



NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 5/6B/57

This is to certify that the pattern and variants of a
Liquip Flowmeter System with Liquid Controls M7 Meter

submitted by Liquid Handling Equipment,
216 Railway Terrace,
Guildford, New South Wales, 2162,

have been approved under the Weights and Measures (Patterns of
Instruments) Regulations as being suitable for use for trade.

Pattern: approved 15/9/77

A vehicle-mounted flowmeter of maximum flow rate 380 L/min.

Variant: approved 29/9/80

1. With Liquid Controls M5 Meter, in place of M7 Meter.

The pattern and variant are described in Technical Schedule
No 5/6B/57 issued on 17/10/80, and in drawings and specifications
lodged with the Commission.

The approval is subject to the following conditions:

1. The maximum and minimum flowrates are 380 L/min and 76 L/min respectively for the M7 Meter and 230 L/min and 45 L/min respectively for the M5 Meter.
2. (a) When the difference between maximum and minimum flowrates, in normal conditions of use, exceeds 38 L/min on the M7 and 23 L/min on the M5 Meters, these maximum and minimum flowrates shall be marked on the data plate.
(b) When the flowrate, in normal conditions of use, is within $\pm 5\%$ of a nominal flowrate, the nominal flowrate shall be marked on the data plate.

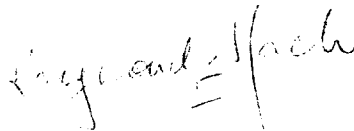
3. The instrument is not used for liquified gases.
4. The type and viscosity range of the liquid for which the instrument is verified is marked on the data plate.
5. The system is designed so that gas cannot affect the accuracy of the metering system.
6. The pump suction operates under a positive liquid head.
7. The liquids to be measured are limited to petroleum products of viscosities between 0,4 and 8,3 mPas, that is, in the range of petrol to diesel fuel.
8. Instruments are installed in the manner described in the Technical Schedule.

The approval is subject to review on or after 1/9/85.

All instruments conforming to this approval shall be marked with the approval number "NSC No 5/6B/57".

This Certificate replaces Certificates Nos 5/6H/5 and 5/6H/6 and their associated Technical Schedules, which are hereby cancelled.

Signed



J. J. O'Connell / Executive Director



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6B/57

Pattern: Liquip Flowmeter with Liquid Controls M7 Meter

Submittor: Liquid Handling Equipment Pty Ltd,
216 Railway Terrace,
Guildford, New South Wales, 2161.

1. Description of Pattern

The pattern (see Figure 1) is a vehicle-mounted instrument for the delivery of liquid petroleum products of viscosity between 0,4 and 8,3 mPas at a maximum flowrate of 380 litres per minute and a maximum system pressure at no flow of 600 kPa.

The flowmeter comprises the following:

- (1) Positive displacement pump mounted on the assembly at a point lower than the minimum height of the liquid in the supply tank. The supply pipe from the tank to the pump has a continuous fall to the pump. The pump by-pass is set so that the maximum no flow system pressure is 600 kPa. Provision is made for a pressure gauge to be connected between the pump and the gas purger.
- (2) Liquid Controls E.1-42100 gas separator[‡] (see Figure 2).
- (3) Liquid Controls M7 Meter (see Figure 2).
- (4) Veeder-Root 7085 zero-start single-handle reset indicator and ticket printer (see Figure 2). The ticket printer has 1-litre increments and the indicator has a scale interval of 1 litre. The first element is marked with ten scale-mark lines numbered from 0 to 9. The aperture through which the first element is viewed is widened in the direction of travel.
- (5) Non-return valve.
- (6) Hose -- any type, bore or length of hose may be used provided that the minimum delivery, determined from Table 1 and marked on the instrument's data plate for reference by the Weights and Measures Authority, is acceptable to that

[‡] This item does not form part of the approved system and may or may not be fitted at the discretion of the submittor.

Authority taking into account the usage of the instrument.

- (7) Anti-drain valve (see Figure 3) - an anti-drain valve, or anti-drain valve and swivel coupling, is fitted on the end of the hose. The anti-drain valve retains a pressure of not less than 55 kPa.
- (8) Nozzle - any nozzle fitted with an integral anti-drain valve which retains a pressure of not less than 5 kPa and which is located downstream of the main nozzle valve.

1.1 Markings

The instrument data plate is marked with the following information.

