[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: **UL 22 ATEX 2655X Rev. 1**

[4] Product: **Optical Encoder**

[5] Manufacturer: **Dynapar Corporation**

[6] Address: **2100 West Broad Street, Elizabethtown NC 28337 USA**

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

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the Council Directive 2014/34/EU of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to 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. **US/UL/ExTR22.0045/01.**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018** **EN 60079-11:2012**
EN 60079-18:2015/A1:2017 **EN 60079-31:2014** **IEC 60079-31, 3rd Edition (2022-01)**

[10] If the sign "**X**" is placed after the certificate number, it indicates that the product 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 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 the certificate.

[12] The marking of the product shall include the following:

II 2 G Ex eb ia mb IIC T4 Gb

II 2 D Ex tb IIIC T119°C Db

Certification Manager
Thomas Wilson

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

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Notified Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

Accredited by DANAK under registration number 7011 to certification of products.

[13] [14]

Schedule
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[15] Description of Product

The equipment is an optical encoder that is intended to be attached to the rotating shaft of a machine. It uses an anodized aluminum enclosure that has three internal compartments. A compartment at one end of the equipment contains certified 'Ex e' terminals that are used for external connections; external cables enter this compartment via certified 'Ex e' cable glands and any unused entries are blanked by certified 'Ex e' plugs. This 'Ex e' compartment is fitted with a lid that allows access to the terminals. The compartment at the other end of the encoder contains 'Ex m' devices that include an encapsulated printed circuit board assembly. The central compartment houses an optically encoded disc, this is fitted to a shaft that emerges from the wall of the compartment. The disc is fitted with an optical reading device that is protected by intrinsic safety, 'Ex ia', however, there are no intrinsically safe inputs or outputs.
An alternative version of the equipment is fitted with a permanently connected cable. This version of the equipment has no Ex 'e' terminal compartment. Entry of the cable is again via an 'Ex e' cable gland.

Nomenclature:

Optical encoders, models EN42aaaabcdef and EN44aaaabcd rated Um = 250 V and as depicted in model code

Where: a = 0000-9999 representing Pulse Per Revolution.
b = single alphamerical digit representing Bore Size.
c = Output
0 – Differential AB, 7-15 V in, 500 mA max input, 7-15 V out*
1 – Differential AB, 7-26 V in, 500 mA max input, 5 V out*
2 – Differential ABZ, 7-15 V in, 500 mA max input, 7-15 V out*
3 – Differential ABZ, 7-26 V in, 500 mA max input, 5 V out*
4 – Differential ABZ, 10-30 V in, 400 mA max input, 10-30 V out*

Option	Output current	Group II Ambient Temperature Range	Group III Ambient Temperature Range
0 or 2	125mA max per channel	Ta = -50°C to +80°C	Ta = -25°C to +80°C
1 or 3	10mA max per channel	Ta = -50°C to +80°C	Ta = -25°C to +80°C
1 or 3	15mA max per channel	Ta = -50°C to +80°C	Ta = -25°C to +80°C
4	90mA max per channel	Ta = -50°C to +60°C	Ta = -25°C to +60°C
4	60mA max per channel	Ta = -50°C to +80°C	Ta = -25°C to +80°C

d = Single numerical digit representing termination options.
e = single numerical digit representing Tether options.
f = single numerical digit representing cover options.

Routine tests

The routine visual inspection requirements of Clause 9.1 of EN 60079-18:2015 are to be covered by a Condition of Manufacture on the certificate. See Section 1.12.

All complete manufactured units shall be subjected to a routine 500V r.m.s. a.c. between all terminals and the equipment enclosure, in accordance with Clause 10.3 of EN 60079-11:2012.

All manufactured units shall be subjected to a visual inspection on the encapsulation. No damage shall be evident such as cracks in the compound, exposure of the encapsulated parts, flaking, inadmissible shrinkage, swelling, decomposition, failure of adhesion or softening.

[16] Descriptive Documents

The scheduled drawings are listed in the report no. provided under item no. [8] on page 1 of this EU-Type Examination Certificate.

[13] **Schedule**

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[17] Specific conditions of use:

- All cable entry holes shall be fitted with either an ATEX certified cable gland or an ATEX certified stopping plug that is suitable for the application. The type of cable, glands and stopping plugs shall have temperature ratings of at least 100°C.
- The MSB series terminals shall only be fitted with wires that have cross sectional area falling within the following limitations:
  Rigid: 0.08 mm^2 to 4 mm^2
  Flexible: 0.08 mm^2 to 2.5 mm^2
- The equipment shall be supplied from a power supply that has an output that is isolated from earth.
- Under certain extreme circumstances, the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.

[18] Essential Health and Safety Requirements
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.

Additional information
The trademark DYNAPAR will be used as the company identifier on the marking label.

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in Annex III to Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014.