IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com
Ex COMPONENT CERTIFICATE

Certificate No.: **IECEx KEM 10.0093U**

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Certificate history:
Issue 5 (2023-10-17)
Issue 4 (2021-07-27)
Issue 3 (2018-01-31)
Issue 2 (2015-09-09)
Issue 1 (2011-12-08)
Issue 0 (2011-05-12)

Status: **Current**

Issue No: 6

Date of Issue: 2025-04-14

Applicant: **Phoenix Contact GmbH & Co. KG**
Flachsmarktstraße 8
Blomberg 32825
Germany

Ex Component: PCB Connector Series Combicon EX: (E)(S)MSTB(V)(A) 2,5, MVSTB(P)(R)(W) 2,5, GMSTB(V) 2,5, GMVSTB(R)(W) 2,5, FKC 2,5, GFKC 2,5, FKIC 2,5, TFKC 2,5, IC(V) 2,5

This component is NOT intended to be used alone and requires additional consideration when incorporated into other equipment or systems for use in explosive atmospheres (refer to IEC 60079-0).

Type of Protection: **Ex eb**

Marking: Ex eb IIC Gb

Approved for issue on behalf of the IECEx Certification Body: **L.G. van Schie**

Position: **Certification Manager**

Signature:
(for printed version)

Date:
(for printed version) 2025-04-14

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2. This certificate is not transferable and remains the property of the issuing body.
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Certificate issued by:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
Netherlands

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Manufacturer: **Phoenix Contact GmbH & Co. KG**
Flachsmarktstraße 8
Blomberg 32825
Germany

Manufacturing locations: **Phoenix Contact GmbH & Co. KG**
Flachsmarktstraße 8
Blomberg 32825
Germany

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

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

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

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

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

TEST & ASSESSMENT REPORTS:
A sample(s) of the component listed has successfully met the examination and test requirements as recorded in:

Test Report:

NL/KEM/ExTR10.0108/06

Quality Assessment Report:

NL/DEK/QAR11.0009/10

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Ex Component(s) covered by this certificate is described below:

The PCB Connector Series Combicon Ex, (E)(S)MSTB(V)(A) 2,5, MVSTB(P)(R)(W) 2,5, GMSTB(V) 2,5, GMVSTB(R)(W) 2,5, FKC 2,5, GFKC 2,5, FKIC 2,5, TFKC 2,5, and IC(V) 2,5 for the interconnection of copper conductors in enclosures in type of protection increased safety “e”.

Operating temperature range -60 °C to +110 °C.

For electrical data and nomenclature see Annex 1.

SCHEDULE OF LIMITATIONS:

1. The PCB connectors shall be mounted in an certified enclosure that meets the requirements of an approved type of protection as specified in IEC 60079-0 clause 1, with a degree of protection at least as required for Ex e.
2. When assembling the PCB connectors, the required creepage distances and clearances have to be observed.
3. The installation instruction of the manufacturer shall be followed. The data regarding current and associated temperature rise shall be used as guideline for the given conductor cross sections. The cross section has influence on the temperature rise which shall be assessed in the end application.
4. If the PCB connectors are used in electrical apparatus of temperature classes T1 up to T5, the highest temperature of the insulating material shall not exceed the maximum value of the operating temperature range.
5. If the PCB connectors are used in electrical apparatus of temperature classes T6 the permissible ambient temperature range is -60 °C ≤ Tamb ≤ +40 °C.
6. To avoid mechanical stress to the soldered joints, the headers have to be mechanically supported by e.g. screwing or, bending the solder pins.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Introduction of alternative screw material.

Annex:

227118800-Annex 1 to ExTR10.0108.05.pdf

Annex 1 to: Report No. NL/KEM/ExTR10.0108/05
IECEx KEM 10.0093U

Note 1: in this document a point [.] is used as decimal separator.

Type designation

Series (E)(S)MSTB(V)(A), MVSTB(P)(R)(W), GMSTB(V) and GMSTB(R)(W) 2,5:

E	MSTB	V	A	2,5	/	2	-	ST	F	-	5,08	RN	EX
I	II	III	IV	V		VI		VII	VIII		IX	X	XI

Designation	Explanation	Value	Explanation
I	Indicator for pitch between electrical contacts or type of connection between header and PCB	-- G E S ES	Normal pitch (5.08 mm) Large pitch (7.62 mm) Header with press-in solder pins Angled header Press in angled header with solder pins
II	Type indicator	MSTB MVSTB	Headers with solder pins (also compatible with FKC Plugs) and plugs with screw connection. With 90° cable entry into plug.
III	Plug-in direction (for header only)	-- V R W PR PW	Horizontal plug-in direction Vertical plug-in direction Cable entry in header at smooth side Cable entry in header at ribbed side As R with test sockets As W with test sockets
IV	Indicator for option on header	A	With side panels
V	Rated cross section	2,5	2.5 mm², 12 AWG
VI	Electrical contacts of plug and header	2 to 16	Amount of contacts
VII	Indicator for plug or header	ST G	Plug Header
VIII	Indicator for type of mechanical locking between plug and header	F FE FZ --	Screw flange Screw flange without screw Screw flange with cable support Designation X applies
IX	Pitch between electrical contacts	5,08 7,62 10,16	5.08 mm (normal pitch) 7.62 mm (large pitch) 10.16 mm (increased normal pitch)
X	Indicator for type of mechanical locking between plug and header	-- RN LR	Designation VIII applies Self-locking nozzle (header only) Lock and release lever (LR)
XI	Indicator for use in potential explosive atmospheres	EX	With Ex approval

Type designation (Continued)

Series FKC, GFKC 2,5 and FKIC:

G	FKC	2,5	/	2	-	ST	F	-	5,08	RF	EX
I	II	III		IV		V	VI		VII	VIII	IX

Designation	Explanation	Value	Explanation
I	Indicator for pitch between electrical contacts	-- G	Normal pitch (5.08 mm) Large pitch (7.62 mm)
II	Type indicator	FKC FKIC	Plugs with push-in spring-cage connection (FKC=female FKIC=male)
III	Rated cross section	2,5	2.5 mm², 12 AWG
IV	Electrical contacts between plug an header	2 to 16	Amount of contacts
V	Indicator for plug or header	ST	Plug
VI	Indicator for type of mechanical locking between plug and header	F FZ --	Screw flange Screw flange with cable support Designation VIII applies
VII	Pitch between electrical contacts	5,08 7,62 10,16	5.08 mm (normal pitch) 7.62 mm (large pitch) 10.16 mm (increased normal pitch)
VIII	Indicator for type of mechanical locking between plug and header	-- RF LR	Designation VI applies Self-locking flange (RF) Lock and release lever (LR)
IX	Indicator for use in potential explosive atmospheres	EX	With Ex approval

Series TFKC 2,5:

FKC	2,5	/	2	-	ST	-	5,08	LR	EX
I	II		III		IV		V	VI	VII

Designation	Explanation	Value	Explanation
I	Type indicator	TFKC	Plugs with twin push-in spring-cage connection (two wiring terminals per pole)
II	Rated cross section	2,5	2.5 mm², 12 AWG
III	Electrical contacts between plug an header	2 to 10	Amount of contacts
IV	Indicator for plug	ST	Plug
V	Pitch between electrical contacts	5,08	5.08 mm (normal pitch)
VI	Indicator for type of mechanical locking between plug and header	LR	Lock and release lever (LR)
VII	Indicator for use in potential explosive atmospheres	EX	With Ex approval

Type designation (Continued)

Series IC(V) 2,5:

