Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 5/6B/208

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.

Compac Model MR400S Bulk Delivery System
submitted by Compac Industries Ltd
52 Walls Road
Penrose Auckland 1061
NEW ZEALAND.

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 becomes subject to review on 01/12/23, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variant 1 approved – interim certificate issued	30/11/05
1	Pattern & variants 1 to 3 approved – certificate issued	24/01/08
2	Pattern & variants 1 to 3 reviewed – notification of change issued	30/03/11

DOCUMENT HISTORY (cont…)

Rev	Reason/Details	Date
3	Pattern & variants 1 to 3 reviewed – Pattern Amended (Any compatible NMI approved Calculator/indicator) - certificate issued certificate issued	21/01/19

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number NMI 5/6B/208 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 Certificates No S1/0/A or 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
Pattern Approval, Policy and Licensing Section

TECHNICAL SCHEDULE No 5/6B/208

1. Description of Pattern approved on 30/11/05

A Compac Industries model MR400S bulk delivery system for ultra high flow rate deliveries of distillate and various grades of petrol, in attendant-operated mode.

1.1 Field of Operation

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

- Minimum measured quantity, V_{min} 20 L
- Maximum flow rate, Q_{max} 400 L/min
- Minimum flow rate, Q_{min} 40 L/min
- Maximum pressure of the liquid, P_{max} 350 kPa
- Minimum pressure of the liquid, P_{min} 100 kPa
- Viscosity range of liquid (at 20°C) 0.5 to 20 mPa.s (#)
- Maximum temperature of the liquid, T_{max} 50°C
- Minimum temperature of the liquid, T_{min} -10°C
- Ambient temperature range -25°C to 55°C
- Accuracy Class 0.5

(#) Flowmeter is adjusted for use with one product viscosity.

1.2 Hydraulic System

The Compac Industries model MR400S bulk delivery system (Figures 1 and 2) comprises:

(i) A submersible turbine pump (STP) system which has the capacity of achieving the maximum flow rate of 400 L/min.

(ii) A filter/strainer and check valve upstream of the flowmeter.

(iii) A Compac model COM 250 rotary vane positive displacement measurement transducer, fitted with an integral magnetic pulse generator.

(iv) In addition, a SHIP hydropneumatic accumulator, or compatible (#) device, may be connected downstream of the flowmeter to accommodate for the expansion and contraction of fuel, and to absorb any high liquid pressure peaks that may occur during deliveries.

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

(v) A Parker model E321G4010 50 mm solenoid-operated control valve, or other compatible (#) valve, is connected upstream of the hose for controlling the delivery.

(vi) A Parker (Goodyear) 50 mm hose, or other compatible (#) hose, downstream of the solenoid valve.

(vii) A TODO-MATIC 50 mm dry break coupling or other compatible (#) dry break coupling is fitted to the end of the hose and acts as the transfer device, which defines the start and finish of the measured volume, and is designed to maintain the hose full of liquid.

(viii) An optional electronic over-fill protection cable and connector may be provided at the side of the dispenser (Figure 3), which connect to the tank level sensing device, and which stops the pump when the receiving tank is full.

1.3 Calculator/Indicator

The bulk delivery system is fitted with a Compac model C4000 calculator/indicator (Figure 4) or any other compatible (#) NMI-approved calculator/indicator, with a volume display only. The volume indication is set for a 0.01 L resolution (up to 9999.99 L or 99999.99 L). The face of the indicator may also have a red and a green light which indicates the status of the over-fill protection system, if fitted.

The C4000 calculator/indicators operate with Compac version 29232 software. For any other compatible (#) NMI-approved calculator/indicator, see the NMI-approval.

Note: To view the software version, refer to the Test Procedure.

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

1.4 Checking Facilities

Removing the dry break coupling from its normal hang-up position initiates a segment check of the volume display.

- 'Err 9' is displayed and delivery stopped when error in pulse output is detected.

1.5 Totaliser

The instrument is fitted with an ENM Company model P2G729A, 4.5 V DC, electronic totaliser for indicating the volume totals in one litre graduations up to a maximum of 9 999 999 litres. The totaliser is located below the indicator.

1.6 Sealing Provision

The calculator/indicator has provision for sealing access to the calibration.

1.7 Verification Provision

Provision is made for the application of a verification mark.

1.8 Descriptive Markings and Notices

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

Pattern approval number	NMI 5/6B/208		
Manufacturer's identification mark or trade mark	.....		
Manufacturer's designation (model number)	.....		
Serial number	.....		
Year of manufacture	.....		
Maximum flow rate *(Q_{max})*	.....	L/min	
Minimum flow rate *(Q_{min})*	.....	L/min	
Maximum operating pressure *(P_{max})*	.....	kPa	
Minimum operating pressure *(P_{min})*	.....	kPa	
Nature of liquids to be measured	.....		(#1)
Environmental class	class C		(#2)

(#1) e.g. distillate or D.

