



Translation

(1) **EC-Type Examination Certificate**

(2) **- Directive 94/9/EC -**
Equipment and protective systems intended for use
in potentially explosive atmospheres

(3) **BVS 05 ATEX E 090 X**

(4) **Equipment:** Capacitive level measurement type Liquicap-M FMI51 and
type Liquicap-M FMI52

(5) **Manufacturer:** Endress + Hauser GmbH + Co. KG

(6) **Address:** D - 79690 Maulburg

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8) The certification body of EXAM BBG Prüf- und Zertifizier GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the test and assessment report BVS PP 05.2059 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:


EN 50014:1997+A1-A2	General requirements
EN 50018:2000+A1	Flameproof enclosure 'd'
EN 50020:2002	Intrinsic safety 'i'
EN 50284:1999	Equipment Group II, Category 1G

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.

Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate

(12) The marking of the equipment shall include the following:

II 1/2G EEx d [ia] IIC T3 ... T6,
II 1/2G EEx d [ia] IIB T3 ... T6,
 **II 2G EEx d [ia] IIC T3 ... T6** resp.
II 2G EEx d [ia] IIB T3 ... T6

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 13. June 2005

Signed: Dr. Jockers

Signed: Dr. Eickhoff

Certification body

Special services unit

(13) Appendix to

(14) **EC-Type Examination Certificate**

BVS 04 ATEX E 090 X

(15) 15.1 Subject and type

Capacitive level measurement type Liquicap-M FMI51 and type Liquicap-M FMI52

15.2 Description

The Capacitive level measurement is mounted to a tank by a flange. The probe is inserted into the tank and, in case of the rod probe or the rope probe, it forms a capacitor with the tank walls or, in case of the rod probe, with a grounded tube.

The Capacitive level measurement is manufactured in different variants. Amongst others there are different types of probes (type Liquicap-M FMI51 has a rod probe and type Liquicap-M FMI52 has a rope probe) and different flanges.

For the Capacitive level measurement the enclosure type T13 is used.

An electronic insert optionally with a display both with intrinsically safe circuits and a supply module are mounted inside the enclosure.

The testing of the intrinsically safe circuits of this apparatus is an item of the test report BVS PP 05.2055 EG.

The enclosures fulfil the requirements of category 2G. The intrinsically safe probe circuit fulfils the requirements of category 1G.

15.3 Parameters

power dissipation		≤	1	W
voltage		≤	DC 37	V
process temperature *	-80	to	200	°C
ambient temperature range *				
temperature class T6	-50	up to	60	°C
temperature class T4 and T3	-50	up to	70	°C

In the version with display and glass window in the cover of the flameproof enclosure the lower limit of the ambient temperature is -40 °C.

* for limitations see temperature diagram in the Safety instructions

(16) Test and assessment report

BVS PP 05.2059 EG as of 13.06.2005

(17) Special conditions for safe use

For the IIC version:

The Capacitive level measurement should only be used where electrostatic charging of the probe caused by the process is not possible.

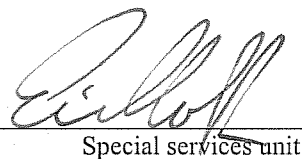
We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 13. June 2005
BVS-Ru/Kw A 20040854

EXAM BBG Prüf- und Zertifizier GmbH



Certification body



Special services unit



Translation
1st Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 05 ATEX E 090 X

Equipment: Capacitive level measurement type Liquicap-M FTI51 and
type Liquicap-M FTI52

Manufacturer: Endress + Hauser GmbH + Co. KG

Address: 79690 Maulburg, Germany

A second capacitive level measurement is added to the capacitive level measurement type Liquicap-M FMI51 and type Liquicap-M FMI52. This is designated:

Liquicap-M FTI51 and Liquicap-M FTI52

The capacitive level measurement type Liquicap-M FTI51 and type FTI52 can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 50014:1997+A1-A2 General requirements
EN 50018:2000 +A1 Flameproof enclosure 'd'
EN 50020:2002 Intrinsic safety 'i'
EN 50284:1999 Equipment Group II, Category 1G

The marking of the equipment shall include the following:



II 1/2G EEx d [ia] IIC T3 ... T6,
II 1/2G EEx d [ia] IIB T3 ... T6,
II 2G EEx d [ia] IIC T3 ... T6 resp.
II 2G EEx d [ia] IIB T3 ... T6

Description

The capacitive level measurement is manufactured in different variants. Amongst others there are different types of probes (type Liquicap-M FTI51 has a rod probe and type Liquicap-M FTI52 has a rope probe) and different flanges. For this level measurement the enclosure type T13 (two compartments) and F13 (one chamber) is used.

Inside the enclosure each one electronic insert is mounted.

The electronic insert type FEI55 (BVS PP 06.2064 EG) is mounted only in enclosure type T13.

The electronic inserts type FEI52 (BVS PP 06.2089 EG) and type FEI54 (BVS PP 06.2088 EG) can be mounted in both enclosures.

The testing of the intrinsically safe circuits of this apparatus is an item of the test reports above-mentioned.

The enclosures fulfil the requirements of category 2G. The intrinsically safe probe circuit fulfils the requirements of category 1G.

Parameters

With electronic insert type FEI55 (BVS PP 06.2064 EG)

Input / signal circuit (terminals 1 – 2)

Power supply intrinsically safe

Voltage	Ui	DC	36	V
Current	Ii		100	mA
Power	Pi		1	W
Effective internal inductance	Li		negligible	
Effective internal capacitance	Ci		2.4	nF

or

Voltage		≤ DC	37	V
Current/power has to be limited by a fuse with a nominal value of			40	mA

Ambient temperature range	Ta	-50 °C bis + 70 °C
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With electronic insert type FEI54 (BVS PP 06.2088 EG)

Input circuit (terminals 1 (L+) – 2 (L-))

Voltage		DC	19... 55	V
		AC	19...253	V
Max. voltage	Um	AC	253	V

Relay contact circuits (terminals 3 – 5 und 6 - 8)

Switching voltage		AC	253	V
Switching current			6	A
Switching power (at $\cos \varphi \geq 0,7$)			750	VA

or

Switching voltage		DC	30/125	V
Switching current			6/ 0.2	A

Ambient temperature range	Ta	-50 °C up to + 70 °C
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With electronic insert type FEI52 (BVS PP 06.2089 EG)

Input circuit (terminals 1 (L+) – 2 (L-)) and

Signal circuit (terminals 3 – 2)

Voltage

Max. voltage

	DC	10...55	V
Um	AC	253	V

Ambient temperature range

Ta -50 °C up to + 70 °C

Process temperature *

-80 °C up to + 200 °C

Ambient temperature range *

Temperature class T6

-50 °C up to + 60 °C

Temperature class T4 and T3

-50 °C up to + 70 °C

* for limitations see temperature diagram in the Safety instructions

Special conditions for safe use

Unchanged

Test and assessment report

BVS PP 05.2059 EG as of 25.09.2006

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 25. September 2006

Signed: Dr. Jockers

Signed: Leiendecker

Certification body

Special services unit

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

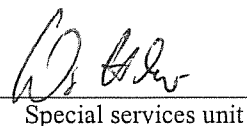
44809 Bochum, 25.10.2006

BVS-Kem/Ar A 20060564

EXAM BBG Prüf- und Zertifizier GmbH



Certification body



Special services unit



Translation 2nd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate BVS 05 ATEX E 090 X

Equipment: Capacitive level measurement Liquicap-M type FMI51, FMI52, FTI51 and FTI52

Manufacturer: Endress + Hauser GmbH + Co. KG

Address: 79689 Maulburg, Germany

Description

The capacitive level measurement Liquicap-M type FMI51, FMI52, FTI51 and FTI52 can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2006	General requirements
EN 60079-1:2004	Flameproof enclosure 'd'
EN 60079-7:2003	Increased safety 'e'
EN 60079-11:2007	Intrinsic safety 'i'
EN 60079-26:2004	Group II, Category 1G
EN 61241-0:2006	General requirements
EN 61241-1:2004	Protection by enclosure "tD"
EN 61241-11:2006	Protection by Intrinsic safety "iD"

Description

The operation range of the capacitive level measurement Liquicap-M types FTI51 and FTI52 is enlarged for the use in the presences of combustible dust. Additionally the enclosure T13 (two compartment enclosure) is modified at type FTI51 and FTI52. A separate certified line-bushing (PTB 97 ATEX 1047 U) type 07-9102-E08E/G resp. type 07-9102-E03E/G is mounted in the separation wall of the two compartments of the enclosure. The terminal box has the type of protection Increased Safety. The electronic box has the type of protection Flameproof Enclosure. The terminal box is equipped with separately certified terminals.

Electronic inserts are mounted inside the enclosures. A further electronic insert in accordance with BVS PP 07.2109 EG can be mounted inside the enclosure.

The assessment of the intrinsically safe circuits of this apparatus is an item of the test reports above-mentioned.

The enclosures fulfil the requirements of category 2G and 2D. The intrinsically safe probe circuit fulfils the requirements of category 1G and 1D.

