



CANCELLED

NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 10/1/0

Approved: LPG Flowmeter of 25-mm to 38-mm Inlet Port Size

This is to certify that patterns of the abovementioned instruments have been approved as being suitable for use for trade under the Weights and Measures (Patterns of Instruments) Regulations, provided they comply with the following requirements:

Performance:

1. The liquids measured are commercial propane of density between 500 and 515 kg/m³ at 15°C.
2. The liquids measured are at temperatures in the range - 10°C to + 50°C.
3. The flow rate is not greater than 450 litres per minute; the minimum flow rate is 20% of the maximum flow rate specified for each instrument.
4. When tested at flow rates between the minimum and maximum flow rates specified, at a liquid temperature of 20°C ± 5°C, the permissible flow-dependent errors are not greater than ± 1% of the quantity measured.
5. The maximum permissible error due to the —
normal range of variation in the density of the liquid,
normal range of variation in liquid temperature,
normal range of variation in operating pressure,
shall not exceed 0,5% of the quantity measured for each of the above factors.
6. The effect of vapour generation on the quantity measured shall not exceed 0,5% of the quantity indicated.
7. The maximum permissible error due to the reading error (0,5 of a graduation) of the indicator or rounding error of the ticket printer (1 increment) shall not exceed 1% of the quantity measured.

Description:

The patterns (see Figure 1) are vehicle-mounted or fixed-installation flowmeters for the delivery of liquefied petroleum gas.

The flowmeter comprises:

1. Pump with its by-pass connected to the supply tanks in order to minimise vapour formation.
2. A vapour-measurement-prevention system vented to the supply tanks through a non-return valve. If a stop valve is fitted to the vent pipe it shall be interlocked with a second stop valve in the delivery pipe so that a delivery can only take place when the vent pipe is open.
3. Positive displacement meter; no by-pass of the meter for measured liquid is permitted.
4. A thermometer pocket in or near the meter to enable the measurement of the temperature of the liquid passing through the meter.
5. Temperature compensator fitted to the meter capable of adjusting the coupling ratio between the meter and indicator so that the indicated volume is the equivalent volume at a temperature of 15°C.
6. A zero-start indicator with 0,1 or 1-litre graduations. A zero-start ticket printer with the same increment as the indicator may be fitted.
7. Differential-pressure-operated valve in the delivery pipe downstream of the meter to maintain the pressure in the metering chamber to prevent the formation of gas. Any pressure-equalising pipe from the differential valve is to be connected to the supply tank through an excess-flow valve (which is not provided with a bleed hole), so that metered liquid will not be by-passed should the diaphragm in the differential valve leak.
8. Non-return valve in the delivery pipe downstream of the differential valve.
9. Three-way valve — may be fitted to direct the delivery to an alternative hose.

10. Hose — up to 25 metres of high-pressure hose of bore not exceeding 25 mm.
11. Stop valve — fitted to the end of the hose.
12. An instrument data plate marked "approved for propane" to be sealed to the instrument by a lead-plug seal.
13. A lead-plug seal or lead-plug seal with sealing wire to prevent the adjustment of any device which affects the accuracy of the flowmeter.
14. The following information clearly and permanently marked on one or more permanently attached nameplates:

Manufacturer's name or mark
Serial number
NSC approval number
Maximum flow rate
Minimum flow rate
Liquid density range
Maximum operating pressure

15. The following notices fixed to the instrument in a prominent location:

Vehicle-mounted Instruments

- (a) On instruments on which the volume is determined by the difference between two printed values (even if one is expressed in zeros) the notice shall read —

"when the vehicle is in motion there shall be no ticket in the printer", or

- (b) on instruments which do not print the zero indication the notice shall read —

"when the vehicle is in motion the indicator shall read zero".

All Instruments

- (a) On instruments with 1-litre increment ticket printers:
"not to be used to fill containers of capacity less than 200 l";

- (b) on instruments with 1-litre-graduated indicators and

without ticket printers: "not to be used to fill containers of capacity less than 100 ℓ";

- (c) on instruments with 0,1-litre-increment ticket printers; "not to be used to fill containers of capacity less than 20 ℓ";
- (d) on instruments with 0,1-litre-graduated indicators and without ticket printers: "not to be used to fill containers of capacity less than 10 ℓ".