(#2) See clause **1.1 Field of Operation**.

In addition, the minimum measured quantity (V_{min}) shall be clearly marked on the indicating device visible to the user during measurement, in the form 'Minimum delivery 20 L'.

2. Description of Variant 1 — approved on 30/11/05

Used with an external centrifugal or vane pump in flooded-suction and with the supply tank above ground (Figure 5). The supply tank is fitted with a low level device which prevents measurements of the fuel dispenser when the device is activated.

3. Description of Variant 2 — approved on 24/01/08

The pattern and variants for use to dispense various grades of petrol which may include up to 20% ethanol ('E20').

4. Description of Variant 3 — approved on 24/01/08

The pattern and variants constructed for use to dispense various grades of pure biodiesel and biodiesel/distillate blends (to Australian government standard).

Note

In addition to the markings as set out in clause **1.8 Markings**, instruments purporting to comply with variants 2 or 3 may need to carry other markings as required by government authorities other than the National Measurement Institute.

TEST PROCEDURE

Instruments should be tested in accordance with any relevant tests specified in the Uniform Test Procedures. Tests should be conducted in conjunction with any tests specified in the approval documentation for any components used, including indicator/controller and submersible turbine pump (STP) hydraulic systems.

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*.

To check the software version number for the C4000 calculator/indicator:

1. Remove main dispenser covers.
2. Remove 4 screws of the C4000 Control Unit enclosure.
3. Make sure the nozzle is hung up.
4. Press the parameter switch ‘Parameter SW1’ (situated on the C4000 PCB) once.
5. The software version number will be displayed on the ‘Litres’ display.

For any other compatible (#) NMI-approved calculator/indicator, see the NMI-approval.

For instruments fitted with compatible submersible turbine pumps:

1. Check the operation of the leak detector in accordance with the procedures specified by the manufacturer for the submersible turbine pump (STP).
2. Check that the STP is able to provide at least the minimum approved flow rate to all corresponding bulk delivery systems operating simultaneously. For the purpose of this test, where two or more STP’s are connected in parallel, they shall be considered as one pump.
3. For system where more than one bulk delivery system are connected to the same pump, check all hoses to ensure that flow and metering only occurs through hoses that have been authorised for delivery.

Note: This test should be carried out on initial verification and whenever the pumps are replaced. Thereafter, it need not be done at every verification/certification but should be done periodically at the discretion of the relevant verifying authority.

