

Australian Government

Department of Industry, Science, Energy and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval NMI 5/6A/237

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.

Transponder Technologies Model 805-B-P11-P40-RR-P Fuel Dispenser for Motor Vehicles

submitted by Transponder Technologies Pty Ltd 119 Hayward Avenue Torrensville SA 5031

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 117 Measuring Systems for Liquids Other than Water, dated June 2011.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1,2 & 3 approved – certificate issued	29/08/19
1	Variants 4 to 7 approved – certificate issued	13/08/21

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6A/237' and only by persons authorised by the submittor.

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 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 No S1/0B.

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

Darryl Hines Manager Policy and Regulatory Services

TECHNICAL SCHEDULE No 5/6B/237

1. Description of Pattern

Transponder Technologies model 805-B-P11-P40-RR-P Fuel Dispenser for Motor Vehicles (Figure 1) approved to dispense various grades of fuels, in attendant-operated mode.

The pattern, model 805-B-P11-P40-RR-P, is an **805** series fuel dispenser based on the **B**ennett Pump Company hydraulic components (805-B) with a single internal suction **P**ump unit and **1** inlet and **1** outlet (P11), dispensing **P**etrol at a nominal flow rate of **40** litres per minute with a two-stage **S**olenoid valve to control flow (P40), two **R**etail display units indicating price, volume and unit-price (RR) and a **P**reset facility (P).

1.1 Field of Operation

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

•	Minimum measured quantity (Vmin)	5 L
•	Maximum flow rate (Q _{max})	80 L/min
•	Minimum flow rate (Qmin)	4 L/min
•	Maximum pressure of the liquid (<i>P</i> _{max})	350 kPa
•	Minimum pressure of the liquid (P_{min})	70 kPa (nominal) (#2)
•	Range of liquids viscosity	0.5 to 20 mPa.s (at 20°C) (#1)
•	Liquid temperature range	-10°C to 50°C
•	Ambient temperature range	-10°C to 55°C
•	Accuracy class	0.5
	-	

- (#1) Minimum pressure required for effective operation of the gas elimination device.
- (#2) The flowmeter is adjusted for use with one product viscosity. Fuels include kerosene, distillate and various grades of petrol (which may include up to 10% ethanol). The pattern and variants constructed for use to dispense various grades of pure biodiesel and biodiesel/distillate blends (to Australian government standard). (*) Fuels include petrol, diesel and kerosene.

1.2 System Components

The model 805-B-P11-P40-RR-P has the following components or features:

- One Bennett model SB100 4-piston positive displacement meter (Figure 2).
- One Bennett model Type 75 (T75) pumping unit (Figure 3) with an integrated gas separator, fitted with a gas test valve that has provision for sealing and driven by an external motor.
- One Transponder Technologies model ZDM quadratic pulse generator (Figure 4).
- One Transponder Technologies model T5b calculator/indicator as described in the documentation of NMI certificate of approval S414.
- A preset facility including an ASCO two-stage solenoid operated control valve fitted downstream from the meter.
- An Elaflex model BS3395/1989 16mm hose or any other compatible hose that meets the maximum permissible errors for hose dilation.

approved on 29/08/19

• One Elaflex model ZVA nozzle or any other compatible NMI-approved nozzles.

1.3 Measurement Transducer

The measurement transducer is a Bennett model SB100 4-piston positive displacement flowmeter fitted with a Transponder Technologies model ZDM quadratic pulse generator. The pulse generator is a dual channel pulse output device, each channel producing 30 for one revolution of the meter/pulse generator shaft.

1.4 Transfer Device

The transfer device is any approved nozzle that maintains the hose full of liquid at all times and is designed so that the nozzle cannot be placed in a hang up position other than to end the delivery.

1.5 Pre-set Facility

The pre-set keypad facility (Figure 5) allows pre-set values to be entered in '\$1' and '\$10' dollar increments up to a maximum of \$999. The pre-set amount is displayed on the price (\$) indicator of the display; the pre-set amount can be viewed before and after the delivery is complete by pressing the 'RCL' button situated in the pre-set pad. To cancel the pre-set amount, or to start again, the 'CLR' button is pressed.

