

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Gauge Glass Level Indicator**with type designation(s)
MR25, MT100

Issued to

KLINGER ITALY SRL CON UNICO SOCIO
Rho MI, Italy

is found to comply with

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**Application :****Products approved by this certificate are accepted for installation on vessels classed by DNV GL.**

| | | | |
|--------------|---|---|-------------------------|
| Type: | Temperature range: | Max. working press.: | Design: |
| MR25 | up to 400 °C, refer to certificate | up to 25 bar, refer to certificate | Reflex Type |
| MT100 | up to 400 °C, refer to certificate | up to 40 bar, refer to certificate | Transparent Type |

This Certificate is valid until **2023-06-30**.Issued at **Høvik** on **2018-07-23**for **DNV GL**DNV GL local station: **Milan**Approval Engineer: **Sinisa Sedlan**

Marianne Spæren Marveng
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: **262.1-016853-4**
 Certificate No: **TAP00000M2**
 Revision No: **2**

Product description

Flat glass level gauges for use on boilers and pressure vessels.

Type MT 100

Transparent level gauge for steam and process applications, with soft sealed gauges cocks, model D (with packing) and bulb or LED illuminator.

Type MR 25

Reflex level gauge for steam and process applications, with soft sealed gauges cocks, model D (with packing).

Materials

Type MT 100 FS / H

| | |
|------------------|------------------|
| Level gauge body | ASTM A 105 |
| Cover / Plate | ASTM A 105 |
| Glass | Borosilicate |
| Bolts / Nuts | B7 / 2H |
| Sealing gasket | Graphite PSM 150 |

Type MR 25 FS / H

| | |
|------------------|------------------|
| Level gauge body | ASTM A105 |
| Cover / Plate | Fe 430 |
| Glass | Borosilicate |
| Bolts | Class 8.8 |
| Sealing gasket | Graphite PSM 150 |

Application/Limitation

The flat glass level gauges of type MT 100 and MR 25 are type approved for application on boilers and pressure vessels containing fluids as follows:

| Model | Nominal pressure | Maximum Allowable Working Pressure (M.A.W.P.) | | Maximum Allowable Working Temperature (M.A.W.T.) | | Flange connection | Hydro test pressure |
|--------|------------------|---|--------|--|--------|-------------------|---------------------|
| | | Hydrocarbon* | Steam | Hydrocarbon | Steam | | |
| MR 25 | PN 25 | 25 bar | 20 bar | 400 °C | 215 °C | PN 25 | 50 bar |
| MT 100 | PN 40 | 40 bar | 30 bar | 400 °C | 235 °C | PN 40 | 80 bar |

* for application with service temperature above 50°C the following pressure reduction factors applies:

| Temperature up to | Pressure reduction factor |
|-------------------|---------------------------|
| 50 °C | 1 |
| 100 °C | 0.92 |
| 200 °C | 0.81 |
| 300 °C | 0.61 |
| 400 °C | 0.51 |

For selection and installation of the level gauges the requirements of the Rules DNVGL –RU-SHIP-Part 4 - Chapter 7 Section 5 – 5.1 Water gauges are to be observed.

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Type Approval documentation

Drawings

| Drawing | Title | Remark |
|--------------------|--|------------------|
| TA/MT100/A - Rev.1 | Transparent level Gauge mod. MT 100/D/FS-H with Drain Cock, vent Plug and Double Lever | Bulb Illuminator |
| TA/MT100/B - Rev.1 | Transparent level Gauge mod. MT 100/D/FS-H with Drain Cock, vent Plug and Double Lever | |
| TA/MT100/D - Rev.0 | Transparent level Gauge mod. MT 100/D/FS-H with Drain Cock, vent Plug and Double Lever | LED Illuminator |
| TA/MT100/E - Rev.0 | Transparent level Gauge mod. MT 100/D/FS-H with Drain Cock, vent Plug and Double Lever | |
| TA/MR25/A - Rev.1 | Transparent level Gauge mod. MR 25/D/FS-H with Drain Cock, vent Plug and Double Lever | No Illuminator |
| TA/MR25/B - Rev.1 | Transparent level Gauge mod. MR 25/D/FS-H with Drain Cock, vent Plug and Double Lever | |

Instructions

- Instructions for Installation and Operation of Reflex Level Gauges Type MT 100 and MR 25
- IST No.11 - Rev.10, Operating Instructions, dated 2016-10-24
- Working condition for glass level gauges – 2008

Work Test Certificates / DNVGL Assessments

- 2013/1.500, Klinger Work Test Certificate UNI-EN 10204 – 3.1, dated 2013-12-12, reviewed by DNV
- 2013/1.498, Klinger Work Test Certificate UNI-EN 10204 – 3.1, dated 2013-12-12, witnessed by DNV
- 2014/53, Klinger Work Test Certificate UNI-EN 10204 – 3.1, dated 2014-01-21, witnessed by DNV
- 2014/76, Klinger Work Test Certificate UNI-EN 10204 – 3.1, dated 2014-01-27, witnessed by DNV

Product catalogues

- MR 25-D-06/16, Reflex level gauges - catalogue
- MT 100-D-06/16, Transparent level gauges - catalogue

Type tests carried out

- Hydrostatic testing of gauge bodies to 2.0 x nominal pressure.

Production testing

All level gauges shall be subject to hydrostatic pressure testing at manufacturer work shop.

Certification

No product certificate is required.

Marking of product

Each level gauge shall be provided with a metallic label at least with the following content:

- Manufacturer name or trade mark
- Type, serial number, date of construction
- Maximum allowable working pressure (M.A.W.P.)
- Maximum allowable working temperature (M.A.W.T.)
- Torque of bolts
- Test pressure (TP)

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.