MINISTRY OF CONSUMER AFFAIRS
MANATŪ KAIHOKOHOKO

MINISTRY OF CONSUMER AFFAIRS

Wellington, New Zealand

CERTIFICATE OF APPROVAL

Weights and Measures Regulations 1999
Part 1 Regulations 5 and 6

Current Date of Issue: 21 December 2011
Original Date of Issue: 21 December 2011

Certificate 2063

Overseas Certificate No: NMI S545

This certifies that the Compac C4000 (Indicator for Liquid Measuring Systems), Indicating Device described overleaf has been approved as suitable for trade use subject to any conditions stated in the schedule:

Figure 1 - Compac Model C4000 Indicator/Calculator

S R Bobbala **J P Crane**

Under delegated authority from the Chief Executive of The Ministry of Economic Development

Note: This is not an approval to any person but only with respect to the type and pattern of weight, measure, or weighing or measuring instrument.

SCHEDULE

Pattern:	Indicating Device
Make:	Compac
Model:	C4000 (Indicator for Liquid Measuring Systems)
Manufacturer:	Compac Industries Ltd, Auckland, New Zealand
Submitter:	Compac Industries Ltd, Auckland, New Zealand
Conditions of Approval:	1. The temperature range applicable to a complete flowmetering system which includes this pattern, shall not exceed the smaller of: i) The temperature range approved for this calculator/indicator ii) The temperature range approved for the flowmetering system 2. This Certificate only covers compliance with respects to the relevant sections of the Weights and Measures Act and Regulations and should not be construed as guarantee of compliance with any safety requirements. 3. 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 MAPSS and with the relevant Certificate of Approval and Technical Schedule. 4. MAPSS reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Description:

A Compac model C4000 calculator/indicator (figure 1) is a control system for liquid measuring systems. It serves as a calculator/indicator and incorporates the following facilities that can be enabled:

- Linearisation facility
- Pre-set; and
- Volume conversion for Temperature facility

Note: Pre-set facility is not approved for trade use.

TABLE 1 ï Specifications

- Maximum input pulse rate: 125 Hz/channel
- Input voltage range: 204 V to 264 V AC
- Environment temperature range -25ºC to 55ºC
- Liquid temperature range -10ºC to 50ºC
- Volume conversion to 15ºC:
  For generalised products density range from 0.654 to 1.000 kg/L
- Accuracy Class: Class 0.5

The model C4000 is a general purpose calculator/indicator interfaced with any approved compatible pulse generator (see "Pulse Generator" section below) for use in MAPSS approved flowmetering system with a minimum measured quantity of at least 2 Litres.

The C4000 Head is designed to work in a gantry type filling tanker trucks and can control an OCV valve so that the flowrate may be ramped up and down avoiding abrupt stops.

1. Construction:

The model C4000 calculator/indicator comprises a C4000 power supply in a flameproof enclosure plus a processing circuit board and indicator circuit board enclosed in a separate housing.

The instrument is configured via the 'parameter' (SW1) and 'k-factor' (SW2) switches located on the processing circuit board (Figure 2), which have provision for sealing. It can either be configured to use the base k-factor for converting the input pulses to volume throughput, or use multi k-factors as a function of input frequency (flow rate) to adjust the accuracy of the measurement transducer as a function of flow rate (linearity correction).
The density setting may be chnaged, and temperature may be viewed, by means of the parameter switch (SW1).

A segment check is initiated by pressing the parameter switch once.

2. Display:
The indicator circuit board has four LCD type displays for displaying volume at metering conditions, pre-set volume, flow rate and operator prompts. The pattern runs with version HIA-xx and HIG-xx software.

The equipment display the following values
- volume to 9999.99 L in increments of 0.01 L
- pre-set to 9999.99 L
- flow rate to 9999 L/min

An electronic totaliser can be viewed via the parameter switch 'SW1' (on the processing circuit board) or the 'Total' button.

NOTE: Configuration to display in kg units
The Compac model C4000 calculator/indicator may also be configured to display quantity in kg units and flow rate in kg/min units.
The field of operation applicable to this variant is that for the system to which the controller is connected.

3. Linearisation Facility:
Instruments are fitted with linearisation correction facility. The calculator/indicator may have linearity correction by using multiple K-factors, each K-factor at a different flowrate.

4. Pre-set facility:
The keypad (figure 1) is used for entering a pre-set (*) value and for authorisation purposes. The maximum pre-set value is 9999.9 L.

NOTE: The pre-set value is not approved for trade use.

5. Volume conversion for temperature facility:
The electronic volume conversion for temperature facility may be enabled to convert the measured volume to volume at 15ºC. the conversion is based on ASTM-IP-API Petroleum Measurement Table 54B for Generalised Petroleum Products.

6. Pulse Generator:
The calculator/indicator is interfaced to a Compac model CU-3000-3CH (*) pulse generator.
(*) Note: Any other compatible OIML R117 approved measurement transducer may be used.

7. Checking Facilities:
The following checking facilities are incorporated, and an error is generated:
- When the transducer is disconnected from the calculator/indicator or it is out of quadrature.
- If the indicator is disconnected or faulty.
- If the liquid temperature or the density is out of range.