FIGURE 5/6B/208 - 1

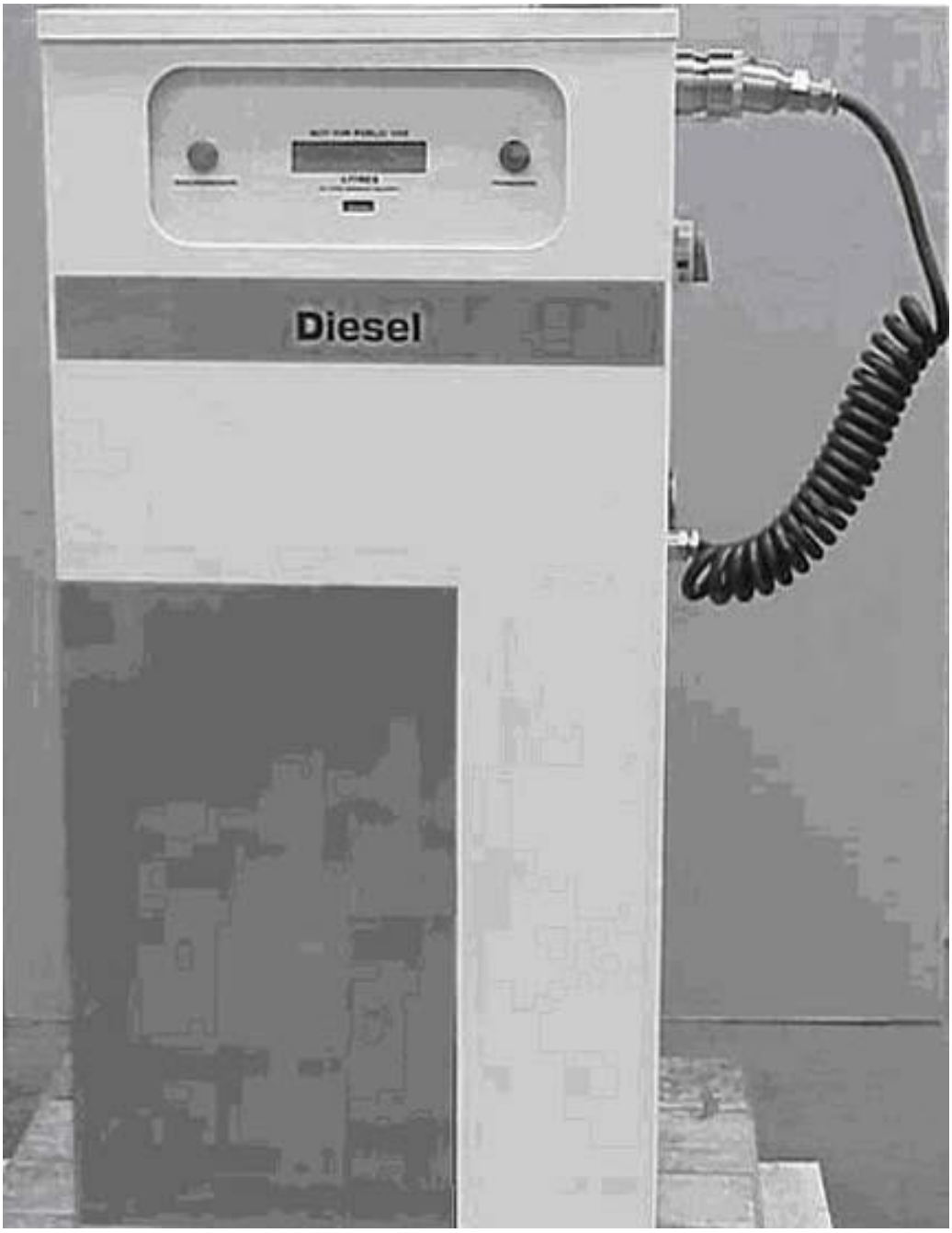

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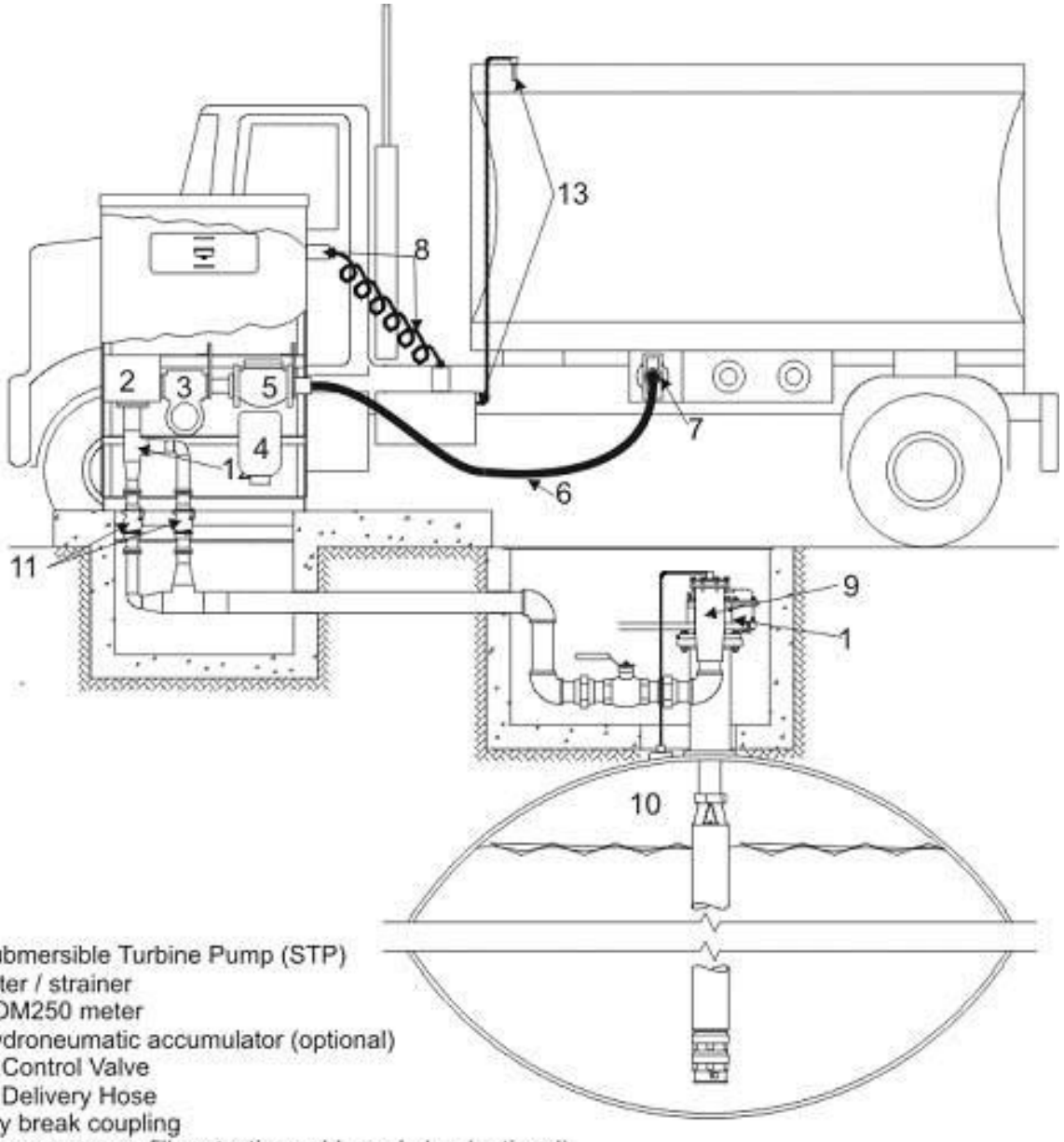
FIGURE 5/6B/208 – 2