Ratings

Electronic insert type FEI51 (BVS PP 07.2109 EG)

Input circuit (terminals 1 (L+) – 2 (L-))

Voltage		AC	19...253	V
max. voltage	Um	AC	253	V

probe circuit (connector X101), type of protection Ex ia IIC

Voltage	Uo		9.93	V
Current	Io		36	mA
Power	Po		99	mW

The other parameters are unchanged.

Thermal data

Process temperature range	unchanged
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Permitted ambient temperature range	unchanged
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Max. surface temperature	T100°C
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Type of protection according to EN 60529	IP65
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The marking of the equipment shall include the following:

- Ⓔ II 1/2G Ex de [ia] IIC T3 ... T6,
- Ⓔ II 1/2G Ex de [ia] IIB T3 ... T6,
- Ⓔ II 2G Ex de [ia] IIC T3 ... T6 resp.
- Ⓔ II 2G Ex de [ia] IIB T3 ... T6,
- Ⓔ II 1/2D Ex iaD 20 / Ex tD A21 IP65 T100 °C

Special conditions for safe use

For the IIC version:

The Capacitive level measurement should only be used where electrostatic charging of the probe caused by the process is not possible.

Test and assessment report

BVS PP 05.2059 EG as of 13.11.2007

DEKRA EXAM GmbH

Bochum, dated 13. November 2007

Signed: Dr. Jockers

Signed: Dr. Eickhoff

Certification body


Special services unit

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.


44809 Bochum, 03.12.2007

BVS-Kem/Ar E 1694/07

DEKRA EXAM GmbH



Certification body



Special services unit



Translation

3rd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate BVS 05 ATEX E 090 X

Equipment: Capacitive level measurement Liquicap-M type FMI51, FMI52, FTI51 and FTI52

Manufacturer: Endress + Hauser GmbH + Co. KG

Address: 79689 Maulburg, Germany

Description

The capacitive level measurement Liquicap-M type FMI51, FMI52, FTI51 and FTI52 can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2006	General requirements
EN 60079-1:2004	Flameproof enclosure 'd'
EN 60079-7:2003	Increased safety 'e'
EN 60079-11:2007	Intrinsic safety 'i'
EN 60079-26:2004	Group II, Category 1G
EN 61241-0:2006	General requirements
EN 61241-1:2004	Protection by enclosure "tD"
EN 61241-11:2006	Protection by Intrinsic safety "iD"

- ⊕ II 1/2G Ex de [ia] IIC T3 ... T6,
- ⊕ II 1/2G Ex de [ia] IIB T3 ... T6,
- ⊕ II 2G Ex de [ia] IIC T3 ... T6 resp.
- ⊕ II 2G Ex de [ia] IIB T3 ... T6,
- ⊕ II 1/2D Ex iaD 20 / Ex tD A21 IP65 T100 °C

Special conditions for safe use

Unchanged

Test and assessment report
BVS PP 05.2059 EG as of 30.06.2008

DEKRA EXAM GmbH

Bochum, dated 30. June 2008

Signed: Dr. Jockers

Signed: Dr. Eickhoff

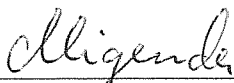
Certification body

Special services unit

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 04.07.2008
BVS-Kem/Ar E 0988/08

DEKRA EXAM GmbH



Certification body



Special services unit

Translation

(1) 4. Supplement to the EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use
in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6
- (3) No. of EC-Type Examination Certificate: **BVS 05 ATEX E 090 X**
- (4) Equipment: **Capacitive level measurement type Liquicap-M FTI51
and type Liquicap-M FTI52**
- (5) Manufacturer: **Endress + Hauser GmbH + Co. KG**
- (6) Address: **79689 Maulburg**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in
the appendix to this supplement.
- (8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of
the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this
equipment has been found to comply with the Essential Health and Safety Requirements relating to
the design and construction of equipment and protective systems intended for use in potentially
explosive atmospheres, given in Annex II to the Directive. The examination and test results are
recorded in the test and assessment report BVS PP 05.2059 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
- | | |
|-------------------------|--|
| EN 60079-0:2009 | General requirements |
| EN 60079-1:2007 | Flameproof enclosure 'd' |
| EN 60079-7:2007 | Increased safety 'e' |
| EN 60079-11:2007 | Intrinsic safety 'i' |
| EN 60079-26:2007 | Equipment Protection Level Ga |
| EN 61241-0:2006 | General requirements |
| EN 61241-1:2004 | Protection by enclosures |
| EN 61241-11:2006 | Protection by intrinsic safety "iD" |
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special
conditions for safe use specified in the appendix to this certificate.
- (11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and
tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this
equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

