DNV·GL

Certificate No:
TAP00000M2

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

Application :

Flat glass level gauges for use on boilers and pressure vessels designed acc. to DNVGL-RU-Ship-Pt.4 Ch.7.
Products approved by this certificate are accepted for installation on all 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 **2018-06-30**.

Issued at **Hamburg** on **2016-11-07**

for **DNV GL**

DNV GL local station: **Milan**

Approval Engineer: **Hagen Markus**

Olaf Drews
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.

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Product description

Type MT100

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	0.51

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

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
- DNV GL Assessment Report, Issued at Milan on 2016-09-07

Product catalogues

- Pk30–12/04, Reflex level gauges – catalogue
- Pk31–12/04, Transparent level gauges - catalogue

Type tests carried out

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

Requierements depending on pipe classes

Depending on the pipe class the pre-material for the pressurised components such as borosilicate glass, level gauge body, cover and plate, material certificates acc. to the Rules as specified below are to be provided. Furthermore production testing is to be carried out on each level gauge.
For the borosilicate glass a works certificate (W certificate type) is to be provided in any case.
Refer to:

DNVGL Rule Pt.2, Ch.2 (Materials)
DNVGL Rule Pt.4, Ch.7, Sec.1 – Table 2 (pipe classes)
DNVGL Rule Pt.4, Ch.7, Sec.1 – Table 3 (Requierements for pressure equipment classes)
DNVGL Rule Pt.4, Ch.7, Sec.1 – Table 5, 6 and 7 (Certification requierements for pressure equipment classes)
DNVGL Rule Pt.4, Ch.7, Sec.2 – Table 1 (Certificates for materials)

Production testing

All level gauges shall be subject to hydrostatic pressure testing at manufacurer work shop.
For level gauges which are according to the Rules Pt.4, Ch.7, Sec.1 – 1.1.2 classified as "pressure equipment", e.g. level gauges on boilers, on pressure vessels containing fluids with flash point below 110°C are to be delivered with a product certificate (PC) issued by the society.
For applications classified as non-pressure equipment a manufacturer's product certificate is sufficient.

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 certificate periodical assessments shall be carried out at production places.
The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:
- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking