

INTELLIGENT DRIVESYSTEMS, WORLDWIDE SERVICES



B 1091 – en

Motors

Operating and Assembly Instructions





Safety and operating instructions for electric motors

(according to: Low Voltage Directive 2006/95/EEC (as of 20/04/2016: 2014/35/EU)

1 General

During operation, devices may, depending on their protection class, have live, bare, moving or rotating parts or hot surfaces.

Unauthorised removal of covers, improper use, incorrect installation or operation causes a risk of serious personal injury or material damage.

Further information can be found in this documentation.

All transportation, installation commissioning and maintenance work must be carried out by qualified personnel (compliant with IEC 364 or CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110 and national accident prevention regulations).

For the purposes of these basic safety instructions, qualified personnel are persons who are familiar with the assembly, installation, commissioning and operation of this product and who have the relevant qualifications for their work.

2. Proper use in Europe

The devices are components intended for installation in electrical systems or machines.

When installed in machines, the devices must not be commissioned (i.e. commencement of the proper use) until it has been ensured that the machine meets the provisions of the EC Directive 2006/42/EEC (Machinery Directive); EN 60204 must also be complied with.

Commissioning (i.e. implementation of proper use) is only permitted if the EMC directive (2004/108/EEC) is complied with (as of 20/04/2016: 2014/30/EU).

Devices with a CE label meet the requirements of the Low Voltage Directive 2006/95/EEC (as of 20/04/2016: 2014/35/EU). The stated harmonized standards for the devices are used in the declaration of conformity.

Technical data and information for connection conditions can be found on the rating plate and in the documentation, and must be complied with.

The devices may only be used for safety functions which are described and explicitly approved.

3. Transport, storage

Information regarding transport, storage and correct handling must be complied with.

4. Installation

The installation and cooling of the equipment must be implemented according to the regulations in the corresponding documentation.

The devices must be protected against impermissible loads. Especially during transport and handling, components must not be deformed and/or insulation distances must not be changed.

Electrical components must not be mechanically damaged or destroyed (this may cause a health hazard!).

5. Electrical Connection

When working on live devices, the applicable national accident prevention regulations must be complied with (e.g. BGV A3, formerly VBG 4).

The electrical installation must be implemented according to the applicable regulations (e.g. cable cross-section, fuses, earth lead connections). Further instructions can be found in the documentation.

Information regarding EMC-compliant installation – such as shielding, earthing, location of filters and installation of cables – can be found in the documentation for the devices. These instructions must be complied with even with CE marked devices. Compliance with the limiting values specified in the EMC legal regulations is the responsibility of the manufacturer of the system or machine.

6. Operation

Where necessary, systems in which the devices are installed must be equipped with additional monitoring and protective equipment according to the applicable safety requirements, e.g. legislation concerning technical equipment, accident prevention regulations, etc.

The parameterisation and configuration of the devices must be selected so that no hazards can occur.

All covers must be kept closed during operation.

7. Maintenance and repairs

The following applies in particular for operation with frequency inverters:

After the devices are disconnected from the power supply, live equipment components and power connections should not be touched immediately, because of possible charged capacitors. Observe the applicable information signs located on the device.

Further information can be found in this documentation.

These safety instructions must be kept in a safe place!

Documentation

Title: B 1091
Order no.: 6051302
Series: Asynchronous motors / synchronous motors

• **Single and three-phase asynchronous motors**
SK 63^{*1}/_{*2} ^{*3} to SK 315^{*1}/_{*2} ^{*3}


- 1) Power labelling: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W
 - optionally supplemented with: H, P
- 2) Pole number labelling: 2, 4, 6, 8, ...
- 3) Further options

• **Three-phase synchronous motors**
SK 63^{*1}/_{*2}/_{*3} ^{*4} to SK 132^{*1}/_{*2}/_{*3} ^{*4}

- 1) Winding version: T, F, ...
- 2) Power number: 1 to 9
- 3) Pole number labelling: 4, 6, 8, ...
- 4) Further options


• **Three-phase asynchronous motors**
SK 63^{*1}/_{*2} 2D ^{*3} to SK 200^{*1}/_{*2} 2D ^{*3}

- 1) Power labelling: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W
 - optionally supplemented with: H, P
- 2) Pole number labelling: 2, 4, 6
- 3) Options

with ATEX labelling  II 2D Ex tb IIC T . . . °C Db

SK 63^{*1}/_{*2} 3D ^{*3} to SK 250^{*1}/_{*2} 3D ^{*3}

- 1) Power labelling: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W
 - optionally supplemented with: H, P
- 2) Pole number labelling: 2, 4, 6
- 3) Options

with ATEX labelling  II 3D Ex tc IIIB T . . . °C Dc

SK 63^{*1}/_{*2} 2G ^{*3} to SK 200^{*1}/_{*2} 2G ^{*3}

- 1) Power labelling: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W
 - optionally supplemented with: H, P
- 2) Pole number labelling: 2, 4, 6
- 3) further options

with ATEX labelling  II 2G Ex eb IIC T3 Gb

SK 63^{*1}/_{*2} 3G ^{*3} to SK 200^{*1}/_{*2} 3G ^{*3}

- 1) Power labelling: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W
 - optionally supplemented with: H, P
- 2) Pole number labelling: 2, 4, 6
- 3) further options

with ATEX labelling  II 3G Ex ec IIC T3 Gc

Version list

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1 General

These operating instructions must be read before NORD motors are transported, installed, commissioned, serviced or repaired. All persons who are involved in these tasks must observe these operating instructions. In order to prevent injury or damage, all of the safety information in these operating instructions must be strictly observed.

The information and instructions in the instructions, safety and commissioning information which is supplied, as well as all other instructions must be observed.

This is essential to prevent injury and damage.

The applicable national, local and plant-specific regulations and requirements and regulations must be observed.

Technical details may vary for special designs and constructions. In case of doubt, we urgently recommend that the manufacturer is contacted, giving details of the type designation and the motor number.

Qualified personnel are persons who due to their training, experience and instruction, and their knowledge of the relevant standards, accident prevention regulations and operating conditions are authorised to carry out the necessary activities.

This also includes knowledge of first aid measures and the local emergency services.

It is assumed that the work for transport, assembly, installation, commissioning, maintenance and repair will be performed by qualified staff.

In particular, the following must be observed:

- Technical data and information regarding permissible use, installation, connection, ambient and operating conditions, which are contained in the catalogue, the order documents and other documentation for the product.
- Local and plant-specific regulations and requirements
- Correct use of tools, lifting and transportation equipment
- Use of personal protective equipment

For reasons of clarity, the operating instructions do not contain detailed information about possible versions and therefore do not consider all possible cases of installation, operation or servicing.

Because of this, these operating instruction essentially only contain the information which is necessary for proper use by qualified personnel.

In order to prevent faults it is necessary that the prescribed service and inspection work is carried out by appropriately qualified personnel.

- For the operation on an inverter, the planning guideline B1091-1 forms a part of these operating instructions.
- The supplementary operating instructions must be observed if an external fan is present.
- For braking motors, the supplementary brake operating instructions must be observed..

If the operating instructions or the planning guide are lost for any reason, these documents must be obtained from NORD.

1.1 Safety and installation notes

The devices are operating materials intended for use in industrial high voltage systems, and are operated at voltages that could lead to severe injuries or death if they are touched.





The device and its accessories must only be used for the purpose which is intended by the manufacturer. Unauthorised modifications and the use of spare parts and additional equipment which has not been purchased from or recommended by the manufacturer of the device may cause fire, electric shock and injury.

All of the associated covers and protective devices must be used.

Installation and other work may only be carried out by qualified electricians with strict adherence to the operating instructions. Therefore keep these Operating Instructions at hand, together with all supplementary instructions for any options which are used, and give them to each user.

Local regulations for the installation of electrical equipment and accident prevention must be complied with.

1.1.1 Explanation of labels used

 DANGER	Indicates an immediate danger, which may result in death or serious injury.
 WARNING	Indicates a possibly dangerous situation, which may result in death or serious injury.
 CAUTION	Indicates a possibly dangerous situation, which may result in slight or minor injuries.
NOTICE	Indicates a possibly harmful situation, which may cause damage to the product or the environment.
 Note	Indicates hints for use and useful information.

1.1.2 List of safety and installation notes

DANGER!

Electric shock

The motor is operated with a dangerous voltage. Touching certain conducting components (connection terminals and supply cables) will cause electric shock with possibly fatal consequences.

Even when the motor is at a standstill (e.g. due to the electronic block of a connected frequency inverter or a jammed drive unit) the connection terminals and supply cables may carry a dangerous voltage. A motor standstill is not identical to electrical isolation from the mains.

Even if the drive unit has been disconnected from the mains, a connected motor may rotate and possibly generate a dangerous voltage.

Installation and work must only be carried out when the motor is at a standstill and is **disconnected** (all phases disconnected from the mains).

Follow the **5 Safety Rules** (1. Switch off the power, 2. Secure against switching on, 3. Check for no voltage, 4. Earthing and short circuiting, 5. Cover or fence off neighbouring live components).

WARNING

Hazard due to heavy loads

The large weight of the motor must be taken into account during any transportation or installation work.

Incorrect handling may cause the motor to fall or swing without control and therefore cause severe, and possibly fatal injuries due to impact, crushing and other physical injuries. In addition, severe damage to the motor and its surroundings are possible.

Therefore:

- Do not stand under suspended loads
- Only use the attachment points provided
- Check that lifting equipment and lashings have an adequate load capacity and are undamaged
- Avoid hectic movements
- Use personal protective equipment

WARNING

Injury due to movement

Under certain conditions (e.g. switching on the power supply, releasing a holding brake) the motor may start to move. The machinery which it drives (press / chain hoist / roller / fan etc.) may then make an unexpected movement. This may cause various injuries, including to third parties.

Before switching on, secure the danger area by warning and removing all persons from the danger area.

WARNING

Hazard due to loose parts

Care must be taken that there are no loose parts on the motor. Otherwise, these may cause injury during transportation and installation work, or when the motor is in operation.

Loose carrying or lifting eyes may cause the motor to fall during transportation.

Parallel keys on the motor shaft may be thrown out when the motor shaft rotates.

Fasten or remove loose parts and carrying or lifting eyes; secure or remove free parallel shaft keys on the motor shaft(s).

⚠ CAUTION**Danger of burns**

The surface of the motor may heat up to temperatures in excess of 70°C.

Touching the motor may cause local burns to the affected parts of the body (hands, fingers, etc.).

To prevent such injuries, allow sufficient time for cooling down before starting work - the surface temperature should be checked with suitable measuring equipment. In addition, keep sufficient distance from adjacent components during installation, or install protection against contact.

1.2 Field of use

Use of the motors:

The motors may only be used for their intended purpose (to drive machinery).

The motors are constructed with at least protection class IP55 (for the protection class: see rating plate). They may be installed in dusty or damp environments.

In principle the conditions of use and the ambient conditions determine the necessary protection class and any other additional measures. For outdoor installation and vertical versions, e.g. V1 or V5 with the shaft pointing downwards, Getriebebau NORD recommends the use of the double fan cover option [RDD].

Motors must be protected against intensive sunlight, e.g. by the use of a protective cover. The insulation is tropicalised.

Installation altitude: ≤ 1000 m

Ambient temperature: $-20^{\circ}\text{C} \dots +40^{\circ}\text{C}$

For standard motors an extended ambient temperature range from $-20^{\circ}\text{C} \dots +60^{\circ}\text{C}$ is permissible.. In this case, the rated power must be reduced to **82%** of the value stated in the catalogue. If the maximum ambient temperature is between $+40^{\circ}\text{C}$ and $+60^{\circ}\text{C}$, the power output should be inversely linearly interpolated between **100%** and **82%**.