Type Liquicap-M FMI51 or Liquicap-M FMI52

II 1/2G Ex d [ia Ga] IIC T3 ... T6 Ga/Gb,



II 1/2G Ex d [ia Ga] IIB T3 ... T6 Ga/Gb,

II 2G Ex d [ia Gb] IIC T3 ... T6 Gb or

II 2G Ex d [ia Gb] IIB T3 ... T6 Gb

Type Liquicap-M FTI51 or Liquicap-M FTI52

II 1/2G Ex d [ia Ga] IIC T3 ... T6 Ga/Gb,

II 1/2G Ex d [ia Ga] IIB T3 ... T6 Ga/Gb,



II 2G Ex d [ia Gb] IIC T3 ... T6 Gb or

II 2G Ex d [ia Gb] IIB T3 ... T6 Gb

II 1/2D Ex iaD 20 / Ex tD A21 IP6X T100 °C

DEKRA EXAM GmbH
Bochum, dated 13.04.2011

Signed: Dr. Eickhoff

Certification body

Signed: Leiendecker

Special services unit

(13) Appendix to

(14) **4. Supplement to the EC-Type Examination Certificate**
BVS 05 ATEX E 090 X

(15) 15.1 Subject and type

Capacitive level measurement type Liquicap-M FTI51 and type Liquicap-M FTI52

15.2 Description

The capacitive level measurement is mounted to a tank by a flange. The probe is inserted into the tank and, in case of the rod probe or the rope probe, it forms a capacitor with the tank walls or, in case of the rod probe, with a grounded tube.

The capacitive level measurement is manufactured in different variants. Amongst others there are different types of probes (type Liquicap-M FMI51 has a rod probe and type Liquicap-M FMI52 has a rope probe) and different flanges. For this level measurement the enclosure type T13 (two compartments) and F13 (one chamber) is used.

A separate certified line-bushing (PTB 97 ATEX 1047 U) type 07-9102-E08E/G resp. type 07-9102-E03E/G will be mounted in the partition wall of the two compartments of the enclosure T13. So it comes into being a terminal box in type of protection Increase safety and an electronic box in type of protection Flameproof Enclosure. The terminal box is equipped with separate certified terminals.

For level measurement type FTI5* the enclosure F27 is used for heavy duty applications. This enclosure is designed in shape of the F13 enclosure but the material is stainless steel.

The testing of the intrinsically safe circuits of this apparatus is an item of the test reports above-mentioned.

The enclosures fulfil the requirements of category 2G resp. 2D. The intrinsically safe probe circuit fulfils the requirements of category 1G and 1D.

15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 With electronic insert type FEI50H (BVS PP 05.2055 EG)

Input / signal circuit (terminals 1 – 2)

power supply intrinsically safe

voltage

U_i

DC

30 V

current

I_i

120 mA

power

P_i

1 W

effective internal inductance

L_i

negligible

effective internal capacitance

C_i

2.4 nF

or

power supply not intrinsically safe, energy limited

voltage

DC

37 V

current/power has to be limited by a fuse with a nominal value of

40 mA

15.3.1.2 With electronic insert type FEI55 (BVS PP 06.2064 EG)

Input / signal circuit (Klemmen – terminals 1 – 2)

power supply intrinsically safe

voltage

U_i

DC

36 V

current

I_i

100 mA

power

P_i

1 W

effective internal inductance

L_i

negligible

effective internal capacitance

C_i

2.4 nF

or

voltage

≤ DC

37 V

current/power has to be limited by a fuse with a nominal value of

40 mA

15.3.1.3 With electronic insert type FEI54 (BVS PP 06.2088 EG)

Input circuit (terminals 1 (L+) – 2 (L-))				
voltage		DC	19...55	V
		AC	19...253	V
max. voltage	Um	AC	253	V
relay contact circuits (terminals 3 – 5 and 6 - 8)				
switching voltage		AC	253	V
switching current			6	A
switching power ($\cos \varphi \geq 0,7$)			750	VA
or				
switching voltage		DC	30/125	V
switching current			6/ 0.2	A

15.3.1.4 With electronic insert type FEI52 (BVS PP 06.2089 EG)

Input circuit (terminals 1 (L+) – 2 (L-)) and				
signal circuit (terminals 3 – 2)				
voltage		DC	10...55	V
max. voltage	Um	AC	253	V

15.3.1.5 With electronic insert type FEI51 (BVS PP 07.2109 EG)

Input circuit (terminals 1 (L+) – 2 (L-))				
voltage		AC	19...253	V
max. voltage	Um	AC	253	V

