

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Pressure Transmitter**

with type designation(s)

**AST45XX, AST43XX, AST44XX, AST46XX, AST4000, AST53XX, AST54XX, AST20HA**

Issued to

**American Sensor Technologies  
Budd Lake, NJ, United States**

is found to comply with

**DNV GL rules for classification – Ships and offshore units**

**Application :**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

**Location classes:**

Type	Temperature	Humidity	Vibration	EMC	Enclosure
<b>AST45XX</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>A</b>	<b>D / IP68*</b>
<b>AST43XX, AST44XX, AST46XX, AST4000, AST53XX, AST54XX, AST20HA</b>	<b>D</b>	<b>B</b>	<b>B</b>	<b>A</b>	<b>B / IP54</b>

**\* IP68 up to 100 psig = 70 m immersion depth**

This Certificate is valid until **2021-02-04**.

Issued at **Høvik** on **2016-02-05**

DNV GL local station: **New York**

Approval Engineer: **Ståle Sneen**

for **DNV GL**

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**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.

## Product description

The following pressure sensors and transducers/transmitters are covered by this certificate:

AST45XX – submersible pressure sensors/transducers  
 AST43XX, AST44XX, AST46XX, AST4000, AST53XX, AST54XX, AST20HA

The following models are intended for hazardous locations:  
 AST43XX, AST44XX, AST45XX, AST46XX, AST53XX, AST54XX

The following models are intended for non-hazardous locations:  
 AST4000, AST5400 & AST20HA

## 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.

## Type Approval documentation

<b>Document</b>	<b>Doc. Ref. No.</b>	<b>Date/Rev.</b>
Data sheet AST20HA Precision Pressure Transducer/Transmitter	AST20HA	10/2015
Data Sheet AST4000 Industrial OEM Pressure Transducer	AST4000	10/2015
Data sheet AST4300 Non-Incendive Pressure Transducer / Transmitter	AST4300	10/2015
Data sheet AST43LP Low Pressure Non-Incendive Transducer / Transmitter	AST43LP	10/2015
Data sheet AST4400 Intrinsically Safe Pressure Transducer / Transmitter	AST4400	10/2015
Data Sheet AST4401 Intrinsically Safe Pressure Transducer / Transmitter	AST4401	10/2015
Data sheet AST44LP Low Pressure Intrinsically Safe Transducer	AST44LP	10/2015
Data sheet AST4500, AST4510 Submersible Liquid Level Sensors	AST4500/4510	10/2015
Data Sheet AST4520 Submersible Flush Diaphragm Liquid Level Sensor	AST4520	10/2015
Data sheet AST4530 PVDF/PTFE Submersible Pressure Transducer	AST4530	10/2015
Data sheet AST4600 Explosion-Proof Standard Pressure Transducer	AST4600	10/2015
Data sheet AST46DS Explosion-Proof Pressure Transducer with Display	AST46DS	10/2015
Data sheet AST46HA Explosion-Proof High Accuracy 0.1% Pressure Transducer	AST46HA	10/2015
Data sheet AST46PT Explosion-Proof Pressure / Temperature Transmitter	AST46PT	10/2015
Data Sheet AST46SW Explosion-Proof SPDT Solid State Pressure Switch	AST46SW	10/2015
Data Sheet AST5300, AST53ED, AST53EN Differential Pressure Transducer	AST5300/AST53ED/ AST53EN	10/2015

Job Id: **262.1-018008-1**  
Certificate No: **TAA0000073**

Data Sheet AST5400, AST54ED, AST54EN Differential Pressure Transducer	AST5400/AST54ED/AST54EN	10/2015
TUV Rheinland of North America, Inc. – EMC Test Report	30762926.004	2009-12-09
TUV Rheinland of North America, Inc. – EMC Test Report	31460126.001	2014-02-13
TUV Rheinland of North America, Inc. – EMC Test Report	31460127.001	2014-02-09
TUV Rheinland of North America, Inc. – EMC Test Report	31460128.001	2014-02-09
DTL Environmental Test Report	7031127	2008-05-19
Tektronix Report of Test on AST Sensors (shock and vibration)	550525-001	2012-04-03, Rev.1
Tektronix Environmental Test (Vibr. B, shock test)	554300-001	2014-08-28
Tektronix Environmental Test (IP68 100 psig)	556704-001	2016-01-26
CSA International Test Report for AST4300 (includ.IP54)	2531803	2013-06-18
CSA International Test Report for AST4300 (includ.IP54)	2672643	2014-09-09
Sira Assessment Ex-ATEX Report of models AST4300, AST43LP Pressure Transducers (against IEC 60079-0:2011)	Sira R70006508B/CSA No. 2693859	2014-09
Type approval initial assessment report, DNV GL New York		2015-11-16

### 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

### 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