Translation

(1) 1. 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 11 ATEX E 033 X**

(4) Equipment: **Coriolis Flow Meter Type C-Flow KCE80** / KCM****
and Type Tricor TCE80** / TCM***

(5) Manufacturer: **KEM Küppers Elektromechanik GmbH**

(6) Address: **Liebigstr. 5, 85757 Karlsfeld, Germany**

(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 11.2282 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 60079-11:2012 Intrinsic safety 'i'

(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:

II 2G Ex d [ia] IIC T4 Gb	(Transmitter housing
II 2G Ex d [ia] IIB T4 Gb	with reference to model)
II (2)G [Ex ia Gb] IIC	(alternate Transmitter housing
II (2)G [Ex ia Gb] IIB	with reference to model)
II 2G Ex ia IIC T4 Gb	(Transducer housing
II 2G Ex ia IIB T4 Gb	with reference to model)

DEKRA EXAM GmbH
Bochum, dated 12th December 2012

Signed: Simanski
Certification body

Signed: Dr. Eickhoff
Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

(13) Appendix to

(14) **1. Supplement to the EC-Type Examination Certificate**
BVS 11 ATEX E 033 X

(15) 15.1 Subject and type

The Coriolis Flow Meter can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report and receives then the marking:

Coriolis Flow Meter Type C-Flow KCE80** / KCM****
or Type Tricor TCE80** / TCM*** comprising:

- Transmitter Unit Type KCE80**-*-*-*-Ex
or Type TCE80**-*-****-Ex-**, respectively:

- and optionally one of the following Transducer Units:

Type KCM0300-*-**-*-*-*-*-Ex or KCM0325-*-**-*-*-*-*-Ex,
KCM0600-*-**-*-*-*-*-Ex or KCM0650-*-**-*-*-*-*-Ex,
KCM1500-*-**-*-*-*-*-Ex or KCM1550-*-**-*-*-*-*-Ex,
KCM3000-*-**-*-*-*-*-Ex or KCM3100-*-**-*-*-*-*-Ex,
KCM7900-*-**-*-*-*-*-Ex or KCM5500-*-**-*-*-*-*-Ex,
KCM28K-*-**-*-*-*-*-Ex,
KCM65K-*-**-*-*-*-*-Ex,

Type TCM0300-**-****-****-Ex-** or TCM0325-**-****-****-Ex-**,
TCM0600-**-****-****-Ex-** or TCM0650-**-****-****-Ex-**,
TCM1500-**-****-****-Ex-** or TCM1550-**-****-****-Ex-**,
TCM3000-**-****-****-Ex-** or TCM3100-**-****-****-Ex-**,
TCM7900-**-****-****-Ex-** or TCM5500-**-****-****-Ex-**,
TCM28K-**-****-****-Ex-**,
TCM65K-**-****-****-Ex-**.

Transducer Unit C-Flow type series KCM**-*-**-*-*-*-*-Ex**

Type	Flow rate
KCM0300-a-bc-d-e-f-g-Ex	≤ 300 kg / h
KCM0325-a-bc-d-e-f-g-Ex	≤ 300 kg / h
KCM0600-a-bc-d-e-f-g-Ex	≤ 600 kg / h
KCM0650-a-bc-d-e-f-g-Ex	≤ 600 kg / h
KCM1500-a-bc-d-e-f-g-Ex	≤ 1.500 kg / h
KCM1550-a-bc-d-e-f-g-Ex	≤ 1.500 kg / h
KCM3000-a-bc-d-e-f-g-Ex	≤ 3.000 kg / h
KCM3100-a-bc-d-e-f-g-Ex	≤ 3.000 kg / h
KCM5500-a-bc-d-e-f-g-Ex	≤ 5.500 kg / h
KCM7900-a-bc-d-e-f-g-Ex	≤ 7.900 kg / h
KCM28k-a-bc-d-e-f-g-Ex	≤28.000 kg / h
KCM65k-a-bc-d-e-f-g-Ex	≤65.000 kg / h

Specification of spacers a to g: no change.

Transducer Unit Tricor type series TCM**-**-****-****-Ex-****

Type	Flow rate
TCM0300-ab-cdef-ghik-Ex-xx	≤ 300 kg / h
TCM0325-ab-cdef-ghik-Ex-xx	≤ 300 kg / h
TCM0600- ab-cdef-ghik-Ex-xx	≤ 600 kg / h
TCM0650- ab-cdef-ghik-Ex-xx	≤ 600 kg / h
TCM1500- ab-cdef-ghik-Ex-xx	≤ 1.500 kg / h
TCM1550- ab-cdef-ghik-Ex-xx	≤ 1.500 kg / h
TCM3000- ab-cdef-ghik-Ex-xx	≤ 3.000 kg / h
TCM3100- ab-cdef-ghik-Ex-xx	≤ 3.000 kg / h
TCM5500- ab-cdef-ghik-Ex-xx	≤ 5.500 kg / h
TCM7900- ab-cdef-ghik-Ex-xx	≤ 7.900 kg / h
TCM28k- ab-cdef-ghik-Ex-xx	≤28.000 kg / h
TCM65k- ab-cdef-ghik-Ex-xx	≤65.000 kg / h

Specification of spacers a to k: no change.

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Transmitter Unit C-Flow type series KCE80-*-*-*-Ex**
No change.

Transmitter Unit Tricor type series TCE80-*-****-Ex-****
No change.

15.2 Description

The Coriolis Flow Meter Type C-Flow KCE80** / KCM**** / Type Tricor TCE80** / TCM*** has been enhanced optionally with sensors type *CM0325-**-****-****-Ex-** / *CM3100-**-****-****-Ex-** / *CM5500-**-****-****-Ex-** and non Ex-relevant area of the electronic circuitry has been subjected to minor change.

15.3 Parameters

15.3.1 Panel mountable housing

No change

15.3.2 Flameproof enclosure

No change

15.3.3 Intrinsically safe transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_i	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current I_i	382 mA	219 mA	17 mA	45 mA
Power P_i	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	screwed terminals (KCM****-0-**-*-*-*-2-Ex, external) screwed terminals (KCM****-1-**-*-*-*-2-Ex, external) screwed terminals (TCM****-**-****-AZZ*-Ex, external) LEMO HEG.2B.308 (TCM****-**-****-E***-Ex, compact) direct wiring (KCM****-EF/EFH/EM/ECMH/E*(H)-**-*-*-*-*-Ex, compact)			
Probe type	*CM28K-x)[1] *CM65K-x)[1]	*CM0300-x)[1] *CM0600-x)[1] *CM1500-x)[1] *CM3000-x)[1] *CM7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Probe type		*CM0325-x)[1] *CM0650-x)[1] *CM1550-x)[1] *CM3100-x)[1] *CM5500-x)[1]	(all models)	
Type of protection		Ex ia IIC	Ex ia IIC / IIB	
Remark:)[1] '*' replaced by 'K' or 'T'; "x" see full-scale type code				

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15.3.4 Ambient temperature range

15.3.4 For the Coriolis C-Flow Meter Type C-Flow KCE80** / KCM**** or Type Tricor TCE80** / TCM****, respectively, the following ambient temperature range applies:

Model	Type	Ambient temperature range	Medium- temperature range	Temperature class
Panel mountable housing	KCE80x-SE-x-Ex TCE80x-L-x-Ex-x	0 °C ≤ T_a ≤ 60°C	not applicable	not applicable
Flameproof enclosure	KCE80x-WE-x-Ex TCE80x-E-x-Ex-x	- 40 °C ≤ T_a ≤ 70°C	not applicable	T4
Transducer compact version	KCMx-a-x-x-Ex TCMx-x-x-Ex-Ex-x	- 40 °C ≤ T_a ≤ 70°C	- 40 °C ≤ T ≤ 70°C	T4
external transducer	KCMx*-0-x-Ex KCMx-1-x-Ex TCMx-x-x-Ax-Ex-x	- 40 °C ≤ T_a ≤ 70°C	- 40 °C ≤ T ≤ 70°C	T4
			- 40 °C ≤ T ≤ 135°C	T3
			- 40 °C ≤ T ≤ 210°C	T2

