

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

Certificate No:
MRA000002R

In accordance with Article 10.1 of EU Regulation 391/2009

This Certificate is issued to

KROHNE NORWAY AS, dept. KROHNE MARINE
Brevik, Norway

for

Flow Gauges/Transmitters

with type designation(s)

Electromagnetic Flowmeter and components: Optiflux, Waterflux, Optiprobe and Converters

The product is found to comply with

EU RO Mutual Recognition Technical Requirements for Flow Gauges/Transmitters

Intended service

Electromagnetic Flowmeters intended for a wide range use. See product description on page 2.

Temperature [°C]: -25°C to 70°C

Vibration: ±1.0 mm / 0.7 g (4 hours endurance test)

EMC: All locations with exceptions. See Application/Limitation

IP Code: IP66/67

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 **2025-07-07**.

Issued at **Høvik** on **2020-07-08**

DNV GL local station: **Sandefjord**

for **DNV GL**

Approval Engineer: **Nils Jarem**

Marta Alonso Pontes
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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



Product description

Components	Type	Explosion Protection	Nominal Size (mm)	Output	Power Supply
Sensor for remote type	OPTIFLUX 1000 2000 4000	Non-Ex Type	2.5, 4, 6, 10, 15, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 800, 900, 1000	N/A	N/A
	OPTIFLUX 2000-Ex 4000-Ex	Ex Type (zone 1)	450, 500, 550, 600, 650, 700, 800, 900, 1000		
	OPTIFLUX 5000 WATERFLUX 3000	Non-Ex Type	2.5, 4, 6, 10, 15, 25, 40, 50, 80, 100, 150, 200, 250, 300		
	OPTIFLUX 5000-Ex	Ex Type (zone 1)	200, 250, 300		
	OPTIPROBE	Non-Ex Type	DN40, DN80		
	OPTIPROBE Ex	Ex Type (zone 2)			
Compact type (sensor with converter)	OPTIFLUX 1050C 2050C 4050C WATERFLUX 3050C	Non-Ex Type	2.5, 4, 6, 10, 15, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 800, 900, 1000	4-20mA/Hart Pulse/frequency Status, Modbus RS485	24VDC 85-250VAC (50/60Hz)
	OPTIFLUX 1100C 2100C 4100C WATERFLUX 3100C	Non-Ex Type, Ex Type (zone 1)	450, 500, 550, 600, 650, 700, 800, 900, 1000		
	OPTIFLUX 5100C	Non-Ex Type	2.5, 4, 6, 10, 15, 25, 40, 50, 80, 100, 150, 200, 250, 300		
Converter for remote type	IFC 050W	Non-Ex Type	N/A		
	IFC 100W	Non-Ex Type, Ex Type (zone 1)			
	IFC 300F	Non-Ex Type, Ex Type (zone 1)			

Manufactured by

KROHNE Altometer, Kerkeplaat 14,
3313LC Dordrecht, Postbus 110,
3300AC Dordrecht,
the Netherlands

KROHNE Measurement Technology (Shanghai) Co.,
Ltd. (KMTS) Minshen Road 555,
Songjiang Industrial Zone, Shanghai,
201612 China

Shanghai Guanghua-Altometer Instruments Co.Ltd.
No 3160 Dongchuan Road, Minhang ETDZ
Shanghai 200245, China

Application/Limitation

- B*: EMC: All locations including bridge and open deck for OPTIFLUX devices and IFC 100W, except OPTIFLUX 1050C, 2050C, 4050C and WATERFLUX 3050C
EMC: All locations including bridge and open deck for IFC 300F when connected to an approved 24 DC power supply
- C*: IP 66/67 including salt mist test for OPTIFLUX devices, IFC 100W and IFC 300F, except OPTIFLUX 1050C, 2050C, 4050C and WATERFLUX 3050C

"Compact type" requires "Reinforced Neck" for nominal sizes 200mm and above.

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Materials, fabrication and welding of structure part of the flow transmitter is not covered by this certificate. Please observe that this shall be carried out according to the relevant rules for each application. Documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case.

Type Approval documentation

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

Other Conditions

The FLOW GAUGES/TRANSMITTERS have been verified for compliance with EU Mutual Recognition Technical Requirements for FLOW GAUGES/TRANSMITTERS version 0.0. The testing covers IACS UR E10 Rev.7, including 5 g / 11 ms impact (shock) test according to IEC 60068-2-27.

Environmental test parameters	DNV GL location classes
Temperature: -25°C and 70°C	D
Vibration: ±1.0 mm / 0.7 g, for general applications	A
Humidity: 95%RH @ 55°C, damp heat cyclic	B
EMC: All locations with exceptions	A/B*
Enclosure: IP66 / IP67 (IP-ratings according to IEC 60529)	B/C*

*See Application / Limitation.

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 will be performed annually and at renewal of the certificate.

Job Id: **262.4-000178-1**
Certificate No: **MRA000002R**

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 GL;
- 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)).