Australian Government

National Measurement Institute

12 Lyonpark Road, North Ryde NSW 2113

Cancellation

Supplementary Certificate of Approval

No S351

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

This is to certify that the approval for use for trade granted in respect of the

Liquip Model EMH 500 Indicator for Liquid-measuring Systems

submitted by Liquip International Pty Limited
13 Hume Road
Smithfield NSW 2164

has been cancelled in respect of new instruments as from 1 May 2006.

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

National Standards Commission

Supplementary Certificate of Approval

No S351

Issued under Regulation 9
of the
National Measurement (Patterns of Measuring Instruments) Regulations

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

Liquip Model EMH 500 Indicator for Liquid-measuring Systems

submitted by Liquip Sales Pty Limited
13 Hume Road
Smithfield NSW 2164.

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.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 March 2003, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No S351 and only by persons authorised by the submittor.

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Instruments incorporating a component purporting to comply with this approval shall be marked NSC No S351 in addition to the approval number of the instrument.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the Commission 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 the Commission's Document 106.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

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

DESCRIPTIVE ADVICE

Pattern: approved 20 February 1998

- A Liquip model EMH 500 Indicator for use in Commission-approved liquid-measuring systems.

Variant: approved 14 May 1998

1. With a Liquip model ERP 100 remote pulse transmitter.

Variant: approved 14 August 1998

2. With an electronic volume conversion for temperature facility.

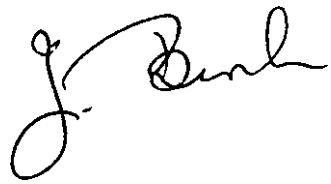
Technical Schedule No S351 describes the pattern and variants 1 & 2.

FILING ADVICE

The documentation for this approval comprises:

Supplementary Certificate of Approval No S351 dated 26 August 1998
Technical Schedule No S351 dated 26 August 1998 (incl. Table 1 & Test Procedure)
Figures 1 to 6 dated 26 August 1998

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Measuring Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.



TECHNICAL SCHEDULE No S351

Pattern: Liquip Model EMH 500 Indicator for Liquid-measuring Systems

Submittor: Liquip Sales Pty Limited
13 Hume Road
Smithfield NSW 2164.

1. Description of Pattern

A Liquip model EMH 500 indicator with integral pulse transmitter (Figure 1) for use in liquid-measuring systems incorporating Commission-approved flowmeters in either fixed or vehicle-mounted installations approved for accuracy classes 1.0, 0.5 and 0.3. The indicator incorporates a linearity correction facility, a batch pre-set facility, and may be fitted with output sockets for the connection of auxiliary and/or peripheral devices.

1.1 Signal Interface

The integral pulse transmitter comprises a 25 slot disk with three opto-coupled sensors positioned to produce a combined output of 150 pulses per revolution of the input shaft. The sensors are bi-directional with a maximum specified shaft speed of 1000 rpm.

1.2 Power Supply

The instrument operates on a nominal 24 V DC power supply and is provided with a model UPS100-240 uninterruptible power supply battery back-up (Figure 2), for applications other than vehicle-mounted systems. The EMH 500 is approved with a model EJB101 power junction box (Figure 3) which incorporates relays for optional control of two stage flow control valves.

1.3 Display

The indicator has two liquid crystal displays, the top display is for displaying the delivered volume whereas the bottom display is mainly for use with the pre-set facility.

The volume display can be set to indicate the maximum delivered volume as follows:

99999.9 L when the resolution is set to 0.1 L
9999999 L when the resolution is set to 1 L or 10 L

The totaliser reading is similarly displayed depending on the resolution setting.

1.4 Calibration

The relationship between the meter volume throughput and the volume displayed by the model EMH 500 indicator is defined by the value of K-factor, which is entered via the calibration mode. The maximum and minimum value of K-factor that can be entered is 500.0000 and 1.0000 pulses/litre respectively.

1.5 Linearity Correction Facility

With the linearity correction facility enabled, eight correction factors can be entered as a function of flow rate.

1.6 Verification/Certification Provision

Provision is made for a verification/certification mark to be applied.

1.7 Sealing Provision

Provision is made for the calibration adjustments to be sealed by means of the sealing screws provided.

1.8 Markings

Instruments carry the following markings, in the form shown at right:

Manufacturer's mark, or name written in full	Liquip
Model number	.....
Serial number	.....
Accuracy class	.....
Pattern approval mark	NSC No S351
Year of manufacture	.....
Maximum temperature of the liquid	T_{max} *
Minimum temperature of the liquid	T_{min} *
Type of liquid	..... *

* For Variant 2 only.

2. Description of Variants

2.1 Variant 1

With a Liquip model ERP 100 remote pulse transmitter (Figure 4), for use up to 1000 rpm and with 150 pulses per input shaft revolution.

2.2 Variant 2

Fitted with an electronic volume conversion for temperature facility to convert the measured volume to volume at 15°C. Activation of the volume conversion feature is indicated by the symbol □ in the top left-hand corner of the display and is activated via the management mode for the following products:

- Liquefied petroleum gas with a density between 0.500 and 0.600 kg/L in steps of 0.005 kg/L, based on ASTM-IP-API Petroleum Measurement Table 54 for LPG.
- Generalised products with a density range from 0.660 to 1.050 kg/L, in steps of 0.001 kg/L, based on ASTM-IP-API Petroleum Measurement Table 54B for Generalised Products.

The volume conversion facility incorporates a temperature probe approved from -15°C to +55°C.