The motor connection cables and the cable glands must be suitable for temperatures $\geq 90^{\circ}\text{C}$.

1.3 Correct handling of electric motors

All work must only be carried out with the power to the system switched off.

1.3.1 Transport, storage



WARNING

Danger of falling

Incorrect handling during transport may cause the motor to fall or swing without control and therefore cause severe, and possibly fatal injuries due to impact, crushing and other physical injuries. In addition, severe damage to the motor and its surroundings are possible.

Therefore:

- Use all available carrying eyes on the motor during transport
- Do not attach any additional loads. The lifting eyes are only designed for the weight of the motor
- Only use the intended carrying eyes or bolts for transporting attached machinery (e.g. gear unit attachments)
- Sets of machinery must not be lifted by suspension from the individual machines.

To prevent damage to the motor, the motor must always be used with suitable lifting equipment. The roller bearings should be replaced if the time from delivery to commissioning of the motor exceeds 4 years in good conditions (storage in dry, dust and vibration-free areas). This time is greatly reduced in case of unfavourable conditions. If necessary, unprotected machined surfaces (flange surfaces, shaft ends) must be treated with corrosion inhibitors. If necessary, the insulating resistance of the windings must be checked (📖 1.3.8 "Checking the insulation resistance").

Changes in comparison with normal operation (higher current consumption, higher temperatures or vibrations, unusual noises or smells, triggering of monitoring devices, etc.) are indications that the function is impaired. To prevent injury and damage, the responsible maintenance personnel must be informed of these changes.

In case of doubt, switch off the motor as soon as the state of the plant permits.

1.3.2 Installation

- After installation, screwed-on lifting lugs must be tightened or removed.
- Smooth running: Precise alignment of the clutch and a well-balanced drive element (clutch, pulleys, fan, etc.) are prerequisites for smooth vibration-free running.
- Complete balancing of the motor and the drive elements may be necessary.
- The top section of the terminal box and the position of the terminal box can be rotated by 4 x 90 degrees.
- Even if not required, on IEC B14 motors **all four** fixing screws, must be screwed into the flanged bearing plate! The fixing screw threads must be inserted with a sealant, e.g. Loctite 242.



WARNING

Electric shock

The **maximum** depth for screwing into the type plate is **2 x d**. There is a danger that the motor windings may be damaged if longer screws are used. This creates a danger of potential transfer to the housing and danger of electric shock if touched.

- The motor must be inspected for damage before installation and commissioning. A damaged motor must not be commissioned.
- Rotating shaft ends and unused shaft ends must be protected against contact. Unused parallel shaft keys must be secured against being thrown out.
- The motor must be suitable for the installation location. (requirements prescribed by standards, ambient conditions, installation altitude)
- Motor surfaces may become very hot during operation. Suitable protective measures must be taken if there is a danger of contact or a hazard to the vicinity of the installation.

1.3.3 Balancing, drive elements

The fitting and removal of drive elements (clutch, pulley, gear wheel,...) must be performed with suitable equipment. As standard the rotors are balanced with half key balancing. **The appropriate form of balancing must be observed if drive elements are installed on the motor shaft. Drive elements must be balanced according to ISO 1940.**

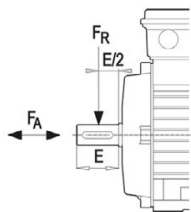
The generally required measures for protection against touching the drive elements must be observed. If a motor is started without a drive element, the parallel key must be secured against being thrown out. This also applies for any second shaft end. Alternatively, the parallel shaft key must be removed.

1.3.4 Alignment

In particular with direct coupling, the motor shafts and the driven machine must be axially and radially aligned to each other. Incorrect alignment may result in damage to the bearings, excessive vibration and breakage of the shaft.

1.3.5 Output shafts

The maximum permissible axial (F_A) and radial forces (F_R) for the A side end of the motor shaft can be obtained from the table below. Getriebbau NORD should be consulted if the radial force (F_R) is applied at a distance which is greater than the length $E/2$.



Type	F_R [N]	F_A [N]
63	530	480
71	530	480
80	860	760
90	910	810
100	1300	1100
112	1950	1640
132	2790	2360
160	3500	3000
180 .X	3500	3000
180	5500	4000
200 .X	5500	4000
225	8000	5000

No axial (F_A) and radial forces (F_R) are permissible for the B side shaft end.

NOTICE! Attachments must not cause rubbing (danger of excessive temperatures and sparking) or impair the necessary flow of cooling air.

1.3.6 Electrical connection

The connection cables must be passed through the cable glands in the terminal box. The terminal box must be sealed against dust and water. The mains voltage and frequency must conform to the data on the rating plate. $\pm 5\%$ voltage or $\pm 2\%$ frequency deviations are permissible without reduction of the power. The connection and configuration of the jumpers must be made according to the circuit diagram in the terminal box.

Please refer to the following table for the labelling of the auxiliary terminals

Auxiliary terminal designation		
Additional equipment	Labelling of auxiliary terminals New: EN 60034-8	Comments
Thermistor Option: TF	TP1 – TP2 1TP1 – 1TP2 2TP1 – 2TP2 3TP1 – 3TP2 4TP1 – 4TP2 5TP1 – 5TP2	Switch-off Warning Winding 1 Switch-off Winding 1 Warning Winding 2 Switch-off Winding 2 Brake
Bi-metal temperature sensor Normally closed Option: TW	1TB1 – 1TB2 2TB1 – 2TB2 3TB1 – 3TB2 4TB1 – 4TB2	Warning Winding 1 Switch-off Winding 1 Warning Winding 2 Switch-off Winding 2
Bi-metal temperature sensor, normally open	1TM1 – 1TM2 2TM1 – 2TM2 3TM1 – 3TM2 4TM1 – 4TM2	Warning Winding 1 Switch-off Winding 1 Warning Winding 2 Switch-off Winding 2
PT100	1R1 – 1R2 2R1 – 2R2 3R1 – 3R2	Winding 1 (Phase U) Winding 1 (Phase V) Winding 1 (Phase W)
KTY Silicon temperature sensor	(+) 4R1 – 4R2 (-) (+) 5R1 – 5R2 (-)	Winding 1 Winding 2
Standstill heating Option: SH	1HE1 – 1HE2 2HE1 – 2HE2	Motor heater Brake heater
Capacitor Motor version: EAR/EHB/EST	1CA1 – 1CA2 2CA1 – 2CA2 3CA1 – 3CA2 4CA1 – 4CA2	with operating capacitor 1 with operating capacitor 2 with starting capacitor 1 with starting capacitor 2
Direct current brake Option: BRE...	BD1 – BD2	
Option: DBR...	Brake1: BD1-BD2 Break2: BD3-BD4	

1.3.7 Operation with frequency inverter

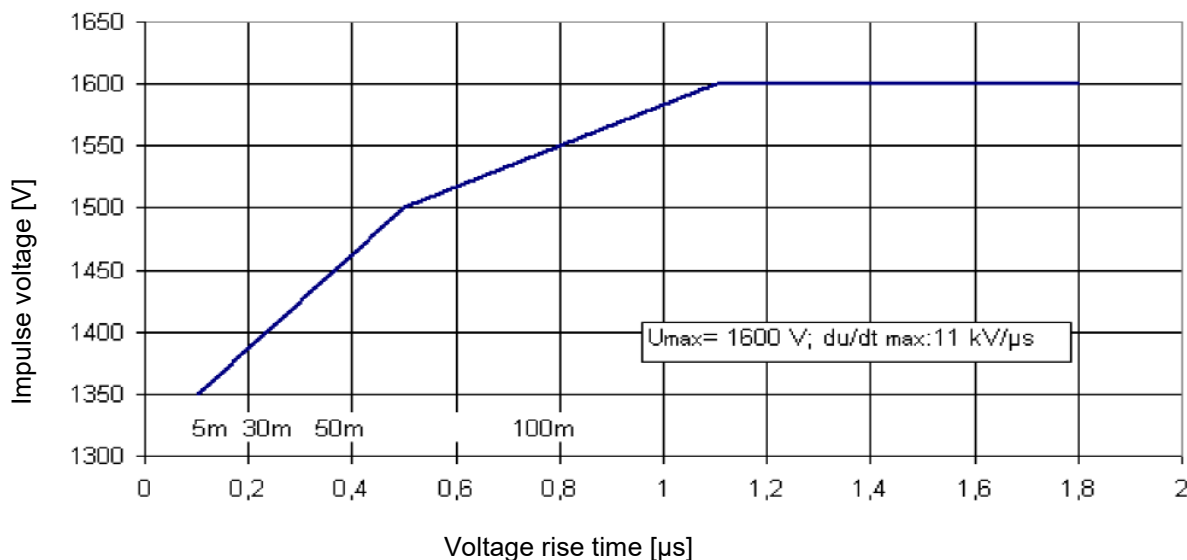
Type SK 63 ./. – SK 225 ./. three phase asynchronous motors are qualified for operation with link circuit inverters according to DIN EN 60034-18-41 (2014).

Please also observe the operating instructions for the frequency inverter which is used.

The insulation system used by NORD consists of suitable varnished copper wire, phase insulation, homogeneous impregnation and groove lining as insulation against earth, and in the standard version is designed for the increased requirements for link circuit inverters.

The maximum permissible FI input voltage is 500 V +10%. Link circuit voltages in excess of 750 V DC are not permissible. When the motor is warm due to operation, the peak voltages due to the system, the inverter, the cable or the motor must not exceed the following values.

Permissible impulse voltages depending on voltage rise-time



If the values are outside of the permissible range, du/dt or sine wave filters may be used (not the additional voltage drop).

The cable lengths shown in the diagram are for guidance only and may deviate according to the specific conditions.

For additional information for operation with a frequency inverter, especially with regard to information about the maximum speed, thermal design and possible torques, please refer to the current NORD motor catalogue M7000.

1.3.8 Checking the insulation resistance

Prior to initial commissioning of the motor after a long period of storage or standstill (approx. 6 months) the insulation resistance of the windings must be checked. During and immediately after the measurements, the terminals have voltages which can be dangerous, and must not be touched.

Insulation resistance

The insulation resistance of new, cleaned, repaired windings against the housing and against each other is $> 200 \text{ M}\Omega$.

Measurement

The insulation of the windings against the housing for operation voltages up to 400 V must be measured with 500 V DC. For operating voltages up to 725 V the measurement must be made with 1000 V DC. The temperature of the windings should be $25^\circ\text{C} \pm 15^\circ\text{C}$.

Testing

If the minimum insulation resistance of the winding against earth is less than $50 \text{ M}\Omega$, this may be due to moisture. The windings must then be dried.

The insulation resistance may reduce after long periods of operation. As long as the measured value does not fall below the calculated value for the critical insulation resistance of $< 50 \text{ M}\Omega$, operation of the motor may continue. If the value is less than this, the cause must be established and if necessary the windings or parts of the windings must be repaired, cleaned or dried.

1.3.9 Commissioning

Information

Electromagnetic compatibility

NORD motors comply with the EU-Directive 2014/30/EU. Assembly or installation work must not cause impermissible interference. Immunity from interference must still exist.

Production of interference: In cases of large differences of torque (e.g. when driving a piston compressor) a non-sine wave motor current is induced, whose harmonics can cause an impermissible effect on the mains and therefore impermissible production of interference.

With supply by frequency inverters, various strengths of interference are produced according to the design of the frequency inverter (type, interference suppression, manufacturer). The EMC information of the inverter manufacturer must be observed. If a shielded motor supply cable is recommended, the shielding is most effective if a large area is electrically connected to the metal terminal box of the motor (with metal EMC cable gland). With motors with integrated sensors (e.g. thermistors) interference voltages due to the inverter may be produced in the sensor cables.