Manufacturer's name or mark
 Meter model
 Serial number
 NSC number in the form: NSC No 5/6B/57
 Maximum flowrate)
 Minimum flowrate) as per condition of approval 1.
 Nominal flowrate)
 Viscosity range or type of liquid for which use is verified
 Minimum delivery

1.2 Sealing

- (a) the indicator, ticket printer and calibration-adjustment cover, by passing a sealing wire through the attachment-mounting bolts and terminating the ends beneath a lead stamping plug (see Figure 2):
- (b) the instrument data plate, by attaching it by a lead stamping plug or by threading the indicator sealing wire through a hole in the data plate.

The approval includes the indicator being a Veeder-Root 1624 zero-start indicator with scale interval of 1 litre; the first element is marked with ten scale-mark lines numbered from 0 to 9 (see Figure 4). The aperture through which the first element is viewed widens in the direction of travel.

2. Variant

- 1. With Liquid Controls M5 meter replacing the M7 meter, and with maximum flow rate of 230 L/min and minimum flow rate of 45 L/min.

3. Test Procedure

The instrument should be tested with the liquid for which it will be used and which is marked on the data plate.

1. Minimum Delivery

The minimum delivery is marked on the instrument data plate.

Weights and Measures inspectors should check that the maximum hose dilation determined by the method described below corresponds with the appropriate minimum delivery; Table 1 refers.

2. Hose Dilation

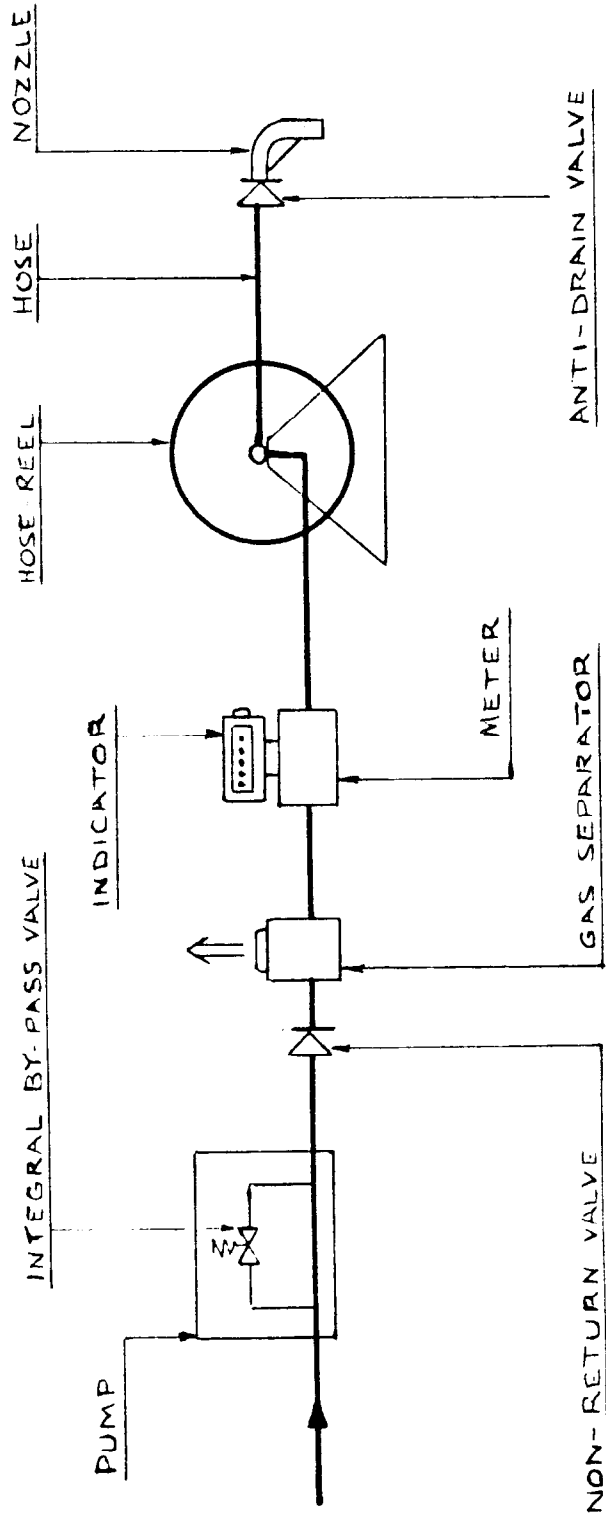
A measure of the hose-dilation quantity may be obtained by the following method:

With the pump stopped and the hose fully wound on its reel, open the nozzle to reduce the pressure in the hose to the anti-drain valve retaining pressure of about 55 kPa. Then fully unwind the hose from the reel, zero the indicator, start the pump and, after allowing not less than 30 seconds for the hose to fully dilate, and with the pump still running, read the quantity on the indicator. This quantity is equal to the maximum hose dilation.

