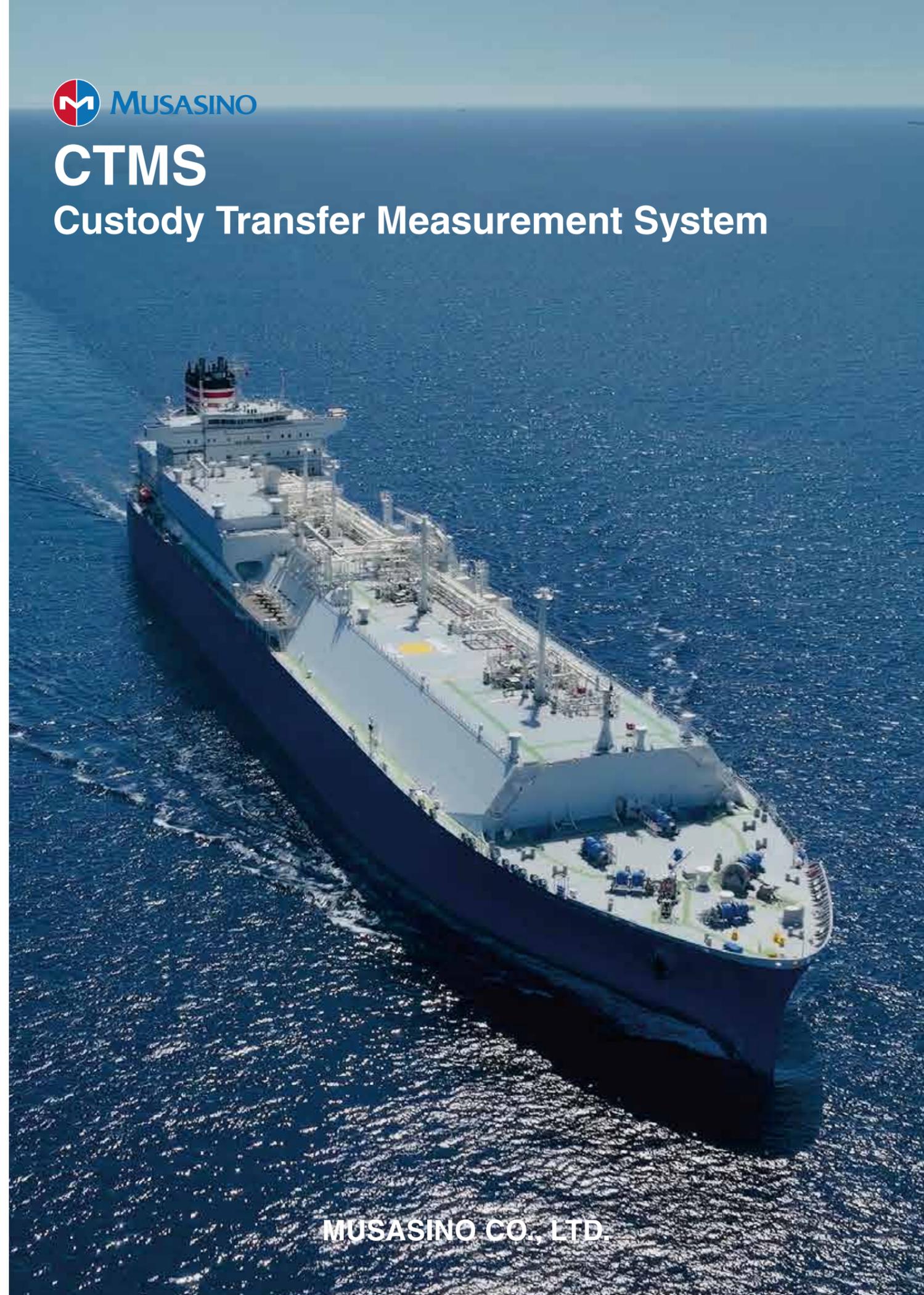




CTMS

Custody Transfer Measurement System



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Custody Transfer Measurement System

Liquefied Natural Gas (LNG) has a density approximately 600 times greater than that of gaseous natural gas, which results in higher transportation costs. Therefore, even a small measurement error can lead to a significant financial risk. For this reason, calibrated and certified level gauges, temperature sensors, and pressure sensors are essential. These instruments are critical for ensuring precise measurement, and each plays a vital role in maintaining the safety and efficiency of LNG tanks.

Musasino systems are compatible with all types of LNG tank designs, and comply with the IGC Code. Furthermore, independent third-party organizations, such as NKKK and various classification societies, have certified the systems. These certifications ensure that Musasino's system can be used with confidence, enhancing operational reliability and safety.

Features

1 Proprietary Self-Calibration Function

The level gauge sensor is equipped with Musasino's proprietary self-calibration function, which maintains long-term measurement accuracy and stability. This function automatically calibrates in response to environmental changes, providing consistently reliable data.

2 All-in-One Structure

The All-in-One design integrates six sensor modules—two each for level, temperature, and pressure measurement (primary and secondary)—within a single housing. Since each module is independent, maintenance can be performed without opening the tank. The level gauge also incorporates a transducer – key to converting physical quantities into electrical signals – developed by Musasino, which minimizes signal attenuation and reduces the influence of guide pipe irregularities, ensuring stable and accurate measurement.

