



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 17.0016** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2017-03-24

Applicant: **ABB STOTZ-KONTAKT GmbH**
Eppelheimer Straße 82
69123 Heidelberg
Germany

Equipment: **Electronic overload relay type EF*****

Optional accessory:

Type of Protection: **Equipment protection by flameproof enclosures "d", Equipment dust ignition protection by enclosure "t",
Equipment protection by increased safety "e"**

Marking: [Ex]

Approved for issue on behalf of the IECEx
Certification Body:

Jörg Koch

Position:

Head of Certification Body

Signature:
(for printed version)

Date:

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 EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

 **DEKRA**
On the safe side.



IECEx Certificate of Conformity

Certificate No.: **IECEx BVS 17.0016**

Page 2 of 3

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Manufacturer: **ABB STOTZ-KONTAKT GmbH**
Eppelheimer Straße 82
69123 Heidelberg
Germany

Additional
manufacturing
locations:

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 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

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 60079-7:2015 Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
Edition:5.0

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/ExTR17.0021/00](#)

Quality Assessment Report:

[DE/BVS/QAR14.0004/02](#)



IECEx Certificate of Conformity

Certificate No.: **IECEx BVS 17.0016**

Page 3 of 3

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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

General product information:

See Annex

Electrical Parameters

See Annex

SPECIFIC CONDITIONS OF USE: NO

Annex:

[BVS_17_0016_ABB_Annex.pdf](#)



IECEX Certificate of Conformity



Certificate No.: **IECEX BVS 17.0016**
Annex
Page 1 of 3

General product information:

The electronic overload relays were tested according to IEC 61508-1:2010 and IEC 61508-2:2010. They were also tested according to IEC 60947-4-1:2009 and IEC 60947-5-1:2003.

A self-supplied electronic overload relay has been installed, which has a delaying effect and a phase failure protection, so that the switches of the safety device (protective device for indirect temperature control) can be used to protect motors in order to avoid non-permitted temperatures.

In general they can be used if the electrical engine is protected by indirect temperature monitoring. This should be stated in the Test Report.

The electronic overload relays are safety devices, controlling devices and regulating devices. They contribute to or are required for the safe functioning of equipment with respect to the hazards of ignition or with respect to the hazard of uncontrolled explosion. The overload relays can be used as overload protective devices for electric motors of type of protection Ex e 'Increased Safety' or Ex d 'Flameproof Enclosure' e.g.

The type series EF*** consists of 16 modules which differ in their current setting ranges, reaching from 0.32 A to 800 A. The individual types of each module are of identical electrical construction. In the full labelling, the asterisk (*) will be replaced by the maximum rated operating current which can be set and which stands for the following values:

Type	Order number	Current setting range
EF19-0,32	1SAX121001R1101	0.1 – 0.32
EF19-1,0	1SAX121001R1102	0.3 – 1.0
EF19-2,7	1SAX121001R1103	0.8 – 2.7
EF19-6,3	1SAX121001R1104	1.9 – 6.3
EF19-18,9	1SAX121001R1105	5.7 – 18.9
EF45-30	1SAX221001R1101	9.0 - 30
EF45-45	1SAX221001R1102	15 - 45
EF65-56	1SAX331001R1102	20 - 56
EF65-70	1SAX331001R1101	25 - 70
EF96-56	1SAX341001R1102	20 - 56
EF96-100	1SAX341001R1101	36 - 100
EF146-150	1SAX351001R1101	54 - 150
EF205-210	1SAX531001R1101	63 - 210
EF370-380	1SAX611001R1101	115 - 380
EF460-500	1SAX721001R1101	150 - 500
EF750-800	1SAX821001R1101	250 - 800



IECEX Certificate of Conformity



Certificate No.: **IECEX BVS 17.0016**
Annex
Page 2 of 3

Electrical parameters

Number of poles: 3
Number of aux. contacts break contact: 1
Number of aux. contacts make contact: 1

EF19, EF45

Rated insulating voltage (U_i):
main circuit 690 V AC
aux. circuit 690 V AC
Rated operational voltage (U_e):
main circuit 690 V AC
aux. circuit 690 V AC / DC

EF65, EF96, EF146, EF205, EF370, EF460, EF750

Rated insulating voltage (U_i):
main circuit 1000 V AC
aux. circuit 690 V AC
Rated operational voltage (U_e):
main circuit 1000 V AC
aux. circuit 690 V AC / DC

Rated operational currents (I_e): depends on type of series EF***

For each module of the respective current setting range there is an own curve in place that shows the release time in relation to x-time the nominal current (two-poles or three-poles) in compliance with the requirements of explosion protection.

Current type: AC, DC

EF19, EF45

Rated impulse withstand voltage (U_{imp}):
main circuit 6 kV
aux. circuit 6 kV

EF65, EF96, EF146, EF205, EF370, EF460, EF750

Rated impulse withstand voltage (U_{imp}):
main circuit 8 kV
aux. circuit 6 kV

Trip class: 10 E, 20 E, 30 E selectable

The trip class of all modules is identical.

Other parameters

Contamination class: 3

Degrees of protection: IP20

Terminals: screw-type terminals

Ambient temperature range: -25 °C...+70 °C

The ambient temperature range of all modules and variants is identical. Contrary to 60947-4-1 the ambient temperature range has been extended.



IECEX Certificate of Conformity



Certificate No.: IECEx BVS 17.0016
Annex
Page 3 of 3

Safety parameters

The system is of type A according to IEC 61508. For the low demand mode of operation the following safety parameters for the electronic overload relays EF*** are determined:

Safety Integrity Level: SIL 1

Average Probability of dangerous Failure on Demand of the safety function, Proof test interval 3 years PFD = $4.16 \cdot 10^{-3}$

Hardware Fault Tolerance HFT = 0

Architecture 1oo1

Safe Failure Fraction SFF = 45 %

Mean Time Between Failures MTBF = 201 years

Ambient temperature 40 °C

	without self diagnostic	with self diagnostic
failure rates of dangerous undetected failures λ_{DU}	$316 \cdot 10^{-9}/h$	$154 \cdot 10^{-9}/h$
failure rates of dangerous detected failures λ_{DD}	0	$162 \cdot 10^{-9}/h$
failure rates of safe undetected failures λ_{SU}	$260 \cdot 10^{-9}/h$	$260 \cdot 10^{-9}/h$
failure rates of safe detected failures λ_{SD}	0	0
diagnostic coverage DC	0	52 %