1.6 Totaliser

The instrument has a Jenm Chicago model P2G729A 4.5 V DC electronic totaliser for the volume throughput in one litre graduations up to a maximum of 9 999 999 litres. The totaliser is located above the nozzle.

1.7 Checking Facilities

Removing the nozzle from its normal hang-up position initiates a segment check of the price, volume, and unit price displays.

- 'Error 19' is displayed and the delivery stopped if excessive amounts of air/vapour are detected;
- 'Error 17' is displayed and the delivery stopped when pulse output errors are detected; and
- 'Error 12' when the non-return valve is faulty and the pulser is measuring reverse flow.

1.8 Calculator/Indicator

The Transponder Technologies model T5b calculator/indicator as described in the documentation of approval NMI S414 comprises a computing unit and two display units. Separate displays are provided for volume, price and unit price. The indicators display the following maximum values:

Total price:	\$9 999.99 in 0.01 cent increments
Volume:	9 999.99 in 0.01 L increments
Unit price:	999.9 ¢/L in 0.1 cent increments

The software version number for the calculator/indicator is 01291.

1.9 Descriptive Markings

Instruments are marked with the following data, together in one location on a data plate:

Pattern approval sign	NMI 5/6A/237
Manufacturer's identification mark or trade mark	
Manufacturer's designation (model number)	
Serial number	
Year of manufacture	
Environmental class	class N (#1)
Maximum flow rate (Q _{max})	L/min (#2)
Minimum flow rate (Qmin)	L/min (#2)
Maximum operating pressure (Pmax)	kPa
Minimum operating pressure (<i>Pmin</i>)	kPa
Nature of liquids to be measured	(#3)
Maximum temperature of the liquid, (T_{max})	50°C
Minimum temperature of the liquid, (T_{min})	-10°C

- (#1) See clause **1.1 Field of Operation.**
- (#2) The maximum and minimum flow rates when used with one or two pump operation shall be marked.
- (#3) e.g. distillate or D.

The minimum measured quantity (V_{min}) shall be clearly visible on any indicating device visible to the user during measurement, in the form "minimum delivery 5 L".

1.10 Sealing Provision

The gas separator test valve and the meter are sealed as shown in Figure 6.

The electronic calibration switch in the model T5b calculator/indicator has provision for sealing as described in the documentation of approval NMI S414.

1.11 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

2. Variant 1

approved on 29/08/19

Certain other models and configurations of the 805-B series of fuel dispensers. Model numbers are made up of a series of fields representing the various approved components/features, as follows:

(For example, the pattern is a model 805-B-P11-P40-RR-P).

Instrument series field – always:

805 representing the 805 series.

Meter field – always:

B representing the Bennett SB100 meter.

Hydraulic system field – either:

P – representing the 'Pump' version with internal pump/s; or

D – representing the 'Dispenser' version with one or more approved submersible turbine pump (STP) hydraulic systems. These hydraulic systems replace the equivalent components (i.e. motor, pump/strainer/gas separator,

and associated pipework) in any fuel dispenser covered by this approval, e.g. refer Figure 7.

Inlet/outlet field – either 11, 12, 22 or 24, comprised of:

1 or 2 as the first digit – representing the number of inlets; and

1, 2 or 4 as the second digit – representing the number of outlets.

End configuration field/s, one field for a single dispenser (e.g. the pattern, *-P40*) and two fields for dispensers with 2 or 4 outlets (e.g. *-P40*-P40*-*, refer Figure 8), representing the product/s and maximum flow rate/s.

Product – either:

D – representing distillate;

K - representing kerosene; or

P – representing petrol.

Note that a gas detection switch is fitted to all units dispensing distillate or kerosene which stops the flow when excessive amount of vapour or gas is entrained in the liquid.

Maximum flow rate, Q_{max} – either:

40 - representing 40 L/min; or

80 – representing 80 L/min ($Q_{min} = 8$ L/min and $V_{min} = 5$ L) and suitable for diesel or kerosene only. An Elaflex model Contislimline BS3395/1989 25 mm hose and an Elaflex model ZVA 25 mm nozzle or any other compatible approved components are used.

Display field – comprised of two characters representing the type of display fitted to each side of the dispenser (e.g. *-RR-*), either:

R representing a retail display (price-computing);

C representing a commercial display (volume only; or

B representing no display fitted, to 2nd side only.

Pre-set field – either:

P – representing that the pre-set facility is fitted; or

X – representing that no pre-set facility is fitted.

3. Variant 2

approved on 29/08/19

Models of the 805-B series of fuel dispenser operating in self-serve mode, whereby the dispenser is authorised by an attendant using a forecourt control device that communicates with the dispenser via a forecourt communications network and protocol.

Various forecourt communications protocols can be used and are defined by a field in the model number that is included after the preset field – either:

E – representing that Email FCN protocol is fitted; or

G – representing that Gilbarco FCN protocol is fitted; or

N – representing that New Zealand FCN protocol is fitted; or

X – representing that no FCN protocol is fitted.

Variant 3 4.

Models of the 805-B series of fuel dispenser fitted with the following:

- One or two Bennett model Type 140 (T140) pumping units (Figure 8) with an integrated gas separator, fitted with a gas test valve that has provision for sealing and each driven by a dedicated external motor.
- Two Bennett model SB100 4-piston positive displacement meters per each • T140 pumping unit (the total measured volume dispensed per hose is the sum of the volume measured through each meter).
- One Transponder Technologies model ZDM guadratic pulse generator per each SB100 meter.
- One ASCO two-stage solenoid operated control valve fitted downstream from each meter.
- One or two 38 mm ZVA nozzle or any other compatible NMI-approved nozzle.
- One or two Global 20 G1 31.5 mm R1 20CIT/SN EN853 (6.4 MPa maximum pressure) hose or any other compatible hose that meets the maximum permissible errors for hose dilation.
- One flow rate selector switch per each pumping unit that selects between one or two meter/valve operation and enables the operator to select the flow rate. One meter/valve operation provides a nominal maximum flow rate of 80 L/min and two meter/valve operation provides a nominal maximum flow rate of 140 L/min.

Such models are suitable for diesel or kerosene only and have a maximum flow rate, Q_{max} , of 140 L/min ($Q_{min} = 8$ L/min and $V_{min} = 10$ L), which is represented in the model numbers as per the following examples:

- 805-B-P11-D**140**-RR-P; or
- 805-B-P22-D140-K140-RR-P.

5. Variant 4

approved on 13/08/21

A Transponder Technologies model 805-OM025-P11-D150-RR Fuel Dispenser for Motor Vehicles (Figure 9) approved to dispense various grades of fuels, in attendant-operated mode.

The variant, model 805-OM025-P11-D150-RR, is an 805 series fuel dispenser based on the Trimec model Flomec OM025 flow meter (805-OM025) with a single internal suction Pump unit and 1 inlet and 1 outlet (P11), dispensing Diesel at a maximum flow rate of **150** litres per minute with a single-stage solenoid valve to control flow (D150), two Retail display units indicating price and volume and unitprice (RR).

5.1 **Field of Operation**

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

20 L

150 L/min

15 L/min

- Minimum measured quantity (V_{min})
- Maximum flow rate (Q_{max}) •
- Minimum flow rate (Q_{min})
- Maximum pressure of the liquid (P_{max})
 - 350 kPa Minimum pressure of the liquid (*P_{min}*) 70 kPa (nominal)
- Page 7 of 26

- NMI 5/6A/237 Rev 1 Range of liquids viscosity 0.4 to 20 mPa.s (at 20°C) (#1) Liquid temperature range -10°C to 50°C -10°C to 55°C Ambient temperature range 0.5
- (#1) Fuels include petrol, diesel and kerosene.