8. METROLOGICAL MARKINGS:
Instruments are marked with the following data, together in one location:
Manufacturer's name or mark Compac
Model number C4000
Serial number .....
Pattern approval mark **MCA 2063**
Year of manufacture .....
Accuracy class 0.5
Minimum Measured Quantity: (when connected to liquid measuring instrument)
Environmental class Class C
Liquid temperature range ..... ºC to ..... ºC **(#)**
(#) Required when the volume conversion for temperature facility is activated.
Additionally, the indicator reading face shall be marked ñReference temperature 15ÁCò or ñLitres at 15ÁCò, and
The minimum measured quanity specified for the liquid-measuring system is marked on the face of the indicator in the form "Minimum Delivery 20L".

Sealing:

The Compac model C4000 calculator/indicator has provision for sealing the cover over the K-factor switch by means of a lead and wire (or similar) type seal through the holes provided. A wire terminating into a lead plug shall secure the metrological functions from unauthorised entry; this shall carry a Mark of Verification.

Mark of Verification:

A lead and wire type seal used for sealing to prevent access to the calibration switch shall take the Mark of Verification.

Temperature:

- Environment temperature range -25ºC to 55ºC
- Liquid temperature range -10ºC to 50ºC

Figure 2 - Processing Circuit Board

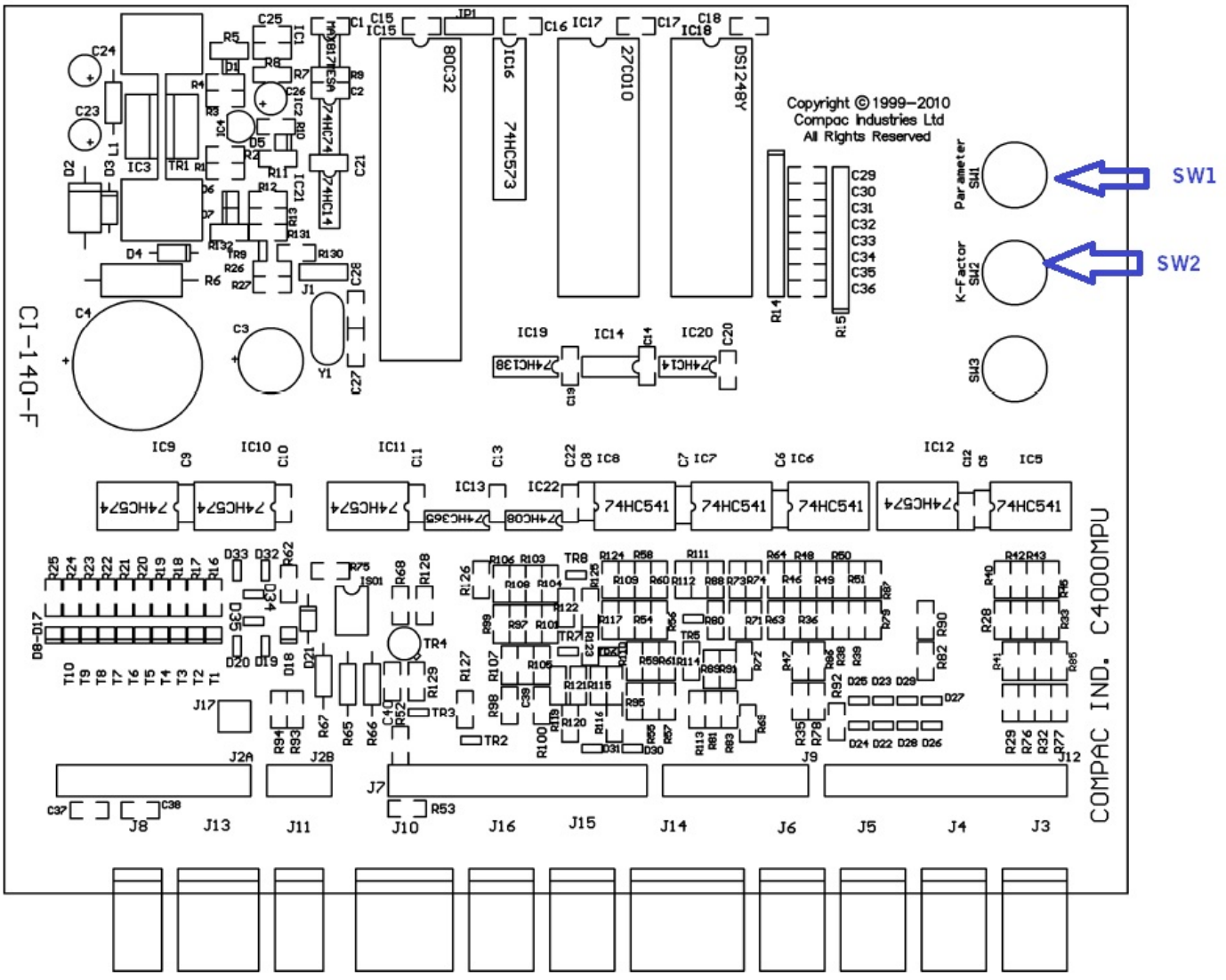

Figure 3 - Typical Sealing Method