3 Bottom Structure

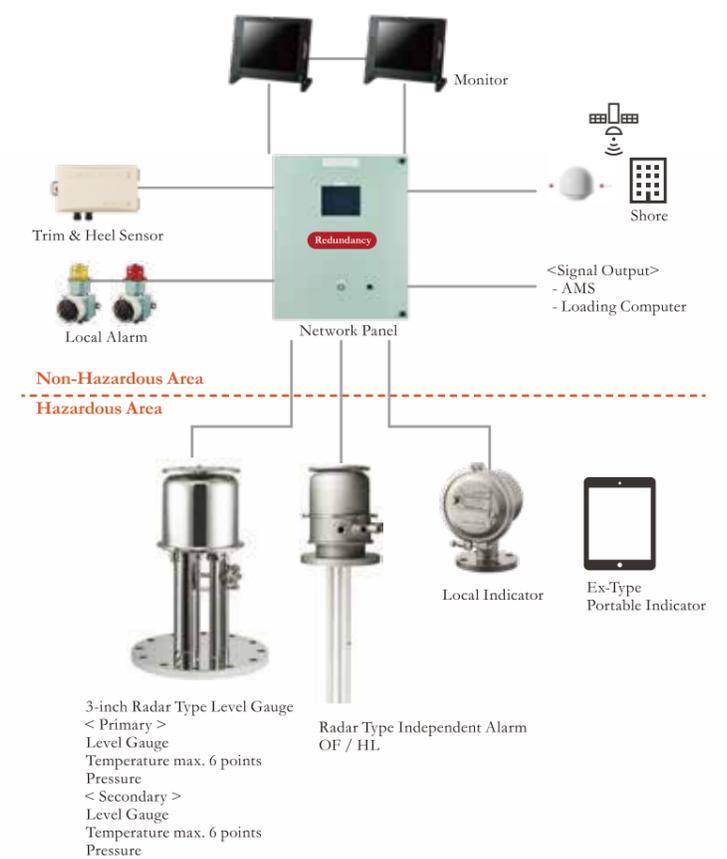
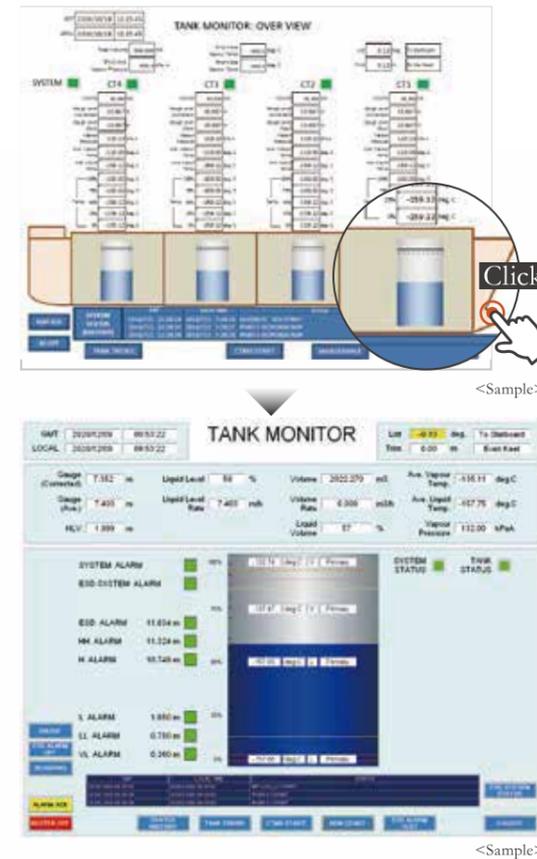
Musasino's bottom structure features a simple and space-saving design, allowing installation even in confined spaces.

4 Internal Structure of LNG Cargo Tanks

The internal structures of LNG cargo tanks must withstand severe sloshing conditions over long periods of operation. To achieve this, sloshing model simulations are performed to ensure structural durability. This design has proven strength sufficient for over 40 years of operation, maintaining high reliability and ensuring safe tank performance.

5 Compatible with Raman Analyzer

Musasino's systems can be connected to a Raman analyzer via a communication interface. This connection allows detailed analysis of LNG composition and enables real-time data acquisition, thereby improving operational efficiency, safety, and precision in management.



Level Gauge

Measuring Method	FMCW (Frequency Modulated Continuous Wave)
Measurement Range	0.0m ~ 50m
Resolution	1mm
Accuracy	±5mm
Ambient Temperature	-30 to +70°C (Electronics Housing)
Explosion Protection	Intrinsically Safe Type Ex ia IIC T5
Protection Class	IP66
Material	SUS316L

Inclinometer

Measuring Method	Capacitive MEMS Sensor
Measurement Range	±5°
Accuracy	±0.05°
Resolution	0.001°

Temperature Sensor

Measuring Method	PT-100, 4-wire Temperature Sensor
Measurement Range	-200 to +100°C
Accuracy	±0.2°C (≤-145°C), ±1.5°C (>-145°C)
Resolution	0.1°C

Pressure Sensor

Measuring Method	Diaphragm with Strain Gauge Bridge
Measurement Range	0.8 bar to 1.4 bar
Accuracy	±0.5% FS
Resolution	1 mbar
Diaphragm Material	SUS 316L