For volume converted deliveries other than LPG, the indicator is marked “Litres at 15°C” or similar. With volume conversion (volume conversion for temperature) activated, the unconverted volume or the temperature can be momentarily viewed by pressing the Totals button twice for unconverted volume or pressing the button five times for temperature display.

The volume conversion facility is approved for use with either the Liquip model Blaster BD 4220 printer (Figure 5) or the Epsom model TM-295 printer (Figure 6), for providing the delivery details and the manually entered density for which the volume conversion device is set. The printers are approved for Class B environment conditions, covering the range -10°C to +40°C, and are so marked.

For LPG measurements, the instrument is approved for applications other than for direct selling to the public.

TEST PROCEDURE

Instruments should be tested in accordance with any tests included in the approval documentation for the flowmeter/s to which the pattern is connected, as appropriate, and in accordance with any relevant tests specified in the Inspector’s Handbook.

The maximum permissible errors applicable are those specified below and those specified for the flowmetering system to which the pattern is connected, as stated in the approval documentation for the system.

To check the volume for temperature conversion device, carry out not less than three deliveries and record the displayed volume at 15°C, the displayed volume at operating conditions (i.e. the unconverted volume), and the average temperature of the liquid metered.

When checking the linearity correction facility, reference should be made to the operating manuals.

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Check that the temperature displayed by the instrument is within:

±0.3°C for class 0.3
±0.5°C for class 0.5 and class 1.0

Apply the necessary volume conversion factors to the unconverted volume using the appropriate ASTM-IP-API tables and compare with the displayed volume at 15°C.

The maximum permissible error for the conversion of volume at the indicated temperature is:

±0.2% for LPG temperature conversion, tested at the set density.
±0.1% for temperature conversion of generalised products, tested at the set density.

S351
10 February 2005

Australian Government

National Measurement Institute

12 Lyonpark Road, North Ryde NSW 2113

Notification of Change
Supplementary Certificate of Approval No S351
Change No 1

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

The following change is made to the approval documentation for the

Liquip Model EMH 500 Indicator for Liquid-measuring Systems

submitted by Liquip Sales Pty Ltd
13 Hume Road
Smithfield NSW 2164.

In Supplementary Certificate of Approval No S351 and its Technical Schedule, both dated 26 August 1998, all references to the submittor should be amended to read:

'Liquip International Pty Limited'

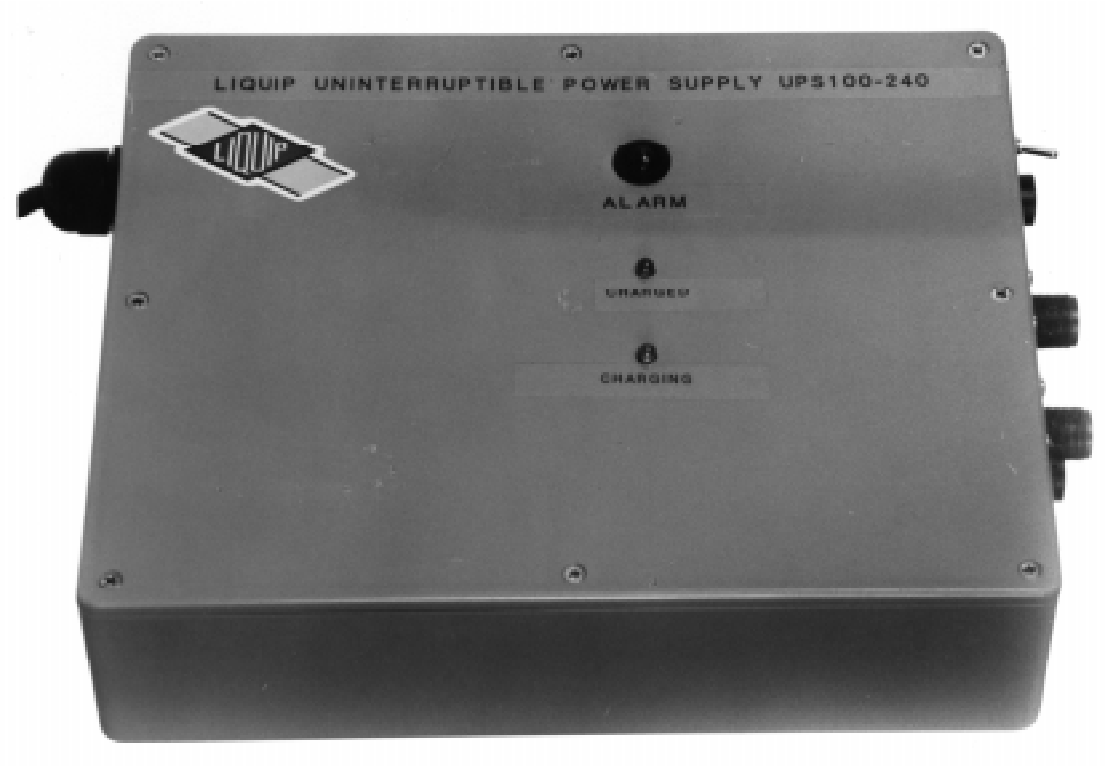
The address remains unchanged.

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

FIGURE S351 - 1

Liquip Model EMH 500 Indicator

FIGURE S351 - 2



Liquip Model UPS100-240 Uninterruptible Power Supply

FIGURE S351 - 3

Liquip Model EJB101 Junction Box

FIGURE S351 - 4

Liquip Model ERP 100 Remote Pulse Transmitter

FIGURE S351 - 5

Liquip Model BD 4220 Printer

FIGURE S351 - 6

Epsom Model TM-295 Printer