BROCHURE

Low voltage motors and drives for applications in explosive atmospheres

Certification. Diligence. Reliability. Safety. Everything counts.

Are you looking for maximized productivity without compromizing safety? Is compliance with global and local standards and regulations together with swift project execution important to you? That's where ABB can help you.

Our extensive experience working with explosive atmospheres along with our comprehensive motor and drive testing ensure that the components are combined in the optimal way to cope with the circumstances on site. Our wide global support network and extensive range of services ensure that your motor and drive packages keep running reliably with top performance throughout their life cycle.

The benefits of purchasing a motor and a drive together from ABB for applications in potentially explosive atmospheres

- You'll have the full advantage of accurate motor speed control without compromising on safety or reliability.

- Cost and time savings as no project-specific testing and certification of the motor and drive combination is needed.
- Cost savings due to optimized performance of the motor and the drive package; there is no need to oversize the motor.

- Selecting the right motor and drive is very easy with our software tools and instructions.

- Tested motor and drive combinations make thermistor protection optional and save on installation costs.

Low voltage motors and drives for potentially explosive atmospheres

By using an ABB motor together with an ABB drive, you can enjoy the benefits of efficient, high-performance motors with optimal speed and control accuracy – without compromising on safety.

Tested with ABB motors

Easy to select, install and use

Drives for reliable and efficient motor control

ATEX-certified built-in overtemperature protection modules

Meet extensive chemical industry requirements, including NAMUR recommendations

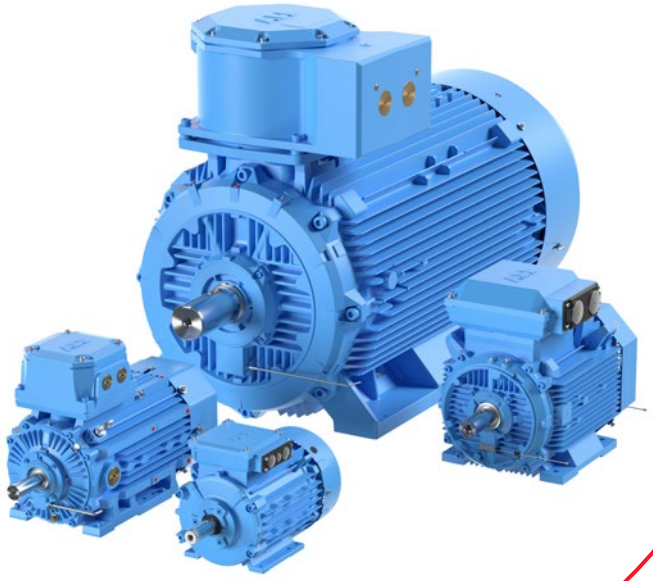
Reliable and accurate DTC functionality together with sine filter

ABB has a wide range of robust, reliable and efficient products for demanding environments, together with decades of experience and know-how in industrial applications. We can offer you full support throughout your project.

Wide range of protection types and suitable applications

Wide range of high-performance motors

Certified to national and international standards



Designed for reliable and safe operation with variable speed drives

Available with efficiency classes IE2 and IE3

Meet national energy efficiency requirements, MEPS (minimum energy performance standards)

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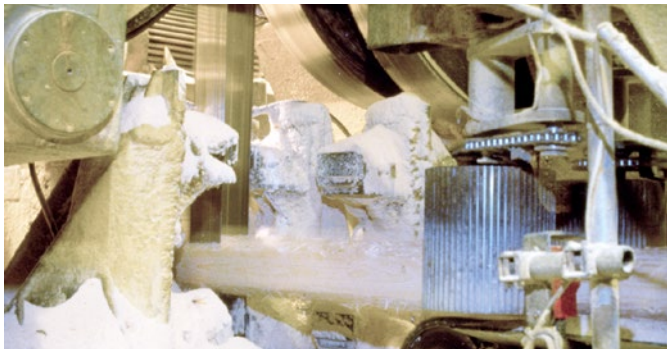

