ventilation slot, limited emergency braking). The degree of abrasion must be checked on a regular basis. The brake must be replaced on reaching the permitted abrasion limit (comp. Section 5.2)

If equipped with the optional shaft sealing ring, this must be checked regularly to ensure that it is functioning correctly (leaks).

5.2 Maintenance

Depending on the operating conditions, (e.g. mode, temperature, speed and load), the service life of the bearings and sealing elements can differ greatly.

In the case of troublefree operation, we generally recommend the following maintenance procedures:

- replacement of the bearings after 20,000 running hours (The bearings are designed for a calculated service life of 20,000 running hours)
- replacement of the shaft sealing ring, if provided, and if no leaking is detected in the course of previous inspections, after approx. 5,000 running hours.

If equipped with the optional brake, this must be replaced when the specified abrasion limits have been reached.

Maintenance work must be carried out by Baumüller or a specialist company that is commissioned by Baumüller.

The maintenance activities for which the user is responsible, include:

- the cleaning of motor surfaces and air channels
- the replacement or cleaning of filter mats when using dust filters
- the regreasing of the bearings at the drive and non-drive ends if regreasing was specified as mandatory.

As a rule, dust filters should be cleaned or replaced after 100 operating hours. The maintenance intervals must be shortened accordingly on high dirt accumulations.

Dry dirt accumulations on filters can be removed by suction, blowing or beating. Wet dirt accumulations on filters can be rinsed off under lukewarm water and commercial detergents before allowing the filters to dry.

Note: Only original replacement filters from the motor manufacturer should be used as filter mat replacements. These are available from Baumüller, specifying motor or article number (refer nameplate).

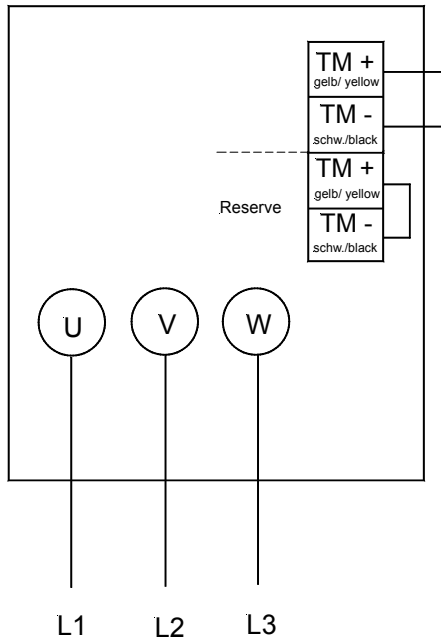
6 Disposal

The motor must be disposed of in accordance with the national and local regulations within the framework of the normal recycling process.

The encoder electronics (if provided) must be disposed of in the proper manner as electronic scrap.

7 Appendix 1

Terminal marking / Main connection:



U V W -----Power connection

TM + TM - -----Thermal sensor

Caution:

If using the thermal sensor KTY 84, attention will have to be paid to the polarity during connection.

Connection assignment / Main connection

The cable inlets of the terminal boxes and the main connection terminals are listed in Table 1 together with the permitted tightening torque.

We recommend EMC screwed fittings for the cable inlets.

It is recommended when tightening the terminal screw to support against the conductor to prevent mounting rail deformation and to keep the terminal base free of torsional forces.

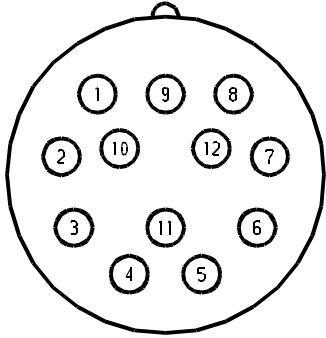
Motor frame size	Cable gland	Number of main connection terminal	Tightening torque for terminals [Nm]
100	1 x M 40 + 1 x M 16	3 x M 8	6
132	3 x M 40 + 2 x M 25 + 2 x M 20	3 x M 10	10
160	2 x M 63 + 2 x M 25	3 x M 12	15,5
200	2 x M 75* + 1 x M 25	3 x M 16	30

* terminal box screening led into terminal in terminal box.

Composition: terminal box designs

Other cable glands and connection terminals are only available on request.

Pin assignment / Resolver connection:

	1	cos -
	2	
	3	
	4	
	5	sin -
	6	sin +
	7	
	8	cos +
	9	
	10	Ref +
	11	
	12	Ref -

View to contact side of female connector

Connection assignment / Resolver

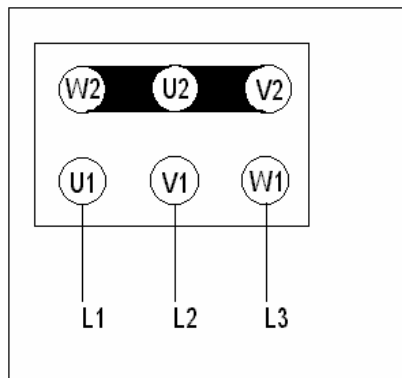
Other encoder types:

Pin assignment corresponds to enclosed wiring diagram or technical documentation.

Terminal marking / fan connection

Fan connection for standard fan motor via terminal box

Connection diagram



U V W Power connection

Axially added-on standard fan motor

Frame Size	Rated current [A] with Y
100	0,33
132	0,8
160	1,4

Radially added-on standard fan motor

Frame Size	Rated current [A] with Y
200	1,4

The standard fan motor serial design is for D/Y 200-265/345-460V 50/60Hz. The rated currents are the maximum values.

Warranty and liability

All the details in this documentation are unbinding customer information and subject to ongoing change and will be continuously updated by our permanent editing staff. Warranty and liability claims against Baumüller Nürnberg GmbH are excluded if, in particular, the damage is caused by one or more of the following:

- You have not followed the instructions in this documentation.
- You have not used the system for the purpose intended.
- You have
 - mounted, installed, commissioned, operated the system incorrectly or have not carried out the required maintenance
 - permitted the system to be mounted, installed, operated and/or maintained by unqualified or insufficiently qualified personnel,
 - overloaded the system,
 - operated the unit with
 - faulty safety devices,
 - safety devices that were incorrectly fitted or not fitted
 - safety devices or protective devices not in proper working order,
 - not operated the system in the stipulated ambient conditions.
- You have modified the system without the written approval of Baumüller Nürnberg GmbH.
- You have not observed the instructions concerning maintenance in the component descriptions.
- You have not monitored parts subject to wear sufficiently.
- You have made a repair incorrectly.
- You have combined the system with the products from other manufacturers in an improper manner.
- You have combined the drive system with faulty and/or incorrectly documented products from another manufacturer.

The "General Terms and Conditions of Sale" Version 1.1 of 15 February 2002 or the latest version drawn up by Baumüller Nürnberg GmbH always apply.

These are available to you, at latest, on the conclusion of the contract.

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