



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx BVS 20.0058X	Page 1 of 3	Certificate history
Status:	Current	Issue No: 0	
Date of Issue:	2020-09-01		
Applicant:	SIEMENS AG Vogelweiherstraße 1-15 Nürnberg 90441 Germany		
Equipment:	Three-phase induction motors type 1MB1*6*-1C*****-Z***		
Optional accessory:			
Type of Protection:	Flameproof Enclosure "d", Increased Safety "e", Protection by Enclosure "t"		
Marking:	Ex db eb IIA/IIB T* Gb or Ex db eb IIA/IIB T* Gb Ex tb IIIA/IIIB/IIIC T***C Db or Ex db eb IIA/IIB T* Gb Ex tc IIIA/IIIB/IIIC T***C Dc		
	Type 1MB1*6*-1C*****-Z Type 1MB1*6*-1C*****-ZB32 Type 1MB1*6*-1C*****-ZB30		

Approved for issue on behalf of the IECEx
Certification Body:

Dr Franz Eickhoff

Position:

Lead Auditor and officially recognised expert

Signature:
(for printed version)

Date:

Eickhoff
2020 - 09 - 01

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



Certificate issued by:

DEKRA Testing and Certification GmbH
Certification Body
Dinnendahlstrasse 9
44809 Bochum
Germany

 **DEKRA**
On the safe side.



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Manufacturer: **SIEMENS AG**
Vogelweiherstraße 1-15
Nürnberg 90441
Germany

Additional
manufacturing
locations: **Siemens s.r.o., Works Mohelnice**
Nádražní 25
Mohelnice 78985
Czech Republic

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition: 7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition: 7.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition: 2

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition: 5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[DE/BVS/ExTR20.0054/00](#)

Quality Assessment Report:

[DE/BVS/QAR09.0009/11](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Subject and Type

See Annex

Description

See Annex

Parameters

See Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

The lengths of the flameproof joints are in parts longer and the gaps of the flameproof joints are in parts smaller than the values of table 2 of IEC 60079-1:2014. For information of the dimensions of the flameproof joints contact the manufacturer.

Screws with a yield strength of 450 N/mm² or better must be used.

If the rotating electrical machine is not self-cooled either the safe operation of the forced cooling must be ensured or the machine must be monitored by the installed temperature sensors together with a suitable trigger unit.

The rotating electrical machine must be operate with a voltage source converter with pulse width modulation regarding the electrical parameters according to clause Parameters clause 1.2.

Before setting-up operation it has to be ensured that no inadmissible overvoltage caused by converter supply may occur at the terminals of the motor.

The maximum permissible peak voltages are 1500V_{pk} (standard) and 2200V_{pk} (optional).

Motor variants with a temperature above 70 °C at the cable glands and above 80 °C at the wire branching are marked with an additional label.

Annex:

[BVS_20_0058X_Siemens_Annex.pdf](#)



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Subject and Type

Three-phase induction motor type 1MB1*6*-1C*****-Z***

Asterisks	Description
1	Production line (no influence to explosion protection) 5 Europe line 8 Special insulating system
2	Efficiency 1 IE2 2 IE1 3 IE3 4 IE4 5 IE5 6 Reduced starting current 600 % / 50 Hz only / T _{amb,max} +55 °C / possible IE and/or power reduced 7 Reduced starting current 700 % / 50 Hz only / T _{amb,max} +55 °C / possible output reduced
3	Number of poles A 2 B 4 C 6 D 8 E 10 F 12 J 4/2 const. torque K 6/4 const. torque L 8/4 const. torque M 8/6/4 const. torque N 8/6 const. torque P 4/2 quadratic torque Q 6/4 quadratic torque R 8/4 quadratic torque S 8/6/4 quadratic torque T 8/6 quadratic torque
4	Core length 0,1 short 2,3 medium 4,5 long 6,7,8 short, medium, long with increased output 9 special output
5-6	Voltage, connections and frequency 2-2 230 VAC (delta) / 400 VAC (star) at 50 Hz 460 VAC (star) at 60 Hz 9-0 Non-Standard voltage, Code Option necessary x-x Other voltages / frequencies
7	Mounting type A IM B3 B to Z further available constructions (not Ex relevant)
8	Winding protection A Without winding protection B 3 PTC thermistors (for tripping) C 6 PTC thermistors (for alarm and tripping) D to R Further winding protections without Ex relevance
9	Position of terminal box 4 on top 5 on right hand side 6 on left hand side 7 connection box bottom
10-12	Order codes for additional features B30 Machine suitable for EPL Dc B32 Machine suitable for EPL Db B43 Machine for voltage source converter use B44 Machine for voltage source converter use / thermal class F D04 Coolant temperature -40°C F20 Break on DE side with flange in "db" design G30 Mounting of encoder Q0* Anti-condensation heating *** Further order codes without Ex relevance



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Description

The rotating electrical machine type 1MB1*6*-1C*****-Z*** itself is designed in type of protection Flameproof Enclosure "db" and is equipped with a separately certified terminal box in type of protection Increased Safety "eb" for use in hazardous gas atmospheres.

For use in hazardous dust atmospheres the machine can be either in type of protection Protection by Enclosure "tb" for zone 21 or "tc" for zone 22. In both case the design of the terminal box is also in accordance with the required level of protection "tb" or "tc".

The machine housing, the end shield and the bearing caps are made of cast iron. The rotor is made of steel.

The shaft will be mounted with one fixed and one floating roller bearing.

Non-metallic gamma rings or radial shaft sealings are used.

The cooling of the rotating electrical machine is realised by an external fan that is made of steel, aluminium, brass or plastic. The fan is driven by the electrical machine itself.

Optionally one or two space heaters can be installed inside the stator housing directly on the surface of the winding heads. The operation of the space heater is only allowed when the machine is not running.

Optionally, an encoder certified as a device can be attached.

Electrical connection is made by separately tested main terminal boxes types TB1H21, TB1J21 and TB1L21 and auxiliary terminal box TB2J21 according to IECEx ExTR CZ/FTZU/ExTR17.0026/00. Within this test report the main terminals types gk230 and gk330 and auxiliary terminals types AKZ 4, AKE 4, 07-9702-0*2*/**** are also considered.

The terminals types AKZ4 and AKE4 are certified according to IECEx TUR 18.0024U and TÜV 18 ATEX 8221 U and the terminals types 07-9702-0*2*/**** are certified according to IECEx PTB 07.0007U and PTB 99 ATEX 3117 U.

For direct temperature monitoring the winding of the motor can be equipped, if required, with thermistors (PTC), or resistant temperature sensors Pt100 or Pt1000. The PTCs are connected in series.

The bearings can be monitored using resistance thermometers Pt100.

The sensors or the thermometers will be connected to a trigger unit which is certified for this purpose.

The ambient temperature range is $-20\text{ °C} \leq T_{\text{amb}} \leq 40\text{ °C}$. A special electrical and thermal design using suitable terminal boxes, materials and components and the respective data sheet of the electrical design allows extending this range up to $-40\text{ °C} \leq T_{\text{amb}} \leq 60\text{ °C}$.

If the motor is converter-fed the converter must be of type voltage-source converter with pulse width modulation.

Listing of all components used referring to older standards

Subject and type	Certificate / Test report	Standards
Terminal boxes Main: TB1H21, TB1J21, TB1L21 Auxiliary: TB2J21	CZ/FTZU/ExTR17.0026/00 ¹	IEC 60079-0:2011, Ed. 6 IEC 60079-7:2015, Ed. 5 IEC 60079-31:2013, Ed. 2
Terminals Main: gk230, gk330		
Terminals Auxiliary: 07-9702-0*20/1	IECEx PTB 07.0007U ¹	IEC 60079-0:2011, Ed. 6 IEC 60079-7:2015, Ed. 5

¹ No applicable technical differences

² Technical differences evaluated and found satisfactory



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Parameters

1 Electrical parameters

1.1 Electrical parameters (rotating electrical machine)

Maximum rated voltage ¹	up to	690	V
Maximum rated current	up to	57	A
Maximum rated power	up to	17	kW
Maximum rated torque	up to	119	Nm
Maximum rated frequency	up to	100	Hz
Maximum poles	up to	12	
Maximum rotational speed	up to	5400	min ⁻¹
Duty type		S1 – S9	

¹ In case of converter-fed: Voltage of the fundamental wave measured at the motor terminals. This voltage must not be decreased by 10 %, taken into account the minimum converter input voltage and the voltage drop caused by the supply line and an optional sinus filter.

1.2 Electrical parameters (voltage-source converter)

Used input voltage	Rated voltage of motor	V
Minimum switching frequency	2	kHz
Current limiting value	$1.5 \times I_N$	
Maximum overload time ²	60	s
Output frequency	5 up to 100	Hz

² The maximum overload time and the permitted time for operation below the minimum output frequency are in relation with a period of 10 minutes.

1.3 Electrical parameters (monitoring circuits)

PTC thermistors	U_{max} 30 VDC I_{max} 0.5 A
Circuits of the resistance thermometer Pt100	U_{max} 0.5 VDC I_{max} 1 mA
Circuits of the resistance thermometer Pt1000	U_{max} 1 V I_{max} 0.5 mA

2 Thermal parameters

2.1 General

Temperature class / Surface temperature	Temperature class T6 to T3 Surface temperature up to T200 °C The values valid for the respective construction / design are indicated on the rating plate and the data sheet of the machine
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2.2 Thermal ratings (flameproof enclosure)

Ambient temperature range	$-20\text{ °C} \leq T_{amb} \leq 40\text{ °C}$ (standard) $-40\text{ °C} \leq T_{amb} \leq 60\text{ °C}$ (optional)
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