NATIONAL STANDARDS COMMISSION

NATIONAL MEASUREMENT (PATTERNS OF INSTRUMENTS) REGULATIONS

REGULATION 9

CERTIFICATE OF APPROVAL No 5/6B/52A

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

Smith D Series Flowmeter System

submitted by Email Limited
Electronic & Petroleum Equipment Division
Canterbury Road
Kilsyth Vic 3137.

This approval is issued upon completion of a review of NSC approval No P5/6B/52.

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/2/91.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/52A. Instruments currently marked NSC No P5/6B/52 but which comply with this approval may have that number changed to 5/6B/52A at their next verification.

This approval may be withdrawn if instruments are constructed and used other than as described in the drawings and specifications lodged with the Commission.

The Commission reserves the right to inspect any installation covered by this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0.

Signed

J. Bird.

~~Acting~~ Executive Director

Descriptive Advice

Pattern: provisionally approved 24/9/80 - approved 28/1/86

. Smith D series flowmeter system.

Technical Schedule No 5/6B/52A describes the pattern.

...../2

Filing Advice

The documentation for this approval comprises:

Certificate of Approval No 5/6B/52A dated 15/5/86
Technical Schedule No 5/6B/52A dated 15/5/86
Test Procedure No 5/6B/52A dated 15/5/86
Figures 1 to 3 dated 15/5/86

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6B/52A

Pattern: Smith D Series Flowmeter System

Submittor: Email Limited
Electronic & Petroleum Equipment Division
Canterbury Road
Kilsyth Vic 3137

1. Description of Pattern

A bulk flowmetering system using a Smith D series flowmeter (Figure 1) which is approved for use with liquids having a viscosity range of 0.4 to 10 mPa.s at maximum and minimum flow rates of 1500 L/min and 300 L/min respectively.

1.1 Pipeline Flowmeter System (Figure 2)

The system comprises:

(i) A supply tank.

(ii) A pump mounted lower than the minimum height of the liquid in the supply tank; the supply pipe from the tank has a continuous fall to the pump. Provision is made for a pressure gauge to be connected downstream of the meter. If the pump is not for the exclusive use of the flowmeter, the flow rate through the meter must stay within the flow rate range marked on the meter.

(iii) A non-return valve between the pump and the meter, or an arrangement of the components and piping to keep the system full of liquid at all times.

(iv) A Smith D series flowmeter.

(v) A strainer with air release head or a strainer with separate de-aerator may be fitted.

(vi) Veeder-Root model VR7887 indicator with or without accumulative or zero-start ticket printer.

The indicator and ticket printers are single-handle reset. A preset indicator, either VR7889 or Smith 300B, and preset-control valve may be fitted to the indicator with or without a ticket printer. The preset indicator is not approved for trade use and must be so marked.

(vii) A Commission-approved pulse generator may be fitted and connected to a compatible Commission-approved indicator and/or Commission-approved bulk flowmeter controller.

(viii) A flow rate control valve and/or an outlet control valve may be located downstream of the meter.

1.2 Loading-rack Flowmeter System

This system is similar to the pipeline system except for the outlet which is replaced by one of the following:

(i) Top-loading arrangement (Figure 3) - the highest point of the pipework forms a sharply defined 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 outlet 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; or

...../2

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

1.3 Features Common to Both Systems

1.3.1 Marking

The instrument is marked with the following, together in one location:

Manufacturer's name or mark	
Meter model	
Serial number	
NSC approval number	NSC No 5/6B/52A
Maximum flow rate	1500 L/min
Minimum flow rate	300 L/min
Nominal flow rate	(when flow rate is within ± 5% of nominal)
Type of liquid for which the instrument is verified	
Minimum delivery	

1.3.2 Sealing and Verification

(a) The indicator, ticket printer, preset indicator and pulse generator may be sealed by passing a sealing wire through the attachment-mounting bolts. The calibrator may be sealed by the same wire or a separate wire terminating beneath the lead stamping plug provided for verification.

(b) The instrument data plate is attached to the instrument by a lead stamping plug or by threading the indicator sealing wire through a hole in the data plate.

TEST PROCEDURE No 5/6B/52A

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

The maximum permissible errors at verification are set out below.

(i) Repeatability:

± 0.15% deviation from the mean error at any constant flow rate within the flow rate range and with the liquid temperature constant.

(ii) Linearity:

± 0.3% over the flow rate range, with the mean error at maximum flow rate set to zero error, and with the liquid temperature constant.

1. Low-level Test

If a device is fitted to prevent the level of the liquid in the supply tank falling to the level of the pump, at least one delivery should occur during which the device stops the delivery. It will be necessary to refill the supply tank to finish the delivery into the proving measure. The effect on the measurement of the quantity delivered should not exceed 1% of the minimum delivery.

Note: This test should only be done where it could be expected that the low-level device may operate during a normal day's operation.

2. Test Delivery

If the test delivery is less than ten times the minimum delivery, the reading error of the indicator or the rounding error of the ticket printer is minimised by completing the delivery at a graduation line on the indicator.

3. Minimum Delivery

The minimum delivery is 100 times the largest non-flow error plus gas purging error.

(a) The non-flow errors are as follows:

With a digital indicator the error is ± 1 scale interval.
With an analogue indicator the error is ± 0.2 scale interval.
With a zero start indicator/printer the error is ± 1 scale interval.
With an accumulative printer or indicator the error is ± 2 scale interval.

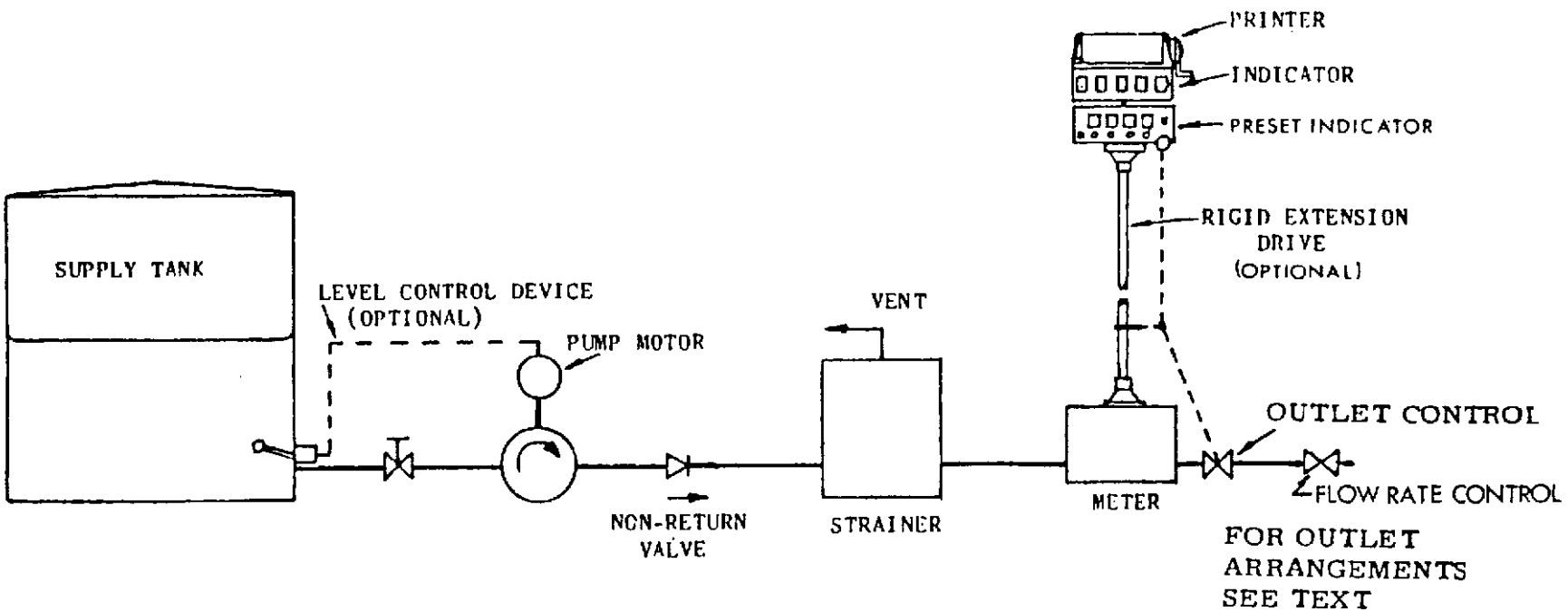
Note: If more than one indicator and/or printer (analogue or digital) is used, the larger of the above is the non-flow error.