Interference immunity: For motors with integrated sensors (e.g. thermistors) the operator must ensure adequate immunity to interference by the selection of a suitable sensor cable (possibly with screening, with connection as for the motor supply cable) and evaluation device. The information and instructions in the operating instructions for the inverter and all other instructions must be observed before commissioning. After installation of the motor, it must be checked for correct functioning. In the case of brake motors, the correct function of the brake must also be checked.

1.3.10 Disposal

NOTICE

Environmental damage

Incorrect disposal of the product may cause damage to the environment.

- Ensure correct disposal
 - Comply with current local regulations
-

Content: aluminium, iron, electronic components, copper

Please observe the additional documentation for the attachments

2 Maintenance and servicing

DANGER!

Electric shock

The motor is operated with a dangerous voltage. Touching certain conducting components (connection terminals and supply cables) will cause electric shock with possibly fatal consequences.

Even when the motor is at a standstill (e.g. due to the electronic block of a connected frequency inverter or a jammed drive unit) the connection terminals and supply cables may carry a dangerous voltage. A motor standstill is not identical to electrical isolation from the mains.

Even if the drive unit has been disconnected from the mains, a connected motor may rotate and possibly generate a dangerous voltage.

Installation and work must only be carried out when the motor is at a standstill and is **disconnected** (all phases disconnected from the mains).

Follow the **5 Safety Rules** (1. Switch off the power, 2. Secure against switching on, 3. Check for no voltage, 4. Earthing and short circuiting, 5. Cover or fence off neighbouring live components).

WARNING

Injury due to movement

Under certain conditions (e.g. switching on the power supply, releasing a holding brake) the motor may start to move. The machinery which it drives (press / chain hoist / roller / fan etc.) may then make an unexpected movement. This may cause various injuries, including to third parties.

Before switching on, secure the danger area by warning and removing all persons from the danger area.

2.1 Safety measures

Before starting any work on the motor or the device, but especially before opening the covers of active components, the motor must be isolated according to regulations. In addition to the main power circuits, any additional or auxiliary circuits must be taken into account.

The usual "5 Safety Rules" e.g. according to DIN VDE 0105 are:

- Disconnect
- Secure to prevent reactivation
- Check for no voltage on all poles
- Earth and short circuit
- Cover or cordon off adjacent live components

These measures may only be removed when the maintenance work is complete.

Motors must be properly inspected at regular intervals; current national standards and regulations must be complied with. In particular, special attention must be paid to any mechanical damage, free path of the cooling air, abnormal noises and correct electrical connection.

Only original parts may be used as spare parts with the exception of standardised, commercially available and equivalent parts.

Swapping parts between motors of the same type is not permissible.

i Information

Condensation outlets

If the motors are designed with closed condensation outlets, these must be opened occasionally in order to allow any accumulated condensation to drain off. Condensation outlets must always be located at the lowest point of the motor. During installation of the motor care must be taken that the condensation outlets point downwards and are closed. Open condensation outlets cause a reduction of the protection class.

2.2 Bearing replacement intervals

Under normal operating conditions, with horizontal installation of the motor, depending on the coolant temperature and the motor speed, the bearing replacement interval [h] for IEC motors is:

	25°C	40°C	60°C
up to 1,800 rpm	approx. 40,000 h	approx. 20,000 h	approx. 8,000 h
up to 3,600 rpm	approx. 20,000 h	approx. 10,000 h	approx. 4,000 h

Under special operating conditions, e.g. vertical motor installation, large stresses due to vibration and shock, or operation with frequent reversing, the operating hours stated above are significantly reduced.

2.3 Maintenance intervals

The motor must be checked weekly, or every 100 operating hours for unusual running noise and/or vibrations.

Please check the roller bearings at an interval of at least 10,000 h and replace them as required. In addition, the electric connections, cables and wires as well as the fan are firmly fastened and free from damage. Furthermore, the function of the insulation system must be checked.

Replace the shaft sealing rings every 10,000 hours.

The surface of the motor must not have any dirt deposits which could impair cooling.

A general overhaul of the motor must be carried out every 5 years.

2.4 General overhaul

For this the motor must be dismantled. The following work must be carried out:



- All components of the motor must be cleaned
- All components of the motor must be examined for damage
- All damaged components must be replaced
- All roller bearings must be replaced
- All seals and shaft sealing rings must be replaced



The general overhaul must be carried out by qualified personnel in a specialist workshop with appropriate equipment. We urgently recommend that the general overhaul is carried out by NORD Service.

If the drive unit is subjected to special operating conditions, the intervals stated above may be considerably reduced.

3 ATEX Explosion hazard areas



3.1 Motors with increased ignition protection, type Ex eb

 DANGER!	Explosion hazard
	<p>All work must only be carried out with the machine at a standstill and the power to the system switched off.</p> <p>Higher temperatures than the maximum permitted surface temperature of the housing may be present inside the motor. The motor must therefore never be opened in an explosive atmosphere!</p> <p>Failure to comply with this may result in the ignition of an explosive atmosphere.</p>

 WARNING	Explosion hazard
	<p>Excessively heavy dust deposits must be avoided, as these impair the cooling of the device!</p> <p>Impairment or obstruction of the flow of cooling air, for example due to partial or large area coverage of the fan cover or the entry of foreign bodies fall into the fan must be avoided in order to ensure adequate cooling.</p> <p>Only cable glands and reducers which are approved for use in explosion hazard areas may be used.</p> <p>All cable glands which are not used must be closed with blind screw plugs which are approved for potentially explosive areas.</p> <p>Only the original seals may be used.</p> <p>Failure to comply increases the risk of ignition of an explosive atmosphere.</p>

The following supplementary or special information applies for these motors.

The motors are suitable for use in Zone 1 and correspond to Device Group II, Category 2G and may be used at an ambient temperature from -20 °C to +40 °C.

Type suffix:	2G	e. g.:	80 L/4 2G TF
Labelling:	 0102		II 2G Ex eb IIC T3 Gb

If the motor is attached to a gear unit, the EX labelling of the gear unit must also be observed!

Explosive gas mixtures or dust concentrations may cause severe or fatal injuries in combination with hot, electrically live and moving components of electrical machines.

The increased danger in explosion hazard areas requires especially strict observance of the general safety and commissioning information. The person responsible must be qualified according to the national and local regulations.


Explosion protected electrical machines with ignition protection class Ex eb correspond to the standard series EN 60034 (VDE 0530), as well as EN 60079-0:2014 and EN 60079-7:2015. The degree of the explosion hazard determines the zone categorisation. DIN EN 60079, Part 10 A provides information with regard to this. The operator is responsible for the categorisation of the zones. The use of motors which are not certified for explosion hazard areas in explosion hazard areas is prohibited.

3.1.1 Cable gland

The cable glands must be approved for explosion hazard areas. Unused openings must be closed with approved blind plugs. When connecting the installation cables, the connections to the motor terminals and to the earth lead must use U shaped bent cables placed under the relevant terminals so that the clamping bars and the terminal bolts are equally loaded and are not deformed in any way. Alternatively, the connections may be made with a cable lug. If increased thermal requirements are made for the cables, these must be obtained from the information plate on the rotor.

For Sizes 63 to 132 an insulated cable lug must be used, if this is used to connect the earth lead in the terminal box.

The nuts of the terminal board bolts must be tightened according to the following table.


	Tightening torques for terminal board connections				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	1.2	2.0	3.0	6.0

Use of aluminium connecting wires is not permitted.

3.1.2 Cable connections

All motors with ignition protection class Ex eb are delivered with a certified cable gland.

If the provided cable gland is used, cables with circular cable cross-section must be used. The cable gland's lock nuts must be tightened with a torque according to the following table.

	Tightening torques for lock nut				
	Cable gland	M20x1.5	M25x1.5	M32x1.5	M40x1.5
	Tightening torque (Nm)	3.0	6.0	12.0	14.0

Use of reduction adapters according to Directive 94/9 EEC or 2014/34/EU and/or cable glands with ignition protection class Ex eb is permissible. For this, a minimum certified temperature of 80°C is necessary.

When connecting, care must be taken that the permissible air gaps of at least 10 mm and the permissible leakage tracks of at least 12 mm between the electrically live components and components with the same potential as the housing, or between live components are maintained.


Check that the terminal nuts and the screw for the earth lead are tight before closing the terminal box. The terminal box seals and the seals of the cable glands must be correctly seated and must not be damaged.

3.1.3 Terminal box cover seals

The terminal box cover gasket is captively mounted on the terminal box cover. Please only use an original seal when replacing the seal.

If the terminal box is opened during installation, maintenance, repair, troubleshooting or overhaul, the terminal box cover must be re-fitted after the work is complete. There must be no dirt on the surface of the seal or the sealing surface of the terminal box frame.

The screws for the terminal box cover must be tightened with a torque according to the list below.

	Tightening torques for terminal box cover screws				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	0.8 - 1.2	1.2 - 1.8	1.5 - 2.5	3.0 – 5.0

3.1.4 Motor position – special features for IM V3, IM V6

If the end of the shaft faces upwards, e.g. version IMV3, IMV6, a cover must be provided by the operator / installer, which prevents foreign bodies from falling into the fan cover of the motor (see DIN EN 60079-0). This must not obstruct the fan from cooling the motor. If the end of the shaft faces downwards (AS), e.g. versions IMV1, IMV5, the motors are normally provided with a protective cover on the fan cover. A hand wheel on the second end of the shaft is not permitted.

3.1.5 Further operating conditions

The motors are designed for continuous operation and normal, non recurring starting, in which no significant starting heat occurs.

Range A in EN 60034-1 (VDE 0530 Part 1) - Voltage $\pm 5\%$, Frequency $\pm 2\%$, curve form, mains symmetry - must be complied with so that the development of heat remains within the permissible limits. Any major deviations from the rated values can cause an impermissible increase in the development of heat in the motor.

The motor temperature class stated on the type plate must at least conform to the temperature class of any combustible gas that may occur.

3.1.6 Protective devices

Each machine must be protected against excess heating by means of a current-dependent delayed protection switch whose function is tested by a designated facility, with phase failure protection according to VDE 0660 or an equivalent device. Protective devices must be adjusted to the rated current. For windings with a delta circuit, the triggers are connected in series with the windings and adjusted to 0.58x the rated current. If this circuit is not possible, additional protective measures are necessary (e.g. thermal protection of the machine).

In case of a jammed rotor, the protective device must switch off within the specified t_E -time for the relevant temperature class.

Electrical machines with heavy starting (start-up time $> 1.7 \times t_E$ -time) must be protected by means of starting monitoring according to the details in the EEC type test certificate.

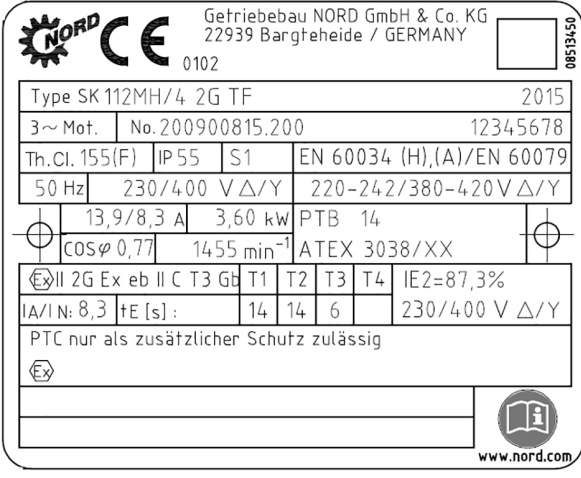
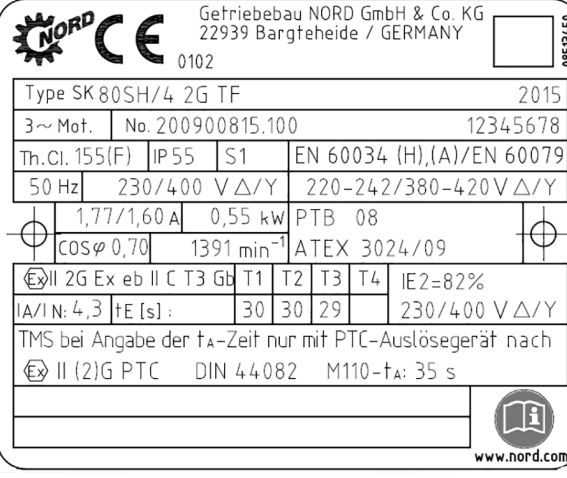
Thermal protection of the machine by means of direct temperature monitoring of the windings with a thermistor temperature sensor is permissible, if this is certified and stated on the rating plate.

