



## Flameproof LVCS FP (Flameproof Continuous Level Sensor)

The Deeter LVCS FP is a magnetic float on a reed switch or Hall Effect sensor stem for control and indication of a liquid level while in a potentially explosive atmosphere.

 II 1/2G 2D  
Ex d IIC (\*) Ga/Gb  
Ex t IIIC (\*) Db IP68  
-20°C ≤ T<sub>a</sub> ≤ +85°C

 II 2GD  
Ex d IIC (\*) Gb  
Ex t IIIC (\*) Db IP68  
-20°C ≤ T<sub>a</sub> ≤ +85°C

\* Temperature class options to suit environment and process temperatures  
T5 / T100°C for process temperatures ≤ 85°C  
T4 / T135°C for process temperatures ≤ 125°C  
T3 / T200°C for process temperatures ≤ 180°C

ATEX Certificate: ExVeritas 17ATEX0301X  
IECEX Certificate: IECEX EXV 17.0030X  
Refer to certificate for clarification of directive code and equipment protection level.



### Features include:

- ATEX and IECEX approved.
- Standard lengths or custom length sensor stems up to 6 Metres.
- Stainless steel 316L housing and wetted components.
- Suitable for gas and dust environments.
- IP68 Ingress protection.
- Reed switch or Hall Effect sensing technology.
- Voltage and current loop analogue output.
- Factory programmable set point triggers available.
- M20 and ½"NPT cable connections.
- Custom mounting options available.
- Narrow sensor stem and mounting for tanks without internal access.
- Suitable for high liquid temperatures.

## Flameproof LVCS FP (Flameproof Continuous Level Sensor)

Type	Specification	
Sensor technology	Magnetic float with reed switch or Hall Effect	Note 1
Reed switch sensing resolution Ø12mm stem Ø8mm stem	5mm 6mm	
Hall Effect sensing resolution	15mm	
Interface options: 4-20mA 0-2V 0-4V 0-10V 4-20mA Loop powered Multi interface	4 to 20mA for 10Ω to 1.2KΩ load 0 to 2.048V @ 5mA 0 to 4.096V @ 5mA 0 to 10.0V @ 5mA 4 to 20mA for 10Ω to 1.2KΩ load 4 to 20mA for 10Ω to 1.2KΩ load and 0 – 10V @ 5mA and 2 X open collector transistor	
Sensor tube and wetted materials	Stainless steel 316L	
Connection head material	Stainless steel 316L	
IP rating with suitable cable gland	IP68	
Approximate weight Ø12mm stem Ø8mm stem	1Kg+process connector + 0.5Kg/Metre 1Kg+process connector + 0.3Kg/Metre	
Float Diameter: Specific gravity Ø12mm stem Ø8mm stem	53mm : 0.65 30mm : 0.75	Other floats available
Maximum liquid temperature Reed switch Hall Effect	-20 to +85°C -10 to +45°C	Note 2
Maximum head temperature	-20 to +80°C	Note 3
Maximum operating pressure	150PSI / 10Bar standard 450PSI / 31Bar	Note 4
Thread connection-Sensor tube	½"-14 NPT	
Thread connection-Wiring port	½"-14 NPT or M20X1.5	
Connection head height	95mm	
Power supply: 4-20mA 0 to 2V 0 to 4V 0 to 10V 4-20mA Loop powered Multi interface	15 to 28Volts. Typical 24V@0.6Watts 5 to 28Volts. Typical 12V@0.25Watts 7 to 28Volts. Typical 12V@0.25Watts 14 to 28Volts. Typical 24V@0.5Watts 17 to 25Volts via current loop 8 to 25Volts. Typical 24V@0.6Watts	
Current loop output. R <sub>Load</sub>	10Ω to 1.2KΩ	Note 5
Multi interface - open collector transistor	28Vdc Max. 50mA Max	

Note 1: Due to the variability of components, the output may be non-monotonic. If this could cause a problem in your application, please call our technical sales department.

Note 2: LVCS FP for liquids with temperature between 85°C and 180°C are available, Call Deeter for assistance.

Note 3: When this equipment is intended to be used in a liquid with a process temperature above 85°C it is an essential requirement that the sensor head temperature is measured to determine if the ambient air cooling is sufficient to keep the head below 80°C. See installation manual for detail.

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Note 4: The LVCS FP sensor float and tube can withstand the stated pressure when sealed inside a tank. The connection head and resin seal inside the sensor stem must not be pressurised. The standard zone0 fittings are rated at 10bar, these fittings are not part of the certified flameproof seal and should not be considered as part of an explosion proof containment. Please call our technical sales department regarding sensors for liquid pressures up to 31bar.

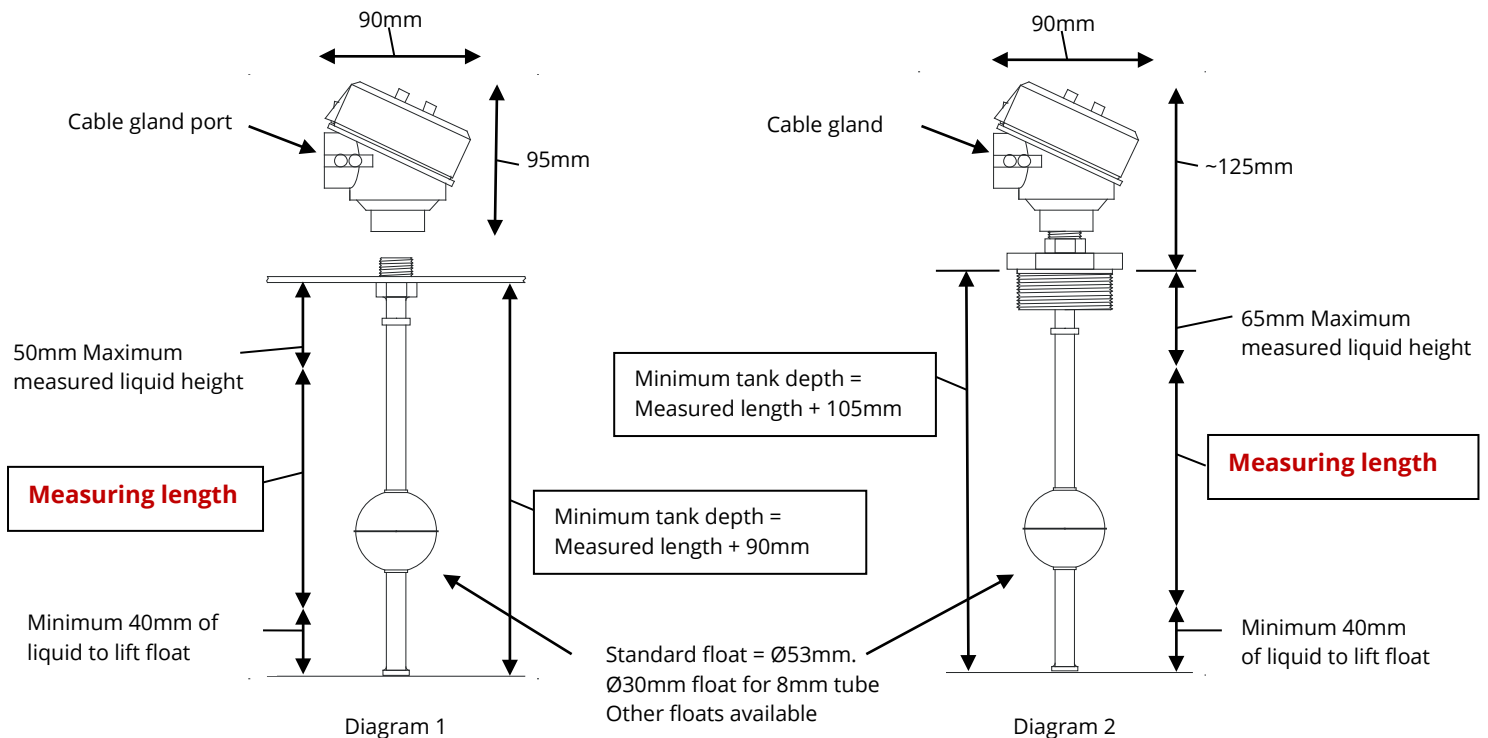
Note 5: Maximum load resistance is determined by the formula:

$$\text{Load(max)} = (\text{supply Voltage} - 2V) / 20\text{mA}.$$

At maximum specified voltage and temperature, the minimum load resistance increases to approximately 500Ω

