

# National Standards Commission



## Certificate of Approval No 5/6B/80

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

Avery Hardoll Model BM250 Bulk Flowmetering System

submitted by GEC Automation & Control  
2 Giffnock Street  
North Ryde NSW 2113.

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.

A handwritten signature in black ink, appearing to read 'J. Birch'.

### CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/4/95.  
This approval expires in respect of new instruments on 1/4/96.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/80 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.

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

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

### DESCRIPTIVE ADVICE

**Pattern:** approved 9/3/90

. An Avery-Hardoll model BM250 bulk flowmetering system.

**Variant:** approved 9/3/90

1. Certain other BM series flowmeters with flow rates as shown in Table 1.

Technical Schedule No 5/6B/80 describes the pattern and variant 1.

### FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/80 dated 27/4/90  
Technical Schedule No 5/6B/80 dated 27/4/90 (Incl. Test Procedure)  
Figures 1 to 4 dated 27/4/90



# National Standards Commission

## TECHNICAL SCHEDULE No 5/6B/80

**Pattern:** Avery-Hardoll Model BM250 Bulk Flowmetering System.

**Submitter:** GEC Automation & Control  
2 Giffnock Street  
North Ryde NSW 2113.

### 1. Description of Pattern

A bulk flowmetering system using an Avery Hardoll model BM250 flowmeter (Figure 1 and Table 1) which is approved for use with liquids having a viscosity range of 0.4 to 10 mm/s<sup>2</sup> at maximum and minimum flow rates of 1150 L/min and 115 L/min, respectively.

#### 1.1 Pipeline Flowmetering System (Figure 2)

The system comprises:

- (i) A supply tank, optionally with a low-liquid level device.
- (ii) A pump of either positive displacement or centrifugal type - in the latter case the pump is 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 to the suction side of 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.
- (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) An Avery Hardoll model BM250 flowmeter protected by a strainer with a gas purger attached (Figure 1). Provision is made for a pressure gauge to be connected downstream of the meter.
- (v) An Avery Hardoll model Masterload digital indicator with a model BEMY115 pulse generator, or with either or both of the following:
  - (a) A Veeder-Root VR788700 zero start indicator.
  - (b) A Veeder-Root VR789000 indicator/printer.
- (vi) An outlet control valve located downstream of the meter with no intermediate outlet.

A flow rate control valve may be fitted.

### 1.2 Loading-rack Flowmetering System (Figure 3)

This system is similar to the pipeline system except that the outlet control valve is replaced by one of the following:

- (i) Top-loading arrangement – 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 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.

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

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

### 1.3 Vehicle-mounted Flowmetering System (Figure 4)

This system is similar to the pipeline and loading-rack systems except that the outlet control valve is in the form of either a nozzle or a dry-break coupling at the end of a flexible hose. The pump is located lower than the minimum height of the liquid in the supply tank.

Any nozzle with integral outlet control valve may be fitted. If fitted with an integral anti-drain valve, the valve shall be immediately before the outlet control valve. A separate anti-drain valve may be fitted to the nozzle end of the hose if an integral anti-drain valve is not part of the nozzle.

The anti-drain valve retaining pressure shall be not less than 55 kPa.

### 1.4 Markings

Instruments are marked with the following data, together in the one location:

Manufacturer's name or mark	
Meter model	
Serial number	
NSC approval number	5/6B/80
Maximum flow rate	..... L/min
Minimum flow rate	..... L/min
Nominal flow rate	(when flow rate is within $\pm 5\%$ of nominal)
	..... L/min
Minimum delivery	..... L
Type of liquid for which the meter is verified	.....
Operating air temperature range	0°C to +40°C

**1.5 Sealing and Verification Provision**

Provision is made for sealing the indicator or indicator/ticket printer, and the calibrator. Provision is also made for a verification mark to be applied.

**2. Description of Variant 1**

With certain other BM series flowmeters with flow rates as listed in Table 1.

**TABLE 1**

Meter Model	No. of Capsules	Pipeline Size mm (Inch)	Flow Rate L/min		Minimum Quantity L
			Maximum	Minimum	
BM250	Single	63 (2.5)	1150	115	300
BM950	Single	76 (3.0)	1370	130	300
BM450	Double	76 (3.0)	2050	200	500
BM550	Double	102 (4.0)	2280	220	500
BM650	Triple	102 (4.0)	3000	300	1000
BM750	Triple	152 (6.0)	3000	300	1000
BM850	Triple	152 (6.0)	3800	385	1000

**Approved Models and Capacities**

### TEST PROCEDURE

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

#### Maximum Permissible Errors at Verification/Certification

The maximum permissible error applied during a verification test from normal flow rate to the minimum flow rate specified in the Certificate of Approval or Technical Schedule is  $\pm 0.3\%$ .