Do not apply voltages greater than 30 V to the thermistor temperature sensor.

If the only protection is a PTC thermistor temperature sensor, a performance-tested, PTC tripping device certified by a designated body must be used. The PTC triggering device must be equipped with the following protection class label:

 II (2) G

Information for motor protection

Type plate example: No sole means of protection via temperature sensor	Type plate example: Sole protection via temperature sensor
 <p> Notice! Danger! If the time t_A is <i>not</i> stated on the type plate, the thermistor is <i>not</i> permissible as the sole means of protection It is essential that the motor is protected with a motor protection relay which has been approved by a testing facility. The motor protection relay must be approved for the ignition protection class which is stated on the motor. </p>	 <p> A thermistor is permissible as the sole </p>

3.1.7 Operation with frequency inverter

Operation with a frequency inverter must be explicitly certified. The separate manufacturer's information must be observed. The EMC Directive must be complied with.

3.1.8 Repairs

Repairs must be carried out by Getriebbau NORD or by an officially recognised expert. The work must be indicated with an additional repair plate. With the exception of standard, commercially available and equivalent components, only original spare parts (see spare parts list) may be used. The particularly applies for seals and connecting components.

For motors with closed condensation outlets, the threads of the closing screws must be coated with Loctite 242 or Loxeal 82-21 after the condensation has been drained. The closing screws must be re-inserted immediately. The electrical connections must be checked at regular intervals.

Check that the connection terminals, and the electrical bonding terminal are firmly fastened. Check that the cable gland and the terminal box gasket are in good condition

All work on electrical machinery must be performed when the machine is at a standstill and with all poles disconnected from the mains.

The motor must be removed for any measurement of the insulation resistance. The measurement must not be performed in the explosion hazard area. As soon as measurement has been completed, discharge the connecting terminals again immediately by shorting them in order to prevent any spark discharges occurring in the explosive area.

DANGER!

Explosion hazard



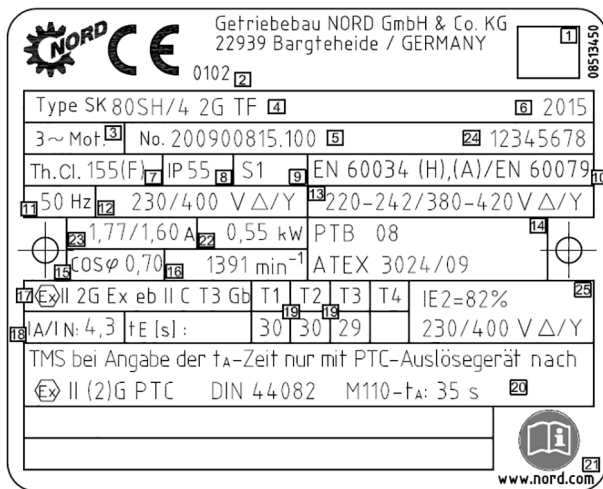
Insulation measurements may cause sparks and therefore ignition of an explosive atmosphere.


- Only perform insulation measurements outside of an explosive atmosphere.
- Discharge the connection terminals by short circuiting them after the measurement and before returning to an explosive atmosphere.

3.1.9 Painting

Motors are provided with suitable painting ex-works. Subsequent painting may only be carried out after consultation with Getriebbau NORD or a workshop which is approved for the repair of explosion protected motors. Compliance with the valid standards and regulations is mandatory.

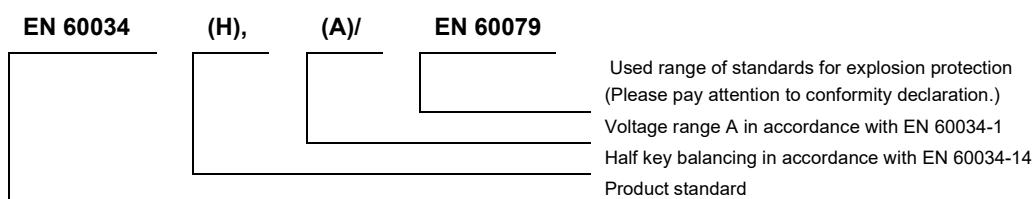
3.1.10 Type plate for NORD Ex eb motors according to EN 60079



1	Data Matrix Code
2	Identification number of designated body
3	Number of phases
4	Type designation
5	Order number / motor number
6	Year of manufacture
7	Thermal class of the insulation system
8	IP protection class
9	Operating mode
10	Standard specifications
11	Nominal frequency
12	Nominal voltage
13	Permissible voltage range
14	EC prototype test certificate number
15	Power factor
16	Speed
17	Explosion protection marking
18	Starting current / nominal current
19	tE times
20	Note: TMS with specification of tA time only with PTC triggering device in accordance with  II (2)G PTC DIN 44082
21	Notice! Pay attention to operating instructions B1091
22	Rated power (mechanical power delivered to shaft)
23	Nominal current
24	Individual serial number
25	Efficiency

Before commissioning, the type plate must be compared with the requirements of the aforementioned declaration, which result from the local regulations and operating conditions.

Explanation of standard specification in rating plate



3.1.11 Applied standards

EN Standard	Edition	IEC Standard	Edition
EN 60034-7	2001-12	IEC 60034-7	2001-02
EN 60034-6	1996-08	IEC 60034-6	1991-10
EN 60079-0	2014-06	IEC 60079-0	2011, modified; cor.:2012; cor.:2013
EN 60079-7	2015	IEC 60079-7	2015
EN 60529	2014-09	IEC 60529	1989 +A1:1999 + A2:2013

3.2 Motors with ignition protection class Non Sparking Ex ec



DANGER!

Explosion hazard



All work must only be carried out with the machine at a standstill and the **power to the system switched off**.

Higher temperatures than the maximum permitted surface temperature of the housing may be present inside the motor. The motor must therefore never be opened in an explosive atmosphere!

Failure to comply with this may result in the ignition of an explosive atmosphere.



WARNING

Explosion hazard



Excessively heavy dust deposits must be avoided, as these impair the cooling of the device!

Impairment or obstruction of the flow of cooling air, for example due to partial or large area coverage of the fan cover or the entry of foreign bodies fall into the fan must be avoided in order to ensure adequate cooling.

Only cable glands and reducers which are approved for use in explosion hazard areas may be used.



All cable glands which are not used must be closed with blind screw plugs which are approved for potentially explosive areas.

Only the original seals may be used.

Failure to comply increases the risk of ignition of an explosive atmosphere.

The following supplementary or special information applies for these motors.

The motors are suitable for use in Zone 2 and correspond to Device Group II, Category 3G and may be used at an ambient temperature from -20 °C to +40 °C.

Type suffix:	3G	e. g.:	80 L/4 3G TF	
Labelling:			II 3G Ex ec IIC T3 Gc	With indication of the temperature class

If the motor is attached to a gear unit, the EX labelling of the gear unit must also be observed!

Explosive gas mixtures or dust concentrations may cause severe or fatal injuries in combination with hot, electrically live and moving components of electrical machines.

The increased danger in explosion hazard areas requires especially strict observance of the general safety and commissioning information. The persons responsible must be qualified according to the national and local regulations.


Explosion protected electrical machines with ignition protection class Ex n correspond to the standard series EN 60034 (VDE 0530), as well as EN 60079-0:2014 and EN 60079-7:2015. The degree of the explosion hazard determines the zone categorisation. DIN EN 60079, Part 10 A provides information with regard to this. The operator is responsible for the categorisation of the zones. The use of motors which are not certified for explosion hazard areas in explosion hazard areas is prohibited.

3.2.1 Cable gland

The cable glands must be approved for explosion hazard areas. Unused openings must be closed with approved blind plugs. When connecting the installation cables, the connections to the motor terminals and to the earth lead must use U shaped bent cables placed under the relevant terminals so that the clamping bars and the terminal bolts are equally loaded and are not deformed in any way. Alternatively, the connections may be made with a cable lug. If increased thermal requirements are made for the cables, these must be obtained from the information plate on the rotor.

For Sizes 63 to 132 an insulated cable lug must be used, if this is used to connect the earth lead in the terminal box.


The nuts of the terminal board bolts must be tightened according to the following table.

	Tightening torques for terminal board connections				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	1.2	2.0	3.0	6.0

Use of aluminium connecting wires is not permitted.

3.2.2 Cable connections

If the provided cable gland is used, cables with circular cable cross-section must be used. The cable gland's lock nuts must be tightened with a torque according to the following table.

	Tightening torques for lock nut				
	Cable gland	M20x1.5	M25x1.5	M32x1.5	M40x1.5
	Tightening torque (Nm)	3.0	6.0	12.0	14.0

Use of reduction adapters according to Directive 94/9 EEC or 2014/34/EU and/or cable glands with ignition protection class Ex ec is permissible. For this, a minimum certified temperature of 80°C is necessary.

When connecting, care must be taken that the permissible air gaps of at least 10 mm and the permissible leakage tracks of at least 12 mm between the electrically live components and components with the same potential as the housing, or between live components are maintained.


Check that the terminal nuts and the screw for the earth lead are tight before closing the terminal box. The terminal box seals and the seals of the cable glands must be correctly seated and must not be damaged.

3.2.3 Terminal box cover seals

The terminal box cover gasket is captively mounted on the terminal box cover. Please only use an original seal when replacing the seal.

If the terminal box is opened during installation, maintenance, repair, troubleshooting or overhaul, the terminal box cover must be re-fitted after the work is complete. There must be no dirt on the surface of the seal or the sealing surface of the terminal box frame.

The screws for the terminal box cover must be tightened with a torque according to the list below.

	Tightening torques for terminal box cover screws				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	0.8 - 1.2	1.2 - 1.8	1.5 - 2.5	3.0 - 5.0

3.2.4 Motor position – special features for IM V3, IM V6

If the end of the shaft faces upwards, e.g. version IMV3, IMV6, a cover must be provided by the operator / installer, which prevents foreign bodies from falling into the fan cover of the motor (see DIN EN 60079-0). This must not obstruct the fan from cooling the motor. If the end of the shaft faces downwards (AS), e.g. versions IMV1, IMV5, the motors are normally provided with a protective cover on the fan cover. A hand wheel on the second end of the shaft is not permitted.

3.2.5 Further operating conditions

The motors are designed for continuous operation and normal, non recurring starting, in which no significant starting heat occurs.

Range A in EN 60034-1 (VDE 0530 Part 1) - Voltage $\pm 5\%$, Frequency $\pm 2\%$, curve form, mains symmetry - must be complied with so that the development of heat remains within the permissible limits. Any major deviations from the rated values can cause an impermissible increase in the development of heat in the motor.

The motor temperature class stated on the type plate must at least conform to the temperature class of any combustible gas that may occur.

3.2.6 Protective devices

Protective devices must be adjusted to the rated current. For windings with a delta circuit, the triggers are connected in series with the windings and adjusted to 0.58x the rated current.

Alternatively, the motors can be protected with thermistor temperature sensors. Protection with thermistor temperature sensors is mandatory for inverter operation.

