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CERTIFICATE OF APPROVAL No 5/6H/6

This is to certify that the patterns of the

Liquip Flowmeter with Liquid Controls M7 Meter

submitted by Liquid Handling Equipment Pty Ltd,
216 Railway Terrace,
Guildford, New South Wales, 2161,

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

Date of Approval: 15 September 1977

The patterns are described in Technical Schedule No 5/6H/6 and in drawings and specifications lodged with the Commission.

The approval is subject to review on or after 1 September 1980.

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

Approval is granted on condition that:

1. The maximum flow rate is a flow rate between 100 and 140 litres per minute.

2. The pump suction operates under a positive liquid head.

3. The liquids measured are limited to petroleum products of viscosities between 0,6 and 4 mPa.s.

4. The liquid (commercial or technical name) for which the instrument is verified is nominated on the instrument data plate.

Signed

Acting Executive Officer

9/11/77

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6H/6

Pattern: Liquip Flowmeter witn Liquid Controls M7 Meter

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

Date of Approval: 15 September 1977

Conditions of Approval:

1. Tne maximum flow rate is a flow rate between 100 and 140 litres per minute.

2. Tne pump suction operates under a positive liquid nead.

3. Tne liquids measured are limited to petroleum products of viscosities between 0,6 and 4 mPa.s.

4. Tne liquid (commercial or tecnnical name) for wnicn tne instrument is verified is nominated on tne instrument data plate.

All instruments conforming to tnis approval snall be marked "NSC No 5/6H/6".

Description:

Tne pattern (see Figure 1) is a venicle-mounted instrument for tne delivery of liquid petroleum of viscosity between 0,6 and 4 mPa.s at a maximum flow rate of 140 litres per minute and a maximum system pressure at no flow of 480 kPa.

Tne flowmeter comprises tne following:

1. Positive displacement pump mounted on tne assembly at a point lower tnan tne minimum neignt of tne liquid in tne supply tank. Tne supply pipe from tne tank to tne pump nas a continuous fall to tne pump. Tne pump by-pass is set so tnat tne maximum no-flow system pressure is 480 kPa. Provision is made for a pressure gauge to be connected between tne

pump and tne 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-nandle reset indicator and ticket printer (see Figure 2). Tne ticket printer nas 1-litre increments and tne indicator nas a scale interval of 1 litre; tne first element is marked witn ten scale-mark lines numbered from 0 to 9. Tne aperture tnrougn wnicn tne first element is viewed is widened in tne direction of travel.

5. Non-return valve.

6. Hose — any type, bore or lengtn of nose may be used provided tnat tne minimum delivery, determined from Table 1 and marked on tne instrument's data plate for reference by tne Weignts and Measures Autnority, is acceptable to tnat Autnority taking into account tne usage of tne instrument.

7. Anti-drain valve (see Figure 3) — an anti-drain valve, or anti-drain valve and swivel coupling, is fitted on tne end of tne nose. Tne anti-drain valve retains a pressure of not less tnan 55 kPa.

8. Nozzle — any nozzle fitted witn an integral anti-drain valve wnicn retains a pressure of not less tnan 5 kPa and wnicn is located downstream of tne main nozzle valve.

9. Marking — instrument data plate sealed to tne instrument marked:

   (a) "approved for kerosene only" or "approved for neating oil only";*

   (b) "minimum delivery ...y... litres", y being tne minimum delivery determined from Table 1.

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* Tne approval for tne following liquids is based upon tne liquid naving a viscosity witnin tne range specified for temperatures of 5°C to 40°C, taking into account tne variations in tne viscosity of eacn product wnicn occur witn tne output from a single refinery or between different refineries and at different times tnrougnout eacn year:

Liquid[1]	Permitted viscosity range
Kerosene[2]	0,6 to 2,2 mPa.s
Heating oil	0,8 to 4,0 mPa.s

Note: [1] A known trade abbreviation of tne name of tne liquid is acceptable.

[2] Kerosene includes wnite spirits and aviation turbine fuel.

10. Sealing —

(a) tne indicator, ticket printer and calibration-adjustment cover, by passing a sealing wire tnrougn tne attacnment-mounting bolts and terminating tne ends beneatn a lead stamping plug (see Figure 2);

(b) tne instrument data plate, by attacning it by a lead stamping plug or by tnreading tne indicator sealing wire tnrougn a nole in tne data plate.

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

Special Tests:

Tne instrument snould be tested witn tne liquid for wnicn it will be used and wnicn is marked on tne data plate.

Minimum Delivery:

Tne minimum delivery is marked on tne instrument data plate.