Remark:
"x" see full-scale type code
"a" = EF / EFH / EM / EMH / E*(H)

(16) Test and assessment report

BVS PP 11.2282 EG as of 12.12.2012

(17) Special conditions for safe use

No change

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, 12th December 2012
BVS-Scha/Mu A 20120864

Certification body

Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

Translation

(1) 2. 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 11 ATEX E 033 X**

(4) Equipment: **Coriolis Durchflussmessgerät type C-Flow KCE80** / KCM**** / Tricor TCE80** / TCM*****

(5) Manufacturer: **KEM Küppers Elektromechanik GmbH**

(6) Address: **Liebigstr. 5, 85757 Karlsfeld, Germany**

(7) The and construction of this equipment component 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 11.2282 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 60079-11:2012	**Intrinsic safety "i"**

(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:

II 2G Ex d [ia] IIC T4 Gb	(Transmitter housing
II 2G Ex d [ia] IIB T4 Gb	with reference to model)
II (2)G [Ex ia Gb] IIC	(alternate Transmitter housing
II (2)G [Ex ia Gb] IIB	with reference to model)
II 2G Ex ia IIC T4 Gb	(Transducer housing
II 2G Ex ia IIB T4 Gb	with reference to model)

DEKRA EXAM GmbH
Bochum, dated 2013-11-29

Signed: Simanski
Certification body

Signed: Dr. Wittler
Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

(13) Appendix to

(14) **2. Supplement to the EC-Type Examination Certificate**
BVS 11 ATEX E 033 X

(15) 15.1 Subject and type

The Coriolis Flow Meter can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report and receives then the marking:

Coriolis Flow Meter Type C-Flow KCE80** / KCM****
or Type Tricor TCE80** / TCM*** comprising:

- **Transmitter Unit** Type KCE80**-*-*-*-Ex
or Type TCE80**-*-****-Ex-**, respectively:

- and optionally one of the following **Transducer Units**:

Type KCM0300-*-**-*-*-*-*-Ex or KCM0325-*-**-*-*-*-*-Ex,
KCM0600-*-**-*-*-*-*-Ex or KCM0650-*-**-*-*-*-*-Ex,
KCM1500-*-**-*-*-*-*-Ex or KCM1550-*-**-*-*-*-*-Ex,
KCM3000-*-**-*-*-*-*-Ex or KCM3100-*-**-*-*-*-*-Ex,
KCM7900-*-**-*-*-*-*-Ex or KCM5500-*-**-*-*-*-*-Ex,
KCM28K-*-**-*-*-*-*-Ex,
KCM65K-*-**-*-*-*-*-Ex,

Type TCM0300-**-****-****-Ex-** or TCM0325-**-****-****-Ex-**,
TCM0600-**-****-****-Ex-** or TCM0650-**-****-****-Ex-**,
TCM1500-**-****-****-Ex-** or TCM1550-**-****-****-Ex-**,
TCM3000-**-****-****-Ex-** or TCM3100-**-****-****-Ex-**,
TCM7900-**-****-****-Ex-** or TCM5500-**-****-****-Ex-**,
TCM28K-**-****-****-Ex-**,
TCM65K-**-****-****-Ex-**,

Transmitter Unit C-Flow type series KCE80-*-*-*-Ex**

KCE800n-a-b-c-Ex		Reduced driver power electronics designed for Transducer type KCM0300-*-**-*-*-*-*-Ex to type KCM7900-*-**-*-*-*-*-Ex
KCE801n-a-b-c-Ex		Enhanced driver power electronics designed for Transducer type KCM28k-*-**-*-*-*-*-Ex to type KCM65k-*-**-*-*-*-*-Ex
KCE802n-a-b-c-Ex		Enhanced driver power electronics providing adjustable amplification factor designed for Transducer type KCM28k-*-**-*-*-*-*-Ex to type KCM65k-*-**-*-*-*-*-Ex
n =	0... 9	Hardware- and Software-options not affecting Ex-relevant parameters
a =	WE	Wall-mountable flameproof enclosure (large); screwed cable gland
	WG	Wall-mountable flameproof enclosure (small); screwed cable gland
	SE	Panel-mountable housing designed for installation in the safe area
b =	(not used)	Standard (RS485, DC 24 V power supply)
	H	HART interface provided additionally
	M	Power supply AC 100 V – 240 V instead of DC 24 V
	?	Further combinations not affecting Ex-relevant parameters
c =	*	Length (in meters) of interconnection cable to Transducer Unit C-Flow type series KCM****-*-**-*-*-*-*-Ex (version KCE80**-WE-*-*-Ex only)

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Transmitter Unit Tricor type series type TCE80-*-****-Ex-**; type code:**

TCE800n-a-bcde-Ex-xx		Reduced driver power electronics designed for Transducer type TCM0300-**-****-****-Ex-** to type TCM7900-**-****-****-Ex-**
TCE801n-a-bcde-Ex-xx		Enhanced driver power electronics designed for Transducer type TCM28k-**-****-****-Ex-** to TCM65k-**-****-****-Ex-**
TCE802n-a-bcde-Ex-xx		Enhanced driver power electronics providing adjustable amplification factor designed for Transducer type TCM28k-**-****-****-Ex-** to TCM65k-**-****-****-Ex-**
n =	0... 9	Hardware- and Software-options not affecting Ex-relevant parameters
a =	E W L	Wall-mountable flameproof enclosure (large); screwed cable gland Wall-mountable flameproof enclosure (small); screwed cable gland Panel-mountable housing designed for installation in the safe area
b =	*	Interface (details see manual)
c =	B D M	Power supply DC 24 V and AC 100 V... 240 V Power supply DC 24 V Power supply AC 100 V ... 240 V
d =	*	Hardware- and Software-options not affecting Ex-relevant parameters
e =	*	Cable length with reference to model TCE80**-E-****-Ex-**
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters

Transducer Unit C-Flow type series KCM**-*-**-*-*-*-*-Ex**

Type	Flow rate
KCM0300-a-bc-d-e-f-g-Ex	≤ 300 kg / h
KCM0325-a-bc-d-e-f-g-Ex	≤ 300 kg / h
KCM0600-a-bc-d-e-f-g-Ex	≤ 600 kg / h
KCM0650-a-bc-d-e-f-g-Ex	≤ 600 kg / h
KCM1500-a-bc-d-e-f-g-Ex	≤ 1.500 kg / h
KCM1550-a-bc-d-e-f-g-Ex	≤ 1,500 kg / h
KCM3000-a-bc-d-e-f-g-Ex	≤ 3.000 kg / h
KCM3100-a-bc-d-e-f-g-Ex	≤ 3.000 kg / h
KCM5500-a-bc-d-e-f-g-Ex	≤ 5.500 kg / h
KCM7900-a-bc-d-e-f-g-Ex	≤ 7.900 kg / h
KCM28k-a-bc-d-e-f-g-Ex	≤ 28.000 kg / h
KCM65k-a-bc-d-e-f-g-Ex	≤ 65.000 kg / h

a to f: mechanical details, g: electrical connection

a =	0	Separated electronics / separated transducer
	1	Separated electronics (separated transducer; revision for KCM0300-*-**-*-*-*-*-Ex)
	E*	Compact version; mechanical unit with electronics KCE80**, variant with ex d enclosure (large) (* = up to 2 characters for different electric variants)
	C*	Compact version; mechanical unit with electronics KCE80**, variant with ex d enclosure (small) (* = up to 2 characters for different electric variants)
b =	HD	High pressure version SS316TI, standard housing
c =	B	With rupture disk
d =	**	Type of process connection (details: see manual)
e =	**	Size and shape of process connection (details: see manual)
f =	**	Pressure range (details: see manual)
g =	2	Terminal box (if a = 0 or 1)

Notes, referring to position a:

- Position 'a' = '0' or '1'; separated transducer; IS connection to transmitter
- Position 'a' = 'EF / EFH / EM / EMH / E*(H); compact version; mechanical unit with KCE80**-*-*-*-Ex

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

The compact version is marked with KCM****-a-bc-d-e-f-g-Ex only. Separate marking of the flameproof housing with KCE80**-*-*-*-Ex is waived.