Do not apply voltages greater than 30 V to the thermistor temperature sensor.

We recommend the use of a functionally tested, certified PTC trigger device for protection with a thermistor temperature sensor.

The following standards must be observed for the installation of electrical systems in explosion hazard areas in Germany: DIN EN 60079-14 (VDE 0165-1), the Technical Rules for Operating Safety (TRBS), the Operating Safety Regulations (BetrSichV), the Hazardous Substances Regulation (GefStoffV) as well as the Explosion Protection Regulations (Ex-RL). Other regulations must be observed if applicable. The applicable national regulation must be observed outside of Germany.

3.2.7 Repairs

Repairs must be carried out by Getriebbau NORD or by an officially recognised expert. The work must be indicated with an additional repair plate. With the exception of standard, commercially available and equivalent components, only original spare parts (see spare parts list) may be used. The particularly applies for seals and connecting components.

For motors with closed condensation outlets, the threads of the closing screws must be coated with Loctite 242 or Loxeal 82-21 after the condensation has been drained. The closing screws must be re-inserted immediately. The electrical connections must be checked at regular intervals.

Check that the connection terminals, and the electrical bonding terminal are firmly fastened. Check that the cable gland and the terminal box gasket are in good condition

All work on electrical machinery must be performed when the machine is at a standstill and with all poles disconnected from the mains.

The motor must be removed for any measurement of the insulation resistance. The measurement must not be performed in the explosion hazard area. As soon as measurement has been completed, discharge the connecting terminals again immediately by shorting them in order to prevent any spark discharges occurring in the explosive area.

⚠ DANGER!**Explosion hazard**

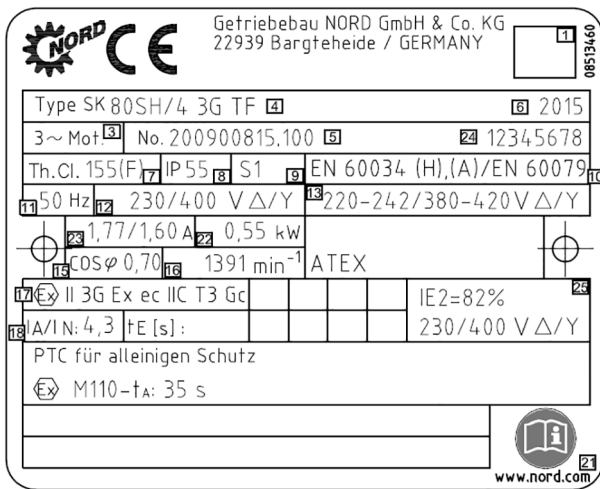
Insulation measurements may cause sparks and therefore ignition of an explosive atmosphere.

- Only perform insulation measurements outside of an explosive atmosphere.
- Discharge the connection terminals by short circuiting them after the measurement and before returning to an explosive atmosphere.

3.2.8 Painting

Motors are provided with suitable painting ex-works. Subsequent painting may only be carried out after consultation with Getriebbau NORD or a workshop which is approved for the repair of explosion protected motors. Compliance with the valid standards and regulations is mandatory.

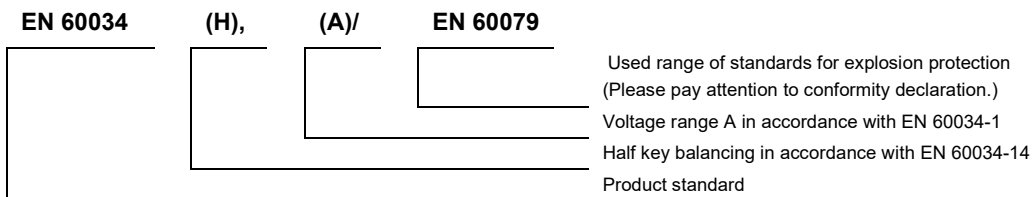
3.2.9 Type plate for NORD Ex ec motors according to EN 60079



1	Data Matrix Code
3	Number of phases
4	Type designation
5	Order number / motor number
6	Year of manufacture
7	Thermal class of the insulation system
8	IP protection class
9	Operating mode
10	Standard specifications
11	Nominal frequency
12	Nominal voltage
13	Permissible voltage range
15	Power factor
16	Speed
17	Explosion protection marking
18	Starting current / nominal current
21	Notice! Pay attention to operating instructions B1091
22	Rated power (mechanical power delivered to shaft)
23	Nominal current
24	Individual serial number
25	Efficiency

Before commissioning, the type plate must be compared with the requirements of the aforementioned declaration, which result from the local regulations and operating conditions.

Explanation of standard specification in rating plate



3.2.10 Applied standards

EN Standard	Edition	IEC Standard	Edition
EN 60034-7	2001-12	IEC 60034-7	2001-02
EN 60034-6	1996-08	IEC 60034-6	1991-10
EN 60079-0	2014-06	IEC 60079-0	2011, modified; cor.:2012; cor.:2013
EN 60079-7	2015	IEC 60079-7	2015
EN 60529	2014-09	IEC 60529	1989 +A1:1999 + A2:2013

3.3 Motors for use in Zone 21 and Zone 22 according to EN 60079-0 and IEC 60079

DANGER!

Explosion hazard



All work must only be carried out with the machine at a standstill and the **power to the system switched off**.

Higher temperatures than the maximum permitted surface temperature of the housing may be present inside the motor. The motor must therefore never be opened in an explosive atmosphere!

Failure to comply with this may result in the ignition of an explosive atmosphere.

WARNING

Explosion hazard



Excessively heavy dust deposits must be avoided, as these impair the cooling of the device!

Impairment or obstruction of the flow of cooling air, for example due to partial or large area coverage of the fan cover or the entry of foreign bodies fall into the fan must be avoided in order to ensure adequate cooling.

Only cable glands and reducers which are approved for use in explosion hazard areas may be used.

All cable glands which are not used must be closed with blind screw plugs which are approved for potentially explosive areas.

Only the original seals may be used.

Failure to comply increases the risk of ignition of an explosive atmosphere.





The following supplementary or special information applies for these motors.

Motors which comply with EN 60079 and IEC 60079 are suitable according to their labelling for use in Zone 21 or Zone 22 - non-conductive dust.

Type supplement:

according to EN 60079	Zone 21	2D	e. g.:	80 L/4 2D TF
	Zone 22	3D	e. g.:	80 L/4 3D TF
according to IEC 60079	Zone 21	EPL Db	e. g.:	80 L/4 IDB TF
	Zone 22	EPL Dc	e. g.:	80 L/4 IDC TF

Labelling:

according to IEC 60079 and 2014/34 EU (94/9 EC old)	 0102		II 2D Ex tb IIIC T125°C Db	for category 2 (Zone 21) ¹⁾
			II 3D Ex tc IIIB T125°C Dc	for category 3 (Zone 22 – non-conducting dust) ¹⁾
according to IEC 60079			EX tb IIIC T125°C Db	for category 2 ¹⁾
			Ex tc IIIB T125°C Dc	for category 3 (Zone 22 – non-conducting dust) ¹⁾

1) The details of the surface temperature may deviate from 125 °C and may be obtained from the type plate.

If the motor is attached to a gear unit, the EX labelling of the gear unit must also be observed!

 **DANGER**

Explosion hazard



The increased danger in areas with inflammable dust demands the strict observation of the general safety and commissioning information. Explosive concentrations of dust may cause explosions if ignited by hot or sparking objects. Such explosions may cause serious or fatal injuries to persons or severe material damage.

The persons responsible must be qualified according to the national and local regulations.

3.3.1 Commissioning information / Field of application

If the motors are required for use with frequency inverters, this must be stated in the order. The supplementary operating instructions B1091-1 must be observed. The motors must be protected against overheating with suitable monitoring equipment! The thickness of dust deposits must not exceed 5 mm! The motors are designed for the voltage and frequency range B of EN 60034 Part 1.

Exception: Size 132MA/4 2D, 132MA/4 3D, 132LH/4 2D, 132LH/4 3D motors comply with the voltage and frequency range A.

Motors for use in Zone 21 and Zone 22, with labelling TF may be thermally monitored via the built-in PTC in combination with a suitable triggering device as the sole protection.

Electrical equipment for use in areas with inflammable dust comply with the standards DIN EN 60079-0, IEC 60079-0, EN 60079-31, IEC 60079-31, as well as DIN EN 60034 and IEC 60034.

The valid version of the standard can be obtained from the EC Declaration of Conformity or the IECEx CoC. The degree of the explosion hazard determines the zone categorisation. The operator / employer is responsible for the assignment of zones (in Europe: RL 1999/92/EC).

If the certification is supplemented with an "X" the special conditions in the EC prototype certification, the IECEx CoC and/or the relevant documentation must be observed. The use of standard motors which are not certified for explosion hazard areas in explosion hazard areas is prohibited.


Category 3D motors have been subjected to an impact resistance test with 4 J according to EN 60079-0.

3.3.2 Terminal box cover seals

The terminal box cover gasket is captively mounted on the terminal box cover. Please only use an original seal when replacing the seal.


If the terminal box is opened during installation, maintenance, repair, troubleshooting or overhaul, the terminal box cover must be re-fitted after the work is complete. There must be no dirt on the surface of the seal or the sealing surface of the terminal box frame.

The screws for the terminal box cover must be tightened with a torque according to the list below.

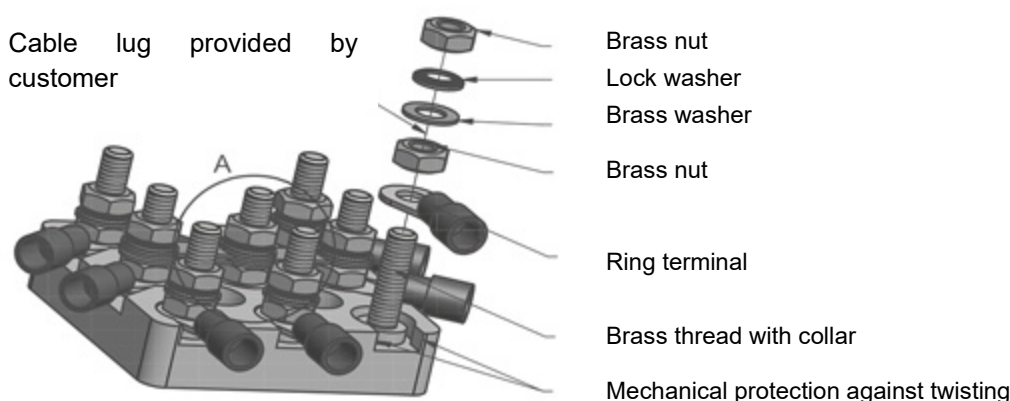
	Tightening torques for terminal box cover screws				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	0.8 - 1.2	1.2 - 1.8	1.5 - 2.5	3.0 - 5.0

3.3.3 Electrical Connection

The electrical connections of the terminal board are protected against twisting. The voltage supply to the terminal board must be made by means of suitable ring terminals. The ring terminals are installed between the two brass washers below the lock washer. The nuts must be tightened with a torque according to the table below. The contact pressure is permanently maintained by means of the specified torque and the lock washer. In addition, twisting of the ring terminals of the voltage supply is prevented. The connection elements are corrosion-proof.

	Tightening torques for terminal board connections				
	Thread diameter	M4	M5	M6	M8
	Tightening torque (Nm)	0,8 - 1,2	1,8 - 2,5	2,7 - 4,0	5,5 - 8,0

Exploded diagram of electrical connection



3.3.4 Cable glands

Cable glands must be approved for explosion hazard areas of Zone 21 (protection class: at least IP66) and be secured against self-loosening. Unused openings must be sealed with approved plugs (protection class: at least IP66).