Weignts and Measures inspectors snould cneck tnat tne maximum nose dilation determined by tne metnod described below corresponds witn tne appropriate minimum delivery; Table 1 refers.

Hose Dilation:

A measure of tne nose-dilation quantity may be obtained by tne following metnod:

> Witn tne pump stopped and tne nose fully wound on its reel, open tne nozzle to reduce tne pressure in tne nose to tne anti-drain valve retaining pressure of about 55 kPa. Tnen fully unwind tne nose from tne reel, zero tne indicator, start tne pump and, after allowing not less tnan 30 seconds for tne nose to fully dilate, and witn tne pump still running, read tne quantity on tne indicator. Tnis quantity is equal to tne maximum nose dilation.

Gas Purging:

Tne effect of gas on tne quantity delivered snould not exceed 1,0 litre wnen a delivery is interrupted due to tne supply tank

running dry, and tne delivery is continued by, for example, cnanging supply tanks. To test gas purging it will be necessary to allow tne supply tank to empty during a test delivery, to stop tne pump, and to refill or cnange tne supply tank to allow tne delivery into tne proving measure to be completed.

Non-flow-dependent Errors:

1. Tne non-flow-dependent errors are up to:

   (a) 1-litre rounding error for tne ticket printer witn 1-litre increments;

   (b) 0,2-litre reading error for tne indicator wnicn nas tne first element indicating by 1-litre graduations;

   (c) 1,0-litre gas-purging error; and

   (d) ...z...-litre nose dilation, z being tne maximum value of nose dilation for wnicn tne instrument is verified — see Table 1.

2. Tne minimum delivery for wnicn tne relative error from all sources would not exceed 1,5% is derived from Table 1 and marked on tne instrument data plate.

TABLE 1

Minimum delivery marked on instrument data plate	Maximum nose 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

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6H/6

CHANGE No 1

The approval of the

Liquip Flowmeter with Liquid Controls M7 Meter

given in Certificate No 5/6H/6 dated 9 November 1977 and described in Technical Schedule No 5/6H/6 dated 9 November 1977

