



Australian Government
Department of Industry,
Innovation and Science

**National
Measurement
Institute**

**Interim
Provisional
Certificate of Approval
NMI P9/2/6**

VALID FOR VERIFICATION PURPOSES UNTIL 1 DECEMBER 2018

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Alfons Haar Model PreciGAUGE Vehicle Tank Measuring System

submitted by HAAR Australia Pty Ltd
 3/10 Law Court
 Sunshine West VIC 3020

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 80-1 Road Tankers with Level Gauging, Part 1 Metrological and Technical Requirements and Part 2 Metrological and Technical requirements, dated November 2014.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	31/11/17

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI P5/6B/218' and only by persons authorised by the submitter. (Note: The 'P' in the approval number may be a temporary marking.)

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate of Approval No S1/0B.

Special Conditions of Approval: (Provisional Approval)

This approval is limited to five (5) instruments only, the serial numbers of which may be obtained from the National Measurement Institute. The submitter shall advise NMI in writing of the serial number of each instrument prior to it being initially verified.

The approval will remain provisional pending completion of satisfactory testing and evaluation.

The submitter shall provide NMI with copies of test results from the initial verification and all subsequent tests.

In the event of unsatisfactory performance the approval may be cancelled (or altered).

The submitter shall implement such modifications as required by NMI. In the event that such modifications (if any are required by NMI) are not made to the satisfaction of NMI, this approval may be withdrawn.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Mr Darryl Hines

TECHNICAL SCHEDULE No P9/2/6

1. Description of Pattern **provisionally approved on 13/06/14**

An Alfons Haar Model PreciGAUGE road and rail tanker level gauging system approved for measuring the quantity of the liquid hydrocarbon products other than LPG in the tank/compartments.

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

- Minimum measured quantity, V_{min} 1000 L
- Capacity of road tanker 0.5 m³ to 50 m³
- Capacity of rail tanker 10 m³ to 120 m³
- Inclination $\pm 5^\circ$
- Dynamic viscosity, η (at 20°C) 0.4 to 20 mPa.s (#1)
- Liquid temperature range -10°C to 50°C
- Ambient temperature range -25°C to 55°C
- Voltage of road vehicle battery 24 VDC (nominal)
- Accuracy class for system Class 0.5
- Applications Road and rail tankers

(#1) The system is adjusted to be correct for the liquid for which it is to be verified as marked on the data plate

1.2 The System

This automatic tank gauging system measures the level in a horizontal tank (measuring vessel), with compensation for the angle of inclination, in x and y direction in respect of horizontal.

The system is intended for volume measurement on a tanker. During normal operation, the volume is displayed on the calculator/indicator; this volume is *derived from the measured level in the compartment and pipework; all product after the external valve (API coupling) is deemed to be the delivered quantity* – this can be achieved gravity or pumped discharge.

Apart from the product volume at delivery temperature, on the basis of standard conversion methods the product volume at reference product temperature may also be viewed displayed.

1.3 Components of the Measuring System

The system includes:

- A tank which may have a number of compartments, and which is designed to comply with NMI General Certificate 9/0/B for Vehicle Tanks of Capacities 0.5 to 105 kilolitres.
- The PreciGauge is powered by the tank truck battery (24 V DC nominal) as the power supply.
- A FAFNIR model 908734-XXX series electronic dipstick. (xxx defines the length of the dipstick.)

- An Alfons Haar Model CountMASTER 4A calculator/indicator unit with a liquid crystal type display. For the purpose of meter verification the calculator/indicator has provision for displaying the delivery of liquid in litres. (Figure 6)

1.4 Auxiliary Flowmeter

The PreciGAUGE system may be installed as a standalone system or on the PreciPURE or PreciTURBO liquid measuring system as described in the documentation of approval NMI 5/6B/218.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Provision is made for the PreciGAUGE to be sealed by sealing bolts and wires outside the gauge, and by a write-protection switch on the CPU module of the CountMASTER 4A calculator/indicator.

1.7 Descriptive Markings and Notices

Instruments are marked with the following data, together in one location, in the form shown at right:

Pattern approval number	NMI No P9/2/6
Manufacturer's identification mark or trade mark
Model number
Serial number
Year of manufacture
Liquid temperature range	... to ...°C
Maximum volume Litres
Minimum volume Litres
Accuracy class	class 0.5

In addition, tanks shall comply with any relevant requirements given in NITP 9 *National Instrument Test Procedures for Vehicle Tanks* in regard to markings, numbering and notices.

TEST PROCEDURE 9/2/6

The measuring system can be verified using the procedures given in the NMI documents NITP 9 *National Instrument Test Procedures for Vehicle Tanks* and General Certificate 9/0/B *Vehicle Tanks of Capacities 0.5 to 105 kilolitres*.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

The maximum permissible errors, that is, the difference between the volume transferred as indicated by the instrument and the transferred volume measured using traceable equipment, are:

- ±0.5% for the measuring system (in-service inspection); and
- ±0.3% during calibration adjustment of the instrument.

The verification may be carried out by either delivering a traceable volume into the tank compartment, or alternatively by dispensing the liquid from the tank compartment via traceable volume measuring equipment.

Within the field of operation, the reference equipment must be able to measure the volume at any level in the-tank compartment with sensitivity at least three times better than a volume equivalent to ±1 mm change in liquid level.

Up to 200 calibration points can be entered to define the tank profile (height versus volume). The tank profile shall be determined at an appropriate number of intervals to ensure that for contents in the tank greater than 2 × minimum measured quantity, the interpolated volume between two adjacent calibration points is within 0.3%.

For each tank, the calibration points shall include the minimum liquid level (rounded up to the nearest 10 L) and the maximum liquid level (rounded down to the nearest 10 L). These maximum and minimum volumes for each tank/compartment shall be indicated to the user as the operating range of the instrument.

Signed by a person authorised by the Chief Metrologist
to exercise their powers under Regulation 60 of the
National Measurement Regulations 1999.

Mr Darryl Hines

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