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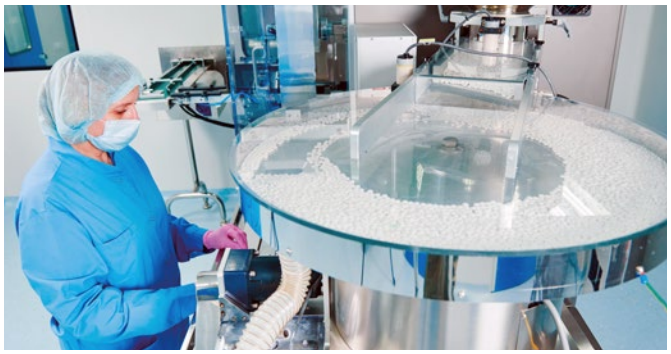

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Typical applications

A potentially explosive area is defined as a location in which gases, vapors, mist or dust mixed with air may form a flammable mixture.

These areas can be found in, for example, a sawmill where sawdust has been allowed to gather in large amounts, in a food factory handling sugar or flour, and in sewage treatment where methane is present. Below is a list of industries, relevant to the respective motor and drive family, where explosive atmospheres often exist.

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01 Oil and gas
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02 Chemical industry
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03 Mining
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04 Water treatment
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05 Food and beverage
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06 Sawmills
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07 Pharmaceutical
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08 Textile industry
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09 Marine
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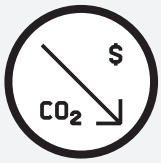
10 Power generation

Correct dimensioning is important



- We help you to size motors and drives to your exact needs.
- Correctly sized motors and drives reduce motor frame heating and sparking from bearing currents.
- They also help you to reduce your energy use.

We have the certificates

- We have our own test center where we can test and certify motor and drive combinations.
- Our low voltage motors for explosive atmospheres and low voltage industrial drives have been tested to verify that, when correctly dimensioned, they are always safe to use in explosive atmospheres.