5.2 System Components

Accuracy class

•

The model 805-OM025-P11-D150-RR has the following components or features:

- One Trimec model Flomec OM025 A441-241QP positive displacement meter (Figure 10).
- One Bennett model Type 140 (T140) pumping unit (Figure 8) with an integrated gas separator, fitted with a gas test valve and driven by an external motor.
- One Parker Hannifin model XLG2O1540AA74DK 1.5-inch solenoid valve for • control of flow.
- One Transponder Technologies model T5b calculator/indicator as described in the documentation of NMI certificate of approval S414.
- A Global 20 G1 31.5 mm R1 20CIT/SN EN853 (6.4 MPa maximum pressure) hose or any other compatible hose that meets the maximum permissible errors for hose dilation.
- One Elaflex model ZVA nozzle or any other compatible Commission-approved nozzles.

5.3 Measurement Transducer

The measurement transducer is a Trimec model Flomec OM025 A441-241QP positive displacement meter incorporating two independent Hall Effect electronic pulse generators, which produce 54 pulses per litre in quadrature.

5.4 **Transfer Device**

The transfer device of the pattern as described above in clause **1.4 Transfer Device**

5.5 **Checking Facilities**

Removing the nozzle from its normal hang-up position initiates a segment check of the price, volume, and unit price displays.

- 'Error 17' is displayed and the delivery stopped when pulse output errors are detected; and
- 'Error 12' when the non-return valve is faulty and the pulser is measuring reverse flow.

5.6 Calculator/Indicator

The calculator/indicator of the pattern as described above in clause 1.8 Calculator/Indicator.

5.7 **Descriptive Markings**

Instruments are marked the data as described above in clause 1.9 Descriptive Markings.

5.8 Sealing Provision

The meter is sealed as shown in Figure 11.

The electronic calibration switch in the model T5b calculator/indicator has provision for sealing as described in the documentation of approval NMI S414.

5.9 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

6. Variant 5

approved on 13/08/21

Certain other models and configurations of the 805-OM025 series of fuel dispensers. Model numbers are made up of a series of fields representing the various approved components/features, as follows:

(For example, the pattern is a model 805-OM025-P11-D150-RR).

Instrument series field – always:

805 representing the 805 series.

Meter field – always:

OM025 representing the Flomec OM025 A441-241QP meter...

Hydraulic system field - either:

P – representing the 'Pump' version with internal pump/s; or

D – representing the 'Dispenser' version with one or more approved submersible turbine pump (STP) hydraulic systems. These hydraulic systems replace the equivalent components (i.e. motor, pump/strainer/gas separator, and associated pipework) in any fuel dispenser covered by this approval.

Inlet/outlet field – either **11** or **22**, comprised of:

1 or 2 as the first digit – representing the number of inlets; and

1, 2 or 4 as the second digit – representing the number of outlets.

End configuration field/s, one field for a single dispenser (e.g. the pattern, *-D150*) and two fields for dispensers with 2 outlets (e.g. *-D150-D150-*), representing the product/s and maximum flow rate/s.

Product – either:

D – representing distillate;

K – representing kerosene; or

Maximum flow rate, Q_{max} – always:

150 – representing 150 L/min

Display field – comprised of two characters representing the type of display fitted to each side of the dispenser (e.g. *-RR-*), either:

R representing a retail display (price-computing);

C representing a commercial display (volume only; or

B representing no display fitted, to 2nd side only.

7. Variant 6

approved on 13/08/21

Certain other models and configurations of the 805-OM series of fuel dispensers described in variant 5, which are capable of delivering fuel at higher flow rates as defined in Table 1, and have model numbers, as per variant 5 with the following differences:

Meter field – either:

OM040 representing the Flomec OM040 A441-241QP meter;

OM050 representing the Flomec OM050 A441-241QP meter; or

OM050E representing the Flomec OM050E A441-241QP meter;

Hydraulic system field – only:

D – representing the 'Dispenser' version with one or more approved submersible turbine pump (STP) hydraulic systems. These hydraulic systems replace the equivalent components (i.e. motor, pump/strainer/gas separator, and associated pipework) in any fuel dispenser covered by this approval.

