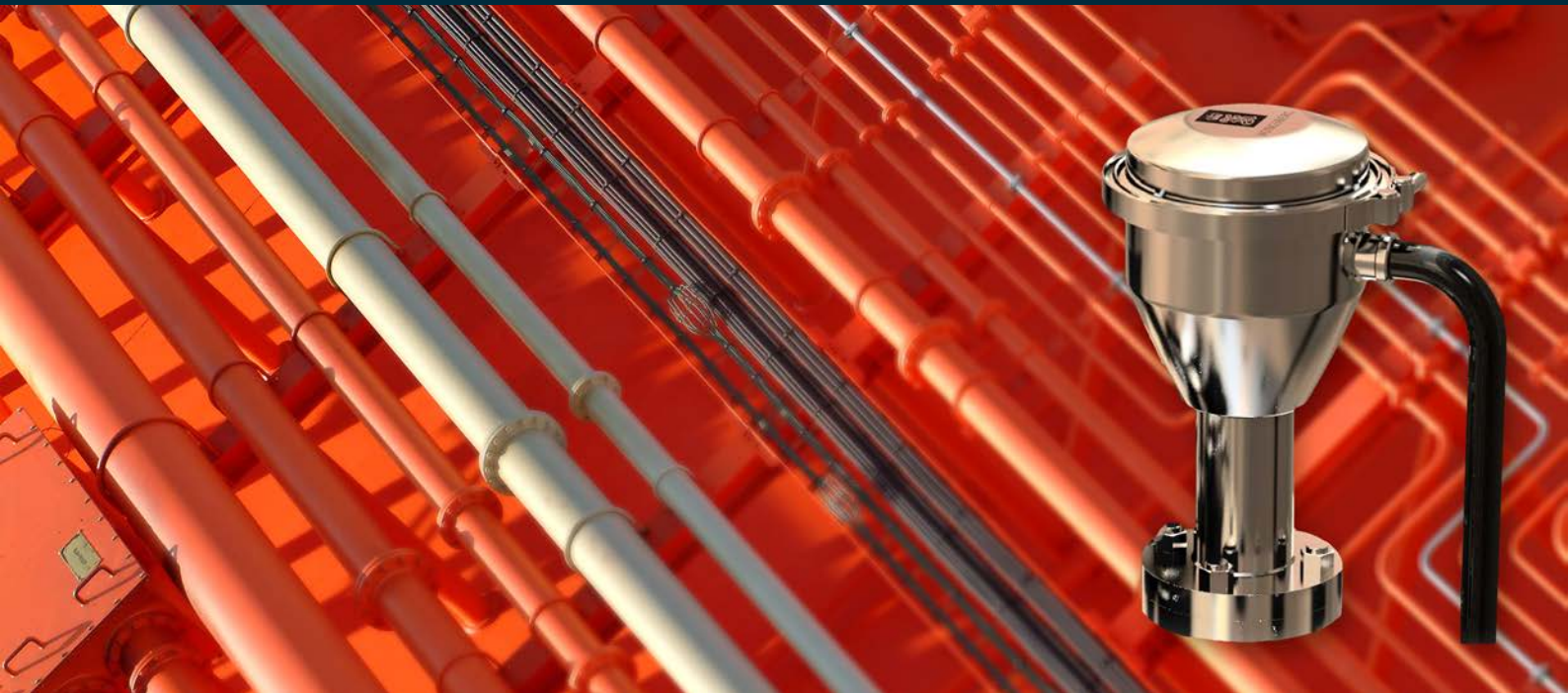


GLA-310/5-NH₃



KONGSBERG



RADAR TANK GAUGE FOR LIQUEFIED AMMONIA (NH₃)

The KONGSBERG Radar Tank Gauge (RTG), GLA-310/5-NH₃ is designed to measure level in tanks containing liquefied Ammonia (NH₃). Accurate measurement is possible regardless of the tank atmospheric conditions. Flexible design ensures easy adaptation to any tank design. The RTG is type approved, and due to its modular design, can be applied as both primary and secondary level gauge and as tank overflow protection sensor onboard gas carriers.

Principle of operation

The RTG employs the Frequency Modulated Continuous Wave (FMCW) principle with dual sweep technology to eliminate Doppler-effect caused by cargo movement. A frequency sweeping microwave signal is emitted by the RTG through a standpipe. The distance (i.e. the ullage) is derived from the time delay of the reflected signal. The standpipe is assembled by sections adjusted to match the total tank height. The pipes have ventilation holes allowing the vapour pressure inside and outside the pipe to stabilize, thus allowing the liquid to rise or fall unimpeded in the pipe.

Each pipe section is supplied with flanges prepared with reference markers. The liquid level and the markers are measured simultaneously, hence the system automatically verifies itself at every measurement. By careful calibration of the pipe sections length before installation, the positions of the markers are recorded and stored in the system. By comparing the liquid echo with the reference marker echo, a continuous auto-calibration of the measurement is done.

The electronic unit in the RTG includes a patented signal detection method that ensures optimum performance. Combined with its superb signal-to-noise ratio, GLA-310/5 offers the highest measurement reliability and accuracy.

Each RTG is connected to a dedicated signal processing unit, where the AutoCAL[®] principle is employed.

AutoCAL[®]

AutoCAL[®] is a unique calibration and verification function in the KONGSBERG system. Gas vapour density and mixture of gases influence the propagation speed of the radar signal, thus the accuracy of the measurement. By using reference markers, AutoCAL[®] continuously compensates for the changes caused by the differences in the propagation speed. AutoCAL[®] ensures high accuracy over the whole measurement range, independent of the gas mixture, pressure and temperature.

