

ICS 75.060

CCS E 24



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 37770.1-2022

**Refrigerated light hydrocarbon fluids - General requirements
for automatic tank gauges - Part 1: Automatic tank gauges for
liquefied natural gas marine floating storage**

Issued on: October 12, 2022

Implemented on: October 12, 2022

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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3.1 Terms and Definitions

foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents" drafted.

This document is the first part of GB/T 37770 "General requirements for automatic level gauges for refrigerated light hydrocarbon fluids". GB/T 37770 has

The following sections were published.

--- Part 1. Automatic level gauges for offshore floating storage of liquefied natural gas;

--- Part 2. Automatic level gauges for shore-based refrigerated storage tanks.

This document is modified to adopt ISO 18132-1.2011 "General requirements for automatic level gauges for refrigerated light hydrocarbon fluids and non-petroleum-based liquefied gases

Part 1. Automatic level gauges for LNG marine carriers and floating storage.

Compared with ISO 18132-1.2011, this document has made the following structural adjustments.

--- Added "normative references" chapter (see Chapter 2).

The technical differences between this document and ISO 18132-1.2011 and their reasons are as follows.

--- Added the definition of "not applicable to ATG for pressurized storage tanks", and changed the content summary to make it more accurate and clear (see Chapter 1),

To improve the suitability of the document;

--- Delete the custody transfer metering system in the term (see ISO 18132-1.2.1.4 of

the.2011 edition), because it is not used in this document;

--- Delete CTMS, EMC, LPG in the abbreviations (see ISO 18132-1.2.2 of the.2011 edition), because this document is not used;

---In order to ensure the dynamic response of the ATG, the guide pipe should "clearly define the number and size of openings, and confirm that the stress of the openings is fully "Enough to use the requirements" (see 5.4) to increase the operability and normativeness of the document;

--- Change the clause that expresses the uncertainty of the measurement result of the reference standard from the recommended type to the required type (see 7.2.1), so as to be consistent with 7.2.2,

7.2.3 Content harmonization.

The following editorial changes have been made to this document.

--- In order to harmonize with existing standards and conform to industry expression habits, the name of the standard has been changed to "General

Requirements Part 1. Automatic Level Meters for LNG for Offshore Floating Storage";

--- Delete the notes of some clauses (see ISO 18132-1.2.1.3, 2.1.7, 6.3 of the.2011 edition);

--- Replaced IEC 60079-0 with the informative reference GB 3836.1 (see 4.2.1);

--- Added GB/T 24964 (see 5.7, E.2, E.5) and GB/T 24959 (see 5.7) for informative references;

--- Adjust the references in Appendix A, Appendix B, Appendix C, Appendix D to "Cycle Certification Method" (see 8.2).

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

This document is Part 1 of GB/T 37770 "General Requirements for Automatic Level Gauge for Refrigerated Light Hydrocarbon Fluids". GB/T 37770 is proposed by

Consists of three parts.

--- Part 1. Automatic level gauges for offshore floating storage liquefied natural gas. Aimed at offshore LNG carriers or floating

Safety precautions, design requirements, installation, standard

Accuracy, calibration and verification, calibration records, etc.

--- Part 2. Automatic level gauges for shore-based refrigerated storage tanks. The purpose is to liquefy near atmospheric pressure liquefaction stored in onshore storage tanks

Requirements for the performance, installation, testing and calibration of automatic level gauges (ATGs) for natural gas.

--- Part 3. Automatic level gauges for liquefied petroleum gas and chemical gas marine carriers and floating storage. aimed at liquefied petroleum

Safety precautions, design of automatic level gauges (ATGs) used in gas and chemical gas marine carriers and floating custody transfer metering

requirements, installation, accuracy, calibration and verification, calibration records, etc.

The revision of this document adopts ISO 18132-1:2011, and is compiled in combination with relevant domestic standards. Compared with ISO 18132-1.

In 2011, the applicability, operability and normativeness of the document were enhanced.

General requirements for automatic level gauges for refrigerated light hydrocarbon fluids

Part 1. Offshore floating storage of liquefied natural gas

automatic level gauge

1 Scope

This document specifies automatic level gauges (ATG) for liquefied natural gas (LNG) marine carriers or floating storage custody transfer metering

General requirements for safety precautions, design, installation, accuracy, calibration and verification, calibration records, etc.

This document applies to fully refrigerated (ie at low temperature) or partially refrigerated LNG storage tanks with a pressure equal to or close to atmospheric pressure

ATG, not suitable for ATG for pressurized storage tanks.

2 Normative references

There are no normative references in this document.

3.1 Terms and Definitions

The following terms and definitions apply to this document.

3.1.1

Automatic level gauge automatic tank gauge; ATG

Instruments for continuous measurement of liquid level (actual or empty) installed in the cargo hold.

Note 1 to entry. ATG usually includes level sensors, gauges and associated mounting hardware and, in some cases, a local display.

Note 2. ATGs are also often referred to as automatic liquid level (gauge) gauges (ALGs).

3.1.2

The output signal from the ATG instrument is processed and displayed by the ATG instrument in the cargo hold, along with any other parameters needed to determine the liquid level.

A system consisting of control and display units for data (eg liquid/vapor interface).

Note. The ATG metering system calculates the volume of LNG in the cargo tank through the values of the cargo tank temperature, pressure, draught and cargo tank capacity table.

3.1.3

Capacitance ATG capacitance-type ATG

The ATG of the liquid level is determined by detecting the dielectric constant of the LNG using electrodes mounted vertically in a coaxial aluminum casing of the cargo tank.

3.1.4

Servo ATG float-type ATG

Float ATG

An ATG that uses a float to detect the liquid level.

Note. The float is guided by a steel ruler or wire and is connected to a reel or gear in the gauge head, where the metered liquid level is displayed locally or remotely.