Special Conditions:

State Weights and Measures Authorities will confirm the suitability of particular patterns in their State; under Section 4 of the Weights and Measures (National Standards) Act 1960-1966 a State Government may vary the provisions in regard to improper practices and tolerances to be applied.

Unless otherwise cancelled by the National Standards Commission, this approval will apply until a date to be set by the Authority in each State.

This approval is subject to review on or after 1 January 1978.

Special Tests:

Verification Procedures

Acceptable verification methods are:

1. A two-stage verification involving at each verification:
 - (a) the replacement of the metering assembly, that is, the meter, temperature compensator and indicator, with a metering assembly that has been checked by the Weights and Measures Authority either at the manufacturer's premises or in a laboratory; and
 - (b) an overall test of the combined meter and temperature-compensator error at the temperature of the LPG. The overall test should include not less than two tests at full flow rate and two tests at 20% of full flow rate; or
2. a winter-summer six-monthly verification period with one verification in the hotter period and a second verification in the cooler period of each year. The tests to be applied at each verification would include not less than two tests

of the delivered volume at full flow rate and two tests at 20% of full flow rate; or

3. a complete determination of the overall system performance by separate determinations of the meter and temperature-compensator errors at an LPG temperature of less than 10°C or more than 20°C, the meter and the temperature-compensator error being determined separately by isolating the temperature compensator while determining the meter error, and then checking that the temperature compensator varies the indication by the correct amount for the temperature of the LPG. As an alternative, either of these separate errors may be determined indirectly by an overall check of the system errors, a determination of either separate error, and a simple subtraction.

The meter-errors check should include not less than three tests of the delivered volume at full flow rate and three tests at 20% of full flow rate.

The temperature-compensator error check should include not less than two tests at any flow rate with the LPG being circulated back to the supply tank. It may necessitate fitting a counter to record the non-compensated volume in addition to the compensated volume.

The overall system performance test is as for 2, except that not less than three tests should be done at each flow rate.

The above tests may be either gravimetric, volumetric, or by master meter, and the LPG density may be measured or a density may be obtained from the supplier.

Test Delivery

1. The test delivery should not be a quantity less than one minute's flow at full flow rate of the instrument.
2. If the test delivery is then less than ten times the minimum delivery, the non-flow-dependent error (reading error of the indicator or rounding error of the ticket printer) should be minimised by making the delivery end at a graduation line.

Minimum Delivery

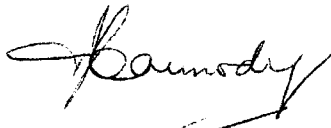
For verification purposes the minimum delivery will be 100 times the instrument's largest non-flow-dependent errors, that is,

1 increment for a ticket printer and 0,2 graduation for an indicator, or 2 mm of indicator movement, whichever is the greater.

Three-way Valve, if fitted, should be checked to ensure that the valve is not able to be set so that both hoses may receive measured liquid at one time.

Date of Approval: 14 December 1976

Signed



Executive Officer

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NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 10/1/0

