

Unofficial Translation

Notification of the Ministry of Commerce

Regarding Prescription of Type and Characteristic of Automatic Level Gauge for Measuring The Height of The Level of Liquid Contained in Storage Tanks, Detail of Materials Used for Manufacturer, Maximum Permissible Error and Term of Verification

By virtue of Section 5, paragraph two of Section 8, Section 16, Section 26 and Section 33 of the Measurement Act, B.E. 2542 (1999), as amended by the Measurement Act (No.3), B.E. 2557 (2014), the Minister of Commerce, upon the recommendation of the Weights and Measures Committee, has therefore issued this Notification, as follows.

Article 1. This Notification shall come into force upon the expiration of ninety days from the date of its publication in the Government Gazette.¹

Article 2. In this Notification:

“Maximum Permissible Error : MPE” means the value of the extreme deviation of the gauge as permitted;

“Discrimination” means the efficacy of the gauge in the response to a change in the small value of the volume as measured;

“Zero Setting Device” means the part which is used to set the gauge to display the zero value;

“Indicating Device” means the part of the gauge which is used to display the value of material volume as measured;

“Rated Operating Conditions” mean the conditions of the use of the gauge which still provide correct results within the maximum permissible error, e.g. the type of liquid, the density of liquid, the viscosity of liquid, the temperature and the pressure of liquid, including other stipulations which affect the operation of the gauge;

“Scale Mark” means the scale or other sign on the indicating device which is used to indicate the value of volume as measured;

¹ Published in the Government Gazette, Volume 135, Special Part 271 d, Page 7, dated 29 October B.E. 2561 (2018).

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“Scale Interval” means the distance between two consecutive scale marks by measuring along the middle of the smallest scale mark;

“Capacity” means the distance of length between the zero scale mark and the highest scale mark;

“Liquid Level Sensor” means the part which is used to measure the level of liquid and to transmit information to the indicating device directly or through a transducer, whereby there are 2 types, i.e.

(1) the movable liquid level sensor, i.e. the liquid level sensor which directly senses the liquid contained in the tank and moves vertically along with the changing liquid level,

(2) the non-moving liquid level sensor, i.e. the liquid level sensor which is installed immovably and has a device to transmit the wave signal to touch the surface of liquid and then reflect back to the receiver of the wave signal of the gauge;

“Dipping Datum Point” means the intersection of the vertical measurement axis with the upper surface of the dip plate, or with the bottom surface of the tank if a dip plate is not provided, it constitutes the origin for the measurement of liquid levels in the tank according to Figure 1;

“Dip Plate” means the horizontal plate which is installed at the bottom of the tank located along the vertical measurement axis descending from the upper reference point according to Figure 1;

“Dip” means the ullage or height of liquid as measured vertically from the dipping datum point to the surface of liquid according to Figure 1;

“Upper Reference Point” means the top point of the tank which is used to be the reference position of ullage or height according to Figure 1;

“Ullage or Height” means the distance of height of the space in the tank as measured from the surface of liquid to the upper reference point of the tank according to Figure 1.

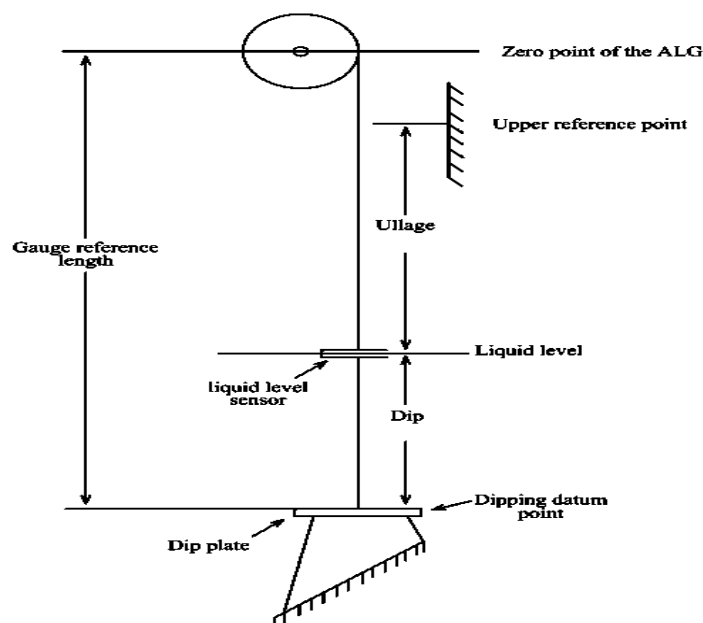


Figure 1

Title 1

Gauge Being Subject to Measurement Act, B.E. 2542 (1999),
as Amended by Measurement Act (No. 3), B.E. 2557 (2014)

Article 3. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks in the condition of liquid in the stationary great volume under atmospheric pressure or pressure being higher than atmosphere and at environment temperature or being higher or lower environment temperature, shall be the gauge being subject to the Measurement Act, B.E. 2542 (1999), as amended by the Measurement Act (No. 3), B.E. 2557 (2014).