Transducer Unit Tricor type series TCM**-**-****-****-Ex-****

Type	Flow rate
TCM0300-ab-cdef-ghik-Ex-xx	≤ 300 kg / h
TCM0325-ab-cdef-ghik-Ex-xx	≤ 300 kg / h
TCM0600- ab-cdef-ghik-Ex-xx	≤ 600 kg / h
TCM0650- ab-cdef-ghik-Ex-xx	≤ 600 kg / h
TCM1500- ab-cdef-ghik-Ex-xx	≤ 1.500 kg / h
TCM1550- ab-cdef-ghik-Ex-xx	≤ 1.500 kg / h
TCM3000- ab-cdef-ghik-Ex-xx	≤ 3.000 kg / h
TCM3100- ab-cdef-ghik-Ex-xx	≤ 3.000 kg / h
TCM5500- ab-cdef-ghik-Ex-xx	≤ 5.500 kg / h
TCM7900- ab-cdef-ghik-Ex-xx	≤ 7.900 kg / h
TCM28k- ab-cdef-ghik-Ex-xx	≤ 28.000 kg / h
TCM65k- ab-cdef-ghik-Ex-xx	≤ 65.000 kg / h

a to f: mechanical details, g to k: electrical parameters

ab =	**	Size and shape of process connection (details: see manual)
c =	*	Temperature range
d =	*	Pressure range (details: see manual)
e =	*	Accuracy (details: see manual)
f =	*	Mounting length (details: see manual)
g =	A	Terminal box (for IS connection to transmitter)
	E	Compact version with flameproof enclosure (large) (details: see manual)
	C	Compact version with flameproof enclosure (small) (details: see manual)
h =	*	Non-IS interface (details: see manual)
	Z	Not provided
i =	D	Power supply DC 24 V; non-IS
	M	Power supply AC 100 V... 240 V; non-IS
	Z	Not provided
k =	*	Hardware- and Software-options not affecting Ex-relevant parameters
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters

Notes, referring to position g, h, i:

- separate transducer: only 'A' possible at position 'g'; (position 'h' and 'i': power supply and interface not provided; marked therefore with Z)

- compact version: only E possible at position 'g' , position 'h' and 'i' all listed options available.

The compact version is marked with TCM****-**-****-E***-Ex-** only. Separate marking of the flameproof housing with TCE80**-E-****-Ex-** is waived.

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

15.2 Description

Description of change

The Coriolis Flow Meter Type C-Flow KCE80** / KCM**** / Type Tricor TCE80** / TCM*** is optionally carried out with empty enclosure FTZU 04 ATEX 0332U

Slightly change of the internal construction

Description of the equipment

The Coriolis Flow Meter type C-Flow KCE8** / KCM**** or type Tricor TCE8** / TCM**** respectively, comprises either:

- a flameproof transmitter housing and an IS-transducer, directly flanged (compact version), or separately mounted; or
- a transmitter housing made of plastics material (panel mountable housing) intended for installation in the safe area combined with separately mounted IS transducer.

The measuring electronic assemblies type KCE800n / TCE800n, type KCE801n / TCE801n or type KCE802n / TCE802n inside the flameproof transmitter housing or inside the panel mountable housing provide IS power supply of the transducer and data transfer between the multi-wire IS transducer circuit to non-IS signal circuits and are designed as current limiting and safety shunt assembly modules.

The measuring electronic assemblies type *CE800n and *CE801n or *CE802n provide different IS driver-coil power, KCE80*n and TCE80*n are identical.

Transmitter Housing
(models type KCE80-WE-*-*-Ex / type TCE80**-E-****-Ex-**/ type KCE80**-WG-*-*-Ex / type TCE80**-C-****-Ex-**):**

The transmitter housing consists of a flameproof enclosure closed with threaded covers.
The enclosure provides two separated compartments of different size, used as flameproof terminal compartment, or as flameproof electronics compartment, respectively.
The terminal compartment contains a terminal board, an LCD-display and buttons, located below the inspection glass of the threaded cover.
Cable entries certified for this purpose are used to lead the non-IS circuits into the terminal compartment.
The electronics compartment contains the printed circuit boards of the measuring electronic assemblies' type KCE800n / TCE800n, type KCE801n / TCE801n or type KCE802n / TCE802n.
For mounting purposes of an associated IS-transducer, the enclosure is fitted with an adapter or terminal box. The IS-transducer may be combined directly with the flameproof enclosure or installed separately.
The intrinsically safe multicore transducer circuit is led out of the electronics compartment into the adapter or the terminal box by means of an ATEX approved threaded conductor bushing.

The electronic of the compact version is installed in the flameproof transmitter housing variant large (FTZU 08 ATEX 0182 U) or small (FTZU 04 ATEX 0332 U).

Panel mountable housing
(models type KCE80-SE-*-*-Ex / type TCE80**-L-****-Ex-**):**

The panel mountable housing comprises a plastics enclosure of cubical size, containing the printed circuit boards of the measuring electronic assemblies' type KCE800n / TCE800n, type KCE801n / TCE801n or type KCE802n / TCE802n, respectively.

Display and keyboard assemblies are integral part of the front side.

Terminals for the non-IS circuits and a 9-pole Sub-D connector for the multicore IS transducer circuit are located on the rear side of the enclosure.

Transducer type KCM**-*-**-*-*-*-*-Ex / type TCM****-**-****-****-Ex-**:**

The transducers comprise a metallic enclosure containing a Coriolis Measuring Chamber or a tubular measuring unit and electronic components (driver- / sensor coils and temperature sensor) designed for interconnection to an multicore IS circuit.

The enclosure of the tubular measuring unit may be filled with inert gas, used as a corrosion protection manner. The inert gas is not used for any ex-relevant purposes.

The transducers differ with regard to size and shape, measuring range and pressure range of media to be measured.

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

15.3 Parameters

4.1 Panel mountable housing

4.1.1 Non-IS circuits

Parameters / circuit	Voltage U_n	Voltage U_m	Terminals
Power supply (AC)	230 V	AC 264 V	91 (N), 90 (L), 52 (PE)
or optionally Power supply (DC)	24 V	AC 264 V	50 (+24 V), 51 (GND), 52 PE)
Relay-SPDT-contact	30 V	AC 264 V	40, 41, 42
RS485 interface	3.3 V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24 V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output(4-20 mA)	24 V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Digital-input	24 V	AC 264 V	7 (CTL IN), 8 (GND)
Digital output	24 V	AC 264 V	5 (F-OUT), 6 (CTL OUT)

4.1.2 IS circuits designed for interconnection to transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_o	DC 16,4 V	DC 9,4 V	DC 2 V	DC 10,5 V
Current I_o	382 mA	219 mA	17 mA	45 mA
Power P_o	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection	9-pol-Sub D connector			
Probe type	*CM28K-x)[1] *CM65K-x)[1]	*CM0300-x)[1] *CM0600-x)[1] *CM1500-x)[1] *CM3000-x)[1] *CM7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Remark:)[1] "*" replaced by 'K' or 'T'; "x" see full-scale type code				

4.2 Flameproof enclosure

4.2.1 Non-IS circuits

Parameter / Circuit	Voltage U_n	Voltage U_m	Terminals
Power supply (AC))[1]	230 V	AC 264 V	91 (N), 90 (L), 52 (PE)
exclusive-or Power supply (DC))[1]	24 V	AC 264 V	50 (+24 V), 51 (GND), 52 PE)
RS485 interface	3.3 V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24 V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output (4-20 mA)	24 V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Digital-input	24 V	AC 264 V	7 (CTL IN), 8 (GND)
Digital output	24 V	AC 264 V	5 (F-OUT), 6 (CTL OUT)
Remark: Relay-SPDT-contact not provided)[1] according to model			

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4.2.2 IS circuits designed for interconnection to transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_o	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current I_o	382 mA	219 mA	17 mA	45 mA
Power P_o	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	LEMO FAG.2B.308 (TCM-****-**-****-E***-Ex-**, compact))[2] cable with open leads (KCE80**-WE-*-*-Ex, wall mountable housing) cable with open leads TCE80**-E-****-Ex-**, wall mountable housing) direct wiring (KCM****-EF/EFH/EM/EMH/E*(H)-**-*-*-*-*-Ex, compact))[2]			
Probe type	*CM28K-x)[1] *CM65K-x)[1]	*CM0300-x)[1] *CM0600-x)[1] *CM1500-x)[1] *CM3000-x)[1] *CM7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Remarks:)[1] '*' replaced by 'K' or 'T'; "x" see full-scale type code)[2] compact version: Transmitter Unit and Transducer Unit form a mechanical unit marked with KCM / TCM				

4.3 Intrinsically safe transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_i	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current I_i	382 mA	219 mA	17 mA	45 mA
Power P_i	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	screwed terminals (KCM****-0-**-*-*-*-2-Ex, external) screwed terminals (KCM****-1-**-*-*-*-2-Ex, external) screwed terminals (TCM****-**-****-AZZ*-Ex, external) LEMO HEG.2B.308 (TCM****-**-****-E***-Ex, compact) direct wiring (KCM****-EF/EFH/EM/ECMH/E*(H)-**-*-*-*-*-Ex, compact)			
Probe type	*CM28K-x)[1] *CM65K-x)[1]	*CM0300-x)[1] *CM0600-x)[1] *CM1500-x)[1] *CM3000-x)[1] *CM7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Probe type		*CM0325-x)[1] *CM0650-x)[1] *CM1550-x)[1] *CM3100-x)[1] *CM5500-x)[1]	(all models)	
Type of protection		Ex ia IIC	Ex ia IIC / IIB	
Remark:)[1] '*' replaced by 'K' or 'T'; "x" see full-scale type code				

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4.4 For the Coriolis C-Flow Meter Type C-Flow KCE80** / KCM**** or Type Tricor TCE80** / TCM***, respectively, the following ambient temperature range applies:

Model	Type	Ambient temperature range	Medium-temperature range	Temperature class
Panel mountable housing	KCE80x-SE-x-Ex TCE80x-L-x-Ex-x	0 °C ≤ T_a ≤ 60 °C	not applicable	not applicable
Flameproof enclosure	KCE80x-WE-x-Ex TCE80x-E-x-Ex	-40 °C ≤ T_a ≤ 70 °C	not applicable	T4
Transducer compact version	KCMx-a-x-x-Ex TCMx-x-x-Ex-Ex-x	-40 °C ≤ T_a ≤ 70 °C	-40 °C ≤ T ≤ 70 °C	T4
External transducer	KCMx*-0-x-Ex KCMx-1-x-Ex TCMx-x-x-Ax-Ex-x	-40 °C ≤ T_a ≤ 70 °C	-100 °C ≤ T ≤ 70 °C	T4
			-100 °C ≤ T ≤ 135 °C	T3
			-100 °C ≤ T ≤ 210 °C	T2
Remarks: "x" see full-scale type code "a" = EF / EFH / EM / EMH / E*(H)				

(16) Test and Assessment Report

BVS PP 11.2282 EG as of 2013-11-29

(17) Special conditions for safe use

17.1 Transmitter Unit type KCE80**-WE-*-*-Ex / type TCE80**-E-****-Ex-** and Compact Version type KCM****-'EF/EFH/EM/EMH/E*(H)-**-*-*-*-*-Ex / type TCM****-**-****-E***-Ex-**

None

17.2 Transmitter Unit type KCE80**-SE-*-*-Ex / type TCE80**-L-****-Ex-**

17.2.1 The Transmitter Units shall be installed in the safe area only.

17.2.2 The installation of Transmitter Units shall be carried out in such a way that the clearances of bare conductive parts of intrinsically safe circuits to grounded metal parts of the enclosure are at least 3 mm, and bare conductive parts of non-intrinsically safe circuits of other apparatus are located in a distance of at least 50 mm away from terminals for external intrinsically safe circuits, or are separated from them by a partition wall according to clause 6.2.1 of EN 60079-11:2007.

17.3 External Transducer Units type KCM****-0-**-*-*-*-*-Ex / type KCM****-1-**-*-*-*-*-Ex / type TCM****-**-****-AZZ*-Ex-**

None

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, 2013-11-29
BVS-Sit/Ma A20130507

Certification body

Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

Translation

(1) 3rd 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 11 ATEX E 033 X**

(4) Equipment: **Coriolis Flow Meter type C-Flow KCE80** / KCM****
and type Tricor TCE80** / TCM**** / TCMH****

(5) Manufacturer: **KEM Küppers Elektromechanik GmbH**

(6) Address: **Liebigstr. 5, 85757 Karlsfeld, Germany**

(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 11.2282 EG.

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

EN 60079-0:2012 General requirements
EN 60079-1:2007 Flameproof enclosure "d"
EN 60079-11:2012 Intrinsic safety "i"

(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:

II 2G Ex d [ia] IIC T4 Gb	(Transmitter housing
II 2G Ex d [ia] IIB T4 Gb	with reference to model)
II (2)G [Ex ia Gb] IIC	(alternate Transmitter housing
II (2)G [Ex ia Gb] IIB	with reference to model)
II 2G Ex ia IIC T4 Gb	(Transducer housing
II 2G Ex ia IIB T4 Gb	with reference to model)

DEKRA EXAM GmbH
Bochum, dated 2014-12-15

Signed: Dr. Eickhoff
Certification body

Signed: Dr. Wittler
Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

(13) Appendix to

(14) **3rd Supplement to the EC-Type Examination Certificate BVS 11 ATEX E 033 X**

(15) 15.1 Subject and type

Coriolis Flow Meter Type C-Flow KCE80** / KCM****
or Type Tricor TCE80** / TCM***,
or Type Tricor TCE80** / TCMH***, comprising:

- Transmitter Unit Type KCE80**-*-*-*-Ex
or Type TCE80**-*-****-Ex-**, respectively:

- and optionally one of the following Transducer Units:

Type KCM0300-*-**-*-*-*-*-Ex or KCM0325-*-**-*-*-*-*-Ex,
KCM0600-*-**-*-*-*-*-Ex or KCM0650-*-**-*-*-*-*-Ex,
KCM1500-*-**-*-*-*-*-Ex or KCM1550-*-**-*-*-*-*-Ex,
KCM3000-*-**-*-*-*-*-Ex or KCM3100-*-**-*-*-*-*-Ex,
KCM7900-*-**-*-*-*-*-Ex or KCM5500-*-**-*-*-*-*-Ex,
KCM28K-*-**-*-*-*-*-Ex,
KCM65K-*-**-*-*-*-*-Ex,

Type TCM*0100-**-****-****-Ex-**,
TCM*0300-**-****-****-Ex-** or TCM*0325-**-****-****-Ex-**,
TCM*0450-**-****-****-Ex-**,
TCM*0600-**-****-****-Ex-** or TCM*0650-**-****-****-Ex-**,
TCM*1500-**-****-****-Ex-** or TCM*1550-**-****-****-Ex-**,
TCM*3000-**-****-****-Ex-** or TCM*3100-**-****-****-Ex-**,
TCM*7900-**-****-****-Ex-** or TCM*5500-**-****-****-Ex-**,
TCM*28K-**-****-****-Ex-**,
TCM*65K-**-****-****-Ex-** or TCM*230k-**-****-****-Ex-**.

Type code Transducer Unit type KCM**-*-**-*-*-*-*-Ex**

Type	Flow rate	Type	Flow rate
KCM0300-a-bc-d-e-f-g-Ex	≤ 300 kg / h	KCM3000-a-bc-d-e-f-g-Ex	≤ 3000 kg / h
KCM0325-a-bc-d-e-f-g-Ex	≤ 300 kg / h	KCM3100-a-bc-d-e-f-g-Ex	≤ 3000 kg / h
KCM0600-a-bc-d-e-f-g-Ex	≤ 600 kg / h	KCM5500-a-bc-d-e-f-g-Ex	≤ 5500 kg / h
KCM0650-a-bc-d-e-f-g-Ex	≤ 600 kg / h	KCM7900-a-bc-d-e-f-g-Ex	≤ 7900 kg / h
KCM1500-a-bc-d-e-f-g-Ex	≤ 1500 kg / h	KCM28k-a-bc-d-e-f-g-Ex	≤ 28000 kg / h
KCM1550-a-bc-d-e-f-g-Ex	≤ 1500 kg / h	KCM65k-a-bc-d-e-f-g-Ex	≤ 65000 kg / h
Remark: Specification of spacers 'a' to 'g': no change			

Type code Transducer Unit type TCM**-**-****-****-Ex-****
type TCMH**-**-****-****-Ex-****

Type	Flow rate	Type	Flow rate
TCM*0100-ab-cdef-ghik-Ex-xx	≤ 100 kg / h	TCM*3000-ab-cdef-ghik-Ex-xx	≤ 3000 kg / h
TCM*0300-ab-cdef-ghik-Ex-xx	≤ 300 kg / h	TCM*3100-ab-cdef-ghik-Ex-xx	≤ 3100 kg / h
TCM*0325-ab-cdef-ghik-Ex-xx	≤ 325 kg / h	TCM*5500-ab-cdef-ghik-Ex-xx	≤ 5500 kg / h
TCM*0450-ab-cdef-ghik-Ex-xx	≤ 450 kg / h	TCM*7900-ab-cdef-ghik-Ex-xx	≤ 7900 kg / h
TCM*0600-ab-cdef-ghik-Ex-xx	≤ 600 kg / h	TCM*28k-ab-cdef-ghik-Ex-xx	≤ 28000 kg / h
TCM*0650-ab-cdef-ghik-Ex-xx	≤ 650 kg / h	TCM*65k-ab-cdef-ghik-Ex-xx	≤ 65000 kg / h
TCM*1500-ab-cdef-ghik-Ex-xx	≤ 1500 kg / h	TCM*230k-ab-cdef-ghik-Ex-xx	≤ 230000 kg / h
TCM*1550-ab-cdef-ghik-Ex-xx	≤ 1550 kg / h		
Remarks: Specification of spacers 'a' to 'k' and 'xx': no change; Spacer '*' omitted or 'H'.			

Transmitter Unit C-Flow type series KCE80-*-*-*-Ex**
Type code: no change.

Transmitter Unit Tricor type series TCE80-*-****-Ex-****
Type code: no change.

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

15.2 Description

The Coriolis Flow Meter type Tricor TCE80** / TCM**** has been enhanced optionally with Transducer Units type TCM*0100-**-****-****-Ex-** / TCM*0450-**-****-****-Ex-** and TCM*230k-**-****-****-Ex-**.

The type code of previous TCM-Transducer Units may be extended optionally with 'H', marking a new product line for special application; electrical parameters of these versions are identical with TCM****-**-****-****-Ex-**.

Previous and new models of Transducer Units may be equipped with a special terminal box replacing previous snap-cap terminal box.

The electronic circuitry of the Transmitter Unit type KCE80**-*-*-*-Ex or type TCE80**-*-****-Ex-**: may be replaced optionally by a new version.

Status of applied standard EN 60079-0 has been subjected to update from edition 5 to edition 6 for previous and new models of the Coriolis Flow Meter.

15.3 Parameters

15.3.1 Panel mountable housing

15.3.1.1 Non-IS circuits

Parameters / circuit	Voltage U_n	Voltage U_m	Terminals
Power supply (AC) or optionally Power supply (DC)	230 V	AC 264 V	91 (N), 90 (L), 52 (PE)
	24 V	AC 264 V	50 (+24 V), 51 (GND), 52 PE)
Relay-SPDT-contact	30 V	AC 264 V	40, 41, 42
RS485 interface	3.3 V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24 V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output(4-20 mA)	24 V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Digital-input	24 V	AC 264 V	7 (CTL IN), 8 (GND)
Digital output	24 V	AC 264 V	5 (F-OUT), 6 (CTL OUT)

15.3.1.2 IS circuits designed for interconnection to transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_o	DC ≤ 16.4 V	DC ≤ 9.4 V	DC 2 V	DC 10.5 V
Current I_o	≤ 382 mA	≤ 219 mA	17 mA	45 mA
Power P_o	≤ 1.56 W	≤ 515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection	9-pol-Sub D connector			
Probe type	*CM*28K-x)[1] *CM*65K.x)[1] TCM*230K-x)[1]	TCM*0100-x)[1] *CM*0300-x)[1] *CM*0325-x)[1] TCM*0450-x)[1] *CM*0600-x)[1] *CM*0650-x)[1] *CM*1500-x)[1] *CM*1550-x)[1] *CM*3000-x)[1] *CM*3100-x)[1] *CM*5500-x)[1] *CM*7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Remark:)[1] first '*' replaced by 'K' or 'T'; second '*' and 'x': see full-scale type code				

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

15.3.2 Flameproof enclosure

15.3.2.1 Non-IS circuits

Parameter / Circuit	Voltage U_n	Voltage U_m	Terminals
Power supply (AC))[1]	230 V	AC 264 V	91 (N), 90 (L), 52 (PE)
exclusive-or Power supply (DC))[1]	24 V	AC 264 V	50 (+24 V), 51 (GND), 52 PE)
RS485 interface	3.3 V	DC 30 V	22 (+), 21 (-), 20 (GND)
Foundation Fieldbus	24 V	DC 30 V	32 (FF+), 31 (FF-), 20 (GND)
Analogue output (4-20 mA)	24 V	DC 30 V	1 (I1+), 2 (I1-), 3 (I2+), 4 (I2-)
Digital-input	24 V	AC 264 V	7 (CTL IN), 8 (GND)
Digital output	24 V	AC 264 V	5 (F-OUT), 6 (CTL OUT)
Remark: Relay-SPDT-contact not provided)[1] according to model			