With AutoCAL[®], the influence of the gas vapour density and composition is measured and compensated for automatically.

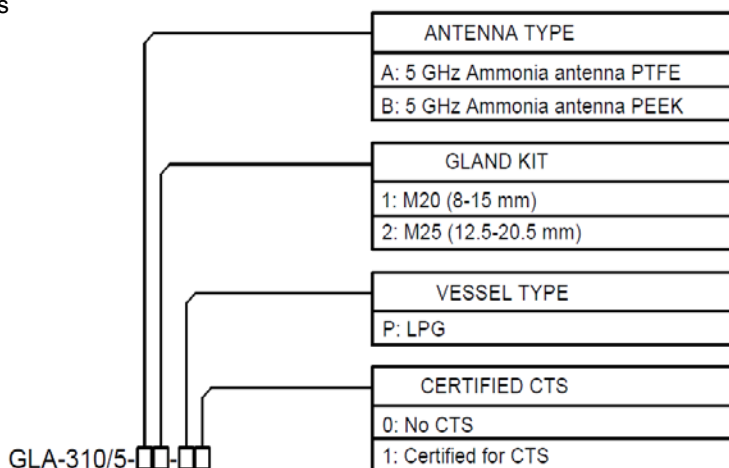
Tank pressure	< 1,4 bar g	8 bar g	20 bar g
Measuring range	24 m	15 m	8 m

Table 1: Tank pressure vs. measuring range

FEATURES

- Closed level gauge suitable for all liquefied gas tank designs
- Measuring range 0 to 24 meter
- Outstanding accuracy in the whole range
- Superior sensitivity
- Continuous level verification - AutoCAL®
- Utilizes 50 mm standpipe
- Modular design
- Intrinsically safe for use in all zones

ORDER CODE



TECHNICAL SPECIFICATIONS

Measuring range:	See Table 1
RMS accuracy*:	3 mm
Signal output:	RS485 (2 pair cable interface to GLK-300 SPU)
Frequency:	C-band (5 GHz)
Radiated power:	< 1 mW
Ex classification:	Ⓢ Ex ia IIC T4
Ex certification:	CE 0044 IECEX SIR 14.0025X Sira 14ATEX2056X
Quality standard:	ISO 9001
EMC standard:	Emission: IEC 60945 Immunity: IEC 61000-4

Operating temperature:	-45 °C to +85 °C
Tank temperature:	Down to -165 °C
Tank pressure:	Up to 20 bar g

Materials

Body:	AISI 316(L)
Antenna lens:	PTFE or PEEK
Standpipe:	AISI 316(L) or Al alloy 5083

Protection:	IP 66/67
Weight:	10.7 kg
Cable size:	Ø12-Ø20 mm

Safety data

Max. input voltage:	Ui = 14.3 VDC
Max. input power:	Pi = 2.1 W
Max. input current:	Ii = 560 mA
Max. internal capacitance:	Ci = 347 nF
Max. internal inductance:	Li = negligible

Type approval:	ABS, BV, CCS, DNV-GL, KRS, LRS, NK
----------------	------------------------------------

* RMS sensor accuracy at controlled environment

Specifications subject to change without any further notice.

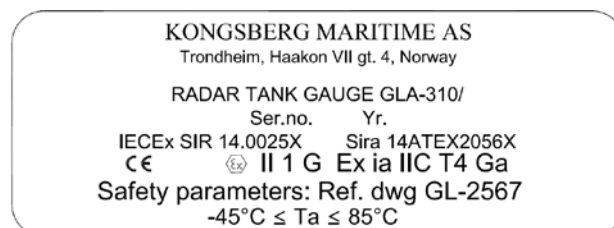


Figure 1: Ex information plate for GLA-310/5 -NH₃

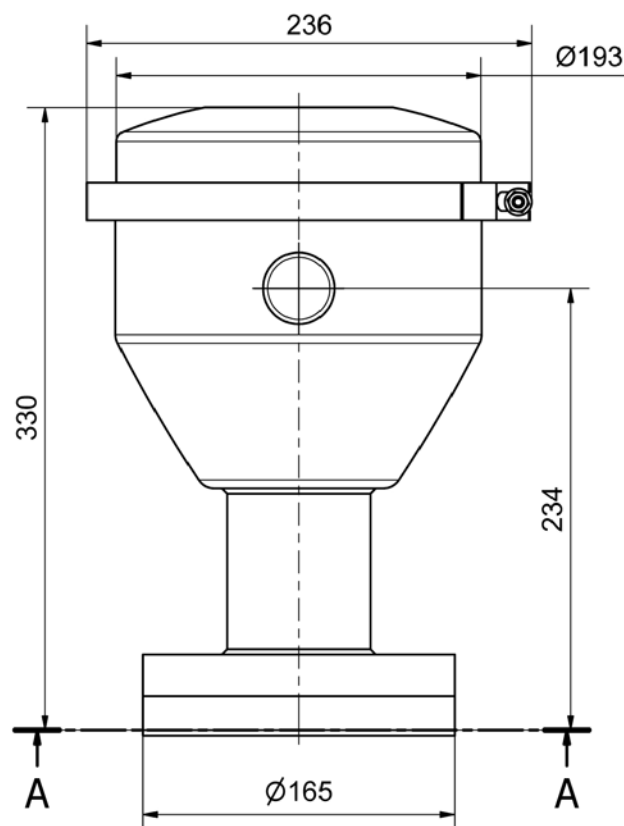


Figure 2: Dimensional sketch of GLA-310/5 -NH₃

411509 Rev. A