MEIDEN

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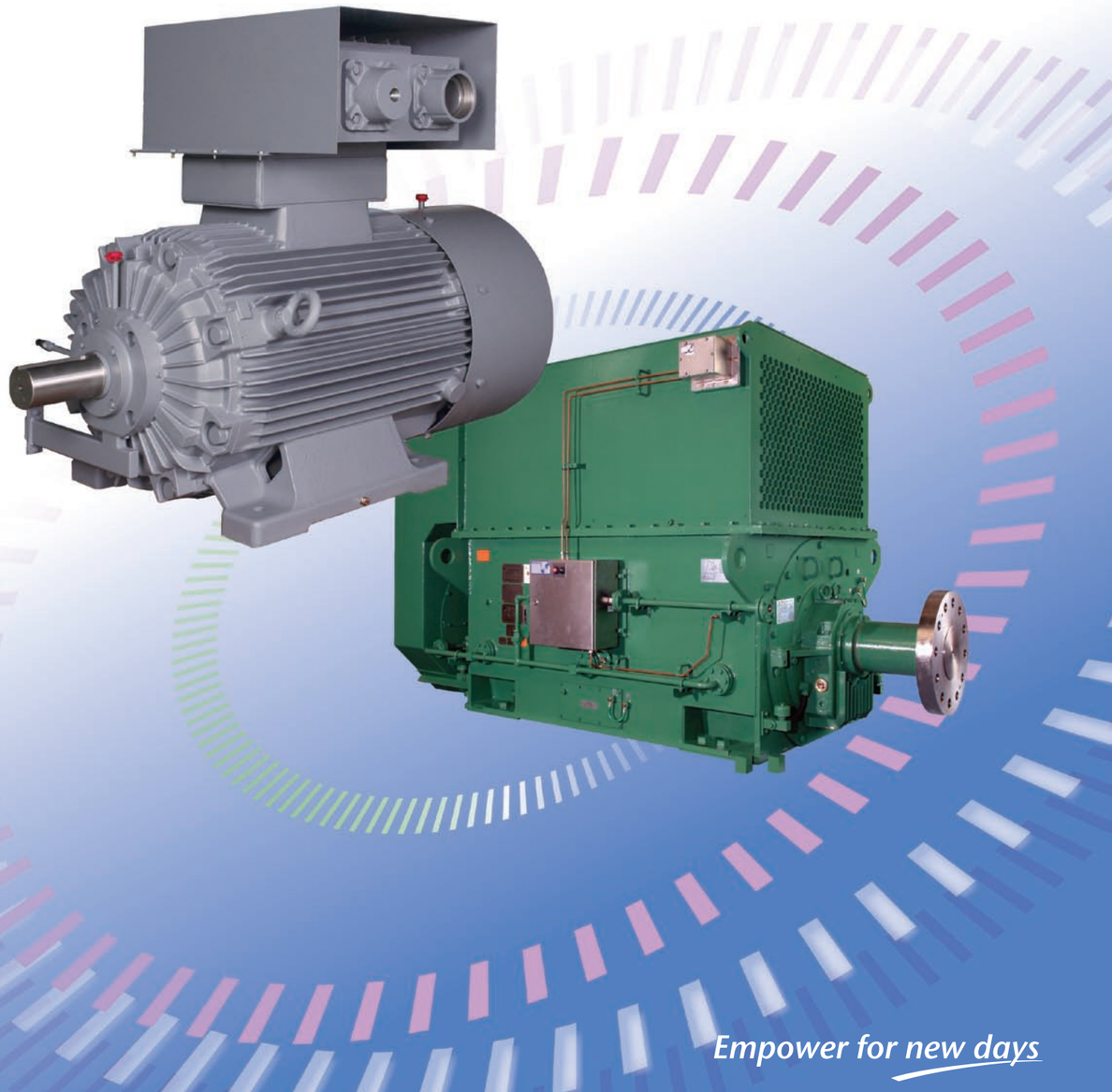
CA181-3051Ⓐ As of Mar., 2012
2012-3ME(0.5L)0.5L

JF2000 and JS2000 Series
ATEX/IECEx Certified

MEIDEN

High-voltage Three-phase Induction Motors for Explosive Gas Atmospheres

- Totally enclosed fan-cooled
- Totally enclosed air-to-air-cooled
- Totally enclosed air-to-water-cooled



Empower for new days

IECEx and ATEX Certified
Complying with International Standards and European Standards

4 main protection types of motors for explosive gas atmospheres are now developed, reflecting experience for more than 100 years and advanced technologies.