The automatic level gauge for measuring the height of the level of liquid contained in storage tanks is the gauge to be used for measuring the level of the height of liquid in stationary storage tanks automatically and compared with the reference point.

Title 2

Characteristic, Detail of Materials Used for Production, Maximum Permissible Error
and Term of Verification

Chapter 1

General Provisions

Article 4. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks which is used in purchasing – selling or exchanging goods with other persons, or providing the service of measurement or using the gauge for the benefit of calculating considerations, taxes and fees, shall have the feature as specified in this Notification.

In the case of any person who wishes to manufacture or import the gauge, the feature of which differs from that as specified in this Notification, the gauge shall be examined by the Central Bureau. If the result of examination appears that the standard feature of the aforesaid gauge does not differ that as specified in this Notification and the gauge is approved by the Minister of Commerce, a competent official is required to grant verification for the aforesaid gauge.

Article 5. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall be produced permanently. In addition, it shall not be simply used as a tool of fraud.

The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall be produced from good materials. In addition, it shall be designed and produced in a manner that when it is used as usual, it can always operate accurately. The components of the gauge can operate continuously without defect, bend or deformation, which affects the accuracy of the gauge. In the case of adjusting the gauge, the adjusted gauge is required to maintain the condition of accuracy appropriately.

In the case of necessity, the Central Bureau may test the prototype of the gauge in accordance with rules, procedures and conditions as stipulated by the Minister, upon the recommendation of the Committee.

Article 6. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall display the following details on the instrument. Such details shall be easily read, clearly and indelibly.

- (1) a name or a trademark of a producer, an importer or a seller,
- (2) a model which is specified the form of an instrument,
- (3) a series number of an instrument which is specified by a competent official.

The provision under paragraph one shall not be applied to the component which is separated from the gauge and necessary to the measurement including not affecting the accuracy of the measurement, or the gauge which cannot display the aforesaid details because of the state of the gauge or because of the display being possible to damage the gauge.

Article 7. The capacity of the automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall be displayed clearly and indelibly, provided that it may be displayed in the form of abbreviation.

The capacity under paragraph one shall be displayed in Thai or Arabic numbers and Thai alphabets or alphabets or symbols as specified by the Minister.

Article 8. The accuracy of the automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall be subject to the maximum permissible error as specified in this Notification.

The maximum permissible error for granting the initial verification and the subsequent verification shall be subject to the stipulation in Article 16.

The maximum permissible error for the examination of the used gauge shall be two times of the maximum permissible error for granting the initial verification.

Article 9. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall have the indicating device in a satisfactory manner and in a sufficient number for operation.

Article 10. The display of value of the automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall have the following characteristics.

(1) Display of Value in Type of Analog Indication

(a) The scale mark and the indicating device shall be designed appropriately and operate connectively.

(b) The scale mark, numbers, alphabets or other symbols shall be easily read, clearly and indelibly.

(c) If there are many places of the indicating device, every place shall display the consistent value.

(d) If there is the printing device, the value of printing shall be consistent with the value of displaying.

(2) Display of Value in Type of Digital Indication

(a) The display of value, whether using numbers, alphabets or other symbols unitedly or not, shall not cause confusion in reading the value.

(b) If there are many places of the indicating device, every place shall display the same value.

(c) If there are the indicating devices in both digital and analog types, the display of value in the digital type shall be consistent with the display of value in the analog type.

(d) If there is the printing device, the value of printing shall be consistent with the value of displaying.

(3) In the case of displaying the value of the gauge which can calculate the price, the sum of money shall be consistent with the volume of the measurement as displayed.

Article 11. The inscriptions of all of the controllers for operation, the indicating device and other equipment, including the switch of the automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall be made to be easily read, clearly and indelibly.

Article 12. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall provide a space for sealing so as to prevent the modification after the examination and verification. The gauge shall be modified or repaired after the sealing is destroyed.

Article 13. In the case where there is a software program to be used with the automatic level gauge for measuring the height of the level of liquid contained in storage tanks, and the aforesaid program results in the accuracy of the gauge,

(1) the program shall neither cause the accuracy of the gauge to deviate exceeding the maximum permissible error, nor express, print, calculate or record the value of the measurement result to deviate exceeding the maximum permissible error after the examination and verification, and there shall be protection methods to prevent the modification or the adjustment of the program by means of a mechanical seal or an electronic seal, e.g. an audit trail, or both methods together,

(2) the business operator of the gauge or the possessor is required to display a name, a model and a software identification relating to the program on the indicating device and/or the value recording device every time of closing or opening the gauge, or such data can be seen when an operator or a relevant person requires,

(3) the business operator of the gauge or the possessor is required to produce a complete guidebook to use the program in accordance with the use of the gauge, and the guidebook shall always be presented to a competent official or the Weights and Measures Inspector.

In the case of a software program to be used with the device which is extended further away from the gauge, the business operator of the gauge or the possessor shall take the following actions :

(1) to inform to a name, a model and a software identification relating to the program together with a product owner including other details to a competent official at the Central Bureau or the Branch Bureau within 15 days as from the date of the completion of installation,

(2) to display a name, a model and a software identification relating to the program and necessary information on the extended device clearly and indelibly.