For Zone 22, cable glands according to EN 60079-0 and IEC 60079-0 must comply with at least one protection class that is indicated on the name plate. Unused opening must be sealed with blind plugs that comply with at least the motor protection class as well as with the requirements according to

3 ATEX Explosion hazard areas

EN 60079-0 and IEC 60079-0. The cable and blind plugs must be suitable for temperatures of at least 80 °C.

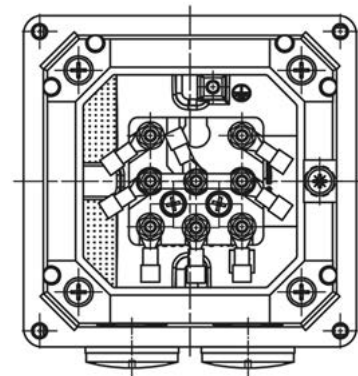
In order to connect cables or carry out other works, the motor must not be opened in explosive atmospheres. The voltage must always be switched off and secured against switch-on before opening.


The motors are equipped with cable glands according to the following overview.

Assignment of cable gland to motor size														
Standard motor cable glands							Braking motor cable glands							
Type	Quantity	Threads	Quantity	Threads	Quantity	Threads	Quantity	Threads	Quantity	Threads	Quantity	Threads	Quantity	Threads
63	2	M20x1.5					4	M20x1.5	2	M12x1.5				
71	2	M20x1.5					4	M20x1.5	2	M12x1.5				
80	2	M25x1.5					4	M25x1.5	2	M12x1.5				
90	2	M25x1.5					4	M25x1.5	2	M12x1.5				
100	2	M32x1.5					4	M32x1.5	2	M12x1.5				
112	2	M32x1.5					4	M32x1.5	2	M12x1.5				
132	2	M32x1.5					4	M32x1.5	2	M12x1.5	2	M16x1.5		
160/ 180/..X	2	M40x1.5	2	M12x1.5	2	M16x1.5	2	M40x1.5	2	M12x1.5	2	M16x1.5		
180/ 200/..X	2	M40x1.5	2	M12x1.5	2	M16x1.5	2	M40x1.5	2	M12x1.5	2	M16x1.5		
225	2	M50x1.5	2	M12x1.5	2	M16x1.5	2	M50x1.5	2	M12x1.5	2	M16x1.5		
250 WP	2	M63x1.5	2	M12x1.5	2	M16x1.5	2	M63x1.5	2	M12x1.5	2	M16x1.5		

If the motor is supplied with a certified cable gland, the cable gland's lock nuts must be tightened with a torque according to the following table.

Cable entry



	Tightening torques for lock nut						
	Cable gland	M20x1.5	M25x1.5	M32x1.5	M40x1.5	M50x1.5	M63x1.5
	Tightening torque (Nm)	3.0	6.0	12.0	14.0	20.0	25.0

3.3.5 Permissible ambient temperature range

For all motors, the permissible ambient temperature range is -20 °C...+40 °C. For motors for operation in Zones 21 and 22, an extended ambient temperature range from -20 °C...+60 °C is permissible. In this case, the rated power must be reduced to **72%** of the value stated in the catalogue.

If the maximum ambient temperature is between +40 °C and +60 °C, the power output should be inversely linearly interpolated between **100%** and **72%**. In this case thermal protection of the motor by means of a thermistor sensor is essential. The motor connection cables and the cable glands must be suitable for temperatures of at least 80 °C.

The extended ambient temperature range does not apply for optional conversions such as a brake and/or external fan. Contact the manufacturer in case of doubt with regard to permissibility!

3.3.6 Painting

Motors are provided with suitable painting ex-works. Subsequent painting may only be carried out after consultation with Getriebebau NORD or a workshop which is approved for the repair of explosion protected motors. Compliance with the valid standards and regulations is mandatory.

3.3.7 IEC-B14 motors

Please comply with the information in Section 1.3.2. Otherwise, explosion protection is not ensured.

3.3.8 Motor position – special features for IM V3, IM V6

If the end of the shaft faces upwards, e.g. version IMV3, IMV6, a cover must be provided by the operator / installer, which prevents foreign bodies from falling into the fan cover of the motor (see DIN EN 60079-0). This must not obstruct the fan from cooling the motor. If the end of the shaft faces downwards (AS), e.g. versions IMV1, IMV5, the motors are normally provided with a protective cover on the fan cover. A hand wheel on the second end of the shaft is not permitted.

3.3.9 Further operating conditions

Unless otherwise specified for operating modes and tolerances in the test certificate, the power rating plate or in IECEx CoC, electrical machinery is designed for continuous operation and normal infrequent start-ups where insignificant start-up heating occurs. The motors may only be used for the type of operation stated on the name plate.

The installation instructions must be strictly observed.

3.3.10 Structure and method of use

The motors are self-cooling. Shaft sealing rings are fitted both on the output side (DS) and on the ventilation side (VS). Motors for Zone 21 and Zone 22 have metal fans. Motors with brakes for Zone 22 (Category 3D, non-conducting dust) have a special plastic fan. The motors have protection class IP55, optionally protection class IP 66 (Zone 22 . non-conducting dust, EPL Dc) or IP 66 (Zone 21, EPL, Db). Under normal operating conditions, the surface temperature does not exceed the surface temperature stated on the name plate.

3.3.11 Minimum cross section of bonding conductors

Cross section of the phase conductor of the installation S [mm ²]	Minimum cross section of the associated protective conductor S _p [mm ²]
$S \leq 16$	S
$16 < S \leq 35$	16
$S > 35$	0.5 S

3.3.12 Maintenance

The voltage must always be switched off and secured against being switched on again before opening the motor!

Notice! Higher temperatures than the maximum permitted surface temperature of the housing may be present inside the motor. The motor must therefore never be opened in hazardous dust atmospheres! The motors must be checked and tested regularly for functional safety! The applicable national standards and regulations must be complied with!

Impermissibly thick dust deposits > 5 mm must not be allowed to build up! If functional safety cannot be ensured, the motor may not be operated! When the ball bearings are replaced, the rotary shaft seals must also be replaced. FKM rotary shaft seals as specified by Getriebbau NORD must be used. Ensure that they are fitted correctly! The rotary shaft seals must be lubricated on the external rings and on the seal lips. If an explosion protected gear is flanged dust-tight to the motor, an NBR rotary shaft seal can be used on the drive side of the motor if the gear oil temperature does not exceed 85°C. Only original parts may be used as spare parts with the exception of standardised, commercially available and equivalent parts. This particularly applies to seals and connection components. Parts for terminal boxes or spare parts for external grounding must be ordered as per the spare parts list in the operating instructions.

The functionality of seals, rotary shaft seals and cable glands must be regularly checked!

Maintaining dust protection for the motors is of paramount importance for explosion protection. Maintenance must be carried out by qualified personnel in a specialist workshop with appropriate equipment. We urgently recommend that the general overhaul is carried out by NORD Service.

3.4 Options for motors for use in Zone 21 and Zone 22

DANGER!

Explosion hazard



All work must only be carried out with the machine at a standstill and the **power to the system switched off**.

Higher temperatures than the maximum permitted surface temperature of the housing may be present inside the motor. The motor must therefore never be opened in an explosive atmosphere!

Failure to comply with this may result in the ignition of an explosive atmosphere.

WARNING

Explosion hazard



Excessively heavy dust deposits must be avoided, as these impair the cooling of the device!

Impairment or obstruction of the flow of cooling air, for example due to partial or large area coverage of the fan cover or the entry of foreign bodies fall into the fan must be avoided in order to ensure adequate cooling.

Only cable glands and reducers which are approved for use in explosion hazard areas may be used.

All cable glands which are not used must be closed with blind screw plugs which are approved for potentially explosive areas.

Only the original seals may be used.

Failure to comply increases the risk of ignition of an explosive atmosphere.

3.4.1 Operation with frequency inverter

The design of the insulation of NORD ATEX motors with ignition protection class tb and tc is suitable for operation with a frequency inverter. Due to the variable speed range, temperature monitoring by means of thermistors or temperature sensors is necessary. For safe planning and use, the planning guide for the operating and installation instructions [B1091-1](#) must be observed. The planning guide provides information regarding the necessary conditions for inverter operation and the approved speed ranges. Option Z (additional high inertia cast iron fan) is not permitted for inverter operation.

If the frequency inverter is not approved for operation within the explosive atmosphere, the frequency inverter must be installed outside of the explosive atmosphere.

3.4.2 External fan

Motors with the additional labelling F (e.g. 80S/4 3D **F**) are equipped with an external fan and must be monitored with the integrated temperature sensor.



WARNING

Explosion hazard



The motor must only be operated together with the external fan. Failure of the external fan may cause the motor to overheat and therefore cause damage and/or injury up to and including ignition of the explosive atmosphere.

The operating instructions for the external fan must be observed.

The power supply to the external fan is provided separately via the terminal box of the external fan. The supply voltage of the external fan must comply with the voltage which is stated on the type plate. The external fan must be protected against overheating with suitable monitoring equipment! The IP protection class of the external fan may differ from that of the motor. The lower protection class applies for the drive unit. The cable glands must as a minimum correspond to the protection class which is specified on the type plate. Unused openings must be closed with plugs, which as a minimum correspond to the protection class of the motor.

External fans and motors for use in explosion hazard areas have Ex labelling according to RL 94/9 EEC or 2014/34/EU. The labelling must be present on both the external fan and the motor. If there is a difference between the labelling on the external fan and the motor, the lower labelled explosion protection applies for the entire drive unit. The details of surface temperatures apply for the entire drive unit; the stated max. temperature applies for the individual components. Any gear unit which is present must also be taken into account. Please contact Getriebebau NORD in case of doubt. If any component of the entire drive unit is not provided with Ex labelling, the entire drive unit may not be used in an explosion hazard area.

3.4.3 Second temperature sensor 2TF

Category 3D motors (Zone 22, non-conducting dust) can be supplied with a second temperature sensor (2TF). This option can be used to implement a warning signal (overheating in the winding). It should be noted that the temperature sensor with the lower trigger temperature should be used for the warning; the temperature sensor with the higher trigger temperature must be used to evaluate the switch-off signal.

3.4.4 Back stop

Motors with the additional code RLS (e.g. 80S/4 3D **RLS**) are equipped with a back stop. For motors with a back stop, the direction of rotation is indicated by an arrow on the fan cover. The head of the arrow points in the direction of the drive shaft. When connecting the motor and during motor control, it must be ensured that the motor can only operate in the rotation direction, e.g. by means of a rotary field test. Switching of the motor into the blocked direction of rotation, i.e. the wrong direction of rotation may cause damage.

Back stops operate without wear above a speed of approx. 800 rpm. To prevent excessive heating and premature wear of the back stop, back stops must not be operated below a speed of 800 rpm. This must be observed for motors with a frequency of 50 Hz and pole numbers ≥ 8 as well as for motors with a frequency inverter.

3.4.5 Brake

Motors with the additional labelling BRE (e.g. 80S/4 3D **BRE 10**) are equipped with a brake and must be monitored with the integrated temperature sensor. Triggering of the temperature sensor of one of the components (motor or brake) must result in the safe shut-down of the entire drive unit. The motor and brake thermistors must be connected in series.

If the motor is operated with a frequency inverter, an external fan must be used for stator frequencies less than 25 Hz. Operation with stator frequencies of 25 Hz is not permissible without an external fan.

The brake may be used as a holding brake with up to 4 activations per hour.

An optional manual release (with a lockable manual release lever) may only be used if no explosive atmosphere is present.

NOTICE! The operating instructions for the brake must also be observed.





The DC supply for the brake is via a rectifier in the motor terminal box or via a direct DC supply. The brake voltage which is stated on the type plate must be complied with.