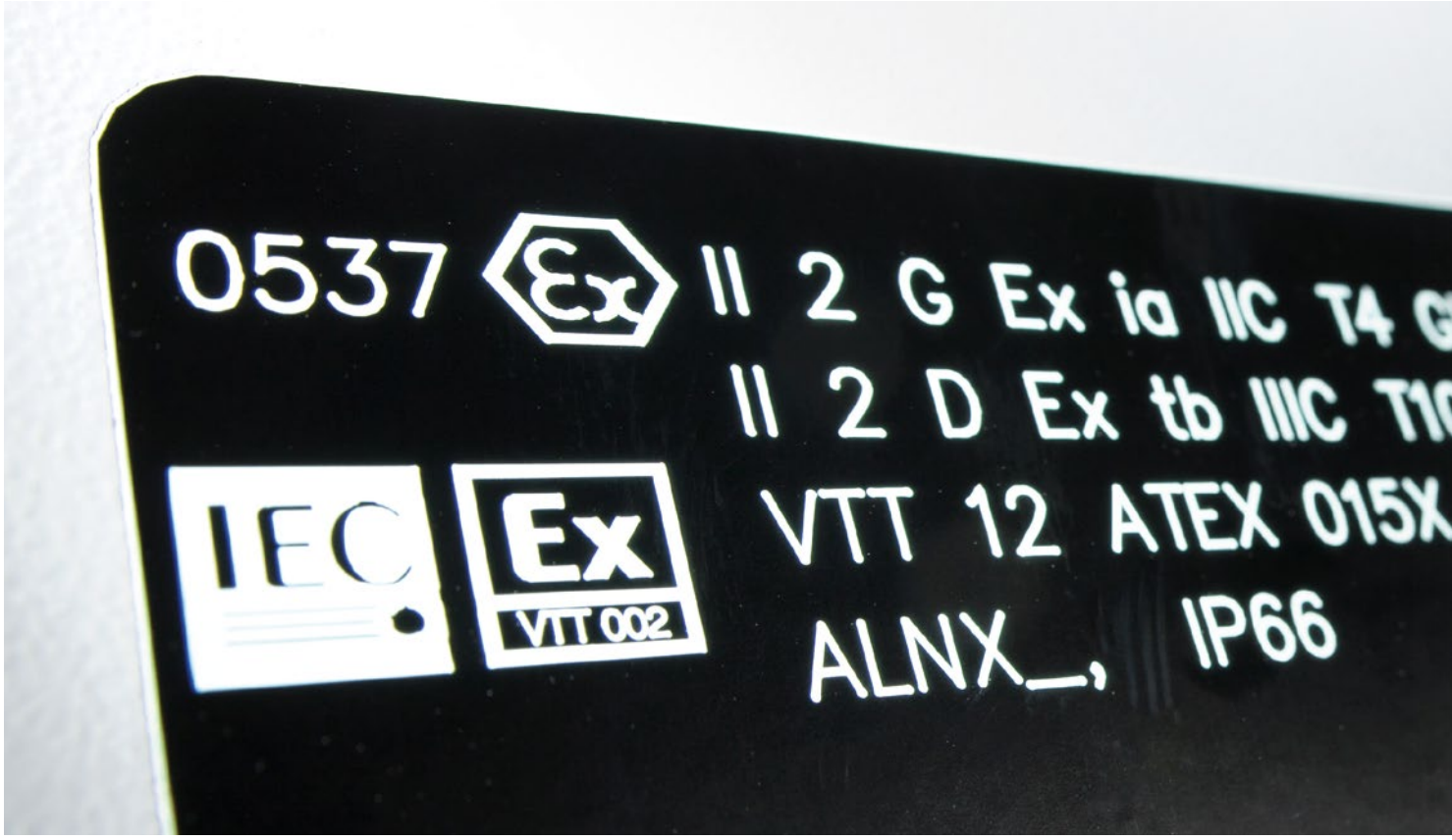
Global service and support network

- Our global network of certified service providers are trained and experienced to help you with motors and drives for applications in explosive atmospheres.
- Our service ensures that your ABB Declaration of Conformity is retained.

Motor selection table

Ex motor	Motor type	Gas/dust group	Temp. class	Equipment protection level (EPL)	Motor power	Motor frame size	Efficiency class	IP class [1]
Flameproof Ex d	M3JP	IIB or IIC	T4	Gb	0.55 to 710 kW	IEC 80 to 450	IE2, IE3	IP55
Flame proof I Ex d (underground mining)	M3JM	–	–	Mb	0.55 to 710 kW	IEC 80 to 450	IE2, IE3	IP66
Flameproof Ex de	M3KP	IIB or IIC	T4	Gb	0.55 to 950 kW	IEC 80 to 450	IE2, IE3	IP55
Increased safety Ex ec (formerly Non-sparking Ex nA)	M3GP cast iron	IIC	T3	Gc	0.25 to 1000 kW	IEC 71 to 450	IE2, IE3	IP55
Increased safety Ex ec (formerly Non-sparking Ex nA)	M3AA aluminum	IIB	T3	Gc	0.25 to 90 kW	IEC 71 to 280	IE2, IE3	IP55
Increased safety Ex eb (formerly Ex e)	M3HP	IIC	T3	Gb	0.25 to 390 kW	IEC 80 to 400	IE2	IP55
Dust ignition proof Ex t	M3GP cast iron	IIIB or IIIC	T125/150 °C [2]	Db/Dc	0.25 to 1000 kW	IEC 71 to 450	IE2, IE3	IP65/IP55
Dust ignition proof Ex t	M3AA aluminum	IIIB/IIIC	T125 °C	Db/Dc	0.25 to 90 kW	IEC 71 to 280	IE2, IE3	IP65/IP55

Larger motors for explosive atmospheres for VSD duty on request.
[1] Higher IP class on request
[2] Temperature class T150 °C when surface temperature protection with PTC is used.
Note! The drive must be installed in a non-Ex area



Protective functions	Motor certification – EC Declaration of Conformity
Winding equipped with temperature sensor to protect the insulation as standard. It is recommended to connect the sensor to the VSD through a safety circuit. PTC sensors for surface temperature control of low voltage motors is available as a standard option.	Type tested with ACS880, ACS800 and ACS580 VSDs. For other VSDs, protection is available with thermistors limiting the surface temperature of the motor (option +813).
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In size 160 and above, winding is equipped with temperature sensor to protect the insulation as standard. It is recommended to connect the sensor to the VSD through a safety circuit.	Type tested with ACS880, ACS800 and ACS580 VSDs.
–	As standards require Ex eb motors to be tested together with the specific drive, Ex d / Ex de motors are usually offered instead for practical reasons.
Winding equipped with temperature sensor to protect the insulation as standard. It is recommended to connect the sensor to the VSD through a safety circuit. PTC sensors for surface temperature control of low voltage motors are available as a standard option.	Type tested with ACS880, ACS800 and ACS580 VSDs. For other VSDs, protection is available with thermistors limiting the surface temperature of the motor (option +813).
In size 160 and above, winding is equipped with temperature sensor to protect the insulation as standard. It is recommended to connect the sensor to the VSD through a safety circuit.	Type tested with ACS880, ACS800 and ACS580 VSDs.