An approximate formula is:

$$\text{Load(min)} = (\text{Supply voltage}) / 20\text{mA} - (150\text{C} - (\text{Ambient temperature})) / 0.04\text{C}/\Omega$$

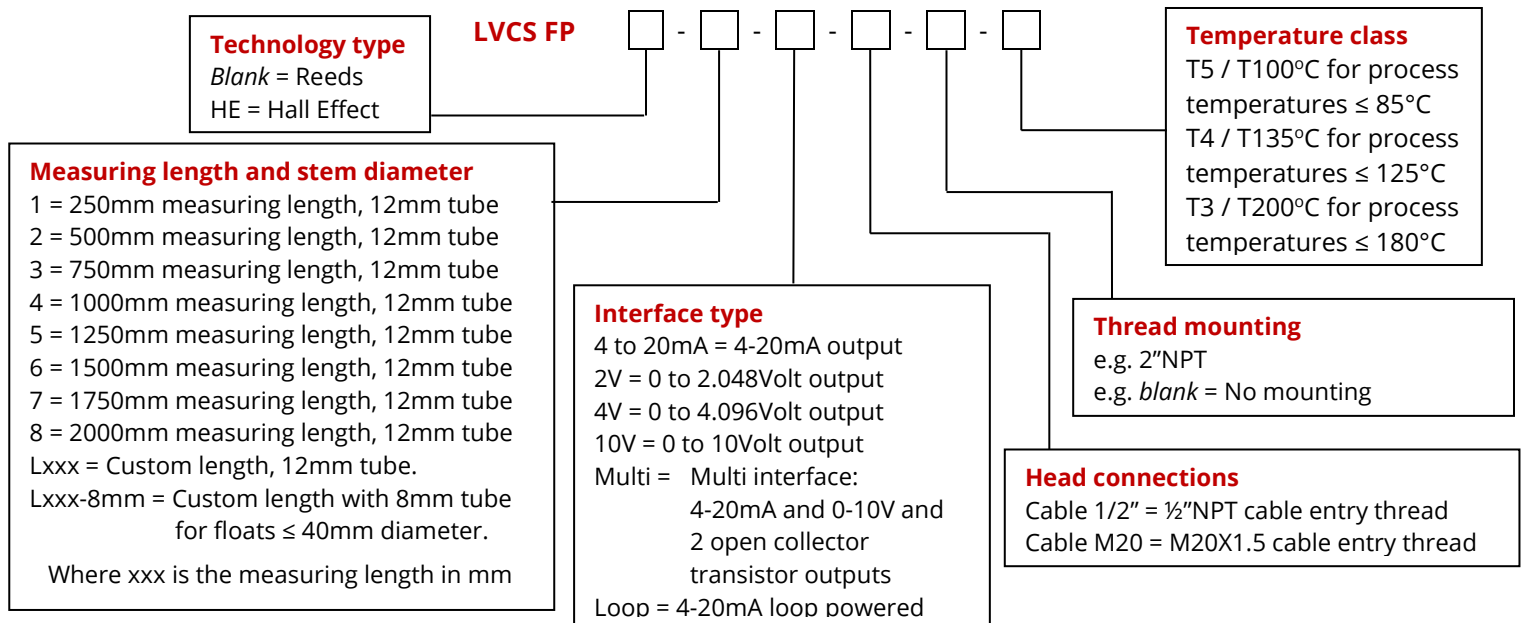


# Flameproof LVCS FP (Flameproof Continuous Level Sensor)

## Ordering information

Custom options available please call our sales office to discuss your requirements.

Options include: Probe length, interface board, Threaded mounting/seal options, Reed/Hall Effect technology, float sizes, 8 or 12mm sensor tube, cable entry thread.