15.3.2.2 IS circuits designed for interconnection to transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_o	DC ≤ 16.4 V	DC ≤ 9.4 V	DC 2 V	DC 10.5 V
Current I_o	≤ 382 mA	≤ 219 mA	17 mA	45 mA
Power P_o	≤ 1.56 W	≤ 515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	LEMO FAG.2B.308 (TCM-****-**-****-E***-Ex-**, compact))[2] cable with open leads (KCE80**-WE-*-*-Ex, wall mountable housing) cable with open leads TCE80**-E-****-Ex-**, wall mountable housing) direct wiring (KCM****-EF/EFH/EM/EMH/E*(H)-**-*-*-*-*-Ex, compact))[2]			
Probe type	*CM*28K-x)[1] *CM*65K.x)[1] TCM*230K-x)[1]	TCM*0100-x)[1] *CM*0300-x)[1] *CM*0325-x)[1] TCM*0450-x)[1] *CM*0600-x)[1] *CM*0650-x)[1] *CM*1500-x)[1] *CM*1550-x)[1] *CM*3000-x)[1] *CM*3100-x)[1] *CM*5500-x)[1] *CM*7900-x)[1]	(all models)	
Type of protection	Ex ia IIB	Ex ia IIC	Ex ia IIC / IIB	
Remarks:)[1] first '*' replaced by 'K' or 'T'; second '*' and 'x': see full-scale type code)[2] compact version: Transmitter Unit and Transducer Unit form a mechanical unit marked with KCM / TCM				

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15.3.3 Intrinsically safe transducers (probes)

Parameter	Circuit			
	Driver		Sensor	Temperature sensor
Voltage U_i	DC 16.4 V	DC 9.4 V	DC 2 V	DC 10.5 V
Current I_i	382 mA	219 mA	17 mA	45 mA
Power P_i	1.56 W	515 mW		
Characteristics	linear	linear	trapezoidal	trapezoidal
Connection facility	screwed terminals (KCM****-0-**-*-*-*-2-Ex, external) screwed terminals (KCM****-1-**-*-*-*-2-Ex, external) screwed terminals (TCM****-**-****-AZZ*-Ex, external) LEMO HEG.2B.308 (TCM****-**-****-E***-Ex, compact) direct wiring (KCM****-EF/EFH/EM/ECMH/E*(H)-**-*-*-*-*-Ex, compact)			
Probe type	*CM*28K-x)[1] *CM*65K.x)[1] TCM*230K-x)[1]	TCM*0100-x)[1] *CM*0300-x)[1] *CM*0325-x)[1] TCM*0450-x)[1] *CM*0600-x)[1] *CM*0650-x)[1] *CM*1500-x)[1] *CM*1550-x)[1] *CM*3000-x)[1] *CM*3100-x)[1] *CM*5500-x)[1] *CM*7900-x)[1]	(all models)	
Type of protection		Ex ia IIC	Ex ia IIC / IIB	
Remark:)[1] first '*' replaced by 'K' or 'T'; second '*' and 'x': see full-scale type code				

15.3.4 For the Coriolis C-Flow Meter Type C-Flow KCE80** / KCM**** or Type Tricor TCE80** / TCM*** / TCMH****, respectively, the following ambient temperature range applies:

Model	Type	Ambient temperature range	Medium-temperature range	Temperature class
Panel mountable housing	KCE80x-SE-x-Ex TCE80x-L-x-Ex-x	0 °C ≤ T_a ≤ 60 °C	not applicable	not applicable
Flameproof enclosure	KCE80x-WE-x-Ex TCE80x-E-x-Ex	-40 °C ≤ T_a ≤ 70 °C	not applicable	T4
Transducer compact version	KCMx-a-x-x-Ex TCMx-x-x-Ex-Ex-x	-40 °C ≤ T_a ≤ 70 °C	-40 °C ≤ T ≤ 70 °C	T4
External transducer	KCMx*-0-x-Ex KCMx-1-x-Ex TCMx-x-x-Ax-Ex-x	-40 °C ≤ T_a ≤ 70 °C	-100 °C ≤ T ≤ 70 °C	T4
			-100 °C ≤ T ≤ 135 °C	T3
			-100 °C ≤ T ≤ 210 °C	T2
Remarks: "x" see full-scale type code "a" = EF / EFH / EM / EMH / E*(H)				

(16) Test and Assessment Report

BVS PP 11.2282 EG as of 2014-12-15

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

(17) Special conditions for safe use

17.1 Transmitter Unit type KCE80**-WE-*-*-Ex / type TCE80**-E-****-Ex-** /
type KCE80**-WG-*-*-Ex / type TCE80**-W-****-Ex-** /
and Compact Version type KCM****-'EF/EFH/EM/EMH/E*(H)'-**-*-*-*-*-Ex /
type KCM****-'CF/CFH/CM/CMH/C*(H)'-**-*-*-*-*-Ex /
type TCM****-**-****-E***-Ex-** / type TCMH****-**-****-E***-Ex-** /
type TCM****-**-****-C***-Ex-** / type TCMH****-**-****-C***-Ex-**

None

17.2 Transmitter Unit type KCE80**-SE-*-*-Ex / type TCE80**-L-****-Ex-**

17.2.1 The Transmitter Units shall be installed in the safe area only.

17.2.2 The installation of Transmitter Units shall be carried out in such a way that the clearances of bare conductive parts of intrinsically safe circuits to grounded metal parts of the enclosure are at least 3 mm, and bare conductive parts of non-intrinsically safe circuits of other apparatus are located in a distance of at least 50 mm away from terminals for external intrinsically safe circuits, or are separated from them by a partition wall according to clause 6.2.1 of EN 60079-11:2012.

17.3 External Transducer Units type KCM****-0-**-*-*-*-*-Ex / type KCM****-1-**-*-*-*-*-Ex /
type TCM****-**-****-AZZ*-Ex-** / type TCMH****-**-****-AZZ*-Ex-**

None

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, 2014-12-15
BVS-Scha/Ma A20140690

Certification body

Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49.234.3696-105 Fax +49.234.3696-110 zs-exam@dekra.com

Translation

(1) 4th 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 11 ATEX E 033 X**

(4) Equipment: **Coriolis Flow Meter type C-Flow KCE80** / KCM****
and type Tricor TCE80** / TCM**** / TCMH****

(5) Manufacturer: **KEM Küppers Elektromechanik GmbH**

(6) Address: **Liebigstr. 5, 85757 Karlsfeld, Germany**

(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 11.2282 EG.

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

EN 60079-0:2012 + A11:2013	**General requirements**
EN 60079-1:2007	**Flameproof enclosure "d"**
EN 60079-11:2012	**Intrinsic safety "i"**

(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:

II 2G Ex d [ia] IIC T4 Gb	(Transmitter housing
II 2G Ex d [ia] IIB T4 Gb	with reference to model)
II (2)G [Ex ia Gb] IIC	(alternate Transmitter housing
II (2)G [Ex ia Gb] IIB	with reference to model)
II 2G Ex ia IIC T4 Gb	(Transducer housing
II 2G Ex ia IIB T4 Gb	with reference to model)

DEKRA EXAM GmbH
Bochum, dated 2015-06-09

Signed: Dr. Eickhoff
Certification body

Signed: U. Hauke
Special services unit

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

(13) Appendix to

(14) **4th Supplement to the EC-Type Examination Certificate**
BVS 11 ATEX E 033 X

(15) 15.1 Subject and type

Coriolis Flow Meter type C-Flow KCE80** / KCM****

Transmitter Unit type code and Transducer Unit type code: no change.

Coriolis Flow Meter Type Tricor TCE80** / TCM***
or Type Tricor TCE80** / TCMH***, comprising:

- Transmitter Unit Type TCE80**-*-****-*-**, respectively:
- and optionally one of the following Transducer Units:

Type TCM*0100-**-****-****-*-**, TCM*3100-**-****-****-*-**,
TCM*0325-**-****-****-*-**, TCM*5500-**-****-****-*-**,
TCM*0450-**-****-****-*-**, TCM*7900-**-****-****-*-**
TCM*0650-**-****-****-*-**, TCM*28K-**-****-****-*-**,
TCM*1550-**-****-****-*-**, TCM*65K-**-****-****-*-**,
TCM*230k-**-****-****-*-**.

