



Australian Government

**National Measurement
Institute**

12 Lyonpark Road, North Ryde NSW 2113

Certificate of Approval
No 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

Compac Model MR400S Bulk Delivery System

submitted by Compac Industries Ltd
52 Walls Road
Penrose Auckland
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.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 January 2011, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with 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.

The National Measurement Institute 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 30 November 2005

- A Compac Industries model MR400S bulk delivery system with a Compac model COM 250 flowmeter.

Variant: approved 30 November 2005

1. With an external centrifugal or vane pump and an above ground supply tank.

Technical Schedule No 5/6B/208 describes the pattern and variant 1.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/208 dated 7 December 2005

Technical Schedule No 5/6B/208 dated 7 December 2005 (incl. Test Procedure)

Figures 1 to 5 dated 7 December 2005

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

A handwritten signature in black ink, appearing to be 'J. K. T.', located in the bottom right corner of the page.

TECHNICAL SCHEDULE No 5/6B/208

Pattern: Compac Model MR400S Bulk Delivery System

Submittor: Compac Industries Ltd
52 Walls Road
Penrose Auckland
NEW ZEALAND

1. Description of Pattern

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 are required for satisfactory operation of the complete system including all checking facilities.

- (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.
- (*) 'Compatible' is defined to mean that no additions/changes to hardware/software are required for satisfactory operation of the complete system including all checking facilities.

1.3 Calculator/Indicator

The bulk delivery system is fitted with a Compac model C4000 calculator/indicator (Figure 4), with a volume display only. The volume indication is set for a 0.01 L resolution (up to 9999.99 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.

Instruments operate with Compac version 29232 software.

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

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/Certification Provision

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

1.8 Markings

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

Pattern approval sign	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

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.

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.

Maximum Permissible Errors at Verification/Certification

The maximum permissible errors applied during a verification test of the bulk delivery system using the liquid for which it is to be verified/certified, and from normal flow rate to the minimum flow rate specified in the Certificate of Approval or Technical Schedule are:

±0.3% for the calibration/adjustment of the meter; and

±0.5% for in-service inspection of the complete bulk delivery system.

Note: Adjusting the errors of a meter to values OTHER than as close as practical to zero is forbidden, even when these values are within the maximum permissible errors.

Other applicable maximum permissible errors are:

$\pm(0.01 \times V_{min})$ L for deliveries equal to the minimum measured quantity;

$\pm(0.01 \times V_{min})$ L due to hose dilation; and

$\pm(0.02 \times V_{min})$ L when using a hose reel.

To check the software version number:

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 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



