

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Temperature Sensor

with type designation(s)

Thermocouples and thermowells as listed under Product description

Issued to

Pentronic AB
VÄSTERVIK, Sweden

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 B

Humidity B

Vibration B

EMC N/A

Enclosure Required protection of cable end terminals to be provided upon installation on board

Issued at **Høvik** on **2018-02-22**

This Certificate is valid until **2023-04-01**.

DNV GL local station: **Stockholm**

for **DNV GL**

Approval Engineer: **Nils Jarem**

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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 Type Approval covers products/drawings as listed below:

Sensor	Product/Drawing No.	Issue
Thermocouple	En-5660042-000	100219
<i>Thermowell 316L</i>	En-5660050-001	100219
Thermocouple	En-5660055-000	100219
Thermocouple	En-5668510-000	080228
<i>Th. couple K, subdrwg.</i>	En-5668511-000	080228
<i>Thermowell, subdrwg.</i>	En-5668512-000	080102
Thermocouple	En-5668520-000	000212
<i>Th. couple K, subdrwg.</i>	En-5668521-000	070119
<i>Thermowell, subdrwg.</i>	En-5668522-000	080522
Thermocouple	En-5668525-001	090107
<i>Th. couple K, subdrwg.</i>	En-5668526-001	090107
<i>Thermowell, subdrwg.</i>	En-5668522-000	080522
Thermocouple	En-5668531-000	110429
Thermocouple	En-5668535-000	060929
Thermocouple	En-5668545-000	120807
Thermocouple	En-5668571-000	100219
Thermocouple	En-5668580-000	140414
<i>Th. couple K, subdrwg.</i>	En-5658006-000	090107
Thermocouple	En-5668582-001	140414
<i>Subdrwg.</i>	En-5658006-000	090107
Thermocouple	En-5668586-000	100219
Thermocouple	En-5668600-000	140414
<i>Subdrwg.</i>	En-5658015-001	000217
Thermocouple	En-5668610-000	140414
Thermocouple	En-5668625-000	100706
Thermocouple	En-5668626-000	100706
<i>Thermowell M24x2</i>	En-5651080-001	041213
Thermocouple	En-5668635-001	090929
<i>Pocket, subdrwg.</i>	En-5668205-001	030217
Thermocouple	En-5668635-005	090929
<i>Pocket, subdrwg.</i>	En-5668205-001	030217
Thermocouple	En-5668636-001	090929
Thermocouple	En-5668636-005	090929
Thermocouple	En-5668637-000	100219
<i>Thermowell</i>	En-5668205-001	030217
Thermocouple	En-5668664-000	100219
<i>Thermowell</i>	En-5651100-000	110429
Thermocouple	En-5668667-000	121009
<i>Thermowell</i>	En-5651100-000	110429
<i>Thermowell</i>	En-5651101-001	110429
Thermocouple	En-5668668-000	100219
<i>Thermowell M18x1,5</i>	En-5651105-000	060118

Place of manufacture

Pentronic AB, Bergsliden 1, SE-593 96 Västervik

Pentronic AB, Traktorvägen 4, SE-593 62 Västervik

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

Thermowells to be used as required by DNV GL Rules.

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.
Applicable tests according to IEC 60584 for TC.

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 after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE