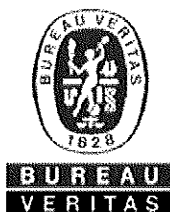


**MARINE DIVISION**

17 bis Place des Reflets - La Défense 2  
92400 Courbevoie - France

Tel. 33 1 42 91 52 91  
Fax. 33 1 42 91 28 94  
www.veristar.com



Certificate number: 18876/A1 BV

File number : AP 3783

Product code : 3741H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

**TYPE APPROVAL CERTIFICATE**

*as per Bureau Veritas Classification Rules*

*This certificate is issued to*

**KROHNE Skarpenord**  
BREVIK - NORWAY

*for the type of product*

**LEVEL SENSORS / TRANSMITTERS**

Level Gauging Radars  
OPTIWAVE 8300C and OPTIFLEX 4300C

**Regulations and standards :**

BUREAU VERITAS Rules for the Classification of Steel Ships.

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements of the Regulations and standards mentioned above.*

**This certificate is valid until : 16 Jan 2012**

At Paris la Défense, on : 12 Sep 2007

**For BUREAU VERITAS,**  
By order of the Secretary

Approval office

Local office : BV OSLO  
Surveyor : R. Marstein

L. COURREGELONGUE



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION :

**OPTIWAVE 8300C and OPTIFLEX 4300C** are level meters intended to measure distance, level and volume of any kind of liquids, pastes and solids.

#### **Technical Specifications:**

	<b>OPTIWAVE 8300C</b>	<b>OPTIFLEX 4300C</b>
Measurement Range:	0.1-40 m	35 m
Radar Principle:	FMCW (Frequency Modulated Continuous Wave)	TDR (Time Domain Reflectometer)
Operating Frequency:	24-26 GHz	2 GHz
Output:	4-20 mA, 2 wires (HART)	4-20 mA, 2 wires (HART)
Process Connection:	DIN DN125/PN16 or ANSI B16.5, 8", 150 lbs	DIN DN50/PN40
Material:	Stainless Steel 316L (Body and Flange)	Stainless Steel 316L (Body and Flange)
Ingress Protection index:	IP 67	IP 68
Power supply:	24 VDC	24 VDC

### 2. DOCUMENTS AND DRAWINGS :

#### **KROHNE Skarpenord:**

OPTIWAVE 7300C KROHNE Handbook No: 7.02535.22.00, dated 08/2005  
 OPTIWAVE 7300C, Supplementary Installation and Operating Instructions No: 7.02525.21.00, dated 12/2004  
 OPTIWAVE 7300M, Drawings No: 04-3/3262 - 1 to 3  
 OPTIWAVE 8300 C, Unreferenced Data Sheet  
 OPTIFLEX 4300 C, Unreferenced Data Sheet.

### 3. TEST REPORTS :

#### **DNV:**

Vibration Test of radar OPTIWAVE 8300C, Report No: 2006-3445 Rev.2 dated 2006-09-29  
 EMC and Environmental testing of Radar Type OPTIWAVE 8300C, Report No: 2006-3573 Rev.1 dated 2006-12-19  
 EMC and Environmental testing of Radar Type OPTIFLEX 4300C, Report No: 2007-3247 Rev.1 dated 2007-06-27.

### 4. APPLICATION / LIMITATION :

4.1 - BUREAU VERITAS Rules for the Classification of Steel Ships.

4.2 - Approval also valid for ships to be granted with the notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**

4.3 - The equipment fulfils the EMC requirements for installation on the Bridge and Deck Zones.

4.4 - BUREAU VERITAS Environmental Category, **EC Code: 41S.**

4.5 - The equipment, once installed on board ship, is to be tested in accordance with the above referred Regulations under the supervision of a Society's Surveyor.

### 5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The **OPTIWAVE 8300C** and **OPTIFLEX 4300C** are to be manufactured, examined and tested by **KROHNE SAS in Romans (FRANCE)** in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - Production sites are to be recognized by Bureau Veritas as per NR320 for HBV products. To this end **KROHNE Skarpenord** has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 - **KROHNE Skarpenord** has declared to Bureau Veritas that the type of product described in this certificate is manufactured at the following production site:

**KROHNE SAS  
 Quartier des Ors - BP 98 - 26103 Romans  
 FRANCE**

5.4 - Each equipment is to be supplied with manual (s) for installation, use and maintenance.

**6. MARKING OF PRODUCT :**

- Maker's name or trade mark,
- Serial number of the units,
- Equipment type number or model identification under which it was type-tested.

**7. OTHERS :**

7.1 - This approval is given with the understanding that:

**KROHNE Skarpenord  
Strømtangveien 21 - 3950 BREVIK  
NORWAY**

will accept full responsibility for informing shipbuilders, ship-owners or their sub-contractors of the proper methods of use and general maintenance of the equipment and the conditions of this approval.

7.2 - This certificate supersedes the Type Approval Certificate N° 18876/A0 BV issued on 16/01/2007 by the Society.

\*\*\* END OF CERTIFICATE \*\*\*