(b) Where there is a possibility of the supply tank emptying, the gas purging error should be determined for inclusion in the non-flow errors.

FIGURE 5/68/52A - 1

Smith D Series Meter

FIGURE 5/6B/52A - 2



Pipeline Flowmeter - Schematic Diagram

5/6B/52A
15/5/86

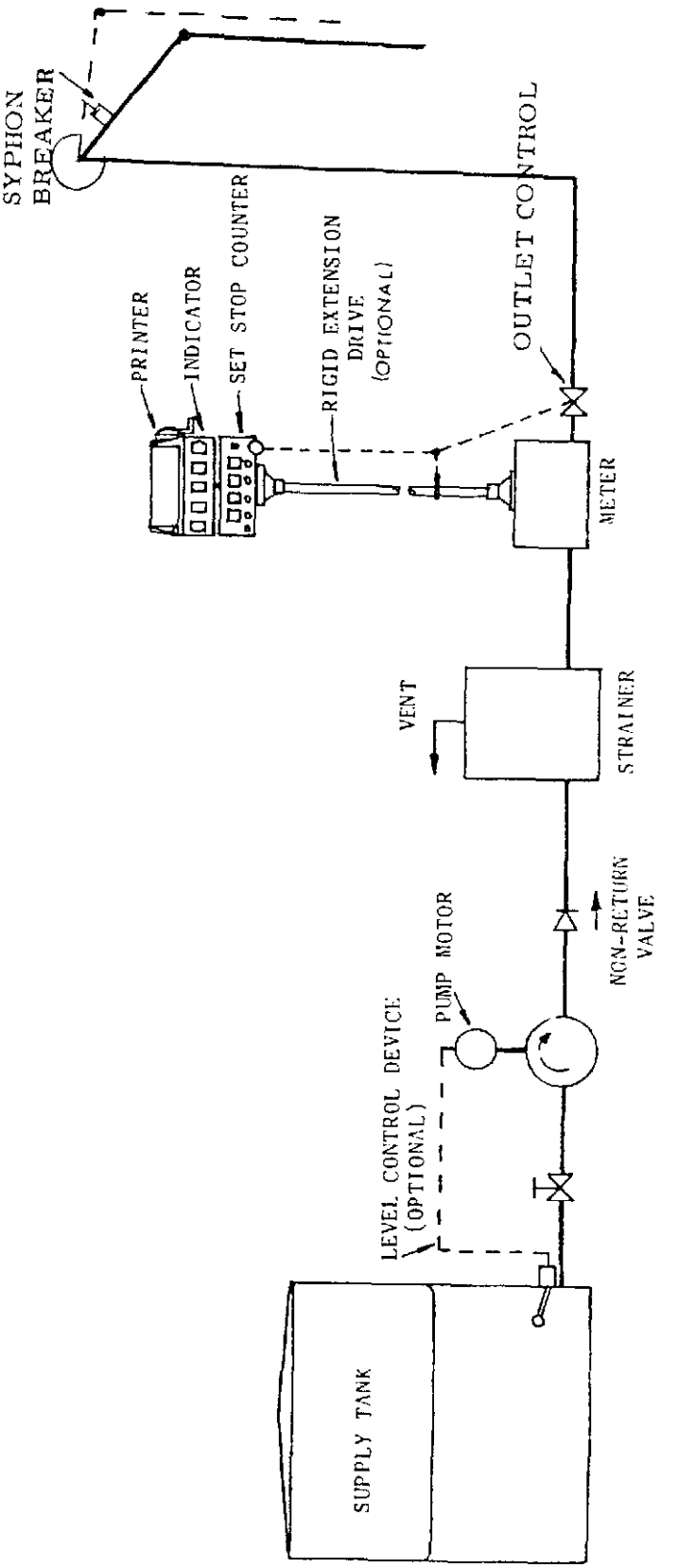


FIGURE 5/68/52A - 3

Loading-rack Flowmeter - Schematic Diagram