



Mining And Surface Certification (Pty) Ltd

2015/021934/07

THIS CERTIFICATE IS ISSUED AS AN I.A. CERTIFICATE IN TERMS OF THE MINE HEALTH AND SAFETY ACT, ACT NO 29 OF 1996 (AND REGULATIONS), THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND REGULATION 17 OF THE ELECTRICAL MACHINERY REGULATIONS

IA CERTIFICATE	MASC MS/18-0089X	Issue	1
Issue Date	23 May 2022	Expiry Date	23 July 2024
** Based on Certificate No	IECEx CES 06.0002X	Issue / Variations / Amendment	3
Requested by	Pepperl+Fuchs (Pty) Ltd 8 Glen Eagle Office Park, Koorsboom Ave, Glen Marais, Kempton Park, 1619, South Africa		
Manufacturer	Pepperl+Fuchs SE Lilienthalstrasse 200, 68307 Mannheim, Germany		
Description	The SMART Transmitter Power Supply HiC2025 and HiC2025A and SMART Current Driver HiC2031 are galvanically isolated apparatus. The equipment's input circuit is isolated from the output circuit by transformer. The voltage and current limitation for the input circuit is achieved with zener diodes and current limiting resistors. All the devices are mounted inside a plastic housing and equipped with two multipolar connectors type DIN 41612 B/3, suitable for direct insertion into Pepperl+Fuchs's certified Termination Boards, HiC series. The product names shall be supplemented by additional characters, indicating equipment variants that have no influence on the approval. Both products do not differ from those for Intrinsic Safety applications. See annex of Base certificate for further description		
Equipment	Galvanically Isolated Barrier	Type	HiC2025, HiC2025A and HiC2031
MARKING: Original marking as per certificate ** remains applicable. IA number must be added.	Type: Ex Marking:	Galvanically Isolated Barrier, type HiC2025, HiC2025A and HiC2031 [Ex ia Ma] I [Ex ia Ga] IIC [Ex ia Da] IIIC Ex ec IIC T4 Gc	
	IA Number: Warnings:	MASC MS/18-0089X (To be additionally marked on equipment) See Base Certificate ** (original marking must be applied)	
Quality Assurance report (QAR) / Notification (QAN):	DE/PTB/QAR06.0008/17		
Quality Assurance report (QAR) / Notification (QAN) Expiry date:	23 July 2024		
Compliance:	The equipment as described above has been allocated the rating <u>Explosion Protected 'as above'</u> utilizing the SANS/IEC Standards: <ul style="list-style-type: none"> • SANS (IEC) 60079-0: 2017 Equipment - General requirements • SANS (IEC) 60079-7: 2015 Equipment protection by intrinsic safety "i" • SANS (IEC) 60079-11: 2011 Equipment protection by increased safety "e" <i>Note: This certificate covers only the listed standards and does not imply compliance to any other standard, related or inferred. It is up to the manufacturer to ensure that the product complies to all relevant standards for the application.</i>		
Special conditions of safe use "X":	<ul style="list-style-type: none"> • Refer to Annex A below for more details. 		
Conditions of manufacture:	<ul style="list-style-type: none"> • Refer to Annex A below for more details. 		
 D.P. Visser TECHNICAL SPECIALIST		 N. Viljoen TECHNICAL OFFICER	
This certificate covers all units sold as long as the QAR/QAN remains valid. According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).			

Apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:
 SANS 10086 requirements;
 Any conditions mentioned in the above certificate;
 Any relevant requirements of the MHS Act;
 Any restrictions and conditions enforced by the chief inspector of mines, principal inspector (Group I equipment) or chief inspector of factories (Group II equipment).

This certificate may only be reproduced in full
 The certificate is not transferable and remains the property of the issuing body.