Upon receipt of the above information a drawing and Deeter part No. will be issued to identify the options selected. This part No. will be required when making your order.

Don't forget: Tank depth must be at least 90mm longer than the measuring length.

Example: LVCS FP HE-L635-loop-cable1/2"-2"BSP is a Flame proof liquid level sensor using Hall Effect technology. Measuring length =635mm, Overall sensor length =740mm using a 12mm tube. Interface is a loop powered 4-20mA board housed in a thermocouple head with1/2"NPT port for a cable gland, and a 2"BSP pipe fitting welded to the top of the stem for mounting the sensor into a tank of liquid.

**All electrical equipment should be installed by a qualified/certified electrician.**

The Deeter Group follows a policy of continual development of its products and reserves the right to change specifications and/or features without notice.

## 1 EU - Type Examination Certificate

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: ExVeritas 17ATEX0301X Issue: 0

4 Equipment: Liquid Vertical Continuous Sensor, Flameproof (LVCS FP) Float Switch, Flameproof (F/S FP)

5 Manufacturer: Deeter Electronics Ltd

6 Address: Deeter House, Valley Road, Hughenden Valley, High Wycombe, Bucks, HP14 4LW, UK

7 This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 ExVeritas, Notified Body number 2585 in accordance with Article 9 of the Council Directive 2014/34/EU of 26 February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems for use in potentially explosive atmospheres given in Annex II to the Directive

9 Compliance with the applicable Essential Health and Safety Requirements has been assured by compliance with the following Standards and section 16 of this certificate:

EN 60079-0: 2012+A11:2013  
BS EN 60079-31:2014

BS EN 60079-1:2014

BS EN 60079-26:2015

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

11 This EU-Type Examination Certificate relates only to the design, construction, examination and tests of the specified equipment or protective system in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment shall include the following:

 II 1/2G (or 2G) Ex db IIC T\* Ga/Gb (or Gb) -55°C ≤ Tamb ≤ +85°C

 II 2 D Ex tb IIIC T\* Db -40°C ≤ Tamb ≤ +85°C



No. 8613

On behalf of ExVeritas  
Notified Body 2585  
  
S Clarke CEng MSc MIET  
Certification Manager

This certificate may only be reproduced in its entirety and without any change, schedule included.

The certificate is only valid when it carries an original signature.

For help or assistance relating to this certificate, contact [info@exveritas.com](mailto:info@exveritas.com).

ExVeritas, Units 16-18, Abenbury Way, Wrexham Industrial Estate, Wrexham, United Kingdom LL13 9UZ.

ExVeritas® is a registered trademark, unauthorised use will lead to prosecution.



## Schedule

### 13 Description of Equipment or Protective System

The LVCS FP (Liquid Vertical Continuous Sensor) and F/S FP (Float Switch) are liquid level sensors with either a continuous analogue or switching output. The equipment comprises of a flameproof, component certified instrument housing with stainless steel level guide which is threaded into the housing. The level guide consists of either an 8mm or 12mm stainless steel tube which contains the sensing electronics. The instrument housing is used for termination and mounting of optional PCB's, depending on the communication and I/O's required. The level guides can be various lengths and are mounted with up to seven stainless steel floats, each containing a magnetic ring. The equipment can be supplied with an optional threaded adaptor or equivalent gas tight seal for mounting across a boundary of two hazardous area zones.

When connected to process temperatures above 85°C, the instrument housing must be sufficiently cooled to keep it below 80°C, as detailed in the manufacturer's instructions.