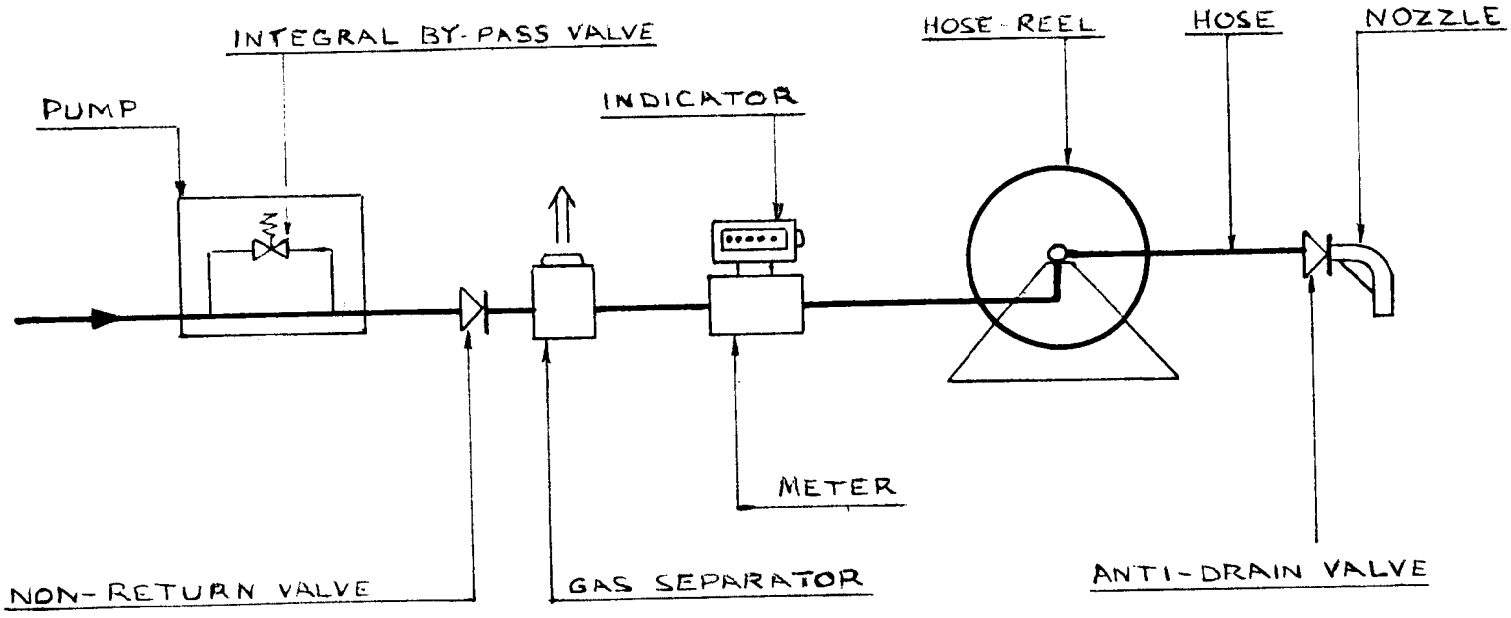
is changed by

altering in the paragraph headed "Hose Dilation" the ~~first~~ sentence of the sub-paragraph to read:

with the pump stopped and the hose fully wound on its .....

