



EUROPEAN UNION RECOGNISED ORGANISATION (EU RO) MUTUAL RECOGNITION TYPE APPROVAL CERTIFICATE

Certificate No:
MRA000003S

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

KEUMYANG IND. CO., LTD.
Busan, Korea, Republic of

for

Pressure Gauges/Transmitters

with type designation(s)

High Temperature & High Pressure Transmitter type HTP-202-3050-1

The product is found to comply with

EU RO Mutual Recognition Technical Requirements for Pressure Gauges – Transmitters

Intended service

Pressure transmitters for use in control, alarm, monitoring and instrumentation systems subject to classification.

See product description on page 2 for further details.

Temperature [°C]: 5°C ~ 70°C
Vibration: ±1.6 mm / 4.0 g
EMC: General power distribution zone
IP Code: Sensor: IP68 (1 m, 1 hour), Transmitter: IP65

This is to certify:

that the Product referred to herein has been inspected for the Manufacturer, pursuant to the relevant requirements of the European Union Recognised Organisation Mutual Recognition procedure, required by Article 10.1 of EU Regulation 391/2009, and has been found in accordance with those requirements.

This Certificate is valid until **2027-10-18**.

Issued at **Høvik** on **2022-10-19**

DNV local station: **Gimhae Station**

for **DNV**

Approval Engineer: **Ståle Sneen**

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Frederik Tore Elter
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: MRTA 201

Revision: 2021-03

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Product description

HTP Series analogue high temperature & high pressure transmitter comprising sensor and transmitter connected by an integrated cable.

Type: **HTP-202-3050-1-a-b-cc**, where:

- 202:** Thread
3050: Length of transmitter and cable in mm
1: Input signal
 1: 0 ~ 350 bar
 2: Other (x ~ max. 350 bar)
a: Output signal
 1: 0-5 Vdc
 2: 1-5 Vdc
 3: 0-20 mAdc
 4: 4-20 mAdc
 5: Contact
 6: Other
b: Mode
 I: Isolator
 N: Non isolator
 O: Other
cc: Connection
 CA: Case
 CO: Connector
 O: Other

Specifications – Pressure transmitter

Media: Liquid, Air, Gas, etc.
Input signal: Pressure
Measuring range: 0 ~ 350 bar
Linearity: 4-20 mA $\leq$ 1% FSO
Operating temperature: -50°C ~ 350°C

Specifications – Transmitter (amplifier)

Input voltage: 14 ~ 32 Vdc
Operating temperature: up to 70°C

Manufactured by

KEUMYANG IND. CO., LTD.
65-1 Jwadong-ro, Haeundae-gu,
48082 Busan, Korea

Application/Limitation

The Type Approval covers hardware listed under product description.

Pressure transmitters for use in control, alarm, monitoring and instrumentation systems subject to classification.

Type Approval documentation

Marking of product

The products to be marked with:

- manufacturer name (KEUMYANG IND.CO.,LTD.)
- type number (as listed under Product description)
- serial number
- date of manufacture
- power supply ratings
- IP rating
- Class of accuracy

Other conditions

The sensors have been verified for compliance with EU Mutual Recognition Technical Requirements for Pressure Gauges - Transmitters version 0.1 dated 2022-01-01, including IACS Unified Requirements E10 Rev.7 and Rev.8.

The technical requirements do not specify any special design requirements for the cable. The pressure sensors are delivered with an integrated cable (BS-FFRC-HF, 7 x 0.75 mm²) that has been reviewed and found to comply with DNV rules for classification of ships Pt.4 Ch.8 Sec.9. See separate DNV type approval certificate TAE00001Z7.

Environmental test parameters:

Temperature: All parts: 5°C and 70°C. Sensor part tested at 350°C.
Vibration: ±1.6 mm / 4.0 g
Humidity: 95% RH @55°C
EMC: All locations except bridge and open deck
Enclosure: Sensor: IP68 (1 m, 1 hour)
Transmitter: IP65
(according to IEC 60529)

DNV location classes:

Temperature: D
Vibration: B
Humidity: B
EMC: A
Enclosure: B

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed annually and at renewal of the certificate.

Generic Statement for EU RO MR Type Approval Certificate

When a product is presented with this EU RO MR Type Approval Certificate for given application, its acceptability with regards to the limitations stated in the certificate conditions defined in 1b, 1c and 1d of the applied Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

In accordance with Article 10 of Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 "on common rules and standards for ship inspection and survey organizations", the following organizations, recognized by the EU on this date, have agreed on the technical and procedural conditions under which they will mutually recognize this certificate:

- American Bureau of Shipping (ABS);
- Bureau Veritas (BV);
- China Classification Society (CCS);
- Croatian Register of Shipping (CRS);
- DNV;
- Indian Register of Shipping (IRS);
- Korean Register (KR);
- Lloyd's Register Group Ltd. (LR);
- Nippon Kaiji Kyokai General Incorporated Foundation (ClassNK);
- Polish Register of Shipping (PRS);
- RINA Services S.p.A. (RINA);
- Russian Maritime Register of Shipping (RS).

The scheme for the mutual recognition of class certificates for materials, equipment and components laid down by Article 10(1) of Regulation (EC) No 391/2009 is only enforceable within the Union in respect of ships flying the flag of a Member State. As far as foreign vessels are concerned, the acceptance of relevant certificates remains at the discretion of relevant non-EU flag States in the exercise of their exclusive jurisdiction, notably under the United Nations Convention on the Law of the Sea (UNCLOS). (In accordance with COMMISSION IMPLEMENTING REGULATION (EU) No 1355/2014 amending Regulation (EC) No 391/2009 - recital (25)).