

DCS IS Intrinsically Safe Capacitive Liquid Level Sensor

The DCS IS is an intrinsically safe capacitive level sensor which is a reliable alternative to our range of float switches, specifically designed for use in cryogenic applications.



Ex ia IIC T(*) Ga
Ex ia IIIB T₂₀₀(*) Da
-40°C ≤ Ta ≤ +70°C
* Temperature class options to suit environment and process temperatures:

T4 / T145°C for process temperatures ≤ 125°C
T3 / T200°C for process temperatures ≤ 190°C

ATEX Certificate: SGS 21ATEX0002X
IECEX Certificate: IECEX BAS 21.0002X

Features Include:

- ATEX & IECEX Intrinsically Safe Approved
- Microprocessor Based Pulse – Counting Technology
- Probe Lengths can be made to measure to suit specific applications – maximum 6m
- Suitable for non-conductive liquids only.
- Easy Push Button Set-up of Span and Zero Points.
- Temperature ranges from -200°C to +200°C available.

Specifications

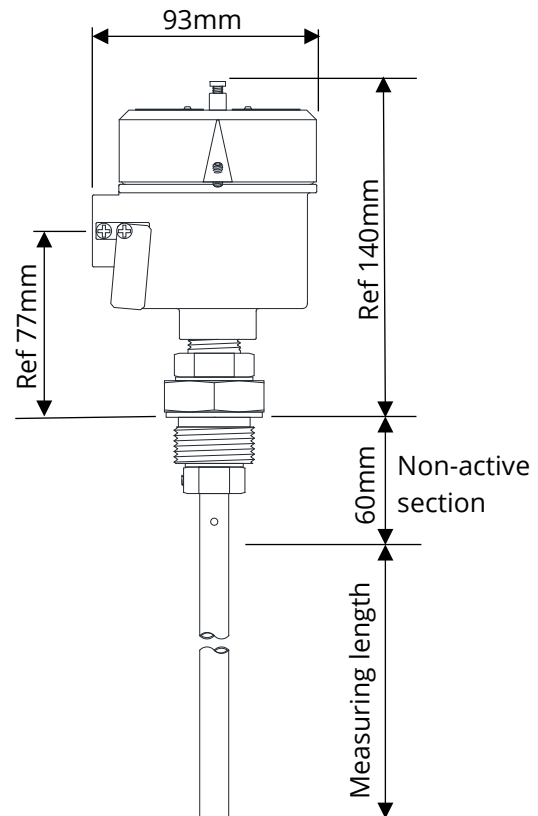
ELECTRICAL DATA	
Operating Voltage	15 – 25.2VDC (a minimum of 24V should be applied to the barrier)
Operating Current	< 50mA
Intrinsic Safety Parameters	
U _i	25.2V DC
I _i	155 mA
P _i	1.2 W
C _i	0
L _i	0
Resolution	< 2mm +/- 0.5mm
Operating Temperature (Head)	-40°C to +70°C
Stem Minimum Operating Temperature	
Standard Version	-40°C
Low Temperature Version	-200°C
Stem Maximum Operating Temperature	
T4/T145°C	+125°C
T3/T200°C	+190°C
Output Accuracy	±1% @ 50% full scale deflection (20°C)
Current Output Signal 1 two wire	4 - 20mA
Voltage Output Signal 2 two wire	0 - 5Vdc
Calibration (Zero, Span)	Stored in NVM
Response time (currently)	1000ms
Response time (enhanced)	250ms / 500ms

MECHANICAL DATA	
Weight	1.90Kg
Enclosure Rating	IP66 / IP68
Electrical Connections	Screw Terminals
Head Material	316L
Stem Material	316L Stainless Steel
Other wetted parts	PTFE
Maximum Stem length	Up to 6m
Stem Diameter	12mm
Mounting Orientation	Vertical or horizontal
Cable Entry	M20 x 1.5p or 1/2"NPT
Mounting Thread	1" BSP Parallel (standard, other threads and flange mounting available)
EMC Standards	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-4-2
UKCA & ATEX Standards	EN IEC 60079-0:2018 EN60079-11:2012
IECEx Standards	IEC 60079-0:2017 Edition 7 IEC 60079-11:2011 Edition 6

Dimensions

The DCS can be ordered with any length of sensor stem up to 5975mm (19' 7¼"). The stem length is the active measuring length of the sensor and should not be confused with the stem depth. The stem depth is 60mm longer and includes the non-active section above the measuring length. The stem depth (measuring +60mm) is the length from the shoulder of the mounting thread to the end of the stem probe.

Non-standard mounting may have a different length of non-active section.



Operation

The DCS IS is suitable for measuring non viscous liquids with a dielectric constant (also known as relative permittivity) shown in the tabulated data above. Viscous liquids may produce a delayed level reading, block the sensor stem and eventually dislodge the internal stem spacers.

The sensor stem is constructed from a stainless steel 316 tube around a stainless steel 316 solid rod. The rod is held centrally inside the tube using a PTFE spacer with cut outs to allow the liquid to flow inside the tube. A breather hole at the top of the stem equalises the air pressure.

Ordering Code

Please contact the sales office at sales@deeter.co.uk or +44 (0)1494 566 046 to discuss this product further.

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

Deeter Electronics Ltd 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 or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU**

3 EU - Type Examination Certificate Number: **SGS21ATEX0002X**
4 Product: **DCS IS Capacitive Liquid Level Sensor**
5 Manufacturer: **Deeter Electronics Ltd**
6 Address: **Deeter House, Valley Road, Hughenden Valley, Buckinghamshire
HP14 4LW**

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

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **GB/BAS/ExTR21.0002/00**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN IEC 60079-0: 2018 EN 60079-11: 2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

**⊕ II 1GD Ex ia IIC T4 Ga or Ex ia IIC T3 Ga
Ex ia IIIB T₂₀₀ 145°C Da or Ex ia IIIB T₂₀₀ 200°C Da
(See Certificate Schedule for Process and Ambient Temperature Information)**

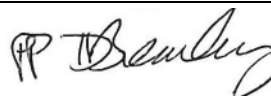
SGS Fimko Oy Customer Reference No. **8083**

Project File No. **20/0433**

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Business ID 0978538-5 Member of the SGS Group (SGA SA)



D BREARLEY
Certification
Manager

R S SINCLAIR
Authorised Signatory for SGS Fimko Oy

13 **Schedule**

14 **Certificate Number SGS21ATEX0002X**

15 **Description of Product**

The DCS IS Capacitive Liquid Level Sensor is designed to measure the level of liquids with a dielectric constant (also known as relative permittivity) and outputs 4-20mA & 0-5V signals indicating the liquid level.

The equipment comprises a stainless steel electronics housing containing an encapsulated main circuit and un-encapsulated terminal / button board. The electronics housing is mounted on a stainless steel Sensor Probe stem of up to 6 metres in length which is secured to the process liquid vessel via a mounting thread or flange with the probe inside the vessel measuring the liquid level. The electronics housing and mounting adapter is electrically insulated from the intrinsically safe circuit and passes the 500V dielectric strength test. The sensor is configured using Zero and Span buttons located inside the electronics housing.

External connections to the equipment are made via a threaded cable entry to screw terminals mounted on the terminal / button board.

The DCS IS Capacitive Liquid Level Sensor can be marked with the following temperature classifications with associated process temperature ranges. When the equipment is installed particular cautions must be taken to ensure, taking into account the effect of process temperature, that the ambient temperature range of the electronics housing of -40°C to +70°C is not exceeded:

Certification Code		Probe Process Temperature Range
⊕ II 1 GD	Ex ia IIC T4 Ga (-40°C ≤ T _a ≤ +70°C) Ex ia IIIB T ₂₀₀ 145°C Da (-40°C ≤ T _a ≤ +70°C)	-200°C to +125°C
⊕ II 1 GD	Ex ia IIC T3 Ga (-40°C ≤ T _a ≤ +70°C) Ex ia IIIB T ₂₀₀ 200°C Da (-40°C ≤ T _a ≤ +70°C)	-200°C to +190°C

Input Parameters

$$\begin{aligned}
 U_i &= 25.2V & C_i &= 0 \\
 I_i &= 155mA & L_i &= 0 \\
 P_i &= 1.2W
 \end{aligned}$$

16 **Report Number**

GB/BAS/ExTR21.0002/00

17 **Specific Conditions of Use**

- When the equipment is installed particular cautions must be taken to ensure, taking into account the effect of process temperature, that the ambient temperature range of the electronics housing of -40°C to +70°C is not exceeded.
- Due to the insulated stainless steel Sensor Probe stem forming part of the intrinsically safe circuit, this part of the equipment is not capable of passing the 500V dielectric strength test. This must be taken into account when installing the equipment.