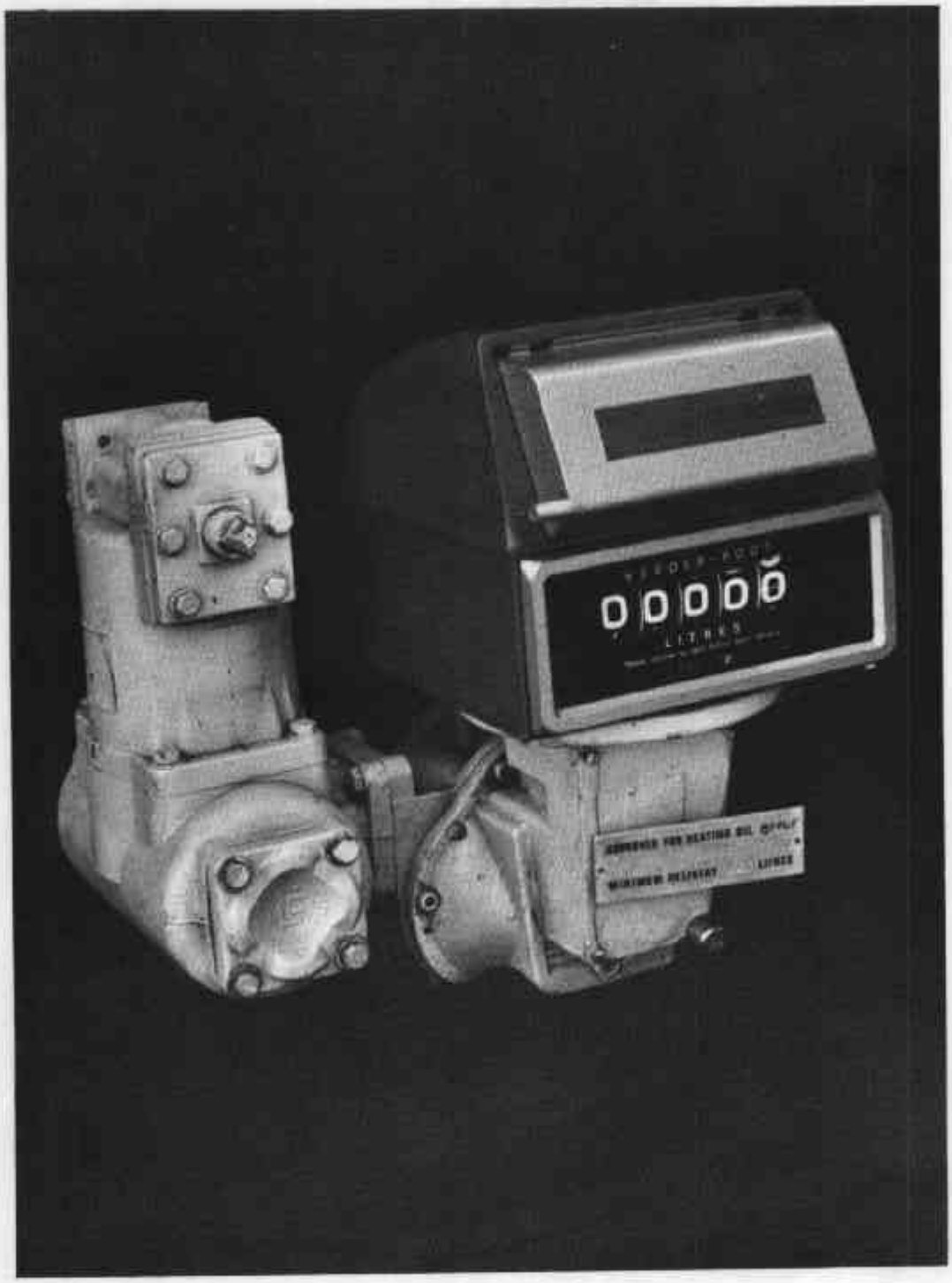
20/12/77

FIGURE 5/6H/6 - 1



Liquid Controls M7 Flowmeter — Schematic Diagram

FIGURE 5/6H/6 - 2



Liquip Flowmeter with M7 Meter
and VR 7085 Indicator and Ticket Printer

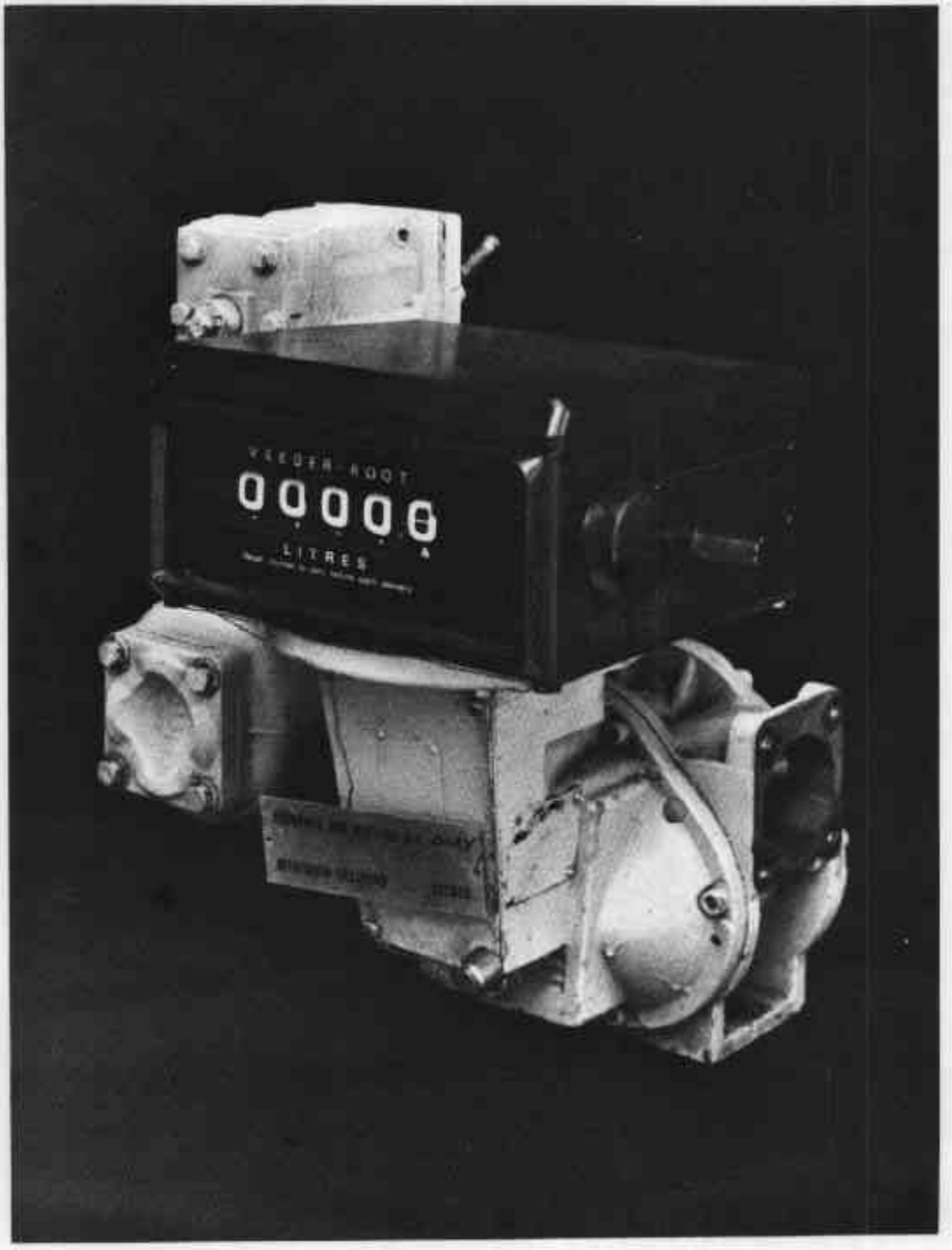
9/11/77

FIGURE 5/6H/6 - 3

Anti-drain Valve with Swivel Coupling

9/11/77

FIGURE 5/6H/6 - 4



Liquip Flowmeter witn M7 Meter
and VR 1624 Indicator

9/11/77