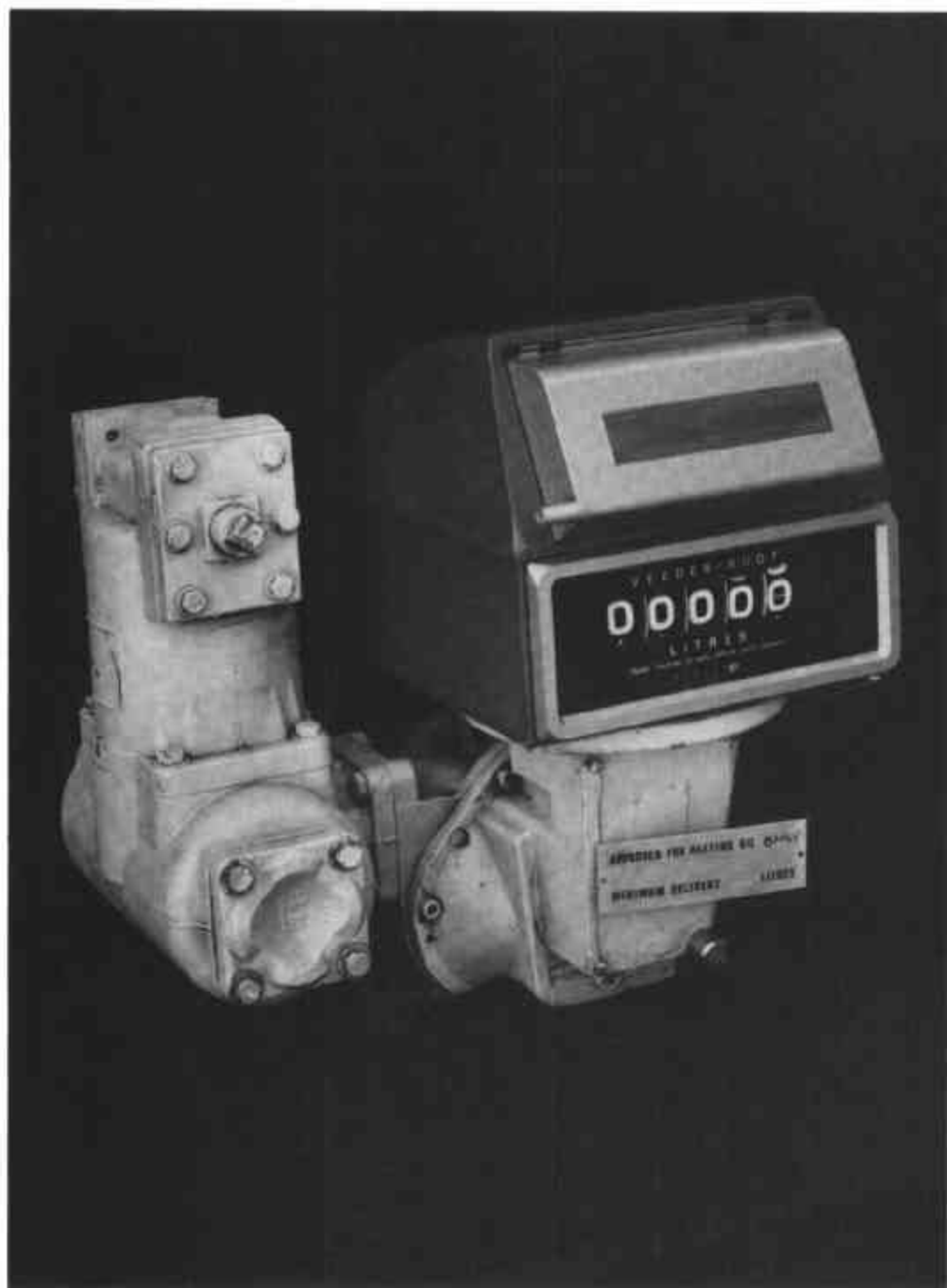
TABLE 1

Minimum delivery marked on instrument data plate	Maximum hose dilation	
	Indicator only fitted	Indicator and printer fitted
L	L	L
50	0,3	.
100	0,8	0
150	1,3	0,5
200	1,8	1,0
250	2,3	1,5
300	2,8	2,0
350	3,2	2,5
400	3,8	3,0
450	4,3	3,5
500	4,8	4,0

