

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flow Transmitter**

with type designation(s)

Electromagnetic Flowmeter and components:**Optiflux 2000, 2000Ex, 4000, 4000Ex, 5000, 5000Ex, 2100C, 4100C, 5100C, Optiprobe, Optiprobe Ex, Converter IFC 050W, IFC 100W, IFC 300F**

Issued to

**KROHNE Marine
BREVIK, Norway**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Location classes:**

Temperature	D
Humidity	B
Vibration	A (4 hours endurance test)
EMC	A
Enclosure	B (tested to IP66/67)

This Certificate is valid until **2021-07-06**.Issued at **Høvik** on **2016-09-22**DNV GL local station: **Sandefjord**Approval Engineer: **Nils Jarem**for **DNV GL**

Odd Magne Nesvåg
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.

Job Id: **262.1-021393-2**
 Certificate No: **TAA00000JA**
 Revision No: **1**

Product description

Sensor for remote type:

Optiflux: 2000, 2000Ex, 4000, 4000Ex, 5000, 5000Ex, Optiprobe, Optiprobe Ex

Compact type (sensor with converter):

Optiflux 2100C, 4100C, 5100C

Converter for remote type:

IFC 050W, IFC 100W, IFC 300F (Ex and non Ex version)

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

Place of manufacture

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

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Application/Limitation

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.

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Type Approval documentation

	Document no:	Revision:	Comment:	
Data sheets:	4000086805	R09	OPTIFLUX 2000 Technical Datasheet	
	4000525103	R06	OPTIFLUX 4000 Technical Datasheet	
	4000525204	R07	OPTIFLUX 5000 Technical Datasheet	
	4002183702	R02	IFC 050 Technical Datasheet	
	4000040504	R04	IFC 100 Technical Datasheet	
	4000295603	R06	IFC 300 Technical Datasheet	
	4001208601	R01	OPTIPROBE Technical Datasheet	
	Manuals:	4000839504	R04	OPTIFLUX 2000 Handbook
		4000818503	R03	OPTIFLUX 4000 Handbook
		4000686302	R02	OPTIFLUX 5000 Handbook
7312252100		R01	OPTIPROBE Quick Start	
7312092200		R02	OPTIFLUX Supplementary instructions	
7313492100		R00	Suppl. to Quick start OPTIPROBE F and IFC 300 F cat III	
7313542100		R01	OPTIFLUX Supplementary instructions	
4002184002		R02	IFC 050 Handbook	
4000041005		R05	IFC 100 Handbook	
4000069803		R04	IFC 300 Handbook	
Test reports:	20809-1	0 / 2016-06-22	EMC and Env. of IFC 050W and Optiflux 2000F-DN40	
	20809-2	0 / 2016-06-14	Env. IFC 100W Converter and Optiflux 2000F-DN200	
	20809-3	0 / 2016-06-14	Environmental testing of Optiflux 2100C-DN40	
	20809-4	1 / 2016-09-09	Environmental testing of Optiflux 2100C-DN200	
	20809-5	0 / 2016-06-30	Env. IFC 100W Converter Optiflux 5000F-DN15	
	20809-6	0 / 2016-06-30	EMC and Env. testing of IFC 300F and Optiprobe	
	20809-7	0 / 2016-06-24	Environmental testing of Optiflux 5100C-DN15	
	10-409(E)	2011-01-07	EMC & Pressure test OF 5000 Ex + IFC 100W	
	10-408(E)	2011-01-07	ENV. test OF 5000 Ex + IFC 100W	
	10-416(E)	2011-01-07	Vibration test OF 5000 Ex + IFC 100W	
	10-417(E)	2011-01-07	Vibration test OF 5100 C	
	10-412(E)	2011-01-07	EMC & Pressure test OF 4000 Ex + IFC 100W	
	10-410(E)	2011-01-07	ENV test OF 4000 Ex + IFC 100W	
	10-413(E)	2011-01-07	Vibration test OF 4000 Ex + IFC 100W	
	10-414(E)	2011-01-07	Vibration test OF 4100 C (stainless steel)	
	10-415(E)	2011-01-07	Vibration test OF 4100 C (carbon steel)	
	10-525(E)	2011-03-07	Vibration test OF 4000 + IFC 100W	
	11-525(E)	2012-02-10	EMC Test OF 4000 + IFC 100W	
	11-526(E)	2012-02-10	ENV Test OF 4000 + IFC 100W	
	11-527(E)	2012-02-10	Vibration test OF 4000 Ex	
	11-528(E)	2012-02-10	Vibration test OF 4100 C	
	11-529(E)	2012-02-10	Vibration test IFC 100 W	

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2015.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number

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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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE