



Australian Government
Department of Industry,
Innovation and Science

**National
Measurement
Institute**

**Interim
Provisional
Supplementary Certificate of Approval
NMI PS723**

VALID FOR VERIFICATION PURPOSES UNTIL 15 JULY 2017

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.

A Transponder Technologies Model T50 Calculator/indicator for Bulk Loading Systems

submitted by Transponder Technologies Pty Limited
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 Export Park
 Adelaide Airport SA 5950

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 of the pattern has been granted with reference to document NMI R 117-1, Measuring Systems for Liquids Other than Water, June 2011.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	15/07/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI PS723' and only by persons authorised by the submitter.

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.

Special Conditions of Provisional Approval:

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

Instruments purporting to comply with this approval shall be marked with approval number 'NMI PS723' and only by persons authorised by the submitter. (Note: The 'P' in the approval number may be a temporary marking.)

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

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.

1. Description of Pattern **provisionally approved on 15/07/16**

A Transponder Technologies model T50 calculator/indicator bulk loading system for use in liquid-measuring and flow control systems incorporating NMI-approved flowmeters.

1.1 Field of Operation

The field of operation is determined by the following characteristics:

- Environmental class -10°C to 55°C
- Liquid density range 600.0 kg/m³ to 999.9 kg/m³
- Liquid temperature -10°C to 55°C
- Input power supply 204 V to 264 V AC
- Maximum input frequency 1,500 Hz per channel (two channel input)
- Accuracy class Class 0.5

2.1 Key Features

The model T50 bulk loading system (BLS) comprises the following devices:

- T50 BLS Control Unit, which is the main control/calculator device of the system constructed in two versions, either with or without an external User Interface comprising a display, a keypad, an iButton™ reader and Start/Stop buttons.

The version with the user interface components is the T50 BLS Load Control Unit and the version without the user interface components is the T50 BLS Expansion Control Unit.

- T50 BLS Control Unit power supply, which is the electrical input power conditioning device and electrical control interface between the T50 BLS control module and liquid pumping units and flow control valves.

The T50 BLS control module comprises the following components:

- TT model T5b calculator;
- TT model T5 Temperature Probe Interface Card (optional);
- The following optional user interface components:
 - Dot matrix liquid crystal display;
 - 16-button keypad with the following keys:
 - 10 numeric keys 0 to 9;
 - 4 specific purpose keys “NO”, “YES”, “CLR” and “ENT”;
 - 2 general purpose keys “*” and “#”;
 - iButton™ reader;
 - “START/RESUME” and “STOP/PAUSE” buttons.

The T50 BLS Control Unit provides the following main functions of the system:

- Monitoring of the state of liquid overfill prevention devices;
- Monitoring of the state of static ground verification devices;
- Control of the flow of liquid through one or two flowmeters (loading-arms) via electronic switching circuits in the T50 BLS Power Control & Supply Unit device, which can control either:
 - Two-stage solenoid control valves; or
 - Variable flow control valves;
- Measurement of the flow of liquid through one or two flowmeters.

When fitted with the optional user interface components, the T50 BLS Load Control Unit also provides the following functions systems:

- Configuration of system parameters, including:
 - Volume increments (i.e. number of displayed decimal places);
 - Liquid density;
 - Control valve operation (i.e. 2-stage or variable flow control operation);
- Identification of the system user and/or tanker to be filled;
- Selection of a pre-set volume of liquid to be delivered;
- Displaying of the following system parameters during an active delivery:
 - Delivered volume;
 - Flowrate;
 - Liquid temperature;
 - Residual volume (i.e. volume remaining to be delivered until pre-set volume is delivered);
 - State of control valve during delivery;
 - Non-resettable total volume delivered through a flowmeter (displayed at the end of a delivery).

The displaying of system parameters can be scrolled automatically during an active delivery or manually selected by the user.

The maximum value of delivery volume, and pre-set volume, amount is 99,999 litres.

The maximum value of non-resettable total volume 99,999,999 litres.

Multiple T50 BLS Control Units can be linked to increase the number of sets of flowmeters/loading-arms controlled by the system to greater than two up to a maximum of twenty sets.

Linearity Correction

The maximum pulse generator frequency supported by the T50 BLS is 1.5 kHz. A pulse generator that produces 1 pulse per litre requires a k-factor of 00.4000 to be set. The k-factor range is 0.1000 to 99.0000.

The configuration switch that allows the k-factor to be changed can be sealed using a wire seal on the T5b calculator PCB assembly and/or via a wire seal through the lid of the T50 BLS Control Unit which then prevents access to the configuration switch.

Checking Facilities

The display incorporates a checking facility (message CRC) to ensure that display data is received accurately from the T5b calculator. Litre quantities are displayed with a character height of 15 mm. A display segment test is performed at the start of the delivery.

The T5b calculator monitors the presence and correct transmission of signal from the measurement transducer, and in the event of detecting a fault the instrument indicates an error code and has provision for deactivating the control valves to stop the delivery.

If a delivery is in progress when power fails the system records the amount delivered at the point of power failure.

The delivery will stop if the liquid temperature is measured outside of the allowable range.

Pulse Generators

The system operates with any NMI-approved pulse generators that produce signal frequencies below the maximum permissible 1.5 kHz.

(#) 'Compatible' is defined to mean that no additions/changes to the hardware/software specified in this approval are required for satisfactory operation of the system.

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



Mario Zamora