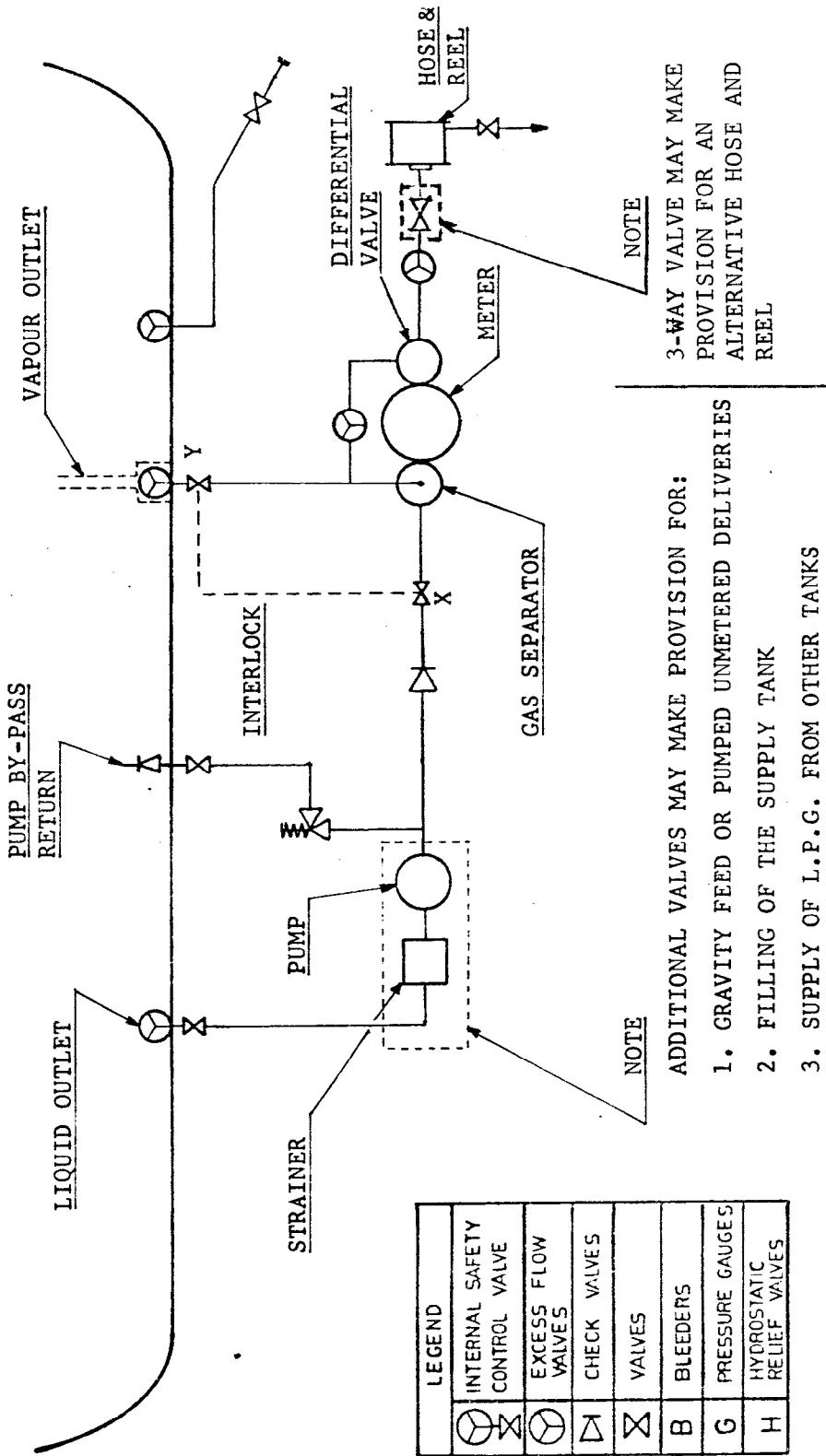
This is to certify that Certificate of Approval No 10/1/0 dated
1/4/77 was cancelled on 7/8/80.

Signed

Executive Director

15/8/80

FIGURE 10/1/0 - 1



LEGEND	
	INTERNAL SAFETY CONTROL VALVE
	EXCESS FLOW VALVES
	CHECK VALVES
	VALVES
	BLEEDERS
	PRESSURE GAUGES
	HYDROSTATIC RELIEF VALVES

ADDITIONAL VALVES MAY MAKE PROVISION FOR:

1. GRAVITY FEED OR PUMPED UNMETERED DELIVERIES
2. FILLING OF THE SUPPLY TANK
3. SUPPLY OF L.P.G. FROM OTHER TANKS

NOTE
3-WAY VALVE MAY MAKE PROVISION FOR AN ALTERNATIVE HOSE AND REEL

Hydraulic Diagram — Typical Instrument