Extended type code of Transducer Unit type TCM****-**-****-****-*-** /
type TCMH****-**-****-****-*-**

Type	Flow rate	Type	Flow rate
TCMz0100-ab-cdef-ghik-m-xx	≤ 100 kg / h	TCMz3100-ab-cdef-ghik-m-xx	≤ 3100 kg / h
TCMz0325-ab-cdef-ghik-m-xx	≤ 325 kg / h	TCMz5500-ab-cdef-ghik-m-xx	≤ 5500 kg / h
TCMz0450-ab-cdef-ghik-m-xx	≤ 450 kg / h	TCMz7900-ab-cdef-ghik-m-xx	≤ 7900 kg / h
TCMz0650-ab-cdef-ghik-m-xx	≤ 650 kg / h	TCMz28k-ab-cdef-ghik-m-xx	≤ 28000 kg / h
TCMz1550-ab-cdef-ghik-m-xx	≤ 1550 kg / h	TCMz65k-ab-cdef-ghik-m-xx	≤ 65000 kg / h
		TCMz230k-ab-cdef-ghik-m-xx	≤ 230000 kg / h

Remarks:
spacer 'a' to 'f': mechanical details, 'g' to 'k': electrical parameters
details dealing with all spacers: see table below

Spacer	Code	Feature
z =	(blanc)	Standard, specification based on liquids
	H	Specifications based on high pressure gas
ab =	AA-ZZ	Size and shape of process connection (extended to four digits, see line 'a', 'b' below)
a =	00-99	Size of process connection
b =	AA-ZZ	Standard and rating of process connection
c =	A-Z	Temperature range
d =	A-Z	Pressure range
e =	A-Z	Accuracy and mechanical design
f =	A-Z	Mounting length
g =	A	Terminal box aluminium (for IS connection to transmitter)
	C	Compact version
	K	Compact version
	E	Compact version, big housing
	H	Terminal box stainless steel (for IS connection to transmitter)
	P	Push pull connector (for IS connection to transmitter)
h =	A-Y	Non-IS interface
	Z	Not provided
i =	D	Power supply DC 24 V; non-IS
	M	Power supply AC 100 V... 240 V; non-IS
	Z	Not provided
k =	A-Z	Hardware- and Software-options not affecting Ex-relevant parameters
m =	Ex	ATEX and IECEx approval
	Ex3	ATEX and IECEx approval and other approvals
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters (up to 3 options possible)

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

Notes: (referring to position g, h, i)

1. Separate transducer: only option A, H or P possible at position 'g'; (position 'h' and 'i': power supply and interface not provided; marked therefore with Z)
2. Compact version: only option C or E possible at position 'g', position 'h' and 'i' all listed options available.

Extended type code of Transmitter Unit type TCE80**-*-****-*-**:

TCE800n-a-bcde-m-xx	Reduced driver power electronics designed for Transducer type TCM0100-**-****-AZZS-*-** to type TCM7900-**-****-AZZS-*-**
TCE801n-a-bcde-m-xx	Enhanced driver power electronics designed for Transducer type TCM28k-**-****- AZZS-*-** to type TCM230k-**-****- AZZS-*-**
TCE802n-a-bcde-m-xx	Enhanced driver power electronics providing adjustable amplification factor designed for Transducer type TCM28k-**-****- AZZS-*-** to type TCM230k-**-****- AZZS-*-**

Spacer	Code	Feature
n =	0... 9	Hardware and Software options not affecting Ex-relevant parameters
a =	W	Wall-mountable flameproof enclosure
	E	Big wall-mountable flameproof enclosure
	I	Wall-mountable flameproof enclosure
	L	Panel-mountable housing (associated Equipment for installation in the safe area only)
b =	A-Z	Interface (details see manual)
c =	B	Power supply DC 24 V and AC 100 V... 240 V
	D	Power supply DC 24 V
	M	Power supply AC 100 V ... 240 V
d =	A-Z	Hardware- and Software-options not affecting Ex-relevant parameters
e =	A-Z	Length of sensor cable to TCM or connector type (for use with separate cable)
m =	Ex	ATEX and IECEx approval
	Ex3	ATEX and IECEx approval and other approvals
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters (up to 3 options possible)

15.2 Description

The entry for intrinsically safe multi-wire transducer circuit into the flameproof enclosure of Transmitter Unit type TCE80**-W-****-*-** is subjected to optional variation.

The previous direct cable entry is replaced optionally by a bushing, terminating the flameproof enclosure.

The open leads of the bushing outside the flameproof enclosure are located in a flanged intrinsically safe terminal box and either permanently connected to the multi-wire transducer circuit or fitted with a plug.

The plug, or a cable gland in case of permanently connected multi-wire transducer circuit, is mounted in the bottom plate of the intrinsically safe terminal box.

Type codes of Transmitter Unit type TCE80**-*-****-*-** and Transducer Unit type TCM****-**-****-****-*-** / type TCMH****-**-****-****-*-** have been subjected to extension.

15.3 Parameters

No change

(16) Test and Assessment Report

BVS PP 11.2282 EG as of 2015-06-09

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

(17) Special conditions for safe use

17.1 Transmitter Unit type KCE80**-WE-*-*-Ex / type TCE80**-E-****-*-** /
type KCE80**-WG-*-*-Ex / type TCE80**-W-****-*-** /
type TCE80**-I-****-*-**

and Compact Version type KCM****-'EF/EFH/EM/EMH/E*(H)'-**-*-*-*-*-Ex /
type KCM****-'CF/CFH/CM/CMH/C*(H)'-**-*-*-*-*-Ex /
type TCM****-**-****-C***-*-** / type TCMH****-**-****-C***-*-** /
type TCM****-**-****-K***-*-** / type TCMH****-**-****-K***-*-**
type TCM****-**-****-E***-*-** / type TCMH****-**-****-E***-*-**

None

17.2 Transmitter Unit type KCE80**-SE-*-*-Ex / type TCE80**-L-****-*-**

17.2.1 The Transmitter Units shall be installed in the safe area only.

17.2.2 The installation of Transmitter Units shall be carried out in such a way that the clearances of bare conductive parts of intrinsically safe circuits to grounded metal parts of the enclosure are at least 3 mm, and bare conductive parts of non-intrinsically safe circuits of other apparatus are located in a distance of at least 50 mm away from terminals for external intrinsically safe circuits, or are separated from them by a partition wall according to clause 6.2.1 of EN 60079-11:2012.

17.3 External Transducer Units type KCM****-0-**-*-*-*-*-Ex / type KCM****-1-**-*-*-*-*-Ex /
type TCM****-**-****-AZZ*-*-** / type TCMH****-**-****-AZZ*-*-**

None

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, 2015-06-09
BVS-Scha/Ma A 20150344

Certification body

Special services unit

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

Translation

(1) 5th 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 11 ATEX E 033 X**

(4) Equipment: **Coriolis Flow Meter type C-Flow KCE80** / KCM**** and type Tricor TCE8*** / TCM**** / TCMH****

(5) Manufacturer: **KEM Küppers Elektromechanik GmbH**

(6) Address: **Liebigstr. 5, 85757 Karlsfeld, Germany**

(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 11.2282 EG.