G	ICV	2,5	/	2	-	ST	F	-	5,08	-	EX
I	II	III		IV		V	VI		VII	VIII	IX

Designation	Explanation	Value	Explanation
I	Indicator for pitch between electrical contacts	-- G	Normal pitch (5.08 mm) Large pitch (7.62 mm)
II	Type indicator	IC ICV	Horizontal plug-in direction Vertical plug-in direction
III	Rated cross section	2,5	2.5 mm², 12 AWG
IV	Electrical contacts between plug an header	2 to 12	Amount of contacts
V	Indicator for plug or header	ST GF	Plug (male) Header (female)
VI	Indicator for type of mechanical locking between plug and header	F --	Screw flange Designation VIII applies
VII	Pitch between electrical contacts	5,08 7,62	5.08 mm (normal pitch) 7.62 mm (large pitch)
VIII	Indicator for type of mechanical locking between plug and header	-- RF LR	Designation VI applies Self-locking flange (RF) Lock and release lever (LR)
IX	Indicator for use in potential explosive atmospheres	EX	With Ex approval

Electrical data

Note 1: in this document a point [.] is used as decimal separator.

Type:	**(E)(S)MSTB(V)(A) 2,5/…-5,08-…**	**EMSTBVA 2,5/…-10,16-…**
Rated insulation voltage [V]	160	400
Rated voltage [V]	176	440
Rated current [A]	12	12
Maximum load current [A]	12	12
Temperature rise [K]	18.8 (13.5 A; 2.5 mm²)	14.5 (13.2 A; 2.5 mm²)
Contact resistance [mΩ]	0.7	1.1
Rated cross section [mm²] (AWG)	2.5 (12)	2.5 (12)
Connectable conductor cross section		
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
- flexible [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
Multi-conductor connection		
(2 conductors with the same cross section)		
- solid [mm²] (AWG)	0.2 - 1.0 (24 - 18)	0.2 - 1.0 (24 - 18)
- flexible [mm²] (AWG)	0.2 - 1.5 (24 - 16)	0.2 - 1.5 (24 - 16)

Type:	**MVSTB(P)(R)(W) 2,5/…**
Rated insulation voltage [V]	160
Rated voltage [V]	176
Rated current [A]	12
Maximum load current [A]	12
Temperature rise [K]	16.5 (13.5 A; 2.5 mm²)
Contact resistance [mΩ]	0.9
Rated cross section [mm²] (AWG)	2.5 (12)
Connectable conductor cross section	
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)
- flexible [mm²] (AWG)	0.2 - 2.5 (24 - 12)
Multi-conductor connection	
(2 conductors with the same cross section)	
- solid [mm²] (AWG)	0.2 - 1.0 (24 - 18)
- flexible [mm²] (AWG)	0.2 - 1.5 (24 - 16)

Electrical data (continued)

Type:	**GMSTB(V) 2,5/…**	**GMVSTB(R)(W) 2,5/…**
Rated insulation voltage [V]	320	320
Rated voltage [V]	352	352
Rated current [A]	12	12
Max. load current [A]	12	12
Temperature rise [K]	18.8 (13.5 A; 2.5 mm²)	14.4 (13.5 A; 2.5 mm²)
Contact resistance [mΩ]	0.7	0.9
Rated cross section [mm²] (AWG)	2.5 (12)	2.5 (12)
Connectable conductor cross section		
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
- flexible [mm²] AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
Multi-conductor connection		
(2 conductors with the same cross section)		
- solid [mm²] (AWG)	0.2 - 1.0 (24 - 18)	0.2 - 1.0 (24 - 18)
- flexible [mm²] (AWG)	0.2 - 1.5 (24 - 16)	0.2 - 1.5 (24 - 16)

Type:	**FKC 2,5/…-5,08-…**	**FKC 2,5/…-10,16-…**
Rated insulation voltage [V]	160	400
Rated voltage [V]	176	440
Rated current [A]	12	12
Max. load current [A]	12	12
Temperature rise [K]	30.6 (13.2 A; 2.5 mm²)	30.6 (13.2 A; 2.5 mm²)
Contact resistance [mΩ]	1.1	1.1
Rated cross section [mm²] (AWG)	2.5 (12)	2.5 (12)
Connectable conductor cross section		
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
- flexible [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
Multi-conductor connection		
(2 conductors with the same cross section)		
- solid [mm²] (AWG)	-	-
- flexible [mm²] AWG)	-	-

