Motors and drives for explosive atmospheres

Selection process

When selecting and dimensioning motors for explosive atmospheres together with a drive, it is vital to ensure that the combination remains safe in its operating environment.

Drives must always be installed outside of the potentially explosive atmosphere. The drives are not Ex-certified, but the safety functions in the drives are ATEX-certified. A combination of an ABB motor and drive is certified as well (IECEx/ATEX).

new.abb.com/motors-generators
new.abb.com/drives

A zone system is usually used to classify potentially explosive areas based on the potential for the presence of a flammable substance. The rules for zone classification are defined in EN/IEC 60079-10-1 and -2. In ATEX countries, the requirements of the ATEX Directives and EN/IEC 60079 (EN 60079-0, EN 60079-10-x, EN 60079-11) must be fulfilled.

The correct Ex motor can be chosen based on the EPL/protection level or product category required using the table on the right.

Selection of motor winding insulation and converter output filters as well as elimination of bearing currents of ABB motors and drives for explosive atmospheres.

Load capacity curves

Load capacity Motor main contactor are needed. See left column for ABB drive safety functions.

ABB drives with non-ABB Ex motors (Check with the motor manufacturer that it is allowed to use the motor with a drive.)

Motor direct temperature control (+813 or +816) and safety function are needed. See left column for ABB drives safety functions.

Non-ABB drives with ABB Ex motors

Motor direct temperature control (+813 or +816) and a certified PTC/Pt100 relay and drive main contactor are needed. The drive must be able to limit the minimum switching frequency according to the requirements of the ABB motor certificate.

Non-ABB drives with ABB Ex motors

Motor direct temperature control (+813 or +816) and a certified PTC/Pt100 relay and drive main contactor are needed. The drive must be able to limit the minimum switching frequency according to the requirements of the ABB motor certificate.

Manual sizing

The drive must be able to limit the minimum switching frequency according to the requirements of the ABB motor certificate.

Manual sizing

Motor is selected by calculating the torque needed at the duty point for the applicable speed range and choosing the right drive accordingly.

Follow the manufacturer’s instructions.

Follow all instructions from the motor manufacturer and ABB Drives.

Follow cable and EMC recommendations from the drive manufacturer and ABB Motors.

Follow cable and EMC recommendations from the motor manufacturer and ABB Drives.

ABB drives not tested with ABB Ex motors

Motor direct temperature control (+813 or 816) and a certified PTC/Pt100 relay and drive main contactor are needed. See left column for ABB drive safety functions.

Ex motor

Motor direct temperature control (+813 or +816) and safety function are needed. See left column for ABB drive safety functions.

Non-ABB drives with ABB Ex motors

Motor direct temperature control (+813 or +816) and safety function are needed. See left column for ABB drive safety functions.

ABB Ex motor

Motor direct temperature control (+813 or +816) and safety function are needed. See left column for ABB drive safety functions.

Customer input

Selection of motor and drive

Dimensioning

Motor insulation and filters

Motor cables

Drive size tool

The tool helps select the right motor and drive.

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