Maximum flow rate, Q_{max} – either:

250 - representing 250 L/min (for 805-OM040 models);

450 - representing 450 L/min (for 805-OM050 models); or

580 – representing 580 L/min (for 805-OM050E models).

Refer to Table 1 below for further details of model variant specifications.

Flowmeter	Minimum	Minimum	Minimum	Pulses per
Model	Flow Rate -	Flow Rate -	Delivery V _{min}	Litre
	Q _{min} (L/min)	Q _{max} (L/min)	(L)	Per Channel
OM040	25	250	50	36
OM050	45	450	100	13
OM050E	58	580	100	9.6

Table 1

8. Variant 7

approved on 13/08/21

Certain "hybrid" models and configurations of the 805-B (Pattern and Variants 1 to 3) and 805-OM025 (Variants 4 and 5) series of fuel dispensers. Model numbers are made up of a series of fields representing the various approved components/features, as follows:

Instrument series field – always:

805 representing the 805 series.

Meter field – always:

B-OM025 representing the 1 x Bennett SB100 meter and 1 x Flomec OM025 A441-241QP meter.

Hydraulic system field – either:

P – representing the 'Pump' version with internal pump/s; or

D – representing the 'Dispenser' version with one or more approved submersible turbine pump (STP) hydraulic systems. These hydraulic systems replace the equivalent components (i.e. motor, pump/strainer/gas separator,

Inlet/outlet field – always 22, comprised of:

2 as the first digit – representing the number of inlets; and

2 as the second digit – representing the number of outlets.

End configuration field/s, two fields for dispensers with 2 outlets (e.g. *-D80-D150-*), representing the product/s and maximum flow rate/s.

Product – either:

D – representing distillate; or

K – representing kerosene.

Maximum flow rate, Q_{max} – either:

80 – representing 18 L/min (for SB100 meter); or

150 – representing 150 L/min (for OM025 meter).

Display field – comprised of two characters representing the type of display fitted to each side of the dispenser (e.g. *-RR-*), either:

R representing a retail display (price-computing);

C representing a commercial display (volume only; or

B representing no display fitted, to 2nd side only.

TEST PROCEDURE No 5/6A/237

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

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.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009.*

Hose Configuration

Where the serial number on the data plate is 12345, the nose serial number will be appended as shown in the figures below, e.g. 12345-1, 12345-2 or 12345-1A, 12345-1B.

805-B series 1 Outlet (Figure 15)

805-B series 2 Outlets (Figure 16)

805-B series 4 Outlets (Figure 17)

FIGURE 5/6A/237 - 1



Transponder Technologies model 805-B-P11-P40S-RR-P Fuel Dispenser



Bennett model SB100 4-piston positive displacement meter



Bennett model Type 75 (T75) pumping unit



Transponder Technologies model ZDM quadratic pulse generator

FIGURE 5/6A/237-5



The pre-set keypad facility

FIGURE 5/6A/237 - 6



Sealing of the SB100 meter





'Dispenser' version with one or more approved submersible turbine pump (STP) hydraulic systems.



Bennett model Type 140 (T140) pumping units



Transponder Technologies model 805-OM025-P11-D150-RR Fuel Dispenser (Variant 4)



Trimec model Flomec OM025 A441-241QP positive displacement meter (Variant 4)

FIGURE 5/6A/237 - 11



Sealing of the Trimec model Flomec OM025 meter (Variant 4)



Transponder Technologies model 805-OM025-P11 Fuel Dispenser (Variant 5)



Transponder Technologies model 805-B-OM025-P22 Fuel Dispenser (Variant 7)

FIGURE 5/6A/237 - 14



Transponder Technologies model 805-B-OM025-D22 (Variant 7)



Hose Configuration 805-B series 1 outlet model

FIGURE 5/6A/237 - 16



Hose Configuration 805-B series 2 outlet model



Hose Configuration 805-B series 4 outlet model

~ End of Document ~