

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pressure Gauge

with type designation(s)
4.36.1, 4.36.2, 4.46.1, 4.46.2

Issued to

Boll & Kirch Filterbau GmbH
Kerpen, Nordrhein-Westfalen, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application :

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

Type:	Temperature range:	Max. working press.:
4.36.1	max. 150°C	max. 32 bar
4.36.2	max. 150°C	max. 32 bar
4.46.1	max. 150°C	max. 40 bar
4.46.2	max. 150°C	max. 40 bar

Issued at **Hamburg** on **2020-09-24**

This Certificate is valid until **2025-09-23**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Matthias Schmidt**

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Harald Pauli
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

Differential pressure indicator with or without electrical output contacts for the monitoring of filters.

Type 4.36.1: GD-AL casing, hard coated, with visual indication only
Type 4.36.2: GD-AL casing, hard coated, with visual indication and two output contacts
Type 4.46.1: GD-AL casing with VA insert, hard coated, with visual indication only
Type 4.46.2: GD-AL casing with VA insert, hard coated, with visual indication and two output contacts

Pipe connections:	G $\frac{1}{4}$
Roller diaphragm:	Viton
Differential pressure ranges (bar):	0-0.5, 0-0.8, 0-1.2, 0-2.0 or 0-3.0
Fixed switching point:	at 75% and 100% differential pressure
Electrical rating:	0.8 A, 60 VA, max 250 V AC
Degree of protection:	IP 65

Location of manufacture:

- Boll & Kirch Filterbau GmbH, Kerpen, Germany

Application/Limitation

Applied Rules and Design Codes:

- DNVGL RU SHIP Pt.4 Ch.6 'Piping Systems' (Edition July 2019)
- DNVGL RU SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2019)
- AD 2000-Merkblatt – S5 'Calculation of Pressure Vessels – Experimental Design Method'

The differential pressure indicator for the use with water or other non-flammable liquids is classified in Pipe Class II (design pressure ≤ 40 bar, design temperature $\leq 300^{\circ}\text{C}$) according to DNVGL RU SHIP Pt.4 Ch.6 Sec.1 Table 1 'Classes of piping systems'.

The differential pressure indicator for the use with flammable liquids (e.g. fuel oil, lubricating oil, flammable hydraulic oil) is classified in Pipe Class I (design pressure > 16 bar) according to DNVGL RU SHIP Pt.4 Ch.6 Sec.1 Table 1 'Classes of piping systems'.

The materials used for the design and fabrication of the differential pressure indicators shall be suitable for the environmental and specific service conditions, the applicable fluids and shall be resistant to corrosion and wear during the intended service life time.

The installation on board the ship shall be performed in such a way that for possible forced vibrations on the differential pressure indicator resulting from e.g. the diesel engine or the propulsion chain will be adequately taken care for.

This type approval is related to the strength of the parts of the differential pressure indicator subjected to pressure. The electrical switching function of the types 4.36.2 and 4.46.2 has not been assessed.

Each differential pressure indicator is to be hydraulic pressure tested to minimum 1,5 times design pressure.

Type Approval documentation

Tests carried out

Burst pressure tests and calculations

Marking of product

For traceability to this type approval the products are at least to be marked with:

- a. Name and domicile of the manufacturer
- b. Manufacturer's type designation and serial number
- c. Year of manufacture
- d. Design pressure
- e. Design temperature in °C

If marking of the product with all of the information stated above is not possible due to the size of the product the complete set of information of the marking shall be stated in the manual delivered by the manufacturer together with the component.

Periodical assessment

The objective of the periodical assessment is to verify that the conditions for the type approval (TA) have not been altered.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the TA products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products
- review of TA documentation and that this is still used as basis for the production
- review of possible changes in the design, the materials and the performance of the product
- verification of the product marking

For retention of the TA certificate in its validity period the periodical assessments will be carried out every two years.

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the type approval applicant has not adhered to the obligations stipulated in the type approval certificate.

End of Certificate