15.3.2 Thermal parameters

ambient temperature range *				
temperature class T6			-50 °C up to	+60 °C
temperature class T4 and T3			-50 °C up to	+70 °C
process temperature *			-80 °C up to	+200 °C

* for limitations see temperature diagram in the Safety instructions

(16) Test and assessment report
BVS PP 05.2059 EG as of 13.04.2011

(17) Special conditions for safe use
For the IIC version:
The capacitive level measurement should only be used where electrostatic charging of the probe caused by the process is not possible.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH
44809 Bochum, 13.04.2011
BVS-Hk/Schae A 20100865



Certification body



Special services unit

Translation

EU-Type Examination Certificate Supplement 5

Change to Directive 2014/34/EU

Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 05 ATEX E 090 X**

Product: **Capacitive level measurement Liquicap-M
type FMI51-***, type FMI52-***, type FTI51-*** and type FTI52-*****

Manufacturer: **Endress+Hauser GmbH + Co. KG**

Address: **Hauptstr. 1, 79689 Maulburg, Germany**

This supplementary certificate extends EU-Type Examination Certificate No. BVS 05 ATEX E 090 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

DEKRA EXAM GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential Report No. BVS PP 05.2059 EU.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012 + A11:2013	General requirements
EN 60079-1:2014	Flameproof enclosure "d"
EN 60079-7:2015	Increased Safety "e"
EN 60079-11:2012	Intrinsic Safety "i"
EN 60079-26:2015	Equipment with equipment protection level (EPL) Ga
EN 60079-31:2014	Protection by Enclosure "t"

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

Liquicap-M type FMI51-***, type FMI52-***, type FTI51-L*** or type FTI52-L***



II 1/2G Ex ia / db IIC T3/T4/T6 Ga/Gb or



II 1/2G Ex ia / db [ia] IIC T3/T4/T6 Ga/Gb or



II 2G Ex db ia IIC T3/T4/T6 Gb or



II 2G Ex db ia [ia] IIC T3/T4/T6 Gb

Liquicap-M type FTI51-G*** or type FTI52-G***



II 1/2G Ex ia / db IIC T3/T4/T6 Ga/Gb

or



II 2G Ex db ia IIC T3/T4/T6 Gb

or



II 2G Ex db ia IIC T3/T4/T6 Gb



II 2D Ex tb ia IIIC T90°C Db

or



II 1/2G Ex ia / db eb IIC T3/T4/T6 Ga/Gb

II 1/2D Ex ia / tb IIIC T90°C Da/Db

DEKRA EXAM GmbH

Bochum, 2016-11-25

Signed: Jörg Koch

Certifier

Signed: Dr. Franz Eickhoff

Approver

13 **Appendix**

14 **EU-Type Examination Certificate**

**BVS 05 ATEX E 090 X
Supplement 5**

15 **Product description**

15.1 **Subject and type**

Capacitive level measurement Liquicap-M

type FMI51-***,
type FMI52-***,
type FTI51-*** and
type FTI52

FMI/FTI:

In the type designation „FMI“ indicates a level measurement and „FTI“ indicates a level limit switch.

51/52:

In the type designation „51“ indicates variants with a rod probe and „52“ indicates variants with rope probe.

In the complete type designation the asterisk will be replaced by characters which indicate variations. For details see the descriptive documents of the manufacturer.

15.2 **Description**

With this supplement the certificate is changed to Directive 2014/34/EU.

(Annotation: In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.)

The Capacitive level measurement Liquicap-M consists of an enclosure and of a rod-probe or rope-probe which is mounted to the enclosure. The transition piece between enclosure and probe is equipped with a process connection. By means of this process connection the Capacitive level measurement will be mounted to a tank. The probe protrudes into the tank.

The Capacitive level measurement is manufactured in several variants. Amongst others there are different process connections, different sorts of probes and different types of enclosures.

For group II (gas-ex):

The probe circuit fulfils the requirements of the type of protection Intrinsic safety and category 1G. Along with the walls of the tank the rod-probes or the rope-probes are forming a capacitor. For the rod-probes this capacitor can optionally be formed by the probe along with an additional measuring tube which encloses the probe.

Three types of enclosures are used:

Enclosure type T13

This enclosure has two chambers which are connected by an aperture. So both chambers are forming one common compartment in the type of protection Flameproof enclosure. For the level measurement type FTI**-*** the aperture can optionally be closed by a cable bushing. In this case the electronics compartment fulfils the requirements of type of protection Flameproof enclosure and the terminal compartment fulfils the requirements of type of protection Increased safety.

Enclosure type F13 and F27

These enclosures have one chamber which is used as an electronic compartment and as a terminal compartment. This chamber fulfils the requirements of type of protection Flameproof enclosure.

Both enclosures differ in the material (F13 = Aluminium, F27 = stainless steel).

The enclosures fulfil the requirements of category 2G.

For group III (dust-ex):

The probe circuit fulfils the requirements of the type of protection Intrinsic safety and category 1D. Along with the walls of the tank the rod-probes or the rope-probes are forming a capacitor. For the rod-probes this capacitor can optionally be formed by the probe along with an additional measuring tube which encloses the probe.

The enclosure type T13 is used. This enclosure has two chambers (electronics compartment and terminal compartment) in the type of protection Protection by enclosure. The aperture between both compartments is closed by a cable bushing.

The enclosure fulfils the requirements of category 2D.

The intrinsically safe circuits of the Capacitive level measurement have been tested separately. These tests are subject of the mentioned test reports.

Reason for the supplement:

Change to Directive 2014/34/EU

The standards and the issue date of the standards which are basis for the test of the Capacitive level measurement are changed (see listing on page 1).

The marking of the maximum surface temperature for group III (dust-ex) is changed to „T90°C“.

Listing of all components used referring to older standards

Subject and type	Certificate	Standards
Single core bushing type 07-091**_*****	PTB 97 ATEX 1047 U	EN60079-0:2006 EN60079-1:2007
	EPS 13 ATEX 1619 U	EN60079-0:2012 EN60079-1:2007
Terminals type 07-9701-...	PTB 99 ATEX 3117 U	EN60079-0:2004 EN60079-7:2007
Terminals type 264-...	PTB 98 ATEX 3129 U	EN60079-0:2012 EN60079-7:2007

15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 With electronic insert type FEI50H (BVS PP 05.2055 EG)

Input / signal circuit (terminals 1 – 2)

Power supply intrinsically safe

Voltage

U_i DC 30 V

Current

I_i 120 mA

Power

P_i 1 W

Effective internal inductance

L_i negligible

Effective internal capacitance

C_i 2.4 nF

or

Power supply not intrinsically safe, energy limited

Voltage

DC 37 V

Current/power

40 mA

has to be limited by a fuse with a nominal value of

15.3.1.2 With electronic insert type FEI55 (BVS PP 06.2064 EG)

Input / signal circuit (terminals 1 – 2)

Power supply intrinsically safe

Voltage

U_i DC 36 V

Current

I_i 100 mA

Power

P_i 1 W

Effective internal inductance

L_i negligible

Effective internal capacitance

C_i 2.4 nF

or

Voltage

\leq DC 37 V

Current/power

40 mA

has to be limited by a fuse with a nominal value of

15.3.1.3 With electronic insert type FEI54 (BVS PP 06.2088 EG)

Input circuit (terminals 1 (L+) – 2 (L-))

Voltage

DC 19...55 V

AC 19...253 V

Max. voltage

U_m AC 253 V

Relay contact circuits (terminals 3 – 5 und 6 - 8)

Switching voltage

AC 253 V

Switching current

6 A

Switching power (at $\cos \varphi \geq 0.7$)

750 VA

or

Switching voltage

DC 30/125 V

Switching current

6/0.2 A

15.3.1.4 With electronic insert type FEI52 (BVS PP 06.2089 EG)

Input circuit (terminals 1 (L+) – 2 (L-)) und – and signal circuit (terminals 3 – 2)

Voltage

DC 10...55 V

Max. voltage

U_m AC 253 V

15.3.1.5 With electronic insert type FEI51 (BVS PP 07.2109 EG)

Input circuit (terminals 1 (L+) – 2 (L-))

Voltage

AC 19...253 V

Max. voltage

U_m AC 253 V

15.3.2 Thermal parameters

Ambient temperature ranges *

group	temperature class or surface temperature	electronic inserts	ambient temperature range
IIC (gas-ex)	T4 and T3	FEI50H, FEI51, FEI52, FEI54 and FEI55	-50 °C to +70 °C
	T6	FEI50H, FEI51, FEI52 and FEI54	-50 °C to +60 °C
		FEI55	-50 °C to +55 °C
IIIC (dust-ex)	T90 °C	FEI51, FEI52 and FEI54	-50 °C to +70 °C

Process temperature *

-80 °C to +200 °C

* for limitations see temperature diagram in the Safety instructions

16 **Report Number**

BVS PP 05.2059 EU, as of 2016-11-25

17 **Special Conditions for Use**

- 17.1 The capacitive level measurement should only be used where electrostatic charging of the probe caused by the process is not possible.
- 17.2 The flameproof joints are not intended to be repaired.