3.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
D 600804	1 of 3	1	4 th January 2020	DCS IS all Versions (General Assembly)
D 600804	2 of 3	1	4 th January 2020	DCS IS all Versions (General Assembly)
D 600851	1 of 1	2	13/1/21	DCS IS Top & Bottom PCB Track & Component Layout
Sch700497 IssD	1 to 4	D	22/12/2020	DCS Capacitive Sensor PCB (Ex I Version)
LP700497	1 of 1	D.1	22 December 2020	DCS_Ex Capacitive Level Sensor (BOM)

The above drawings are associated, and held with, IECEx BAS 21.0002X Iss. 0.



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 BAS 21.0002X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2021-02-12

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

Equipment: **DCS IS Capacitance Liquid Level Sensor**

Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: Ex ia IIC T4 Ga or Ex ia IIC T3 Ga
Ex ia IIIB T₂₀₀ 145°C Da or Ex ia IIIB T₂₀₀ 200°C Da
See Certificate Schedule for process and ambient temperature Information

Approved for issue on behalf of the IECEx
Certification Body:

Mr R S Sinclair

Position:

Technical Manager

Signature:
(for printed version)

D BREARLEY
Certification
Manager

Date:

12.2.2021

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:

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





IECEx Certificate of Conformity

Certificate No.: **IECEx BAS 21.0002X**

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Date of issue: 2021-02-12

Issue No: 0

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

Additional
manufacturing
locations:

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

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 Report:

[GB/BAS/ExTR21.0002/00](#)

Quality Assessment Report:

[GB/SIR/QAR12.0004/07](#)



IECEx Certificate of Conformity

Certificate No.: **IECEx BAS 21.0002X**

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Date of issue: 2021-02-12

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The DCS IS Capacitive Liquid Level Sensor is designed to measure the level of liquids with a dielectric constant (also known as relative permittivity) and outputs 4-20mA & 0-5V signals indicating the liquid level.

The equipment comprises a stainless steel electronics housing containing an encapsulated main circuit and un-encapsulated terminal / button board. The electronics housing is mounted on a stainless steel Sensor Probe stem of up to 6 metres in length which is secured to the process liquid vessel via a mounting thread or flange with the probe inside the vessel measuring the liquid level. The electronics housing and mounting adapter is electrically insulated from the intrinsically safe circuit and passes the 500V dielectric strength test. The sensor is configured using Zero and Span buttons located inside the electronics housing.

External connections to the equipment are made via a threaded cable entry to screw terminals mounted on the terminal / button board.

The DCS IS Capacitive Liquid Level Sensor can be marked with the following temperature classifications with associated process temperature ranges. When the equipment is installed particular cautions must be taken to ensure, taking into account the effect of process temperature, that the ambient temperature range of the electronics housing of -40°C to $+70^{\circ}\text{C}$ is not exceeded:

Certification Code

Probe Process Temperature Range

Ex ia IIC T4 Ga ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)
Ex ia IIIB T₂₀₀ 145°C Da ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

-200°C to +125°C

Ex ia IIC T3 Ga ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)
Ex ia IIIB T₂₀₀ 200°C Da ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

-200°C to +190°C

Input Parameters

$U_i = 25.2\text{V}$ $C_i = 0$

$I_i = 155\text{mA}$ $L_i = 0$

$P_i = 1.2\text{W}$

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. When the equipment is installed, particular cautions must be taken to ensure that, taking into account the effect of process temperature, the ambient temperature range of the electronics housing of -40°C to $+70^{\circ}\text{C}$ is not exceeded.
2. Due to the insulated stainless steel Sensor Probe stem forming part of the intrinsically safe circuit, this part of the equipment is not capable of passing the 500V dielectric strength test. This must be taken into account when installing the equipment.