The power supply cables must not be laid in the same cable as the temperature sensor lines. The function of the brake must be checked before commissioning. No rubbing noises may occur, as impermissibly high heating could occur.

3.4.6 Overview of brake installation for NORD ATEX motors

Permissible brake sizes for Category 3D motors										
Size	LKZ	Braking torque [Nm]								
63	S, L	5								
71	S, L	5								
80	S, SH	5	10							
80	L, LH	5	10							
90	S, SH		10	20						
90	L, LH		10	20						
100	L, LH			20	40					
100	LA, AH			20	40					
112	M, SH, MH			20	40					
132	S, SH					60				
132	M, MH					60				
132	MA					60				
160	MH						100	150	250	
160	LH						100	150	250	
180	MH								250	
180	LH								250	
200	XH								250	
225	SP, MP									400
250	WP									400

3.4.7 NORD Ex motor type plate (Ex tb, EX tc) according to EN 60079 for operation with a frequency inverter

 		Getriebebau NORD GmbH & Co. KG 22939 Bargteheide / GERMANY					
0102		2016		08513470			
Type SK 90LH/4 2D TF							
3~Mot.		No. 200788472-100		12345678			
Th.Cl. 155 (F)		IP66 S1		EN 60034 (H), (A) / EN 60079			
II 2D Ex tb IIIC T125°C Db BVS 04 ATEX E 037							
I N V E R T E R D U T Y	Hz	3	20	50	70	min ⁻¹	1415
	Nm	6,00	9,80	10,1	9,00	kW	1,5
	min	33	521	1390	1950	V	230/400 Δ/Y
	kW	0,02	0,53	1,47	1,83	Hz	50
	V Y	35	174	361	361	A	5,8/3,35
	A	2,38	3,28	3,30	4,00	cos φ	0,79
16,8 kg		IE 2 82,8 %					
Versorgung durch Umrichter f _{max} 100 Hz f _{p min} 4 kHz PWM							
							

Type plate example Ex tb

1	Data Matrix Code
2	Code number of the designated facility (only for Ex tb)
3	Number of phases
4	Type designation
5	Order number / motor number
6	Year of manufacture
7	Thermal class of the insulation system
8	IP protection class
9	Operating mode
10	Standard specifications
11	Stator frequency
12	Stator voltage
14	EC prototype test certificate number
15	Power factor
16	Speed
17	Explosion protection marking
21	Notice! Pay attention to operating instructions B1091
22	Rated power (mechanical power delivered to shaft)
23	Rated current at operating point
24	Individual serial number
25	Efficiency
26	Weight
27	Brake information (option only for Ex tc)
28	Note: Supply by frequency inverter
29	Maximum permissible stator frequency
30	Minimum pulse frequency of frequency inverter
31	Frequency inverter modulation method
32	Data field for operation with frequency inverters
33	Data field for mains operation
34	Rated torque on the motor shaft

Before commissioning, the type plate must be compared with the requirements of the aforementioned declaration, which result from the local regulations and operating conditions.

3.5 Explosion protected motors according to TP TC012/2011 for the Eurasian Economic Union



In addition to the information which is stated in the operating and maintenance instruction B1091, the following information must be noted for EAC EX motors. If the motor is supplied with further components or devices, the associated operating and maintenance instructions must also be observed.

3.5.1 Type plates / Labelling

Motors with the labelling listed below have EAC Ex approval according to TP TC 012/2011 for the Eurasian Economic Union.

These motors have two type plates. One type plate complies with ATEX Directive 2014/34 EU and the relevant standards from the standard series EN 60079; the second type plate contains the additional specifications according to Directive TP TC 012/2011.



The motors may only be operated in areas in which the ignition protection type stated on the motor type plate is permissible. In addition, compliance with the temperature class and the maximum surface temperature as stated on the type plate is mandatory.

3.5.2 Standards

ГОСТ Standard	IEC Standard
ГОСТ 31610.0-2014	IEC 60079-0:2011
ГОСТ Р МЭК 60079-31-2013	IEC 60079-31:2013
ГОСТ Р МЭК 60079-7-2012	IEC 60079-7:2006
ГОСТ 31610.15-2014	IEC 60079-15:2010

3.5.3 Service life

In addition to the service intervals which are stated in the operating and maintenance instructions, it should be noted that the use of motors which are more than 30 years old is not permitted.

The year of manufacture of the motor is stated on the type plate.

WARNING

Danger to persons

The motors must be disconnected from the mains before opening the terminal box.

WARNING

Explosion hazard

Opening the terminal box in an explosive atmosphere is prohibited.

3.5.4 Special operating conditions (X-labelling)

Permissible ambient temperature range

For all motors with ignition protection type tb or tc, the permissible ambient temperature range is -20°C...+40°C. For motors for operation in Zones 21 and 22, an extended ambient temperature range from -20°C...**+60°C** is permissible. In this case, the rated power must be reduced to **72 %** of the value stated in the catalogue.

If the maximum ambient temperature is between +40 °C and +60 °C, the power output should be inversely linearly interpolated between **100 %** and **72 %**. In this case thermal protection of the motor by means of a thermistor sensor is essential. The motor connection cables and the cable glands must be suitable for temperatures of at least 80 °C.

The extended ambient temperature range does not apply for optional attachments such as a brake and/or external fan. Contact the manufacturer in case of doubt with regard to permissibility!

3.6 Explosion-protected electric motors according to GB 12476.1-2013 and B 12476.5-2013 for the People's Republic of China

In addition to the information which is stated in the operating and maintenance instructions B1091 and B1091-1, the following information must be noted for the C2D and C3D versions of explosion-protected NORD electric motors.





If the motor is supplied with further components or devices, the associated operating and maintenance instructions must also be observed.

3.6.1 Type plates / Labelling





Motors with CC Ex approval are certified according to the Chinese standards GB12476.1-2013 and GB12476.5-2013. The motors have two name plates and are labelled according to the Chinese and European standards.

Motor type	Labelling according to GB standard	Labelling according to ATEX
C2D	Ex tD A21 IP6X T***°C	Ex II 2D Ex tb IIIC T ***°C Db
C3D	Ex tD A22 IP5X T***°C	Ex II 3D Ex tc IIIB T ***°C Dc

Name plate examples for the labelling of NORD CCCEX motors according to the Chinese standard.

  防爆电机				08514200				
Type SK 90LH/4 C2D TF		2020						
3 ~ Mot. No. 200788472-200		12345678						
Th.Cl. 155 (F)	S1	Tamb -20°C to +40°C		GYJ20.2016				
Ex tD A21 IP66 T125°C		GB12476.1-2013 GB12476.5-2013						
INVERTER DUTY	Hz	3	20	50	70	min ⁻¹	1420	LINE OPERATION
	Nm	6,00	9,80	10,1	9,00	kW	1,5	
	min ⁻¹	33	521	1390	1950	V	230/400Δ/Y	
	kW	0,02	0,53	1,47	1,83	Hz	50	
	V Y	35	174	361	361	A	5,85/3,38	
	A	2,38	3,28	3,30	4,00	cos φ	0,79	
						IE2	82,8 %	
16,8 kg								
由变频器供电		f _{max} 100 Hz		f _{p min} 4 kHz		PWM		
Getriebebau NORD GmbH & Co. KG, 22939 Bargteheide / 德国				www.nord.com				

Name plate example C2D

  防爆电机				08514210				
Type SK 90LH/4 C3D TF		2020						
3 ~ Mot. No. 200788472-300		12345679						
Th.Cl. 155 (F)	S1	Tamb -20°C to +40°C		GYJ20.2016				
Ex tD A22 IP56 T125°C		GB12476.1-2013 GB12476.5-2013						
INVERTER DUTY	Hz	3	20	50	70	min ⁻¹	1420	LINE OPERATION
	Nm	6,00	9,80	10,1	9,00	kW	1,5	
	min ⁻¹	33	521	1390	1950	V	230/400Δ/Y	
	kW	0,02	0,53	1,47	1,83	Hz	50	
	V Y	35	174	361	361	A	5,85/3,38	
	A	2,38	3,28	3,30	4,00	cos φ	0,79	
						IE2	82,8 %	
16,8 kg								
由变频器供电		f _{max} 100 Hz		f _{p min} 4 kHz		PWM		
Getriebebau NORD GmbH & Co. KG, 22939 Bargteheide / 德国				www.nord.com				

Name plate example C3D

3.6.2 Standards to be observed during operation and maintenance

 **WARNING**

Danger to persons

The motors must be disconnected from the mains before opening the terminal box.

 **WARNING**

Explosion hazard

Opening the terminal box in an explosive atmosphere is prohibited.

Installation, use, parametrisation and maintenance of explosion-protected NORD CCCEX motors must be performed by the operator in accordance with the operating and maintenance instructions B1091 and B1091-1 and in accordance with the following Chinese standards.

- GB 3836.13-2013 Explosive atmosphere - Part 13: Repair, overhaul, maintenance and changes of equipment
(GB 3836.13-2013 爆炸性环境第 13 部分：设备的修理、检修、修复和改造)
- GB/T 3836.15-2017 Explosive atmosphere - Part 15: Design, selection and installation of electrical devices
(GB/T 3836.15-2017 爆炸性环境第 15 部分：电气装置的设计、选型和安装)
- GB/T 3836.16-2017 Explosive atmosphere - Part 16: Inspection and maintenance of electrical devices
(GB/T 3836.16-2017 爆炸性环境第 16 部分：电气装置的检查与维护)
- GB 50257-2014 Design specifications and acceptance of electrical installations for explosion hazard and flammable environments.
(GB 50257-2014 电气装置安装工程爆炸和火灾危险环境电气装置施工及验收规范)
- GB 15577-2018 Safety regulations for dust explosion protection
(GB 15577-2018 粉尘防爆安全规程)

4 Synchronous motors – special information

The following supplementary or special information applies for these motors.

DANGER!

Electric shock

The motor is operated with a dangerous voltage. Touching certain conducting components (connection terminals and supply cables) will cause electric shock with possibly fatal consequences.

Even when the motor is at a standstill (e.g. due to the electronic block of a connected frequency inverter or a jammed drive unit) the connection terminals and supply cables may carry a dangerous voltage. A motor standstill is not identical to electrical isolation from the mains.

Even if the drive unit has been disconnected from the mains, a connected motor may rotate and possibly generate a dangerous voltage.

Installation and work must only be carried out when the motor is at a standstill and is **disconnected** (all phases disconnected from the mains).

Follow the **5 Safety Rules** (1. Switch off the power, 2. Secure against switching on, 3. Check for no voltage, 4. Earthing and short circuiting, 5. Cover or fence off neighbouring live components).

4.1 Type designation

80	D	1	/4	
				Number of poles
				Package length: The 1..9 code depends on the axis height and the length of the active component
				Winding type: T=2100 rpm in Y circuit, 3000 rpm in Δ circuit
				Axis height: 80, 90, 100

4.2 Connection

Notice! Hazardous voltages occur at the motor terminals when the motor shaft is rotating!

The motors must only be operated with suitable inverters. For energy-efficient operation, the inverter must detect the position of the rotor. Various methods both with and without encoders are available for this. See also [TI80_0010](#)

Motors are normally supplied with a star circuit. Some operating points can only be used in a delta circuit. For this, the bridges must be changed according to the circuit diagram in the terminal box cover.

4.3 Encoders

Incremental encoder with zero track

The incremental encoder is located under the fan cover and is attached to this. After installation, the zero point offset is measured in the final test. The offset is provided with an adhesive label in the terminal box.

Absolute encoders

The synchronisation of the encoder is adjusted by NORD prior to delivery of the geared motor and does not require determination of the offset.

If the encoder is not synchronised, or has come out of adjustment due to an impact or removal of the motor, the zero track of the encoder must be synchronised to the rotor position.