The following temperature classes are applicable based on the process temperature which the equipment is connected to:

Model	Level guide length (mm)	Sensing device	Input/Output Options	Process Temperature and associated temperature class	Cable Entry sizes
LVCS	100 to 6000	Reed switch or Hall effect	Optional PCB's for various input/outputs	≤85°C (T5) (T100°C) ≤125°C (T4) (T135°C) ≤180°C (T3) (T200°C)	M20 x 1.5 or ½" NPT
F/S	60 to 6000	Reed switch	Between 1 to 7 I/O float switches, direct output	≤85°C (T5) (T100°C) ≤125°C (T4) (T135°C) ≤190°C (T3) (T200°C)	M20 x 1.5 or ½" NPT

The following ratings are applicable:

- 0 to 2v output. 5 to 25vdc input @ 25mA
- 0 to 4 v output. 7 to 25Vdc input @ 25mA
- 0 to 10v output. 14 to 28vdc input @ 35mA
- 8 to 28vdc input @30mA Multi interface 4-20mA, voltage output
- 0-50VDC 0-240V AC 1Amp (F/S FP reed switch only)

### 14 Descriptive Documents

#### 14.1 Associated Report and Certificate History:

Report Number	Cert Issue Date	Issue	Comment
R1288/A/1	14/12/2017	0	Initial issue of the Prime Certificate

Certificate: ExVeritas 17ATEX0301X Issue 0

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## Schedule

### 14.2 Compliance Drawings:

#### Issue 0

Number	Date	Issue	Description
D 600779	29/11/2017	2	LVCS FP all versions Sheet 1 of 2
D 600779_2	29/11/2017	3	LVCS FP all versions Sheet 2 of 2
D 600781	29/11/2017	2	F/S FP all versions Sheet 1 of 2
D 600781_2	29/11/2017	3	F/S FP all versions Sheet 2 of 2
Dwg 950553	11/8/2017	2	Adaptor 1/2" NPT Long thread to 12mm Sheet 1 of 2
Dwg 950568	11/8/2017	2	Adaptor 1/2" NPT long thread to 8mm Sheet 1 of 2

### 15 Conditions of Certification

#### 15.1 Special Conditions for Safe Use

- When intended to be operating with process temperatures above 85°C, the sensor head shall be sufficiently cooled to keep it below 80°C. See installation manual for details.

#### 15.2 Conditions for Use

- Routine tests on production in accordance with clause 16 of EN/IEC 60079-1 to a pressure of at least 57.2 Bar.
- The equipment covered under this certificate incorporates previously certified components, it is therefore the responsibility of the manufacturer to monitor the status of the certification of these components and inform ExVeritas of any changes that may affect the explosion safety design of their products.

### 16 Essential Health and Safety Requirements

Essential Health and Safety Requirements are addressed by the standards listed in section 9 and where required the report listed in section 14.1

The manufacturer shall inform the Notified Body of any modifications to the design of the product described by this schedule.

Certificate: ExVeritas 17ATEX0301X Issue 0

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# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx EXV 17.0030X

Issue No: 0

Certificate history:

[Issue No. 0 \(2017-12-19\)](#)

Status: **Current**

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Date of Issue: **2017-12-19**

Applicant: **Deeter Electronics Limited**  
Deeter House, Valley Road,  
Hughenden Valley,  
High Wycombe,  
Bucks,  
HP14 4LW  
**United Kingdom**

Equipment: **Liquid Vertical Continuous Sensor, Flameproof (LVCS FP) and Float Switch, Flameproof (F/S FP)**

*Optional accessory:*

Type of Protection: **Equipment protection by flameproof enclosure "d", Equipment with EPL Ga and Equipment dust ignition protection by enclosure "t"**

Marking:  
Ex db IIC T\* Ga/Gb or Ex db IIC T\* Gb  
Ex tb IIIC \*°C Db

*Approved for issue on behalf of the IECEx  
Certification Body:*

S Clarke CEng MSc MIET

*Position:*

Certification Manager

*Signature:  
(for printed version)*

*Date:*

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 the [Official IECEx Website](#).