Where an instrument is fitted with a device to convert the indication of volume to volume at reference conditions, the maximum permissible error specified above is increased by 0.2%.

Reference conditions for petroleum liquids are specified in Australian Standard 2649 - 1983, Petroleum Liquids and Gases - Measurement - Standard Reference Conditions.

# National Standards Commission



## NOTIFICATION OF CHANGE CERTIFICATE OF APPROVAL No 5/6B/80 CHANGE No 1

The following changes are made to the approval documentation for the  
Avery-Hardoll Model Type BM250 Bulk Flowmetering System

submitted by GEC Automation & Control  
2 Giffnock Street  
North Ryde NSW 2113.

1. In Certificate of Approval No 5/6B/80 and its Technical Schedule both dated 27 April 1990, all references to the submitter should be amended to read:

Gilbarco Aust. Ltd  
12-38 Talavera Road  
North Ryde NSW 2113.

2. In Technical Schedule No 5/6B/80 dated 27 April 1990, subclause (ii) of clause 1.1 Pipeline Flowmetering System is replaced by the following:

- (ii) The pump may be fitted in either a suction lift or suction head (flooded suction) installation, i.e. either above or below the liquid level in the supply tank, depending on the type of pump used.

Positive displacement type pumps may be fitted in either suction lift or suction head installations.

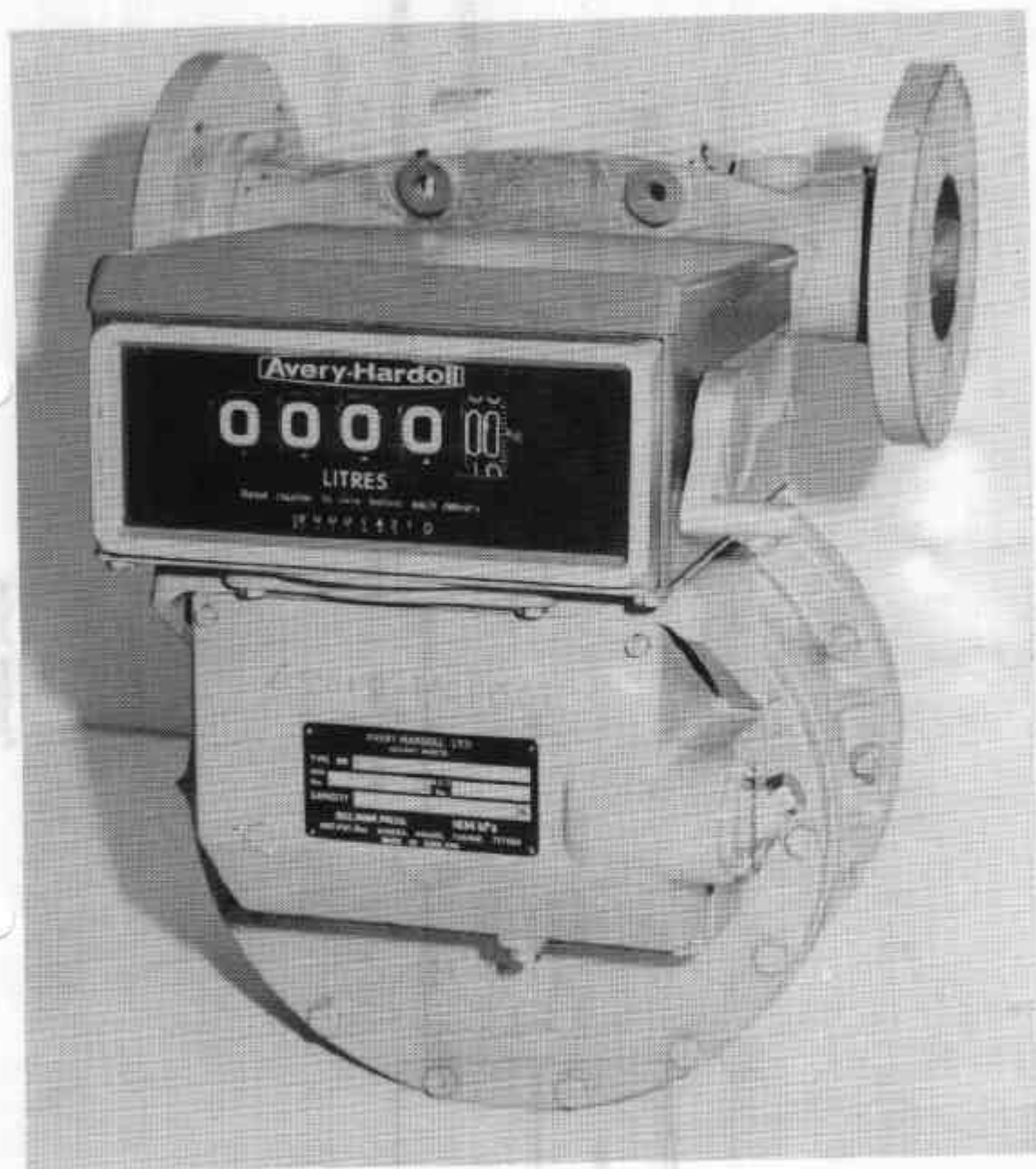
Centrifugal type pumps, including submersible turbine types, shall NOT be fitted in suction lift installations.