Standard motor specifications

Type of protection	Type *1	Ex "n"	Ex "e"	Ex "d"	Ex "p"
	Symbol *2	Ex nA ⅡT3	Ex e Ⅱ T3	Ex d ⅡB T4	Ex px Ⅱ T3
IEC standard		IEC 60079-15	IEC 60079-7	IEC 60079-1	IEC 60079-2
Degree of protection		IP44, PI54, or IP55			
Method of cooling		Totally enclosed fan-cooled(IC411)	Totally enclosed fan-cooled(IC411)	Totally enclosed fan-cooled(IC411)	Totally enclosed air-to-air-cooled(IC611)
		Totally enclosed air-to-air-cooled(IC611)	Totally enclosed air-to-air-cooled(IC611)		Totally enclosed air-to-water-cooled(IC81W)
		Totally enclosed air-to-water-cooled(IC81W)	Totally enclosed air-to-water-cooled(IC81W)		
Mounting arrangement		Foot-mounted (IM B3) or Flange-mounted (IM V1)			
Reted voltage*3		3.3kV, 6.6kV, or 11kV		3.3kV or 6.6kV	3.3kV, 6.6kV, or 11kV
Frequency*4		50 or 60Hz			
Ambient temperature*5		—20 to 40℃			
Insulation thermal class		Class F			
Locked rotor time t_E		—	8 sec. (5 sec. min.)	—	—
Additional tests for certification*6		Not required	Required	Not required	Required

*1: Symbols are explained on next page.
2: For "n" or "e" motors, necessity of pre-start purge units depends on motor rating.
3: Motors with other rated voltage are also available.
4: Inverter-fed motors are also available, but required of temperature test with the relevant inverters.
5: Motors for ambient temperature exceeding 40℃ are also available.
6: Ex "n" and Ex "d" motors are range-certified.
Ex "e" motors are frame-approved, but individual certificate on temperature rise and locked rotor test is required.
Ex "p" motors to be certified individually regarding purge, pressurizing and temperature rise tests.
Note: The embedded temperature detectors, bearing temperature detectors and dial thermometers with contacts, must be connected into intrinsically safe circuits.

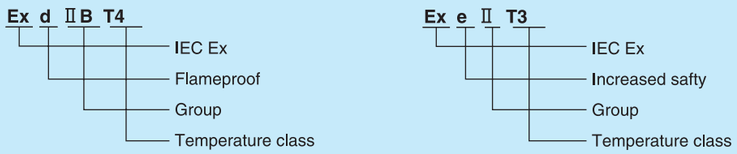
Applicable frame sizes

IC411 (JF2000 series)	250S to 500J	250S to 500J	280M to 400M	—
IC611 (JS2000 series)	355 to 710	355 to 710	—	355 to 710
IC81W (JS2000 series)	355 to 710	355 to 710	—	355 to 710

Example of output range (at 6kV, 50Hz, 4-pole device equivalent)

IC411 (JF2000 series)	110 to 1600kW	110 to 1250kW	110 to 335kW	—
IC611 (JS2000 series)	630 to 5000kW	500 to 2800kW	—	630 to 5000kW
IC81W (JS2000 series)	800 to 5000kW	560 to 3000kW	—	800 to 5000kW

Example of symbol



Note: For ATEX, motors comply with EN standards and have marking symbol EEEx.
ATEX is the abbreviation of "Atmospheres Explosibles".
ATEX derective means DERECTIVE 94/9/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres

Type of protection of motors for explosive gas atmospheres

Type of protection	Symbol	IEC standard	Principle	Location
Flameproof enclosures	"d"	IEC 60079-1	Enclosure withstands the pressure caused by internal explosion and prevents the transmission of explosion to explosive gas surrounding.	Zone 1
Pressurized enclosures	"p"	IEC 60079-2	Protective gas is maintained at pressure above external atmosphere to guard against the formation of explosive gas atmosphere inside.	Zone 1
Increased safety	"e"	IEC 60079-7	Additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks in normal service or under locked rotor condition.	Zone 1
Type of protection "n"	"n"	IEC 60079-15	("nA" for motors) Constructed to minimize the risk of occurrence of arcs and sparks capable of creating an ignition hazard during conditions of normal operation	Zone 2

Note 1: "p" is subdivided into three protection types of "px", "py", and "pz". "px" is applicable to motors.
2: "n" is subdivided further. "nA" is applicable to motors.

Hhazardous area

Zone 1	Place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.
Zone 2	Place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

Group

Group Ⅰ	Electric apparatus for mines susceptible to firedamp
Group Ⅱ	Electrical apparatus for places with an explosive gas atmosphere, other than mines susceptible to firedamp

Subdivision of group II

Group ⅡA	MESG ＞0.9mm or MIC ratio＞0.9	Propane, etc.
Group ⅡB	0.55mm ≦ MESG ≦ 0.9mm or 0.5 ≦ MIC ratio ≦ 0.8	Ethylene, etc.
Group ⅡC	MESG ＜ 0.5mm or MIC ratio ＜ 0.45	Hydrogen, acetylene

Note 1: MESG:Maximum experimental safe gap (for flameproof enclosure)
2: MIC:Minimum igniting currents (for intrinsically safe electrical apparatus)
3: Electrical apparatus, applicable to ⅡA, ⅡB and ⅡC, is designated Ⅱ.

Classification of maximum surface temperatures

Temperature class	Maximum surface temperature (℃)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

Subdivision of group Ⅱ and example of explosive gas

Temperature class		T1	T2	T3	T4	T5	T6
Group Ⅱ	ⅡA	Acetone Ammonia Benzene Carbon monoxide Ethyl acetate Methane Propane Toluene	Butyl acetate Chloro-ethylene Butyl-acetate Ethanol Propylene	Butyl chloride Cyclohexane Hexane Petroleum Petroleum naphtha Hexane	Acetaldehyde		
		Acrylonitrile Coke oven gas	Ethylene	Dimethyl ether	Diethyl ether		
		Hydrogen	Acetylene			Carbon disulfide	Ethyl nitrate