

1 General

The following information relates to electronic drive technology devices from Getriebbau NORD GmbH & Co. KG and is based on the standard **DIN EN 60721-3-3**.

This standard governs the ambient conditions for permanently installed, weather-protected conditions of use, including installation, maintenance and repair work on the relevant device. The ambient conditions which are considered are classified in six categories

- Climatic ambient conditions (K),
- Other climatic ambient conditions (Z),
- Biological ambient conditions (B),
- Chemically active substances (C),
- Mechanically active substances (S) and
- Mechanical ambient conditions (M).

For NORD electronic drive technology products, the categories

- Climatic ambient conditions (K) and
- Mechanical ambient conditions (M)

are relevant and will be considered in greater detail below.

Technical Information / Datasheet	Climate classes			
Documentation	TI 80_0020	V 1.1	3917	en

2 Climatic and mechanical ambient conditions

The **climatic** ambient conditions are stated as limit values and are specified so that all normal conditions are covered. However, no exceptional events such as failure of climate control are considered. The most informative influences which are considered in this category are the following parameters which prevail at the place of use:

- Relative and absolute humidity,
- Air temperature and pressure,
- Solar and thermal radiation,
- Speed of temperature fluctuation

A "Climate Class" can be determined on the basis of the listed limit values and the operating range. However, this also depends on the IP protection class and can therefore not be generally specified for an entire series of devices.

The **mechanical** ambient conditions relate to sine-wave vibrations and impacts. Noise-like vibrations are not considered. The criteria which are to be taken into consideration are also stated in the limit values and relate to

- The amplitudes of the vibrations,
- The amplitude of acceleration and
- The frequency range.

A "Vibration Class" can be determined by comparing these limit values with the permissible ranges of the frequency inverter.

Conversely, on the basis of the conditions at the place of use, it can be determined which classes the device must at least fulfil without any danger of damage and major influence to its long-term behaviour in use.

3 Explanations regarding specific classes

The relevant classes for NORD electronic drive technology devices are defined as follows.

Class 3K3

Devices in this class are suitable for use in temperature controlled locations without humidity regulation. Heating and cooling are used as necessary in order to maintain the necessary boundary conditions. The device can be exposed to both solar and thermal radiation and can withstand air movements due to draughts. The conditions are those of normal domestic and work environments, for example living areas, public buildings, offices and production facilities for electrical engineering products.

Class 3K4

Class 3K4 includes the conditions of the aforementioned Class 3K3.

In addition, devices with this classification are suitable for use in locations in which condensation and dripping water occur, however not for rainfall. Air humidity is not controlled and the place of use has a wide range of relative humidity. These conditions apply for domestic and work areas (e.g. kitchens, bathrooms, cellars, storerooms and garages), as well as for normal domestic and work areas (see above) in regions with a more humid outdoor climate.

Class 3M4

The permissible mechanical ambient conditions for this class include noticeable impacts and vibrations. This enables use in the vicinity of machines or comparable places of use, for example at locations with passing vehicles.

Class 3M7

Places of use with very high vibration levels and high energy impacts, as well as high impact accelerations are assigned to this class. Therefore use in the immediate vicinity of heavy machinery or operation when mounted on machinery is possible with devices of this class.

Limit values

Influencing factors		3K3	3K4
Air temperature (minimum)	[°C]	5	5
Air temperature (maximum)	[°C]	40	40
Relative humidity (minimum)	[%]	5	5
Relative humidity (maximum)	[%]	85	95
Absolute humidity (minimum)	[g/m ³]	1	1
Absolute humidity (maximum)	[g/m ³]	25	29
Speed of temperature fluctuation (maximum)	[°C/min]	0.5	0.5
Air pressure (minimum)	[kPa]	70	70
Air pressure (maximum)	[kPa]	106	106
Solar radiation (maximum)	[W/m ²]	700	700

Table 1: Limit values for climatic ambient conditions

Influencing factors		3M4	3M7
Sine wave vibrations			
Displacement amplitude (maximum)	[mm]	3.0	10.0
... in frequency range	[Hz]	2 ... 9	2 ... 9
Acceleration amplitude (maximum)	[m/s ²]	10.0	30.0
... in frequency range	[Hz]	9 ... 200	9 ... 200
Permissible vibration level at place of use (maximum) <i>(In the levels: none, slight, noticeable, high, very high, extremely high)</i>		Noticeable	Very high
Impacts, mobile			
Shock response spectrum Type L Peak acceleration (maximum)	[m/s ²]	-	-
Shock response spectrum Type I Peak acceleration (maximum)	[m/s ²]	100	-
Shock response spectrum Type II Peak acceleration (maximum)	[m/s ²]	-	250
Permissible impact acceleration at place of use (maximum) <i>(In the levels: none, slight, noticeable, high)</i>		Noticeable	High

Table 2: Limit values for mechanical ambient conditions