5/6B/74
25/6/90

National Standards Commission

Certificate of Approval

No 5/6B/74

Issued under Regulation 9
of the
National Measurement (Patterns of Instruments) Regulations

This is to certify that an approval for use for trade has been granted in respect of the

Smith Model GL Turbine Flowmetering System

submitted by Email Electronics
Cnr Canterbury and Liverpool Roads
Kilsyth VIC 3137.

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.

J. Birch

..../2

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/8/91.
This approval expires in respect of new instruments on 1/8/92.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/74 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 drawings and specifications lodged with the Commission 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 the Commission's Document 106.

The Commission 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.

DESCRIPTIVE ADVICE

Pattern: approved 24/7/86

- A Smith model GL 80 mm turbine flowmetering system.

Technical Schedule No 5/6B/74 describes the pattern.

Variant: approved 6/4/87

1. With a maximum flow rate of 2750 L/min.

Technical Schedule No 5/6B/74 Variation No 1 describes variant 1.

Variant: approved 12/3/90

2. A model G turbine flowmetering system.

Technical Schedule No 5/6B/74 Variation No 2 describes variant 2.

FILING ADVICE

Certificate of Approval No 5/6A/74 dated 31/7/87 is superseded by this Certificate, and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 5/6B/74 dated 25/6/90
Technical Schedule No 5/6B/74 dated 17/11/86
Technical Schedule No 5/6B/74 Variation No 1 dated 31/7/87
Technical Schedule No 5/6B/74 Variation No 2 dated 25/6/90
Test Procedure No 5/6B/74 dated 17/11/86
Figures 1 and 2 dated 17/11/86

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6B/74

Pattern: Smith Model GL 80 mm Turbine Flowmetering System.

Submittor: Email Limited
Electronic & Petroleum Equipment Division
Canterbury Road
Kilsyth Victoria 3138.

1. Description of Pattern

A bulk flowmetering system using a Smith model GL 80 mm turbine flowmeter (Figure 1) which is approved for use with petrol, kerosene or distillate at any flow rate between 1540 L/min and 500 L/min.

1.1 Loading-rack Flowmetering System

The system (refer to Figure 2) comprises:

(i) A supply tank, optionally with a low-level detection device.

(ii) A pump of either positive displacement or centrifugal type - in the latter case the pump is mounted lower than the minimum level of liquid in the supply tank. The supply pipe from the tank has a continuous fall to the pump.

If the pump is not for the exclusive use of the flowmeter, the flow rate through the meter must stay within the appropriate flow rate range for all combinations of alternative uses of the pump.

The system is constructed with the meter operating at sufficient back-pressure in, and immediately downstream of, the meter to minimise vaporisation.

(iii) Non-return valves or an arrangement of the components and piping to ensure that the system remains full of liquid at all times, and that reverse flow or syphoning is prevented.

(iv) Flow straighteners of at least 10 pipe diameters and 5 pipe diameters in length installed upstream and downstream of the meter respectively.

(v) A Smith model GL 80 mm turbine flowmeter with single or dual pickup coils generating a sinusoidal output voltage of 0.2 V at minimum flow rate and 3.4 V at maximum flow rate, with a nominal output of 13.2 cycles per unit volume.

The output signal from the turbine meter may be connected to a Smith model PA-4 preamplifier which converts the signal to the required square wave with amplitudes as specified in Table 1. The preamplifier provides frequency multiplication factors of 0.5:1, 1:1 and 2:1.

The output signal is interfaced either directly or via the PA-4 preamplifier to a Commission-approved Smith model Accuload bulk flowmetering controller or to any other Commission-approved indicator or controller which has input characteristics compatible to the preamplifier or the turbine output.

...../2

(vi) An outlet control valve located downstream of the meter with no intermediate outlet. Provision shall be made for fitting a pressure gauge downstream of the meter.

(vii) Top-loading outlet arrangement (Figure 2) - the highest point of the pipework forms a weir at a fixed level from which the delivery pipe drains to the outlet for all configurations of the loading arm whilst in operation. The shut-off control valve is installed at or upstream of the highest point and a syphon breaker is installed to ensure complete draining of the pipework downstream of the weir.

Alternatively, an anti-drain valve which retains a pressure of not less than 55 kPa may be installed at the delivery point of the pipework; or

Bottom-loading arrangement - a dry-break coupling located at the delivery point of the pipework.

1.2 Markings

The following information shall be clearly and permanently marked on one or more permanently attached nameplates:

Manufacturer's name or mark	
Model number	
Serial number	
NSC approval number	5/6B/74
Maximum flow rate	... L/min
Minimum flow rate	... L/min
Minimum delivery	... L
Type of liquid for which the meter is verified	

1.3 Verification Provision

Provision is made for a verification mark to be applied.

TABLE 1

Power Supply (DC)	Output Square Wave	
	With no load	270 ohm load
9 V to 14 V	6 V ± 1 V (p-p)	3 V ± 1 V (p-p)
14 V to 28 V	10 V ± 1 V (p-p)	5 V ± 1 V (p-p)

Specification of the output signal from the PA-4 preamplifier when interfaced to the Smith model GL 80 mm turbine meter.

TEST PROCEDURE

Instruments should be tested in accordance with the Formal Conference Inspector's Handbook and with the liquid with which they will be used and which is marked on the data plate.

The maximum permissible errors applicable are specified in Document 118, Second Edition, October 1986.

TECHNICAL SCHEDULE No 5/6B/74

VARIATION No 1

Pattern: Smith Model GL 80 mm Turbine Flowmetering System

Submittor: Email Limited
Electronic & Petroleum Equipment Division
Canterbury Road
Kilsyth Victoria 3138

1. Description of Variant 1

The pattern for use at any flow rate between 2750 L/min and 500 L/min.

National Standards Commission

TECHNICAL SCHEDULE No 5/6B/74

VARIATION No 2

Pattern: Smith Model GL 80 mm Turbine Flowmetering System.

Submittor: Email Electronics
Cnr Canterbury and Liverpool Roads
Kilsyth VIC 3137.

1. Description of Variant 2

A Smith model G turbine flowmetering system which is approved for use either:

(a) With maximum and minimum flow rates of 3100 L/min and 900 L/min, respectively; or

(b) With a digital indicator which is Commission-approved with a multipoint, variable flow rate linearisation facility, in which case the flowmeter may be used with maximum and minimum flow rates of 3100 L/min and 250 L/min, respectively.

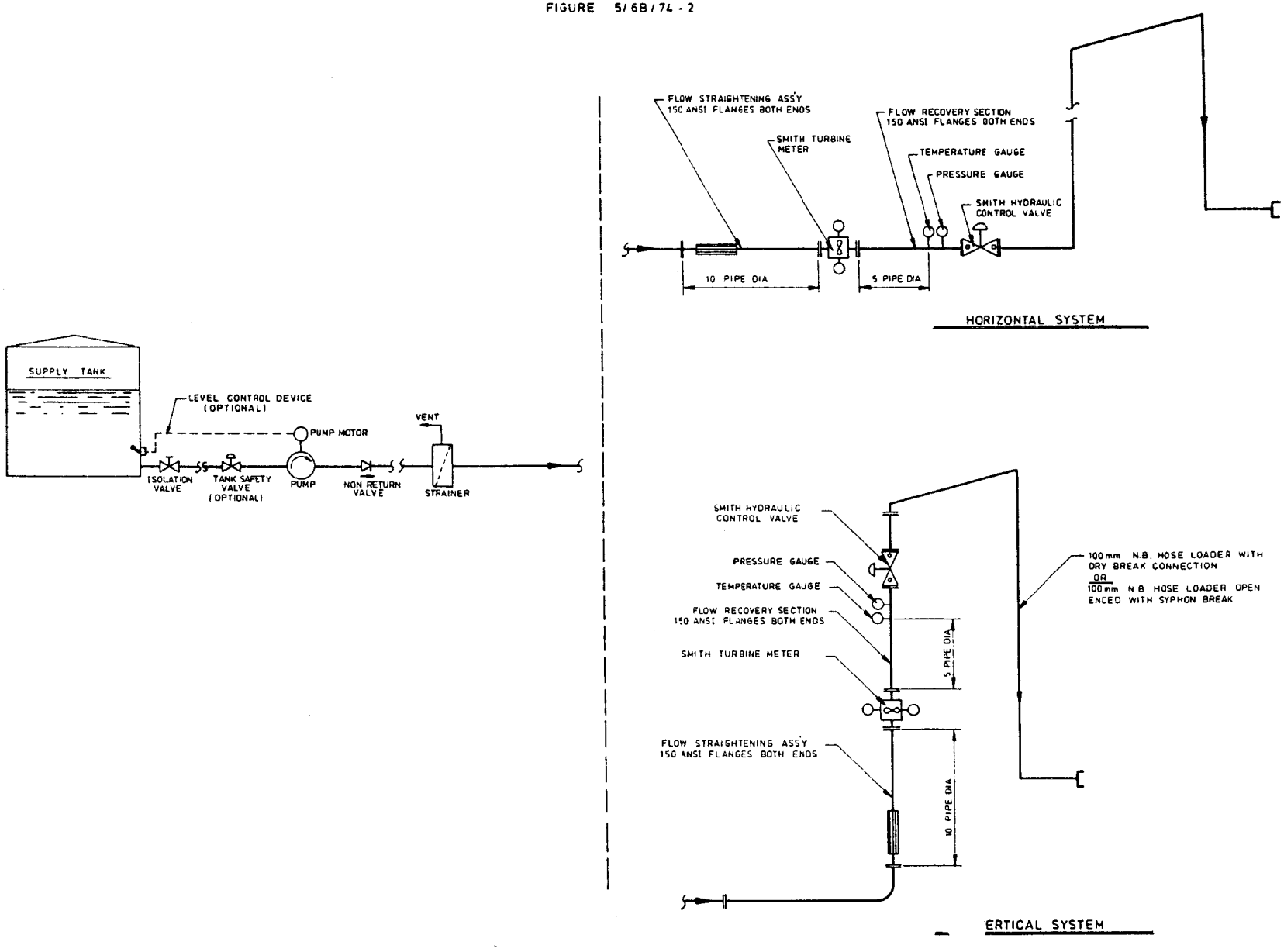
The linearisation facility shall be able to linearise the calibration curve of the meter over not less than 3 points all of which are presettable within the flow rate range of the meter. The maximum effect of linearisation at each point shall be not less than $\pm$1%.

The meter shall be used with flow straighteners in accordance with Australian Standard AS 2651 – 1983 Liquid hydrocarbons – Volumetric measurement by turbine meter systems (or as revised).

FIGURE 5/6B/74 - 1

Smith Dual-pickup Turbine Flowmeter

FIGURE 5/6B/74 - 2



Loading-rack Flowmeter – Schematic Diagram

5/6A/74
17/11/86