IA CERTIFICATE: MASC MS/18-0089X

Equipment: Galvanically Isolated Barrier, HiC2025, HiC2025A and HiC2031
(Expiry date: 23 July 2024)

Page 2 of 2

ANNEX A

This document is based on and must be read in conjunction with certificate IECEx CES 06.0002X.	
Description (According to Base Certificate) **	
"Refer to description in Base Certificate ** (and any applicable schedules/issues/variations)."	
Standard compliance	See Base Certificate **
Special conditions of safe use ("X")	<ul style="list-style-type: none">• Products shall only be used, with the designated Pepperl+Fuchs HiC series, Termination Boards <u>Installation in areas that requiring EPL Gc equipment</u>• The equipment shall be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60079-0, IEC 60079-7 & IEC 60529 and it shall be located and operated in a controlled environment that ensures a pollution degree 2, as defined in IEC 60664-1.• The device must be installed and operated only in an environment of overvoltage category II (or better) according to IEC/EN 60664-1.• Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.
Conditions of manufacture	<ul style="list-style-type: none">• None.
Conditions of Certification	<ul style="list-style-type: none">• This IA Certificate covers all units sold from the date of this document to the expiry date of this certificate.• As per ARP 0108 a maximum three yearly review is required on this IA Certificate (expiry is determined as per the QAR/QAN/QMS expiry date).• The apparatus must be additionally marked with the MASC marking details above.• This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date.• The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by the certificate on which this IA Certificate is based and any other conditions in this IA Certificate.• The certification on which this IA Certificate is based must remain valid.• The extent of the requirements in the ARP 0108 (or regulations), SANS 10108 and any other applicable regulations on the certification of the equipment must remain unchanged.• The Ex quality assurance notification/report for the equipment must remain valid.
Conclusion:	<ul style="list-style-type: none">• From the above and the selective examination of the documentation, nothing contrary to the requirements of the applicable standards was found, provided that the equipment / component is used as described in the above document / certificate and according to the MASC conditions below. A MASC IA certificate is issued based on the work done as per the Base Certificate **.• The routine tests for production units according to the Base Certificate ** must be complied with (if applicable).

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment / inspection is representative and accurately performed, and that a report / certificate is accurate in the quoted results and conclusions drawn from the test / assessment / inspection, MASC or its directors/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report / certificate issued pursuant to a test / assessment / inspection.

MASC takes no responsibility for any non-conformances, exclusions or any results / assessments / inspections not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer / applicant attests on his own responsibility that the equipment / installation has been designed and constructed in accordance with the applicable requirements of the relevant standards and documentation, that the routine verifications / routine tests have been correctly completed and the equipment / installation complies with the documentation and standard(s).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practices.

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francois du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
Tel: 012 653 2959 ♦ Fax: 086 605 8568
e-mail: info@masc-ex.co.za



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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

Certificate No.: **IECEX CES 06.0002X** Page 1 of 4 Certificate history:
Status: **Current** Issue No: 3 [Issue 2 \(2019-07-15\)](#)
Date of Issue: 2021-05-24 [Issue 1 \(2011-08-29\)](#)
[Issue 0 \(2006-07-05\)](#)
Applicant: **Pepperl+Fuchs SE**
Lilienthalstrasse 200
68307 Mannheim
Germany
Equipment: **Galvanically Isolated Barrier, type HiC2025, HiC2025A and HiC2031**
Optional accessory:
Type of Protection: **Intrinsic safety 'ia'; Increased safety 'ec'**
Marking: **[Ex ia Ma] I**
[Ex ia Ga] IIC
[Ex ia Da] IIIC
Ex ec IIC T4 Gc

Approved for issue on behalf of the IECEx
Certification Body:

Mirko Balaz

Position:

Head of IECEx CB

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



Certificate issued by:

CESI
Centro Elettrotecnico
Sperimentale Italiano S.p.A.
Via Rubattino 54
20134 Milano
Italy

CESI



IECEX Certificate of Conformity

Certificate No.: **IECEX CES 06.0002X**

Page 2 of 4

Date of issue: 2021-05-24

Issue No: 3

Manufacturer: **Pepperl+Fuchs SE**
Lilienthalstrasse 200
68307 Mannheim
Germany

Additional manufacturing locations: **Pepperl+Fuchs Asia Pte. Ltd.**
18 Ayer Rajah Crescent
Singapore 139942
Singapore

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

STANDARDS :

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

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

[IEC 60079-7:2015](#) Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
Edition:5.0

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

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

[IT/CES/ExTR06.0002/00](#)
[IT/CES/ExTR21.0005/00](#)

[IT/CES/ExTR06.0002/01](#)

[IT/CES/ExTR06.0002/02](#)

Quality Assessment Report:

[DE/PTB/QAR06.0008/15](#)



IECEX Certificate of Conformity

Certificate No.: **IECEX CES 06.0002X**

Page 3 of 4

Date of issue: 2021-05-24

Issue No: 3

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The SMART Transmitter Power Supply HiC2025 and HiC2025A and SMART Current Driver HiC2031 are galvanically isolated apparatus.