1 Submersible Turbine Pump (STP)
2 Filter / strainer
3 COM250 meter
4 Hydroneumatic accumulator (optional)
5 2" Control Valve
6 2" Delivery Hose
7 Dry break coupling
8 Dispenser over-fill protection cable and plug (optional)
9 Leak detector
10 Underground tank
11 Dual acting Shear valves
12 Inlet manifold
13 Truck overfill protection sensor & cable (optional)

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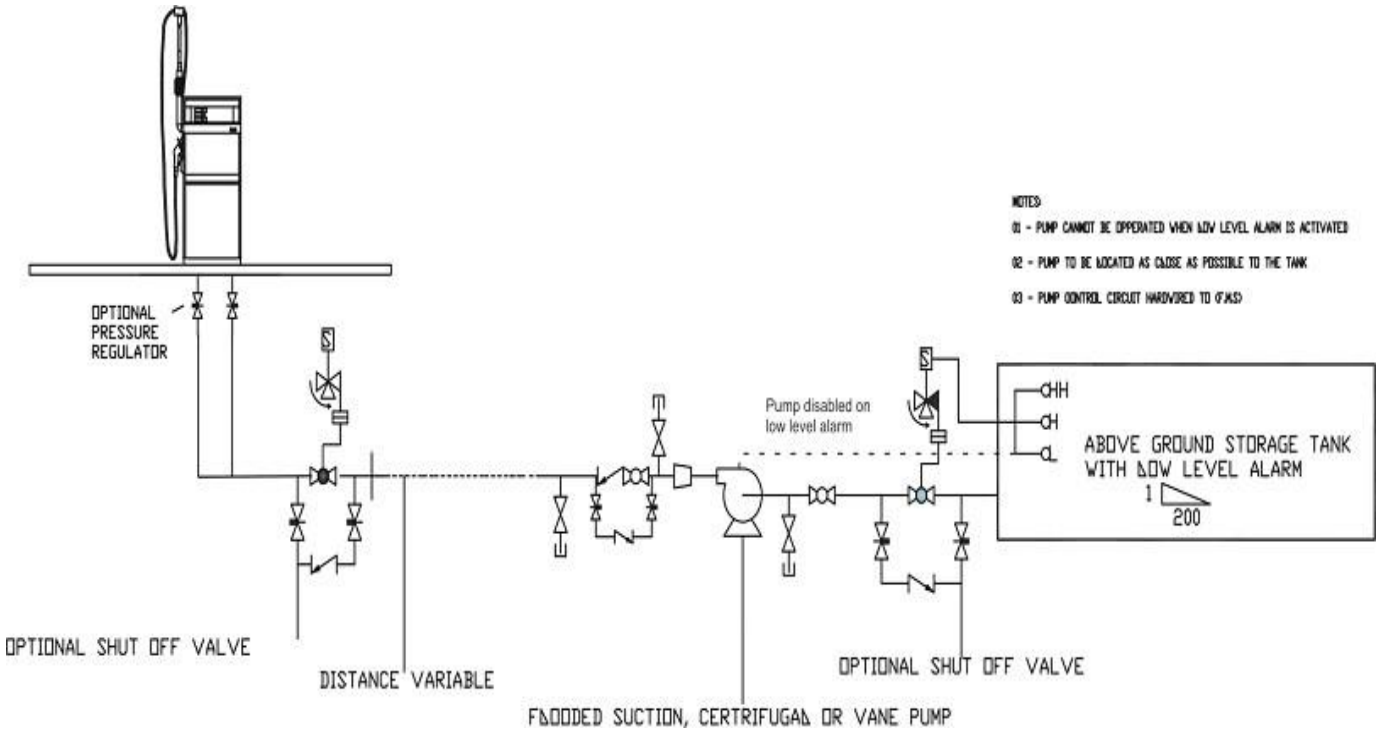
FIGURE 5/9B/208 – 3

Electronic Over-fill Protection Cable and Connector

FIGURE 5/6B/208 – 4

Compac Model C4000 Calculator/Indicator

FIGURE 5/6/208 - 5



Compac Model C4000 Calculator/Indicator

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