

## 1 EU - Type Examination Certificate

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

3 Certificate Number: ExVeritas 21ATEX0860X Issue: 2

4 Equipment: Thickness Gauge CYGNUS 1 EX

5 Manufacturer: Cygnus Instruments Ltd.

6 Address: 30 Prince of Wales Road  
Dorchester, Dorset, DT1 1PW 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 2804 in accordance with Article 17 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 IEC 60079-0: 2018 EN 60079-11:2012

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:

 I M1 Ex ia I Ma T<sub>amb</sub> = 0°C to +50°C

 II 1G Ex ia IIC T4 Ga T<sub>amb</sub> = 0°C to +50°C

## Schedule

### 13 Description of Equipment or Protective System

Cygnus CYGNUS 1 EX is a battery powered hand-held thickness gauge. The system operation is based on multiple echo sounding technology, where an ultrasonic probe is used.

The Cygnus CYGNUS 1 EX comprises a plastic enclosure where the encapsulated electronic module, keypad and battery pack are installed.

This system includes two main boards, both are encapsulated. Encapsulation protruding conductive parts are the connector for the main battery pack, backup battery, keypad, Serial Interface connector (used only on safe areas) and Ultrasonic Probe connector.

CYGNUS 1 EX probes have the following part numbers Cygnus S2C, S3C, S5A, T2C, T5B, T5A and T7A.

Rating:

- 2x Lithium battery 4.2 Vpeak in series, resulting in a 8.4 Vpeak battery pack, current limited by a fuse to 750 mA
- Connections for devices in safe area:
  - Charger (PN 060-xxxx) – Um = 8.4 V
  - Comms Interface PN 060-1002 – Um = 250 V
- Probe output:  
Uo = 45.15 V, Io = 28 mA, Po = 312 mW, Co = 10 nF, Lo = 10 µH

### 14 Descriptive Documents

#### 14.1 Associated Report and Certificate History:

Report Number	Cert Issue Date	Issue	Comment
R2407/A/1	23-06-2021	0	Initial issue of the Prime Certificate
R3681/A/1	14-12-2021	1	Probe T7A added.
R4340/A/1	05-07-2023	2	<ul style="list-style-type: none"> <li>• Inclusion of the new battery Molicel ICP103450DA.</li> <li>• Marking of probes ports output limiting parameters: Uo = 45.15 V, Io = 28 mA, Po = 312 mW, Co = 10 nF, Lo = 10 µH.</li> <li>• Schedule Drawings minor updates.</li> </ul>

#### 14.2 Compliance Drawings:

Title:	Drawing No.:	Rev. Level:	Date:
Scheme for Intrinsic Safety - Gauge Body Cygnus 1 Ex	M5-IS-13-01	1	30/04/2021
Scheme for Intrinsic Safety - Battery Pack Cygnus 1 Ex	M5-IS-13-02	2	30/04/2021
Scheme for Intrinsic Safety - Electronics Module Cygnus 1 Ex	M5-IS-13-03	1	30/04/2021
Scheme for Intrinsic Safety - S-Probe Transducer Cygnus 1 Ex	M5-IS-13-04	1	30/04/2021
Scheme for Intrinsic Safety - T-Probe Transducer Cygnus 1 Ex	M5-IS-13-05	1	30/04/2021
Scheme for Intrinsic Safety - Comms Interface Cygnus 1 Ex	M5-IS-13-06	1	30/04/2021
Scheme for Intrinsic Safety - S-Probes and Leads Cygnus 1 Ex	M5-IS-13-07	1	30/04/2021

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## Schedule

Title:	Drawing No.:	Rev. Level:	Date:
Scheme for Intrinsic Safety - Txx Remote Probes Cygnus 1 Ex	M5-IS-13-08	1	30/04/2021
Scheme for Intrinsic Safety - RA Remote Probes Cygnus 1 Ex	M5-IS-13-09	1	30/04/2021
Scheme for Intrinsic Safety - Marking Cygnus 1 Ex (*)	M5-IS-13-10	3	16/05/2023
Scheme for Intrinsic Safety - CYG059 PCBs Cygnus 1 Ex	M5-IS-13-11	1	06/05/2021
Scheme for Intrinsic Safety - Materials Register Cygnus 1 Ex	M5-IS-13-12	1	06/05/2021
Scheme for Intrinsic Safety - Hand Strap Cygnus 1 Ex	M5-IS-13-13	1	06/05/2021
Scheme for Intrinsic Safety - Battery Charger Cygnus 1 Ex	M5-IS-13-14	1	06/05/2021
Bill Of Materials CYG059-01 - Control Board (*)	CYG059-01_b5b	5b	15/04/2021
Gerber Files CYG059-01 - Control Board	CYG059-01_g5a	5a	03/02/2021
Schematic Diagram CYG059-01 - Control Board	CYG059-01_s5a	5a	18/12/2020
Bill Of Materials CYG059-02 - Ultrasound Board (*)	CYG059-02_b5b	5b	09/07/2021
Gerber Files CYG059-02 - Ultrasound Board	CYG059-02_g5a	5a	03/02/2021
Schematic Diagram CYG059-02 - Ultrasound Board	CYG059-02_s5b	5b	28/01/2021
Bill Of Materials CYG059-03 - Connection Board	CYG059-03_b2a	2a	05/06/2020
Gerber Files CYG059-03 - Connection Board	CYG059-03_g2a	2a	04/06/2020
Schematic Diagram CYG059-03 - Connection Board	CYG059-03_s2a	2a	01/05/2020
Bill Of Materials CYG059-04 - Keypad	CYG059-04_b3a	3a	20/11/2019
Gerber Files CYG059-04 - Keypad	CYG059-04_g3a	3a	20/11/2019
Schematic Diagram CYG059-04 - Keypad	CYG059-04_s3a	3a	18/11/2019
Bill Of Materials CYG059-08 - Comms Interface	CYG059-08_b6a	6a	01/03/2021
Gerber Files CYG059-08 - Comms Interface	CYG059-08_g6a	6a	02/03/2021
Schematic Diagram CYG059-08 - Comms Interface	CYG059-08_s6a	6a	01/03/2021
Bill Of Materials CYG059-09 - Battery	CYG059-09_b4a	4a	20/05/2020
Gerber Files CYG059-09 - Battery	CYG059-09_g4b	4a	02/03/2021
Schematic Diagram CYG059-09 - Battery	CYG059-09_s4a	4a	20/05/2020
Bill Of Materials CYG059-13 - Probe Ex Clamp	CYG059-13_b2a	2a	29/05/2020
Gerber Files CYG059-13 - Probe Ex Clamp	CYG059-13_g2a	2a	05/06/2020
Schematic Diagram CYG059-13 - Probe Ex Clamp	CYG059-13_s2a	2a	20/05/2020
M5-EX Segregation Statement (Issue 1)(Signed).pdf	-	1	19/06/2020
M5-EX Ultrasonic Energy Statement (Issue 1)(signed).pdf	-	1	19/06/2020
Instructions declaration form.pdf	-	-	01/03/2021
Maximum Ultrasonic Probe Output Power Statement.pdf	-	-	01/06/2012
Scheme for Intrinsic Safety - Gauge Body Cygnus 1 Ex	M5-IS-13-01	1	30/04/2021