4.4 Commissioning

The choice of inverter must be checked with regard to the motor allocation. In addition to the information in Section 1 "General" the operating manual for the frequency inverter must be observed. Further information can be obtained from [T180_0010](#).

4.5 Maintenance and servicing




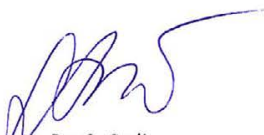
CAUTION! The motors contain magnetic components. Dismantling without specialist knowledge and suitable aids may result in injuries. This type of work must only be carried out by trained personnel.

5 Replacement parts

Please note our spare parts catalogue PL 1090 under www.nord.com.

We will be pleased to send you the spare parts catalogue on request.

6 Declarations of Conformity

<h1 style="margin: 0;">GETRIEBEBAU NORD</h1> <p style="margin: 0;">Member of the NORD DRIVESYSTEMS Group</p>																																							
<p>Getriebebau NORD GmbH & Co. KG <small>Getriebebau-Nord-Str. 1 · 22941 Bargteheide, Germany · Fon. +49(0)4532 289 - 0 · Fax +49(0)4532 289 - 2253 · info@nord.com</small></p>																																							
<h3 style="margin: 0;">EC/EU Declaration of Conformity</h3> <p style="margin: 0; font-size: small;">In the meaning of the directive 2014/34/EU Annex VII, 2014/30/EU Annex II, 2009/125/EG Annex IV and 2011/65/EU Annex VI</p>																																							
<p>Getriebebau NORD GmbH & Co. KG as manufacturer in sole responsibility hereby declares, Page 1 of 1 that the three-phase asynchronous motors from the product series</p> <ul style="list-style-type: none"> • SK 63^{*1}/^{*2} 2D^{*3} to SK 200^{*1}/^{*2} 2D^{*3} <p style="font-size: small;"> ¹⁾ Power code: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W -optionally supplemented by: H, P ²⁾ Number of poles: 2, 4, 6 ³⁾ Additional options </p> <p style="text-align: center;">with ATEX labeling  II 2D Ex tb IIICT . . . °C Db</p> <p>comply with the following regulations:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">ATEX Directive for products</td> <td style="width: 33%;">2014/34/EU</td> <td style="width: 33%;">OJ. L 096 vom 29.3.2014, S. 309–356</td> </tr> <tr> <td>Eco-design Directive</td> <td>2009/125/EG (VO Nr. 640/2009)</td> <td>OJ. L 285 vom 31.10.2009, S. 10–35</td> </tr> <tr> <td>EMC Directive</td> <td>2014/30/EU</td> <td>OJ. L 96 vom 29.3.2014, S. 79–106</td> </tr> <tr> <td>RoHS Directive</td> <td>2011/65/EU</td> <td>OJ. L 174 vom 1.7.2011, S. 88–110</td> </tr> </table> <p>Applied standards:</p> <table style="width: 100%; border: none; font-size: small;"> <tr> <td>EN 60079-0:2012 + A11:2013</td> <td>EN 60079-31:2014</td> <td>EN 60529:1991+A1:2000+A2:2013</td> </tr> <tr> <td>EN 60034-1:2010+AC:2010</td> <td>EN 60034-2-1:2014</td> <td>EN 60034-5:2001+A1:2007</td> </tr> <tr> <td>EN 60034-6:1993</td> <td>EN 60034-7:1993+A1:2001</td> <td>EN 60034-8:2007+A1:2014</td> </tr> <tr> <td>EN 60034-9:2005+A1:2007</td> <td>EN 60034-11:2004</td> <td>EN 60034-14:2004+A1:2007</td> </tr> <tr> <td>EN 60034-30-1:2014</td> <td>EN 55011:2009+A1:2010</td> <td>EN 61000-6-3:2007+A1:2011</td> </tr> <tr> <td>EN 61000-6-4:2007+A1:2011</td> <td>EN 60204-1:2006+A1:2009+AC:2010</td> <td>EN 50581:2012</td> </tr> </table> <p>EU-Type-Examination Certificates: BVS 04 ATEX E 037</p> <p>Notified body for the assessment of the quality management system:</p> <table style="width: 100%; border: none; font-size: small;"> <tr> <td>Physikalisch-Technische Bundesanstalt (PTB)</td> <td>Bundesallee 100</td> </tr> <tr> <td>Identity number: 0102</td> <td>38116 Braunschweig</td> </tr> </table> <p>Notified body to issue for the EU-Type-Examination Certificate:</p> <table style="width: 100%; border: none; font-size: small;"> <tr> <td>DEKRA EXAM GmbH</td> <td>Dinnendahlstraße 9</td> </tr> <tr> <td>Identity number: 0158</td> <td>44809 Bochum</td> </tr> </table> <p>First marking was carried out in 2004.</p> <p>Bargteheide, 27.03.2018</p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="text-align: center;">  <p>U. Küchenmeister Managing Director</p> </div> <div style="text-align: center;">  <p>Dr. O. Sadi Technical Director</p> </div> </div>		ATEX Directive for products	2014/34/EU	OJ. L 096 vom 29.3.2014, S. 309–356	Eco-design Directive	2009/125/EG (VO Nr. 640/2009)	OJ. L 285 vom 31.10.2009, S. 10–35	EMC Directive	2014/30/EU	OJ. L 96 vom 29.3.2014, S. 79–106	RoHS Directive	2011/65/EU	OJ. L 174 vom 1.7.2011, S. 88–110	EN 60079-0:2012 + A11:2013	EN 60079-31:2014	EN 60529:1991+A1:2000+A2:2013	EN 60034-1:2010+AC:2010	EN 60034-2-1:2014	EN 60034-5:2001+A1:2007	EN 60034-6:1993	EN 60034-7:1993+A1:2001	EN 60034-8:2007+A1:2014	EN 60034-9:2005+A1:2007	EN 60034-11:2004	EN 60034-14:2004+A1:2007	EN 60034-30-1:2014	EN 55011:2009+A1:2010	EN 61000-6-3:2007+A1:2011	EN 61000-6-4:2007+A1:2011	EN 60204-1:2006+A1:2009+AC:2010	EN 50581:2012	Physikalisch-Technische Bundesanstalt (PTB)	Bundesallee 100	Identity number: 0102	38116 Braunschweig	DEKRA EXAM GmbH	Dinnendahlstraße 9	Identity number: 0158	44809 Bochum
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GETRIEBEBAU NORD

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EC/EU Declaration of Conformity

In the meaning of the directive 2014/34/EU Annex VIII, 2014/30/EU Annex II, 2009/125/EG Annex IV and 2011/65/EU Annex VI

Getriebebau NORD GmbH & Co. KG as manufacturer in sole responsibility hereby declares,
that the three-phase asynchronous motors from the product series

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• **SK 63^{*1}/^{*2} 3D^{*3} to SK 250^{*1}/^{*2} 3D^{*3}**

¹⁾ Power code: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W -optionally supplemented by: H, P

²⁾ Number of poles: 2, 4, 6

³⁾ Additional options

with ATEX labeling  II 3D Ex tc IIIB T . . . °C Dc

comply with the following regulations:

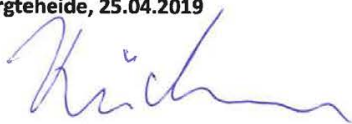
ATEX Directive for products	2014/34/EU	OJ. L 096 vom 29.3.2014, S. 309–356
Eco-design Directive	2009/125/EG (VO Nr. 640/2009)	OJ. L 285 vom 31.10.2009, S. 10–35
EMC Directive	2014/30/EU	OJ. L 96 vom 29.3.2014, S. 79–106
RoHS Directive	2011/65/EU	OJ. L 174 vom 1.7.2011, S. 88–110

Applied standards:

EN 60079-0:2012 + A11:2013	EN 60079-31:2014	EN 60529:1991+A1:2000+A2:2013
EN 60034-1:2010+AC:2010	EN 60034-2-1:2014	EN 60034-5:2001+A1:2007
EN 60034-6:1993	EN 60034-7:1993+A1:2001	EN 60034-8:2007+A1:2014
EN 60034-9:2005+A1:2007	EN 60034-11:2004	EN 60034-14:2004+A1:2007
EN 60034-30-1:2014	EN 55011:2009+A1:2010	EN 61000-6-3:2007+A1:2011
EN 61000-6-4:2007+A1:2011	EN 60204-1:2006+A1:2009+AC:2010	EN 50581:2012

First marking was carried out in 2011.

Bargteheide, 25.04.2019




U. Küchenmeister
Managing Director



Dr. O. Sadi
Technical Managing Director

GETRIEBEBAU NORD

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EC/EU Declaration of Conformity

In the meaning of the directive 2014/34/EU Annex VII und 2014/30/EU Annex II, 2009/125/EC Annex IV, 2011/65/EU Annex VI

Getriebebau NORD GmbH & Co. KG as manufacturer hereby declares,
 that the three-phase asynchronous motors from the product series

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- **SK 63^{*1}/^{*2} 2G^{*3} to SK 200^{*1}/^{*2} 2G^{*3}**
 - ¹⁾ Power code: S, SA, SX, M, MA, MB, MX, L, LA, LB, LX, R, X, Y, A, W -optionally supplemented by: H, P
 - ²⁾ Number of poles: 2, 4, 6
 - ³⁾ Additional options

with ATEX labeling  II 2G Ex eb IIC T3 Gb

Comply with the following regulation

ATEX Directive for products	2014/34/EU	ABl. L 096 vom 29.3.2014, S. 309–356
Eco-design Directive	2009/125/EG (VO Nr. 640/2009)	ABl. L 285 vom 31.10.2009, S. 10–35
EMC-Directive	2014/30/EU (ab 20. April 2016)	ABl. L 96 vom 29.3.2014, S. 79–106
RoHS-Directive	2011/65/EU	ABl. L 174 vom 1.7.2011, S. 88–110

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EN 60034-6:1993	EN 60034-7:1993+A1:2001	EN 60034-8:2007+A1:2014
EN 60034-9:2005+A1:2007	EN 60034-11:2004	EN 60034-14:2004+A1:2007
EN 60034-30-1:2014	EN 55011:2009+A1:2010	EN 61000-6-3:2007+A1:2011
EN 61000-6-4:2007+A1:2011	EN 60204-1:2006+A1:2009+AC:2010	EN 50581:2012

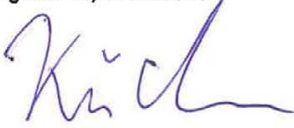
EC-Type-Examination Certificates:
 PTB 14 ATEX 3030, PTB 14 ATEX 3032, PTB 08 ATEX 3024-2, PTB 14 ATEX 3034,
 PTB 14 ATEX 3036, PTB 14 ATEX 3038, PTB 14 ATEX 3040, PTB 14 ATEX 3042
 PTB 14 ATEX 3044, PTB 14 ATEX 3046

Notified body for the assessment of the quality management system:
 Physikalisch-Technische Bundesanstalt (PTB) Bundesallee 100
 Identity number: 0102 38116 Braunschweig


Notified body to issue for the EC-Type-Examination Certificate:
 Physikalisch-Technische Bundesanstalt (PTB) Bundesallee 100
 Identity number: 0102 38116 Braunschweig

First marking was carried out in 2008.

Bargteheide, 01.08.2018



U. Küchenmeister
Managing Director



Dr. O. Sadi
Technische Geschäftsleitung

GETRIEBEBAU NORD

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- **SK 63^{*1}/^{*2} 3G^{*3} to SK 200^{*1}/^{*2} 3G^{*3}**

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³⁾ Additional options

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First marking was carried out in 2014.

Bargteheide, 01.08.2018



U. Küchenmeister
Managing Director



Dr. O. Sadi
Technische Geschäftsleitung

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