Electrical data (continued)

Type:	**GFKC 2,5/…**	**FKIC 2,5/…**
Rated insulation voltage [V]	320	200
Rated voltage [V]	352	220
Rated current [A]	12	12
Max. load current [A]	12	12
Temperature rise [K]	30.6 (13.2 A; 2.5 mm²)	19.8 (13.5 A; 2.5 mm²)
Contact resistance [mΩ]	1.1	0.9
Rated cross section [mm²] (AWG)	2.5 (12)	2.5 (12)
Connectable conductor cross section		
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
- flexible [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
Multi-conductor connection		
(2 conductors with the same cross section)		
- solid [mm²] (AWG)	-	-
- flexible [mm²] (AWG)	-	-

Type:	**TFKC 2,5/…-5,08-…**	**IC(V) 2,5/…**
Rated insulation voltage [V]	160	160
Rated voltage [V]	176	176
Rated current [A]	12	12
Max. load current [A]	12	12
Temperature rise [K]	19.4 (13.2 A; 2.5 mm²)	20.3 (13.5 A; 2.5 mm²)
Contact resistance [mΩ]	1.5	0.9
Rated cross section [mm²] (AWG)	2.5 (12)	2.5 (12)
Connectable conductor cross section		
- solid [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
- flexible [mm²] (AWG)	0.2 - 2.5 (24 - 12)	0.2 - 2.5 (24 - 12)
Multi-conductor connection		
(2 conductors with the same cross section)		
- solid [mm²] (AWG)	-	0.2 - 1.0 (24 - 18)
- flexible [mm²] (AWG)	-	0.2 - 1.5 (24 - 16)

Scope

Series (E)(S)MSTB(V)(A) 2,5:
MSTB 2,5/…-STF-5,08 EX
MSTB 2,5/…-STFZ-5,08 EX
MSTB 2,5/…-GF-5,08 EX
EMSTB 2,5/…-GF-5,08 EX
MSTBV 2,5/…-GF-5,08 EX
EMSTBV 2,5/…-GF-5,08 EX
MSTBA 2,5/…-G-5,08-RN EX
MSTBVA 2,5/…-G-5,08-RN EX
EMSTBA 2,5/…-G-5,08-RN EX
EMSTBVA 2,5/…-G-5,08-RN EX
EMSTBVA 2,5/…-G-5,08-LR EX
SMSTB 2,5/ …-G-5,08-RN EX
MSTBV 2,5/…-GFE-5,08-LR EX
EMSTBVA 2,5/...-G-10,16-LR EX

Series MVSTB(P)(R)(W) 2,5:
MVSTBR 2,5/…-STF-5,08 EX
MVSTBW 2,5/…-STF-5,08 EX
MVSTBPR 2,5/…-STF-5,08 EX
MVSTBPW 2,5/…-STF-5,08 EX

Series GMSTB(V) 2,5:
GMSTB 2,5/…-STF-7,62 EX
GMSTB 2,5/…-STFZ…-7,62 EX
GMSTB 2,5/…-GF-7,62 EX
GMSTBV 2,5/…-GF-7,62 EX

Series GMVSTB(R)(W) 2,5:
GMVSTBR 2,5/…-STF-7,62 EX
GMVSTBW 2,5/…STF-7,62 EX

Series FKC 2,5:
FKC 2,5/…-STF-5,08 EX
FKC 2,5/…-ST-5,08-RF EX
FKC 2,5/…-ST-5,08-LR EX
FKC 2,5/…-ST-10,16-LR EX

Series GFKC 2,5:
GFKC 2,5/…-STF-7,62 EX

Series FKIC 2,5:
FKIC 2,5/…-STF-5,08 EX

Series TFKC 2,5:
TFKC 2,5/…-ST-5,08-LR EX

Series IC(V) 2,5:
IC 2,5/…-STF-5,08 EX
IC 2,5/…-STFZ…-5,08 EX
IC 2,5/…-GF-5,08 EX
ICV 2,5/…-GF-5,08 EX