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Scheme for Intrinsic Safety - Battery Pack Cygnus 1 Ex	M5-IS-13-02	1	30/04/2021
Scheme for Intrinsic Safety - Electronics Module Cygnus 1 Ex	M5-IS-13-03	1	30/04/2021
Scheme for Intrinsic Safety - S-Probe Transducer Cygnus 1 Ex	M5-IS-13-04	1	30/04/2021
Scheme for Intrinsic Safety - T-Probe Transducer Cygnus 1 Ex	M5-IS-13-05	1	30/04/2021
Scheme for Intrinsic Safety - Comms Interface Cygnus 1 Ex	M5-IS-13-06	1	30/04/2021
Scheme for Intrinsic Safety - S-Probes and Leads Cygnus 1 Ex	M5-IS-13-07	1	30/04/2021
Scheme for Intrinsic Safety - Txx Remote Probes Cygnus 1 Ex	M5-IS-13-08	1	30/04/2021
Scheme for Intrinsic Safety - RA Remote Probes Cygnus 1 Ex	M5-IS-13-09	1	30/04/2021
Scheme for Intrinsic Safety - Marking Cygnus 1 Ex	M5-IS-13-10	1	30/04/2021
Scheme for Intrinsic Safety - CYG059 PCBs Cygnus 1 Ex	M5-IS-13-11	1	06/05/2021
Scheme for Intrinsic Safety - Materials Register Cygnus 1 Ex	M5-IS-13-12	1	06/05/2021
Scheme for Intrinsic Safety - Hand Strap Cygnus 1 Ex	M5-IS-13-13	1	06/05/2021
Scheme for Intrinsic Safety - Battery Charger Cygnus 1 Ex	M5-IS-13-14	1	06/05/2021
Bill Of Materials CYG059-01 - Control Board	CYG059-01_b5a	5a	28/06/2021
Gerber Files CYG059-01 - Control Board	CYG059-01_g5a	5a	03/02/2021
Schematic Diagram CYG059-01 - Control Board	CYG059-01_s5a	5a	18/12/2020
Bill Of Materials CYG059-02 - Ultrasound Board	CYG059-02_b5a	5a	29/01/2021
Gerber Files CYG059-02 - Ultrasound Board	CYG059-02_g5a	5a	03/02/2021
Schematic Diagram CYG059-02 - Ultrasound Board	CYG059-02_s5b	5b	28/01/2021
Bill Of Materials CYG059-03 - Connection Board	CYG059-03_b2a	2a	05/06/2020
Gerber Files CYG059-03 - Connection Board	CYG059-03_g2a	2a	04/06/2020
Schematic Diagram CYG059-03 - Connection Board	CYG059-03_s2a	2a	01/05/2020
Bill Of Materials CYG059-04 - Keypad	CYG059-04_b3a	3a	20/11/2019
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Bill Of Materials CYG059-08 - Comms Interface	CYG059-08_b6a	6a	01/03/2021
Gerber Files CYG059-08 - Comms Interface	CYG059-08_g6a	6a	02/03/2021
Schematic Diagram CYG059-08 - Comms Interface	CYG059-08_s6a	6a	01/03/2021
Bill Of Materials CYG059-09 - Battery	CYG059-09_b4a	4a	20/05/2020
Gerber Files CYG059-09 - Battery	CYG059-09_g4b	4a	02/03/2021
Schematic Diagram CYG059-09 - Battery	CYG059-09_s4a	4a	20/05/2020
Bill Of Materials CYG059-13 - Probe Ex Clamp	CYG059-13_b2a	2a	29/05/2020
Gerber Files CYG059-13 - Probe Ex Clamp	CYG059-13_g2a	2a	05/06/2020

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Schematic Diagram CYG059-13 - Probe Ex Clamp	CYG059-13_s2a	2a	20/05/2020
M5-EX Segregation Statement (Issue 1)(Signed).pdf	-	1	19/06/2020
M5-EX Ultrasonic Energy Statement (Issue 1)(signed).pdf	-	1	19/06/2020
Instructions declaration form.pdf	-	-	01/03/2021
Maximum Ultrasonic Probe Output Power Statement.pdf	-	-	01/06/2012
Cygnus 1 Ex Intrinsically Safe Ultrasonic Thickness Gauge Instructions for Safety	M5-C1EX-M-01-E	D	23/11/2021

(\* ) Document affected as part of this revision.

### 15 Conditions of Certification

#### 15.1 Special Conditions for Safe Use

- *Charge only in Safe Area. Use only the specified charger.*
- *Only replace or remove the battery in Safe Area.*
- *The Serial RS422 port can only be used in Safe Area and through the accessory Comms Interface part number 060-1002. The use of this port without the Comms Interface accessory invalidates the approval.*

#### 15.2 Conditions for Use (Routine tests)

- N/A

### 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.