For intrinsic safety applications they are associated apparatus.

The devices HiC2025 and HiC2025A supplies 2-wire SMART transmitters in a hazardous area and can also be used with 2-wire SMART current sources. It transfers the analog input signal to the safe area as an isolated current value.

The SMART Current Driver type HiC2031 repeats the input signal from a control system to drive HART I/P converters, valve actuators, and displays located in a hazardous area.

For non incendive applications (type of protection Ex ec).

The devices HiC2025 and HiC2025A are isolated apparatus suitable to supply/interface signal transmitter placed in hazardous area and transfer the analog signal to a safe area.

The device HiC2031 is an isolated apparatus suitable to repeat a current signal coming from a safe area to drive smart I/P converter, valve actuator and displays placed in hazardous area.

Both products do not differ from those for Intrinsic Safety applications.

See annex for further description.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Products shall only be used, with the designated Pepperl+Fuchs HiC series, Termination Boards.

Installation in areas that requiring EPL Gc equipment

- The equipment shall be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60079-0, IEC 60079-7 & IEC 60529 and it shall be located and operated in an controlled environment that ensures a pollution degree 2, as defined in IEC 60664-1.

- The device must be installed and operated only in an environment of overvoltage category II (or better) according to IEC/EN 60664-1.

- Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.



IECEX Certificate of Conformity

Certificate No.: **IECEX CES 06.0002X**

Page 4 of 4

Date of issue: 2021-05-24

Issue No: 3

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Details of certificate changes (for issues 2):

Variation 2.1

The constructive modifications introduced by the Manufacturer, relate to the improvement the thermal dissipation of the infallible components on which intrinsic safety depends in relation to the maximum service temperature of +94 °C.

Variation 2.2

Extended the ambient temperature range from -20 °C ÷ +60°C up to -40 °C ÷ +70 °C.

Variation 2.3

New alternative I.S. components and PCBs modification.

Variation 2.4

Added new type of protection "ec", for EPL Gc (IEC 60079-7:2015).

Variation 2.5

Added electrical data for EPL Gc. Electrical data for "i" remains unchanged.

Variation 2.6

Added a new device called HiC2025A with new external safety parameters.

Variation 2.7

The product denomination has been updated, introducing asterisks at the end of name. The asterisks shown in at the end of the name can be replaced by a combination of tokens, indicating different versions that have no influence on the approval (e.g. HiC2025(A)** or HiC2031**). The external safety parameters are the same as for the standard version and have not any influence on the type of protection.

Variation 2.8

The Manufactory location(s) have been update.

Variation 2.9

The equipment have been assessed in compliance to IEC 60079-0:2007, IEC 60079-11:2006, IEC 60079-26:2006, IEC 61241-11:2005. The equipment have been re-assessed on the basis of IEC 60079-0:2017 and IEC 60079-11:2011 Standards.

Variation 2.10

Update "Specific Conditions of Use" / "Schedule of Limitations"

Variation 3 (Issue No.3):

Variation 3.1

Updated the Applicant and Manufacturer name.

Variation 3.2

Updated the Additional Manufacturing locations.

No other changes were applied to the Equipment.

Annex:

[P+F IECEX_CES_06.0002X Issue 3 - ANNEX - HiC2025+HiC2031.pdf](#)



Prot: C1007943

Annex to certificate:
Applicant:

Electrical Apparatus:

IECEX Certificate of Conformity



IECEX CES 06.0002X Issue No.:3 of 2021-05-24

Pepperl+Fuchs SE

Lilienthalstrasse 200; 68307 Mannheim - Germany

Galvanically isolated barrier type: HiC2025, HiC2025A and HiC2031

Intrinsically safe circuits – equipment HiC2025**

Connector SL2 pins	Uo	Io	Po	Gas Group	Co (μF)	Lo (mH)	Lo/Ro (μH/Ω)
	Ui	Ii					
5a(+); 1b(-) 7a(-)	7.2V #	100 mA	25 mW	IIC	13.49	3.5	27
				IIB	239	14	108
	30 V	128 mA		IIA	1000	28	216
				I	1000	46	356