Chapter 2

Automatic Level Gauge for Measuring Height of Level of Liquid Contained in Storage Tanks

Article 14. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall have the following characteristics.

(1) The gauge shall be used for measuring the height of the level of liquids being fuel oil, lubricating oil, liquefied petroleum gas, nectar obtained from plants, vegetable oil, milk and water.

(2) The gauge shall be made of good materials which do not harm users or other materials which have already been examined by the Central Bureau to be similarly qualified.

(3) Indicating Device

(a) The indicating device shall be able to display the value of measured volume as numbers immediately upon measurement.

(b) The indicating device shall display the value of the unit of length with clear alphabets or symbols.

(c) The principal scale mark shall have the value 1×10^k or 2×10^k or 5×10^k meters, by k being a positive or negative whole number or zero.

(d) As for the analog indicating device, the interval between scale marks shall not be less than 1 millimeter.

(e) If there are more than one indicating devices, the deviation of the difference of indicating devices shall not exceed 1 millimeter.

(f) The provisions in (b), (c) and (e) shall be applied to the printing device mutatis mutandis.

(4) Other components which are not stipulated in this Notification shall not adversely affect the accuracy of measurement if they are used with the gauge.

(5) The wire or the tape which is hung with the movable liquid level sensor and rolled in a storage shall be pulled out or rolled back into the storage smoothly without jam, and shall stretch and not drop while measuring.

(6) The change of the position of the liquid level sensor due to environmental conditions, e.g. vibration, temperature, vapor pressure or change in the type of liquid under conditions of normal use shall not exceed 1 millimeter.

(7) Installation of Liquid Level Sensor

(a) In the case of the storage tank having a channel for casting a level measuring plummet, the liquid level sensor shall be installed near to the channel for casting a level measuring plummet,

(b) The movable liquid level sensor shall move freely and equivalently along with the change of the level of liquid throughout the period of measuring.

Article 15. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks which contains electronics, shall have the following characteristics.

(1) In the case where there is an external disturbance, the gauge containing electronics shall be able to operate correctly, or shall display that there is an error occurring from such a disturbance.

(2) In the case where the error that has occurred adversely affect the accuracy of the gauge, the gauge shall have to stop operating automatically, or show the error to a gauge user, and the show shall exist until the disappearance of such an error.

(3) In the case of switching on the gauge, the indicating device shall display all symbols which can be displayed.

(4) The gauge that can be powered by a battery shall operate correctly and continuously, or shall not display the value of height of the level of liquid when the potential difference obtained from the battery is too low from the specification of a manufacturer.

(5) The gauge shall prevent the disturbance of the signal of electromagnetic wave and the wave of radio frequency from adversely affecting the accuracy of the gauge, the indicating device, the recording device and the printing device.

(6) If the gauge provides a computer system or an associated device through an external signal connection equipment, the computer system and the associated device shall not cause the errors of measurement result and data. In addition, such devices shall not be able to transmit an order or data to the gauge to cause the gauge to display, to print, to calculate or to record the measurement result to be different from a situation where there is no such equipment connected to the gauge. Besides, the provision for sealing the aforesaid external signal connection equipment shall be made.

Article 16. The maximum permissible error for granting the initial verification and the subsequent verification shall have both positive and negative sides at rated operating conditions as follows:

(1) The maximum permissible error at the dip or the ullage or height of liquid shall be in accordance with the following table.

Automatic Level Gauge for Measuring The Height of the Level of Liquid in Storage Tanks	Maximum Permissible Error
Gauge not Being Installed on Storage Tanks Yet	1 millimeter
Gauge Being Installed on Storage Tanks	4 millimeters

(2) The discrimination value of the gauge at all levels of measurement shall not exceed 1 millimeter.

(3) The difference of value in the same level when there are the increase and the decrease of the level of liquid contained in storage tanks shall not exceed 1 millimeter.

Article 17. In displaying signs, the following details shall be displayed to be able to read easily, clearly and in a permanent manner.

- (a) the rated operating conditions,
- (b) the scope of measurement,
- (c) the highest and lowest temperatures of the liquid as measured,
- (d) highest and lowest pressures in the storage tank,
- (e) the highest and lowest values of the density of liquid,
- (f) the diameter size of the wire or the thickness of the tape and the weight of the liquid level sensor in the case of the automatic level gauge for measuring the height of the level of liquid contained in storage tanks which has the liquid level sensor or the frequency range, in the case of the gauge which applies electromagnetic wave or audio wave.

Article 18. The automatic level gauge for measuring the height of the level of liquid contained in storage tanks shall have the term of verification for 2 years as from the date of granting the verification.

In the case where the automatic level gauge for measuring the height of the level of liquid contained in storage tanks is verified by a repairer, there shall be the term of verification for 60 days as from the date of granting the verification.

Given on the 26th Day of September B.E. 2561 (2018)

Sontirat Sontijirawong

Minister of Commerce