18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 **Drawings and Documents**

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH
Bochum, dated 2016-11-25
BVS-Ru/Nu A 20151190

Certifier

Approver

Translation

EU-Type Examination Certificate Supplement 6

Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 05 ATEX E 090 X**

Product: **Capacitive level measurement Liquicap-M
type FMI51-***, type FMI52-***, type FTI51-*** and type FTI52-*****

Manufacturer: **Endress+Hauser SE + Co. KG**

Address: **Hauptstr. 1, 79689 Maulburg, Germany**

This supplementary certificate extends EU-Type Examination Certificate No. BVS 05 ATEX E 090 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential Report No. BVS PP 05.2059 EU.

The Essential Health and Safety Requirements are assured in consideration of:

EN IEC 60079-0:2018	General requirements
EN 60079-1:2014	Flameproof enclosure "d"
EN IEC 60079-7:2015 + A1:2018	Increased Safety "e"
EN 60079-11:2012	Intrinsic Safety "i"
IEC 60079-26:2021	Equipment with Separation Elements or combined Levels of Protection
EN 60079-31:2014	Protection by Enclosure "t"

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

See 15.4 Marking

DEKRA Testing and Certification GmbH
Bochum, 2021-11-17

Signed: Jörg-Timm Kilisch

Managing Director



Page 1 of 5 of BVS 05 ATEX E 090 X / N6 – Jobnumber 342303900
This certificate may only be reproduced in its entirety and without any change.

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

13 **Appendix**
14 **EU-Type Examination Certificate**

BVS 05 ATEX E 090 X
Supplement 6

15 **Product description**

15.1 **Subject and type**

Capacitive level measurement Liquicap-M

type FMI51-***,
type FMI52-***,
type FTI51-*** and
type FTI52

Explanation of the type designation

FMI/FTI:

In the type designation „FMI“ indicates a level measurement and „FTI“ indicates a level limit switch.

51/52:

In the type designation „51“ indicates variants with a rod probe and „52“ indicates variants with rope probe.

In the complete type designation the asterisk will be replaced by characters which indicate variations. For details see the descriptive documents of the manufacturer.

15.2 **Description**

The Capacitive level measurement Liquicap-M consists of an enclosure and of a rod-probe or rope-probe which is mounted to the enclosure. The transition piece between enclosure and probe is equipped with a process connection. By means of this process connection the Capacitive level measurement will be mounted to a tank. The probe protrudes into the tank.

The Capacitive level measurement is manufactured in several variants. Amongst others there are different process connections, different sorts of probes and different types of enclosures.

For Group II (gas-ex):

The probe circuit fulfils the requirements of the type of protection Intrinsic Safety and Category 1G. Along with the walls of the tank the rod-probes or the rope-probes are forming a capacitor. For the rod-probes this capacitor can optionally be formed by the probe along with an additional measuring tube which encloses the probe.

Three types of enclosures are used. The enclosures fulfil the requirements of Category 2G:

Enclosure type T13

This enclosure has two chambers which are connected by an aperture. So both chambers are forming one common compartment in the type of protection Flameproof Enclosure. For the level measurement type FTI**-*** the aperture can optionally be closed by a cable bushing. In this case the electronics compartment fulfils the requirements of type of protection Flameproof Enclosure and the terminal compartment fulfils the requirements of type of protection Increased Safety.

Enclosure type F13 and F27

These enclosures have one chamber which is used as an electronic compartment and as a terminal compartment. This chamber fulfils the requirements of type of protection Flameproof Enclosure. Both enclosures differ in the material (F13 = Aluminium, F27 = stainless steel).

For Group III (dust-ex):

The probe circuit fulfils the requirements of the type of protection Intrinsic Safety and Category 1D. Along with the walls of the tank the rod-probes or the rope-probes are forming a capacitor. For the rod-probes this capacitor can optionally be formed by the probe along with an additional measuring tube which encloses the probe.

The enclosure type T13 is used. The enclosure fulfils the requirements of Category 2D. It has two chambers (electronics compartment and terminal compartment) in the type of protection Protection by Enclosure. The aperture between both compartments is closed by a cable bushing.

The testing of the intrinsically safe circuits of this equipment is carried out separately and is the subject of the respective test protocol mentioned.

