



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx KEM 07.0037X issue No.:0 Certificate history:.....

Status: Current

Date of Issue: 2007-08-14 Page 1 of 3

Applicant: **ABB Automation Products GmbH**
Dransfelder Straße 2
D-37079 Göttingen
Germany

Electrical Apparatus: **Variable Area Flowmeter Model Series FAM54.....**
Optional accessory:

Type of Protection: **d, i, nA, nL, tD**

Marking: **Ex ia IIC T1 ... T4**
Ex d IIC T1 ... T6
Ex nA [nL] IIC T1 ... T6
Ex nA II T1 ... T6
Ex tD A21 IP6X T85 °C ... Tmedium

Approved for issue on behalf of the IECEx Certification Body: C.G. van Es

Position: Certification Manager

Signature:
(for printed version)

Date:



2007-08-14

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 the Official IECEx Website.

Certificate issued by:

KEMA Quality B.V.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands





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Manufacturer: **ABB Automation Products GmbH**
Dransfelder Straße 2
D-37079 Göttingen
Germany

Manufacturing location(s):

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 electrical apparatus 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 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2001 Edition: 4	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosures 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: Ed 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 61241-0 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical 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:

NL/KEM/ExTR07.0041/00

Quality Assessment Report:

DE/TUN/QAR06.0010/01



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Variable Area Flowmeter Model Series FAM54abcdefghijkl is designed for vertical installation and is suitable for the measurement of the flow of gases, liquids and steam. The Flowmeter is provided with a mechanical display and depending on the options with electrical output signals (analog and/or digital) and an electronic display.

CONDITIONS OF CERTIFICATION: YES as shown below:

For the different models of the Variable Area Flowmeter Series FAM54-....., the relation between the model code, the equipment marking, the electrical data, the ambient temperature range, the temperature class, and the medium temperature range, taking into account the presence of optional thermal insulation and/or a steam jacket, shall be taken from the tables listed in the Attachment to this certificate.

Service of the internal cylindrical flameproof joints (magnetic system) should be avoided. Contact the manufacturer if necessary.

Electrical data

Table 1

Model	Equipment Marking	Terminal	Input Data	T _{amb} -20 °C or -50 °C to	Temp. Class	Max. Medium Temp.	Thermal Isolation	Steam Jacket
FAM54abcA4f_ and FAM54abcA9f.. with b = E or F	Ex ia IIC T4 ... T1 Ex tD A21 IP6X T85°C to Tmedium	31/32 for connection to an intrinsically safe circuit	U _i = 30 V I _i = 110 mA P _i = 770 mW C _i = 5,3 nF L _i = 266 µH	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
		41/42 for connection to an intrinsically safe circuit	U _i = 30 V I _i = 30 mA P _i = 115 mW C _i = 4,8 nF L _i = 133 µH	+50 °C	T2	+220 °C	YES	YES
				+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
FAM54abcA9f_ with b = E or F	Ex d IIC T6 ... T1 Ex tD A21 IP6X T85°C to Tmedium	31/32 for connection to a non-intrinsically safe circuit (note 1)	U _{max} = 46 V	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
		41/42 for connection to a non-intrinsically safe circuit (note 1)	U _{max} = 30 V I _{max} = 30 mA P _{max} = 115 mW	+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+60 °C	T4	+130 °C	YES	YES
				+60 °C	T5	+95 °C	YES	YES
				+60 °C	T6	+80 °C	YES	YES
FAM54abcB1f.. and FAM54abcA4f.. and FAM54abcA9f.. with b = E or F	Ex nA [nL] IIC T6 ... T1 Ex tD A21 IP6X T85°C to Tmedium	31/32 for connection to a non-intrinsically safe circuit (note 1)	U _{max} = 46 V	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
		41/42 for connection to a non-intrinsically safe circuit (note 1)	U _{max} = 30 V I _{max} = 30 mA P _{max} = 115 mW	+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
				+70 °C	T3	+150 °C	YES	NO
				+70 °C	T4	+130 °C	YES	YES
+70 °C +30 °C	T5 T6	+95 °C	T5	+95 °C	YES	YES		
		+25 °C	T6	+25 °C	YES	YES		

Table 1: Special condition for use with dust for Model **FAM54abcA4f..** and **FAM54abcB1f ..**:
 Tmedium ≤ 250°C with Tamb = -50 °C to +60 °C
 Tmedium ≤ 340°C with Tamb = -50 °C to +40 °C
 Tmedium ≤ 430°C with Tamb = -50 °C to +20 °C

Note 1: If the possibility is kept open, that the apparatus in a next instance may be used as an intrinsically safe device, Um = 60 V is applicable to the input circuits.

Table 2

Model	Equipment Marking	Terminal	Input Data	Tamb -20 °C or -50 °C to	Temp. Class	Max. Fluid Temp.	Thermal Isolation	Steam Jacket
FAM54abcA4f.. and FAM54abcA9f.. with b = B, C or D	Ex ia IIC T6 ... T1 Ex tD A21 IP6X T85 °C to Tmedium	41/42 and 51/52 for connection to an intrinsically safe circuit	For each circuit $U_i = 16\text{ V}$ $I_i = 25\text{ mA}$ $P_i = 64\text{ mW}$ $C_i = 50\text{ nF}$ $L_i = 250\text{ }\mu\text{H}$	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
				+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
				+70 °C	T3	+150 °C	YES	NO
				+70 °C	T4	+130 °C	YES	YES
				+70 °C	T5	+95 °C	YES	YES
				+60 °C	T6	+80 °C	YES	YES
				41/42 and 51/52 for connection to an intrinsically safe circuit	For each circuit $U_i = 16\text{ V}$ $I_i = 52\text{ mA}$ $P_i = 169\text{ mW}$ $C_i = 50\text{ nF}$ $L_i = 250\text{ }\mu\text{H}$	+40 °C	T1	+440 °C
		+40 °C	T1			+375 °C	YES	NO
		+40 °C	T1			+260 °C	YES	YES
		+50 °C	T1			+300 °C	YES	NO
		+50 °C	T2			+290 °C	YES	NO
		+50 °C	T2			+220 °C	YES	YES
		+60 °C	T2			+320 °C	NO	NO
		+60 °C	T2			+230 °C	YES	NO
		+60 °C	T3			+170 °C	YES	YES
		+70 °C	T3			+195 °C	NO	NO
		+70 °C	T3			+150 °C	YES	NO
		+70 °C	T4			+130 °C	YES	YES
		+60 °C	T5			+60 °C	YES	YES
		+50 °C	T5			+90 °C	NO	YES
		+40 °C	T6			+60 °C	YES	YES
		41/42 and 51/52 for connection to an intrinsically safe circuit	For each circuit $U_i = 16\text{ V}$ $I_i = 76\text{ mA}$ $P_i = 242\text{ mW}$ $C_i = 50\text{ nF}$ $L_i = 250\text{ }\mu\text{H}$	+40 °C	T1	+440 °C	NO	NO
+40 °C	T1			+310 °C	YES	NO		
+40 °C	T2			+190 °C	YES	YES		
+50 °C	T2			+340 °C	NO	NO		
+50 °C	T2			+230 °C	YES	YES		
+60 °C	T2			+230 °C	NO	NO		
+60 °C	T3			+160 °C	YES	YES		
+70 °C	T4			+120 °C	NO	NO		
+70 °C	T4			+100 °C	YES	YES		
+40 °C	T5			+60 °C	YES	YES		
+30 °C	T6			+30 °C	YES	YES		

Table 2: Special condition for use with dust for Model **FAM54abcA4f..** and **FAM54abcA9f..**:
 Tmedium ≤ 250°C with Tamb = -50°C to +60°C
 Tmedium ≤ 340°C with Tamb = -50°C to +40°C
 Tmedium ≤ 430°C with Tamb = -50°C to +20°C

Table 3

Model	Equipment Marking	Terminal	Input Data	Tamb -20 °C or -50 °C to	Temp. Class	Max. Fluid Temp.	Thermal Isolation	Steam Jacket
FAM54abcA9f.. with b = B, C or D	Ex d IIC T6 ... T1 Ex tD A21 IP6X T85°C to Tmedium	41/42 and 51/52 for connection to a non-intrinsically safe circuit	For each circuit Umax = 16 V Imax = 25 mA Pmax = 64 mW	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
				+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
				+70 °C	T3	+150 °C	YES	NO
				+70 °C	T4	+130 °C	YES	YES
				+70 °C	T5	+95 °C	YES	YES
				+60 °C	T6	+80 °C	YES	YES
				41/42 and 51/52 for connection to a non-intrinsically safe circuit	For each circuit Umax = 16 V Imax = 52 mA Pmax = 169 mW	+40 °C	T1	+440 °C
		+40 °C	T1			+375 °C	YES	NO
		+40 °C	T1			+260 °C	YES	YES
		+50 °C	T1			+300 °C	YES	NO
		+50 °C	T2			+290 °C	YES	NO
		+50 °C	T2			+220 °C	YES	YES
		+60 °C	T2			+320 °C	NO	NO
		+60 °C	T2			+230 °C	YES	NO
		+60 °C	T3			+170 °C	YES	YES
		+70 °C	T3			+195 °C	NO	NO
		+70 °C	T3			+150 °C	YES	NO
		+70 °C	T4			+130 °C	YES	YES
		41/42 and 51/52 for connection to a non-intrinsically safe circuit	For each circuit Umax = 16 V Imax = 76 mA Pmax = 242 mW	+60 °C	T5	+60 °C	YES	YES
+50 °C	T5			+90 °C	NO	YES		
+40 °C	T6			+60 °C	YES	YES		
+40 °C	T1			+440 °C	NO	NO		
+40 °C	T1			+310 °C	YES	NO		
+40 °C	T2			+190 °C	YES	YES		
41/42 and 51/52 for connection to a non-intrinsically safe circuit	For each circuit Umax = 16 V Imax = 76 mA Pmax = 242 mW	+50 °C	T2	+340 °C	NO	NO		
		+50 °C	T2	+230 °C	YES	YES		
		+60 °C	T2	+230 °C	NO	NO		
		+60 °C	T3	+160 °C	YES	YES		
		+70 °C	T4	+120 °C	NO	NO		
		+70 °C	T4	+100 °C	YES	YES		
		+40 °C	T5	+60 °C	YES	YES		
		+30 °C	T6	+30 °C	YES	YES		