Ci = 5.7nF; Li = negligible; Output characteristic: diodes blocking barrier.
The voltage Uo, of channel 5a(+); 1b(-) 7a(-) is derived from the Ui voltage max 30 V

Intrinsically safe circuits – equipment HiC2025A**

Connector SL2 pins	Uo	Io	Po	Gas Group	Co (μF)	Lo (mH)	Lo/Ro (μH/Ω)
5a(+); 5b(-)	25.2V	93 mA	586 mW	IIC	0.100	4.1	61
				IIB	0.81	16.4	244
				IIA	2.8	32.8	488
				I	4.14	53.9	800

Ci = 5.7nF; Li = negligible; Output characteristic: linear.

Connector SL2 pins	Uo	Io	Po	Gas Group	Co (μF)	Lo (mH)	Lo/Ro (μH/Ω)
	Ui	Ii					
5a(+); 1b(-) 7a(-)	1	100 mA	25 mW	IIC	100	3.5	1.4
				IIB	1000	14	5.6
	30 V	128 mA		IIA	1000	28	11.2
				I	1000	46	18

Ci = 5.7nF; Li = negligible; Output characteristic: diodes blocking barrier.

Intrinsically safe circuits – equipment HiC2031**

Connector SL2 pins	Uo	Io	Po	Gas Group	Co (μF)	Lo (mH)	Lo/Ro (μH/Ω)
5a(+); 5b(-)	25.2V	100 mA	630 mW	IIC	0.100	3.5	55
				IIB	0.81	14	222
				IIA	2.8	28	444
				I	4.14	46	743

Ci = 5.7nF; Li = negligible; Output characteristic: linear.

Note - External circuits with both inductance and capacitance

The above maximum Lo and Co parameters apply where:

- the total Ci of the external circuit (excluding the cable) is < 1% of the Co value or
- the total Li of the external circuit (excluding the cable) is < 1% of the Lo value.

The above Lo and Co parameters shall reduce to 50% when both of the two conditions below are given:

- the total Li of the external circuit (excluding the cable) > 1% of the Lo value and
- the total Ci of the external circuit (excluding the cable) > 1% of the Co value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 uF for Groups I, IIA, IIB and 600 nF for Group IIC.



Prot: C1007943

Annex to certificate:

Applicant:

Electrical Apparatus:

IECEX Certificate of Conformity



IECEX CES 06.0002X Issue No.:3 of 2021-05-24

Pepperl+Fuchs SE

Lilienthalstrasse 200; 68307 Mannheim - Germany

Galvanically isolated barrier type: HiC2025, HiC2025A and HiC2031

Dust protection [ia Da] IIIC: the barriers **HiC2025**, **HiC2025A** and **HiC2031** meet the spark ignition energy level requirements for Groups IIB apparatus.

Electrical characteristic - type of protection: Ex ec

Power Supply [*Connector SL1 pins: 2a(+), 2b(+); 1a(-), 2b(-)*]: rated voltage U_n : 24 Vdc (*from 19 V up to 30 V*)

Devices HiC2025** and HiC2025A**

Input [*Connector SL2 pins: 5a(+); 5b(-)*]: 0/4 ÷ 20 mA signal (*$U_n > 15$ V at 20 mA*)

Input [*Connector SL2 pins: 5a(+); 1b(-), 7a(-)*]: 0/4 ÷ 20 mA signal (*up to U_n : 30 V max*)

Output [*Connector SL1 pins: 8a(+); 7a(-)*]: 0/4 ÷ 20 mA signal (*up to U_n : 30 V max*)

Device HiC2031**

Input [*Connector SL1 pins: 8a(+); 7a(-)*]: 0/4 ÷ 20 mA signal (*up to U_n : 30 V max*)

Output [*Connector SL2 pins: 5a(+); 5b(-)*]: 0/4 ÷ 20 mA signal (*0 ÷ 650 Ω loadx*)

Tamb.: from -40 °C up to +70 °C

The maximum electrical values, at input/output terminals, are those above defined for the [Ex ia] type of protection.