We have tested and certified our motors for explosive atmospheres with our drives. Therefore when you purchase a motor and a drive together from ABB, you save time and money, as no additional testing and certification are needed.

Drive selection table

Drive family	Type and construction	Supply voltage	Power range	ATEX-certified STO	ATEX-certified protective functions
ACS880	-01	208 to 690 V	0.75 to 250 kW	+Q971	+L537 +Q971
	-11, -31	380 to 500 V	2.2 to 110 kW	+Q971	+L537 +Q971
	-04/-04F	380 to 690 V	250 to 2200 kW	+Q971	+L537 +Q971
	-04XT	380 to 690 V	630 to 1200 kW	+Q971	FPTC-02*) +Q971
	-M04	200 to 500 V	0.37 to 45 kW	–	–
	-14, -34	380 to 690 V	200 to 2200 kW	+Q971	+L537 +Q971
	-multidrive modules	380 to 690 V	1.5 to 3200 kW	+Q971	FPTC-02*) +Q971
	-liquid-cooled multidrive modules	525 to 690 V	355 to 3000 kW	+Q971	FPTC-02*) +Q971
ACS880	-07	380 to 690 V	55 to 2800 kW	See next column	+L513/L514/L537 +Q971
	-17, -37	380 to 690 V	55 to 3200 kW		+L513/L514/L537 +Q971
	-multidrives	380 to 690 V	1.5 to 5600 kW		+L513/L514/L537 +Q971
ACS800	-multidrive modules LC	380 to 690 V	1.5 to 2800 kW	–	-
ACS800	-multidrives LC	380 to 690 V	1.1 to 5600 kW	See next column	+L513/L514 +Q971
ACS580	-01	380 to 480 V	0.75 to 250 kW	See next column	+L537 +Q971
	-04	380 to 480 V	250 to 500 kW		+L537 +Q971
	-07	380 to 480 V	75 to 500 kW		+L537 +Q971

Note! The drive must be installed in a non-Ex area
*) ATEX-certified thermistor protection module kit for ACS880 multidrive modules available with an MPR order code

	Recommendations
	The customer can connect the motor thermistor sensors to the interface of the ATEX-certified thermistor protection module FPTC-02 (+L537 +Q971), which executes the protection function Safe Motor Temperature (EN/IEC 61800-5-2). Alternatively, the customer can build the temperature protection function with a motor temperature sensor, an ATEX-compliant protection relay and the ATEX-certified Safe Disconnection Function of the drive (+Q971).
	The customer can connect the thermistor sensors of the motor to the interface of the ATEX-certified protection module FPTC-02 (+L537 +Q971), which executes the protection function Safe Motor Temperature (EN/IEC 61800-5-2). Alternatively, the customer can connect the motor temperature sensors to the protective function (PTC/Pt100) of the drive (+L513/+L514 +Q971).
	The customer can build the safety circuit by connecting the motor temperature sensors to a certified PTC/PT100 relay, which controls the main contactor of the drive. In this case, the contactor should be dimensioned to withstand twice the nominal current of the drive.
	The customer can connect the motor temperature sensors to the protective function (PTC/Pt100) of the drive (+L513/+L514 +Q971).
	The customer can connect the motor thermistor sensors to the interface of the ATEX-certified thermistor protection module CPTC-02 (+L537 +Q971), which executes the protection function Safe Motor Temperature (EN/IEC 61800-5-2).

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For more information, please contact your local ABB representative or visit

abb.com/drives
abb.com/motors&generators

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3AUA0000158367 REV C EN 23.08.2018