Reason for the supplement:

Up-date of the standard basis

Listing of all components used incl. standard basis

Subject and type	Certificate	Standards
Single core bushing type 07-091**_*****	EPS 13 ATEX 1619 U	EN IEC 60079-0:2018 EN 60079-1:2014
Terminals type 07-9702-...	PTB 99 ATEX 3117 U	EN IEC 60079-0:2018 EN IEC 60079-7:2015+A1:2018
Terminals type 264-...	PTB 98 ATEX 3129 U	EN IEC 60079-0:2018 EN IEC 60079-7:2015+A1:2018

15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 With electronic insert type FEI50H (BVS PP 05.2055 EU) Input / signal circuit (terminals 1 – 2)

Power supply intrinsically safe

Voltage	U_i	DC	30	V
Current	I_i		120	mA
Power	P_i		1	W
Effective internal inductance	L_i		negligible	
Effective internal capacitance	C_i		2.4	nF

or

Power supply not intrinsically safe, energy limited

Voltage		DC	37	V
Current/Power has to be limited by a fuse with a nominal value of			40	mA

15.3.1.2 With electronic insert type FEI55 (BVS PP 06.2064 EU) Input / signal circuit (terminals 1 – 2)

Power supply intrinsically safe

Voltage	U_i	DC	36	V
Current	I_i		100	mA
Power	P_i		1	W
Effective internal inductance	L_i		negligible	
Effective internal capacitance	C_i		2.4	nF

or

Voltage		\leq	DC	37	V
Current/power has to be limited by a fuse with a nominal value of				40	mA

15.3.1.3 With electronic insert type FEI54 (BVS PP 06.2088 EU) Input circuit (terminals 1 (L+) – 2 (L-))

Voltage		DC	19...55	V
		AC	19...253	V
Max. voltage	U_m	AC	253	V

Relay contact circuits (terminals 3 – 5 and 6 - 8)

Switching voltage		AC	253	V
Switching current			6	A

Switching power (at $\cos \varphi \geq 0.7$)

750 VA

or

Switching voltage

DC 30/125 V

Switching current

6/0.2 A

15.3.1.4 With electronic insert type FEI52 (BVS PP 06.2089 EU)

Input circuit (terminals 1 (L+) – 2 (L-)) and

signal circuit (terminals 3 – 2)

Voltage

DC 10...55 V

Max. voltage

U_m

AC 253 V

15.3.1.5 With electronic insert type FEI51 (BVS PP 07.2109 EU)

Input circuit (terminals 1 (L+) – 2 (L-))

Voltage

AC 19...253 V

Max. voltage

U_m

AC 253 V

15.3.2 Thermal parameters

Group	Temperature-class or surface temperature	Electronics inserts	Ambient temperature range*	Process-temperature*
IIC (gas-Ex)	T4 and T3	FEI50H, FEI51, FEI52, FEI54 and FEI55	-50 °C up to 70 °C	-80 °C up to 200 °C
	T6	FEI50H, FEI51, FEI52 and FEI54	-50 °C up to 60 °C	
		FEI55	-50 °C up to 55 °C	
IIIC (dust-Ex)	T90 °C	FEI51, FEI52 and FEI54	-50 °C up to 70 °C	-80 °C up to 180 °C

* for further limitations see temperature diagram in the safety instructions

15.4 Marking

Liquicap-M type FMI51-*** or type FMI52-***		
	II 1/2G Ex ia IIC T6 Ga / Ex db IIC T6 Gb	or
	II 1/2G Ex ia IIC T6 Ga / Ex db [ia] IIC T6 Gb	or
	II 2G Ex db ia IIC T6 Gb	or
	II 2G Ex db ia [ia] IIC T6 Gb	
Liquicap-M type FTI51-L*** or type FTI52-L***		
	II 1/2G Ex ia IIC T6 Ga / Ex db IIC T6 Gb	or
	II 1/2G Ex ia IIC T6 Ga / Ex db [ia] IIC T6 Gb	or
	II 2G Ex db ia IIC T6 Gb	or
	II 2G Ex db ia [ia] IIC T6 Gb	
Liquicap-M type FTI51-G*** or type FTI52-G***		
	II 1/2G Ex ia IIC T6 Ga / Ex db IIC T6 Gb	or
	II 2G Ex db ia IIC T6 Gb	or
	II 2G Ex db ia IIC T6 Gb	or
	II 2D Ex tb ia IIIC T90°C Db	
	II 1/2G Ex ia IIC T6 Ga / Ex db eb IIC T6 Gb	
	II 1/2D Ex ia IIIC T200 90°C Da / Ex tb IIIC T90°C Db	

17 **Special Conditions for Use**

17.1 For group II: The capacitive level measurement should only be used where electrostatic charging of the probe and, if used, of the adhesive nameplates caused by the process is not possible.

17.2 The flameproof joints are not intended to be repaired.

18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 **Drawings and Documents**

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2021-11-17
BVS-Ru/Mu A20210418



Managing Director