FIGURE 5/6B/57 - 1



Liquid Controls M7 and M5 Flowmeter - Schematic Diagram



Liquid Flowmeter with M7 or M5 Meter
and VR 7085 Indicator and Ticket Printer

24/10/80

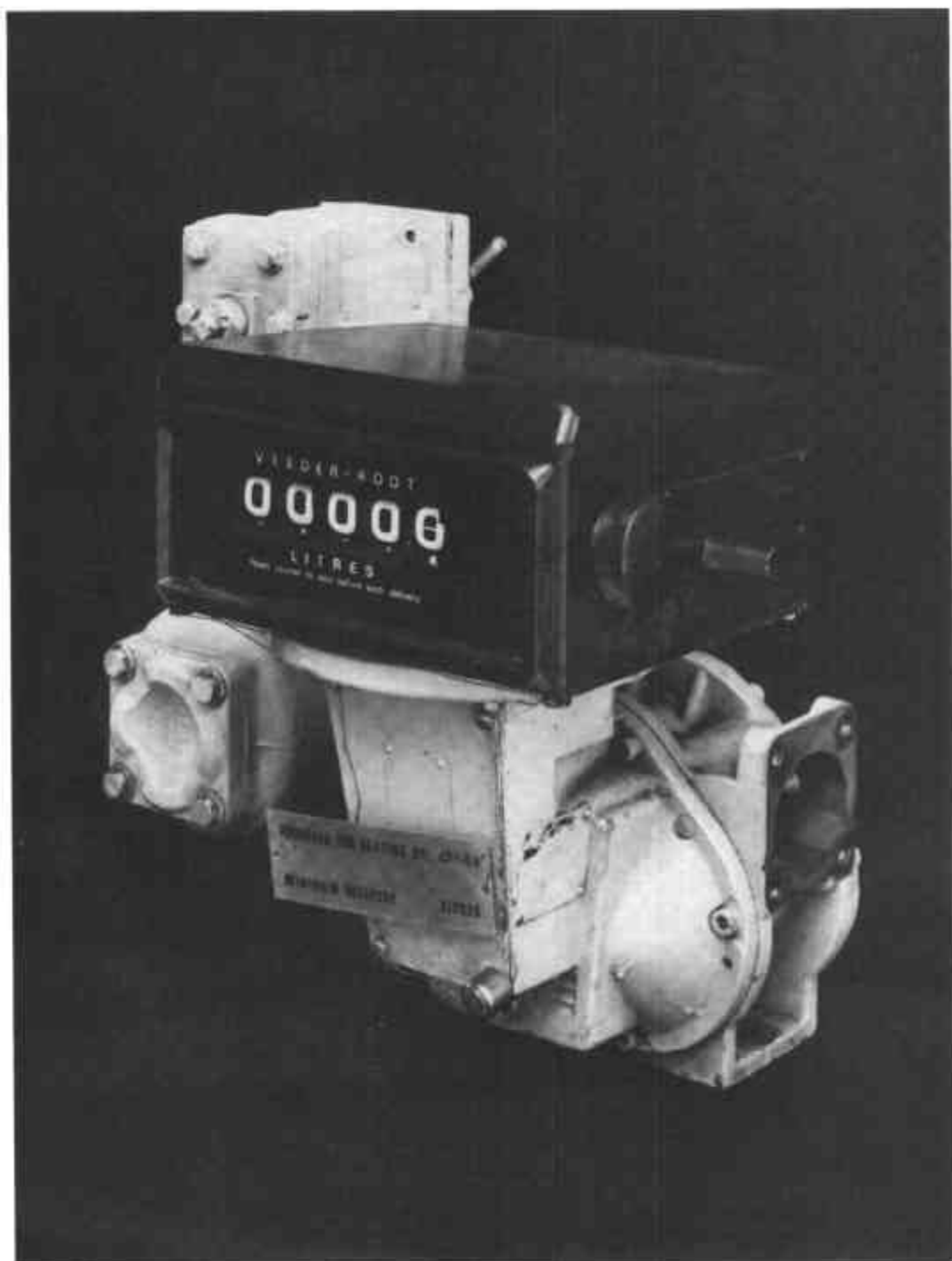
FIGURE 5/6B/57 - 3



Anti-drain Valve with Swivel Coupling

24/10/80

FIGURE 5/6B/57 - 4



Liquid Flowmeter with M7 or M5 Meter
and VR 1624 Indicator

24/10/80