



# 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](http://www.iecex.com)

### Ex COMPONENT CERTIFICATE

Certificate No.: **IECEx BAS 10.0125U**

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Certificate history:

Status: **Current**

Issue No: 3

[Issue 2 \(2022-06-14\)](#)

[Issue 1 \(2012-01-10\)](#)

[Issue 0 \(2011-06-24\)](#)

Date of Issue: 2023-12-22

Applicant: **Topworx Incorporated**  
3300 Fern Valley Road  
Louisville  
Kentucky 40213  
**United States of America**

Ex Component: FF CC Electronic Unit

*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: **Intrinsic Safety**

Marking: Ex ib IIC Gb  
-40°C ≤ Ta ≤ +60°C

Approved for issue on behalf of the IECEx  
Certification Body:

**Mr R S Sinclair**

Position:

**Technical Manager**

Signature:  
(for printed version)

pp P. Oates

Date:  
(for printed version)

22/12/2023

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Certificate issued by:

**SGS UK Limited**  
Rockhead Business Park  
Staden Lane  
Buxton, Derbyshire SK17 9RZ  
**United Kingdom**





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3300 Fern Valley Road  
Louisville  
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Manufacturing locations: **Topworx Incorporated**  
3300 Fern Valley Road  
Louisville  
Kentucky 40213  
**United States of America**

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

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 component listed has successfully met the examination and test requirements as recorded in:

Test Reports:

[GB/BAS/ExTR11.0121/00](#)  
[GB/BAS/ExTR22.0045/00](#)

[GB/BAS/ExTR11.0122/00](#)  
[GB/SGS/ExTR23.0165/00](#)

[GB/BAS/ExTR11.0301/00](#)

Quality Assessment Report:

[GB/SIR/QAR07.0025/11](#)



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

The FF CC Electronic Unit is designed as an interface between a Foundation Fieldbus network and intrinsically safe connected and controlled components. The component is designed to connect to Foundation Fieldbus or FISCO input and provide control of up to two intrinsically safe piezoelectric pilot valves and interface with up to two mechanical feedback switches and / or a position feedback sensor.

The component comprises a Fieldbus Comms Board component certified under IECEx Certificate No. IECEx BAS 07.0027U fitted on a Fieldbus Connect & Control (FF CC) printed circuit board (PCB). The FF CC PCB provides the interface between the Foundation Fieldbus or FISCO input & the Fieldbus Comms Board and also provides voltage and current limitation on the interface outputs to the certified pilot valves and feedback switches & sensors.

The circuitry is fully encapsulated in a plastic enclosure with external connections to the unit being made via screw terminals and plug and socket connections. The unit is fitted with user interface comprising three button membrane keypad with LED indication to permit the configuration of the component.

See Certificate Annex for electrical parameters

**SCHEDULE OF LIMITATIONS:**

- 1) The component must be installed within an enclosure which provides a degree of protection of not less than IP20 in accordance with IEC 60529.
- 2) The component has a surface temperature of less than 135°C in a maximum ambient temperature of 60°C.



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## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

### Variation 3.1

To permit minor changes in drawings not affecting the certification assessment.

ExTR: **GB/SGS/ExTR23.0165/00**

File Reference: **23/0548**

### Annex:

[IECEX BAS 10.0125U Annex 1.pdf](#)

## FF CC Electronics Unit

### Input / Output Parameters

Input Parameters: Bus Connector J1 pins 1 to 3

#### I.S Parameters

$$\begin{array}{ll} U_i = 30V & C_i = 5nF \\ I_i = 380mA & L_i = 10\mu H \\ P_i = 1.5W & \end{array}$$

#### FISCO Parameters

$$\begin{array}{ll} U_i = 17.5V & C_i = 5nF \\ I_i = 380mA & L_i = 10\mu H \\ P_i = 5.32W & \end{array}$$

#### Output Parameters

Pilot Valve Terminals: V1 + & - and V2 + & -

$$\begin{array}{ll} U_o = 9.56V & C_i = 0 \\ I_o = 11.4mA & L_i = 0 \\ P_o = 27.2mW & \end{array}$$

Open / Close Go Switch Terminals: Open NO & C and Close NO & C

$$\begin{array}{ll} U_o = 9.56V & C_i = 0 \\ I_o = 3.7mA & L_i = 0 \\ P_o = 8.8mW & \end{array}$$

Position Sensor Output Connector pins 1 & 4 w.r.t. 3

$$\begin{array}{ll} U_o = 9.56V & C_i = 0 \\ I_o = 7.6mA & L_i = 0 \\ P_o = 15mW & \end{array}$$

Position Sensor Output Connector pins 1 to 4 combined

$$\begin{array}{ll} U_o = 9.56V & C_i = 2.67\mu F \\ I_o = 58.6mA & L_i = 0 \\ P_o = 112mW & \end{array}$$

### Load Parameters

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to output terminals of the unit must not exceed the following values: -

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
Pilot Valve Terminals J4, Pins 1 to 4				
IIC	3.6	273.5		1,304
IIB	26.0	1,000		5,219
IIA	210	1,000		10,439
Open / Close Go-Switch Terminals J5, Pins 1 to 4				
IIC	3.6	1,000		4,020
IIB	26.0	1,000		16,083
IIA	210	1,000		32,166
Position Sensor Terminals J7, Pins 1 & 4 w.r.t. 3				
IIC	3.6	615.5		1,957
IIB	26.0	1,000		7,829
IIA	210	1,000		15,659
Position Sensor Terminals J7, Pins 1 to 4 combined				
IIC	0.84	10.3		253
IIB	23.3	41.4		1,015
IIA	207	82.8		2,030

### Notes:

- 1) The above load parameters apply when one of the two conditions below is given:
  - the total  $L_i$  of the external circuit (excluding the cable) is  $< 1\%$  of the  $L_o$  value or
  - the total  $C_i$  of the external circuit (excluding the cable) is  $< 1\%$  of the  $C_o$  value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total  $L_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $L_o$  value and
  - the total  $C_i$  of the external circuit (excluding the cable) is  $\geq 1\%$  of the  $C_o$  value.

The reduced capacitance of the external circuit (including cable) shall not be greater than  $1\mu\text{F}$  for Groups IIB & IIA and  $600\text{nF}$  for Group IIC.