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

EN 60079-0:2012 + A11:2013	**General requirements**
EN 60079-1:2007	**Flameproof enclosure "d"**
EN 60079-11:2012	**Intrinsic safety "i"**

(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:

II 2G Ex d [ia] IIC T4 Gb	(Transmitter housing
II 2G Ex d [ia] IIB T4 Gb	with reference to model)
II (2)G [Ex ia Gb] IIC	(alternate Transmitter housing
II (2)G [Ex ia Gb] IIB	with reference to model)
II 2G Ex ia IIC T4 Gb	(Transducer housing
II 2G Ex ia IIB T4 Gb	with reference to model)

DEKRA EXAM GmbH
Bochum, dated 2016-04-19

Signed: Dr. Eickhoff
Certification body

Signed: Dr. Wittler
Special services unit

DAkkS Deutsche Akkreditierungsstelle D-ZE-12009-01-00

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

(13) Appendix to

(14) **5th Supplement to the EC-Type Examination Certificate**
BVS 11 ATEX E 033 X

(15) 15.1 Subject and type

Coriolis Flow Meter type C-Flow KCE80** / KCM****
Transmitter Unit type code and Transducer Unit type code: unchanged

Coriolis Flow Meter type Tricor TCE8*** / TCM***
or type Tricor TCE8*** / TCMH***, comprising:

- Transmitter Unit type TCE8***-*-****-*-**, respectively:

- and optionally one of the following Transducer Units:

Type TCM*0100-**-****-****-*-**, TCM*3100-**-****-****-*-**,
TCM*0325-**-****-****-*-**, TCM*5500-**-****-****-*-**,
TCM*0450-**-****-****-*-**, TCM*7900-**-****-****-*-**
TCM*0650-**-****-****-*-**, TCM*28K-**-****-****-*-**,
TCM*1550-**-****-****-*-**, TCM*65K-**-****-****-*-**,
TCM*230k-**-****-****-*-**.

Extended type code of Transducer Unit type TCM****-**-****-****-*-** /
type TCMH****-**-****-****-*-**

Type	Flow rate	Type	Flow rate
TCMz0100-ab-cdef-ghik-m-xx	≤ 100 kg / h	TCMz3100-ab-cdef-ghik-m-xx	≤ 3100 kg / h
TCMz0325-ab-cdef-ghik-m-xx	≤ 325 kg / h	TCMz5500-ab-cdef-ghik-m-xx	≤ 5500 kg / h
TCMz0450-ab-cdef-ghik-m-xx	≤ 450 kg / h	TCMz7900-ab-cdef-ghik-m-xx	≤ 7900 kg / h
TCMz0650-ab-cdef-ghik-m-xx	≤ 650 kg / h	TCMz28k-ab-cdef-ghik-m-xx	≤ 28000 kg / h
TCMz1550-ab-cdef-ghik-m-xx	≤ 1550 kg / h	TCMz65k-ab-cdef-ghik-m-xx	≤ 65000 kg / h
		TCMz230k-ab-cdef-ghik-m-xx	≤ 230000 kg / h

Remarks:
spacer 'a' to 'f': mechanical details, 'g' to 'k': electrical parameters
details dealing with all spacers: see table below

Spacer	Code	Feature
z =	(blanc)	Standard, specification based on liquids
	H	Specifications based on high pressure gas
ab =	AA-ZZ	Size and shape of process connection (extended to four digits, see line 'a', 'b' below)
a =	00-99	Size of process connection
b =	AA-ZZ	Standard and rating of process connection
c =	A-Z	Temperature range
d =	A-Z	Pressure range
e =	A-Z	Accuracy and mechanical design
f =	A-Z	Mounting length
g =	A	Terminal box aluminium (for IS connection to transmitter)
	C	Compact version
	K	Compact version
	E	Compact version, big housing
	H	Terminal box stainless steel (for IS connection to transmitter)
	P	Push pull connector (for IS connection to transmitter)
h =	A-Y	Non-IS interface
	Z	Not provided
i =	D	Power supply DC 24 V; non-IS
	M	Power supply AC 100 V... 240 V; non-IS
	Z	Not provided
k =	A-Z	Hardware- and Software-options not affecting Ex-relevant parameters
m =	Ex	ATEX and IECEx approval
	Ex3	ATEX and IECEx approval and other approvals
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters (up to 3 options possible)

DAkkS Deutsche Akkreditierungsstelle D-ZE-12059-03-00

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

Extended type code of Transmitter Unit type TCE8***-*-****-*-**:

TCE800n-a-bcde-m-xx Reduced driver power electronics designed for Transducer type TCM0100-**-****-AZZS-*-** to type TCM7900-**-****-AZZS-*-**

TCE801n-a-bcde-m-xx Enhanced driver power electronics designed for Transducer type TCM28k-**-****- AZZS-*-** to type TCM230k-**-****- AZZS-*-**

TCE802n-a-bcde-m-xx Enhanced driver power electronics providing adjustable amplification factor designed for Transducer type TCM28k-**-****- AZZS-*-** to type TCM230k-**-****- AZZS-*-**

Spacer	Code	Feature
TCE80*		Housing in Aluminium (FTZU 04 ATEX 0332U / IECEx FTZU 10.0019U) (FTZU 08 ATEX 0182U / IECEx FTZU 09.0031U)
TCE81*		Housing in Stainless steel (FTZU 15 ATEX 0142U / IECEx FTZU 15.0037U)
n =	0... 9	Hardware and software options not affecting Ex-relevant parameters
a =	W	Wall-mountable flameproof enclosure
	E	Big wall-mountable flameproof enclosure
	I	Wall-mountable flameproof enclosure
	L	Panel-mountable housing (associated equipment for installation in the safe area only)
b =	A-Z	Interface (details see manual)
c =	B	Power supply DC 24 V and AC 100 V ... 240 V
	D	Power supply DC 24 V
	M	Power supply AC 100 V ... 240 V
d =	A-Z	Hardware- and software-options not affecting Ex-relevant parameters
e =	A-Z	Length of sensor cable to TCM or connector type (for use with separate cable)
m =	Ex	ATEX and IECEx approval
	Ex3	ATEX and IECEx approval and other approvals
xx =	00 – 99	Special versions, due to application; not affecting Ex-relevant parameters (up to 3 options possible)

15.2 Description

Description of change
Change of the type designation from type Tricor TCE80** to type Tricor TCE8***.

The Coriolis Flow Meter type Tricor TCE8*** is optionally carried out with empty enclosure FTZU 15 ATEX 0142 U.

15.3 Parameters

Unchanged

(16) Test and Assessment Report

BVS PP 11.2282 EG as of 2016-04-19

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com

(17) Special conditions for safe use

17.1 Transmitter Unit type KCE80**-WE-*-*-Ex / type TCE8***-E-****-*-** /
type KCE80**-WG-*-*-Ex / type TCE8***-W-****-*-** /
type TCE8***-I-****-*-**

and Compact Version type KCM****-'EF/EFH/EM/EMH/E*(H)'-**-*-*-*-*-Ex /
type KCM****-'CF/CFH/CM/CMH/C*(H)'-**-*-*-*-*-Ex /
type TCM****-**-****-C***-*-** / type TCMH****-**-****-C***-*-** /
type TCM****-**-****-K***-*-** / type TCMH****-**-****-K***-*-**
type TCM****-**-****-E***-*-** / type TCMH****-**-****-E***-*-** /

None

17.2 Transmitter Unit type KCE80**-SE-*-*-Ex / type TCE8***-L-****-*-**

17.2.1 The Transmitter Units shall be installed in the safe area only.

17.2.2 The installation of Transmitter Units shall be carried out in such a way that the clearances of bare conductive parts of intrinsically safe circuits to grounded metal parts of the enclosure are at least 3 mm, and bare conductive parts of non-intrinsically safe circuits of other apparatus are located in a distance of at least 50 mm away from terminals for external intrinsically safe circuits, or are separated from them by a partition wall according to clause 6.2.1 of EN 60079-11:2012.

17.3 External Transducer Units type KCM****-0-**-*-*-*-*-Ex / type KCM****-1-**-*-*-*-*-Ex / type TCM****-**-****-AZZ*-*-** / type TCMH****-**-****-AZZ*-*-**.

None

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, 2016-04-19
BVS-Scha/Mu A 20150466

Certification body

Special services unit

DEKRA EXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany,
telephone +49.234.3696-105, Fax +49.234.3696-110, zs-exam@dekra.com