Compac Industries Model MR400S Compac Model MR400S Bulk Delivery System

FIGURE 5/6B/208 – 2

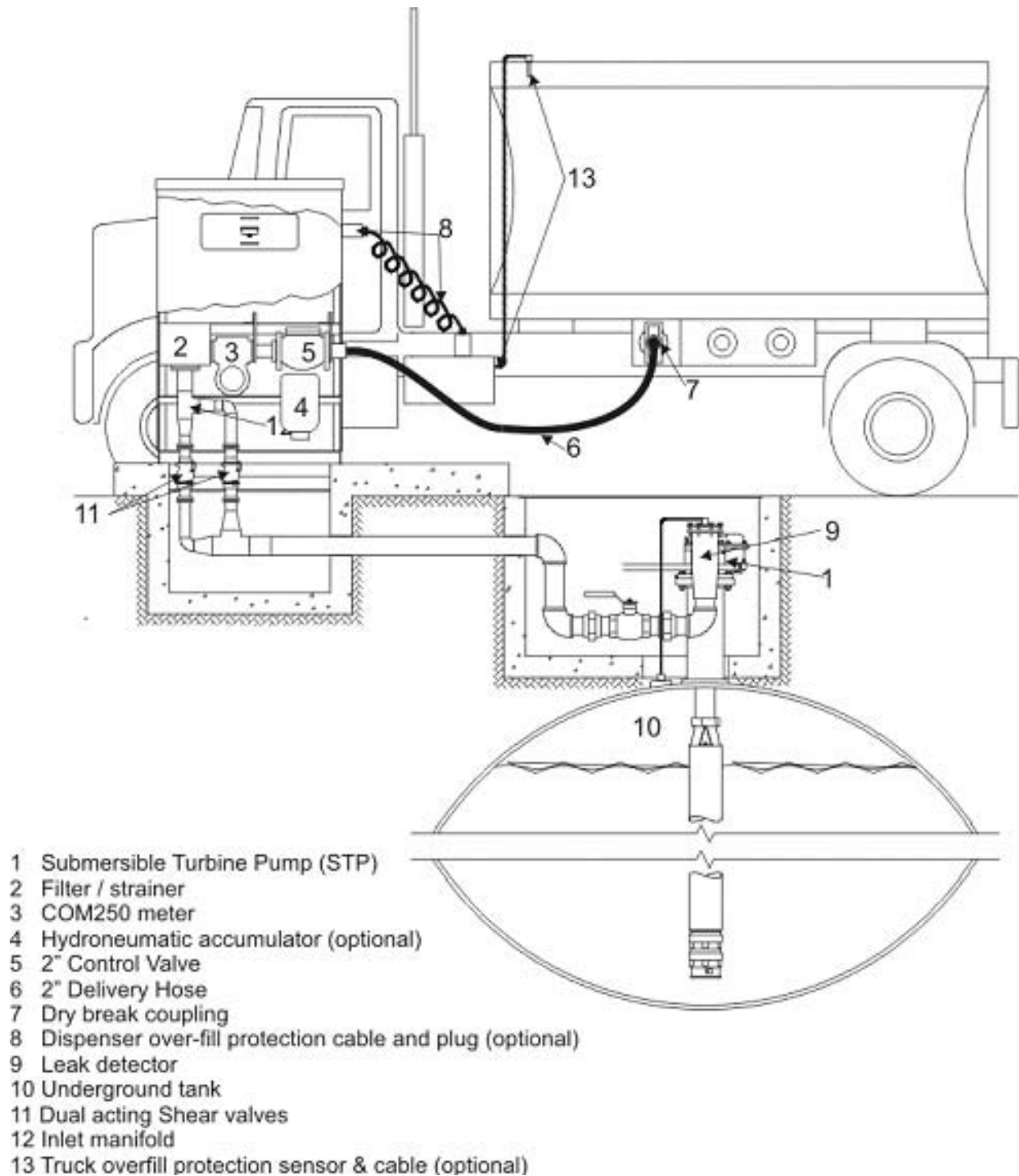


FIGURE 5/6B/208 – 3



Electronic Over-fill Protection Cable and Connector

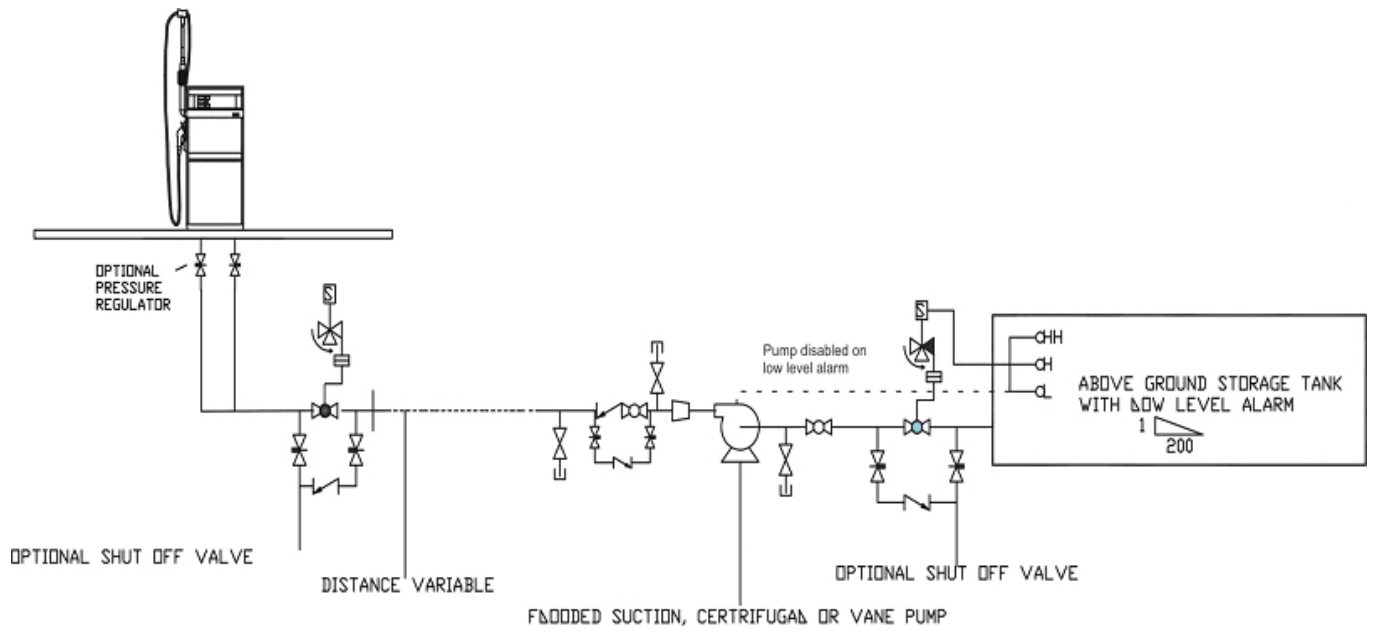
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FIGURE 5/6B/208 – 4



Compac Model C4000 Calculator/Indicator

FIGURE 5/6B/208 – 5



Variant 1 – With External Pump and Above-ground Supply Tank