Table 3: Special condition for use with dust for Model FAM54abcA9f..
 Tmedium ≤ 250°C with Tamb = -50°C to +60°C
 Tmedium ≤ 340°C with Tamb = -50°C to +40°C
 Tmedium ≤ 430°C with Tamb = -50°C to +20°C

Annex to: IECEx KEM 07.0037 X
 Applicant: ABB Automation Products GmbH
 Electrical Apparatus: Variable Area Flowmeter Model Series FAM54-.....

Table 4

Model	Equipment Marking	Terminal	Input Data	Tamb -20 °C or -50 °C to	Temp. Class	Max. medium Temp.	Thermal Isolation	Steam Jacket
FAM54abcB1f.. and FAM54abcA4f.. and FAM54abcA9f.. with b = B, C or D	Ex nA II T6 ... T1 Ex tD A21 IP6X T85°C to Tmedium	41/42 and 51/52 for connection to a non-intrinsically safe circuit (* note 1)	For each circuit Umax = 16 V Imax = 25 mA Pmax = 64 mW	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
				+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
				+70 °C	T3	+150 °C	YES	NO
				+70 °C	T4	+130 °C	YES	YES
		+70 °C	T5	+95 °C	YES	YES		
		+60 °C	T6	+80 °C	YES	YES		
		41/42 and 51/52 for connection to a non-intrinsically safe circuit (* note 1)	Umax = 16 V Imax = 52 mA Pmax = 169 mW	+40 °C	T1	+440 °C	NO	NO
				+40 °C	T1	+375 °C	YES	NO
				+40 °C	T1	+260 °C	YES	YES
				+50 °C	T1	+300 °C	YES	NO
				+50 °C	T2	+290 °C	YES	NO
				+50 °C	T2	+220 °C	YES	YES
				+60 °C	T2	+320 °C	NO	NO
				+60 °C	T2	+230 °C	YES	NO
				+60 °C	T3	+170 °C	YES	YES
				+70 °C	T3	+195 °C	NO	NO
+70 °C	T3			+150 °C	YES	NO		
+70 °C	T4			+130 °C	YES	YES		
+60 °C	T5	+60 °C	YES	YES				
+50 °C	T5	+90 °C	NO	YES				
+40 °C	T6	+60 °C	YES	YES				
41/42 and 51/52 for connection to a non-intrinsically safe circuit (* note 1)	Umax = 16 V Imax = 76 mA Pmax = 242 mW	+40 °C	T1	+440 °C	NO	NO		
		+40 °C	T1	+310 °C	YES	NO		
		+40 °C	T2	+190 °C	YES	YES		
		+50 °C	T2	+340 °C	NO	NO		
		+50 °C	T2	+230 °C	YES	YES		
		+60 °C	T2	+230 °C	NO	NO		
		+60 °C	T3	+160 °C	YES	YES		
		+70 °C	T4	+120 °C	NO	NO		
		+70 °C	T4	+100 °C	YES	YES		
		+40 °C	T5	+60 °C	YES	YES		
		+30 °C	T6	+30 °C	YES	YES		

Table 4: Special condition for use with dust for Model **FAM54abcA4f..**, **FAM54abcA9f..** and **FAM54abcB1f..**:
 Tmedium ≤ 250°C with Tamb = -50°C to +60°C
 Tmedium ≤ 340°C with Tamb = -50°C to +40°C
 Tmedium ≤ 430°C with Tamb = -50°C to +20°C

Note 1: If the possibility is kept open, that the apparatus in a next instance may be used as an intrinsically safe device, Um = 60 V is applicable to the input circuits.

Annex to: IECEx KEM 07.0037 X
Applicant: ABB Automation Products GmbH
Electical Apparatus: Variable Area Flowmeter Model Series FAM54-.....

Installation instructions

The cable entry devices and blanking elements must be suitable for the conditions of use and correctly installed.

Cables and cable glands with a temperature rating of at least 80 °C shall be used. For cable which are limited to 70 °C the maximum medium temperatures can be determined from the temperature class tables.

After connection of an intrinsically safe Flowmeter Type FAM54-.... to a non-intrinsically safe circuit of which it is guaranteed that the voltage has not exceeded 60 V (e.g. because it is an SELV or a PELV circuit), and after execution of the test and inspection as described in the safety instructions, the flowmeter may be used as an intrinsically safe apparatus.

The installation instructions as provided by the manufacturer shall be followed in detail in order to assure safe functioning of the equipment, taking into account the local installation rules.