Certificate issued by:

**ExVeritas Limited**  
Units 16-18 Abenbury Way  
Wrexham Ind. Est.  
Wrexham LL 139UZ  
United Kingdom







# IECEx Certificate of Conformity

Certificate No: IECEx EXV 17.0030X

Issue No: 0

Date of Issue: 2017-12-19

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Manufacturer: **Deeter Electronics Limited**  
Deeter House, Valley Road,  
Hughenden Valley,  
High Wycombe, Bucks, HP14 4LW  
**United Kingdom**

Additional Manufacturing location(s):

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 electrical apparatus 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:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-1 : 2014-06</b> Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-26 : 2014-10</b> Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
<b>IEC 60079-31 : 2013</b> Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical 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 Report:

[GB/EXV/ExTR17.0029/00](#)

Quality Assessment Report:

[GB/SIR/QAR12.0004/05](#)



# IECEx Certificate of Conformity

Certificate No: IECEx EXV 17.0030X

Issue No: 0

Date of Issue: 2017-12-19

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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The LVCS FP (Liquid Vertical Continuous Sensor) and F/S FP (Float Switch) are liquid level sensors with either a continuous analogue or switching output. The equipment comprises of a flameproof, component certified instrument housing with stainless steel level guide which is threaded into the housing. The level guide consists of either an 8mm or 12mm stainless steel tube which contains the sensing electronics. The instrument housing is used for termination and mounting of optional PCB's, depending on the communication and I/O's required. The level guides can be various lengths and are mounted with up to seven stainless steel floats, each containing a magnetic ring. The equipment can be supplied with an optional threaded adaptor or equivalent gas tight seal for mounting across a boundary of two hazardous area zones.

When connected to process temperatures above 85°C, the instrument housing must be sufficiently cooled to keep it below 80°C, as detailed in the manufacturer's instructions.

The following temperature classes are applicable based on the process temperature which the equipment is connected to:

Model	Level guide length (mm)	Sensing device	Input/Output Options	Process Temperature and associated temperature class	Cable Entry sizes
LVCS	100 to 6000	Reed switch or Hall effect	Optional PCB's for various input/outputs	≤85°C (T5) (T100°C) ≤125°C (T4) (T135°C) ≤180°C (T3) (T200°C)	M20 x 1.5 or ½" NPT
F/S	60 to 6000	Reed switch or Hall effect	Between 1 to 7 I/O float switches, direct output	≤85°C (T5) (T100°C) ≤125°C (T4) (T135°C) ≤190°C (T3) (T200°C)	M20 x 1.5 or ½" NPT

### SPECIFIC CONDITIONS OF USE: YES as shown below:

When intended to be operating with process temperatures above 85°C, the sensor head shall be sufficiently cooled to keep it below 80°C. See installation manual for details.



# IECEx Certificate of Conformity

Certificate No: IECEx EXV 17.0030X

Issue No: 0

Date of Issue: 2017-12-19

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## EQUIPMENT (continued):

The following ratings are applicable:

- 0 to 2v output. 5 to 25vdc input @ 25mA
- 0 to 4 v output. 7 to 25Vdc input @ 25mA
- 0 to 10v output. 14 to 28vdc input @ 35mA
- 8 to 28vdc input @30mA Multi interface 4-20mA, voltage output
- 0-50VDC 0-240V AC 1Amp (F/S FP reed switch only)

## Routine Tests:

- Routine tests on production in accordance with clause 16 of EN/IEC 60079-1 to a pressure of at least 57.2 Bar.
- The equipment covered under this certificate incorporates previously certified components, it is therefore the responsibility of the manufacturer to monitor the status of the certification of these components and inform ExVeritas of any changes that may affect the explosion safety design of their products.





# IECEx Certificate of Conformity

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Issue No: 0

Date of Issue: 2017-12-19

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**Additional information:**

**Annex:**

[IECEx EXV 17\\_0030X Certificate Annex.pdf](#)

Manufacturer's documents:			
Title:	Drawing No.:	Rev	Date:
LVCS FP all versions Sheet 1 of 2	D 600779	2	29/11/2017
LVCS FP all versions Sheet 2 of 2	D 600779_2	3	29/11/2017
F/S FP all versions Sheet 1 of 2	D 600781	2	29/11/2017
F/S FP all versions Sheet 2 of 2	D 600781_2	3	29/11/2017
Adaptor 1/2" NPT Long thread to 12mm Sheet 1 of 2	Dwg 950553	2	11/8/2017
Adaptor 1/2" NPT long thread to 8mm Sheet 1 of 2	Dwg 950568	2	11/8/2017