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



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Figure 5/68/80 - 1



Avery Hardoll BM250 Flowmeter



Figure 5/6B/80 - 2

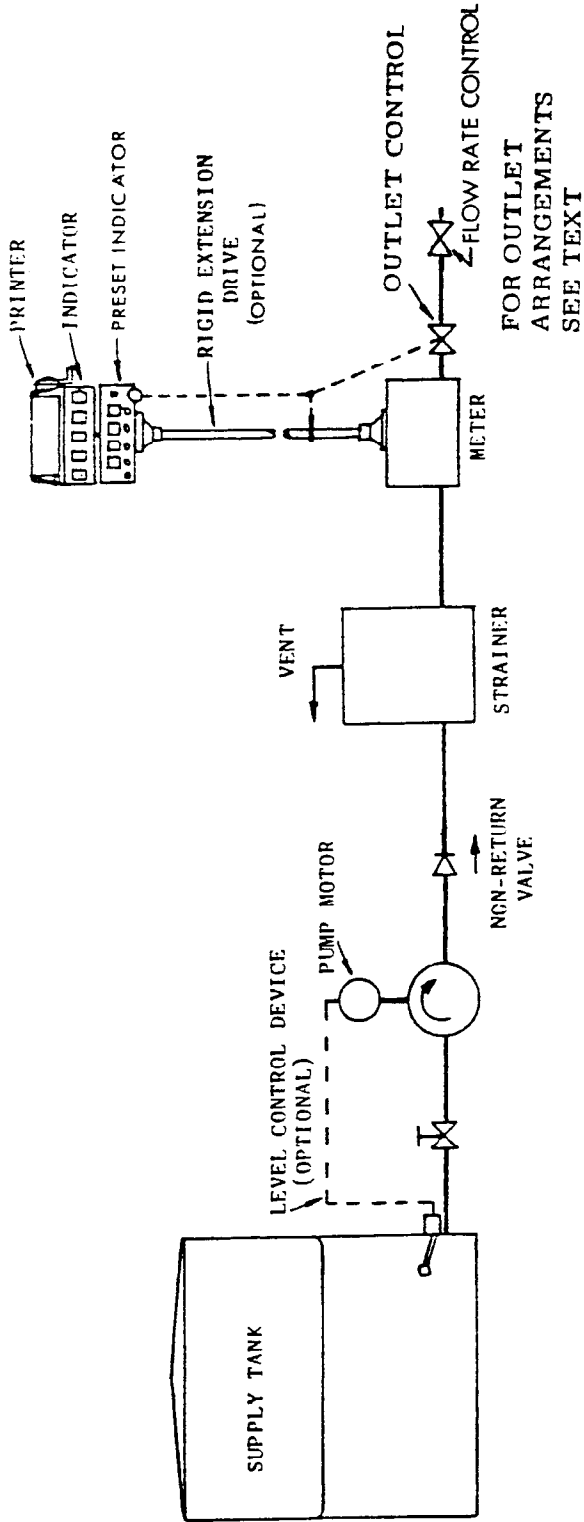
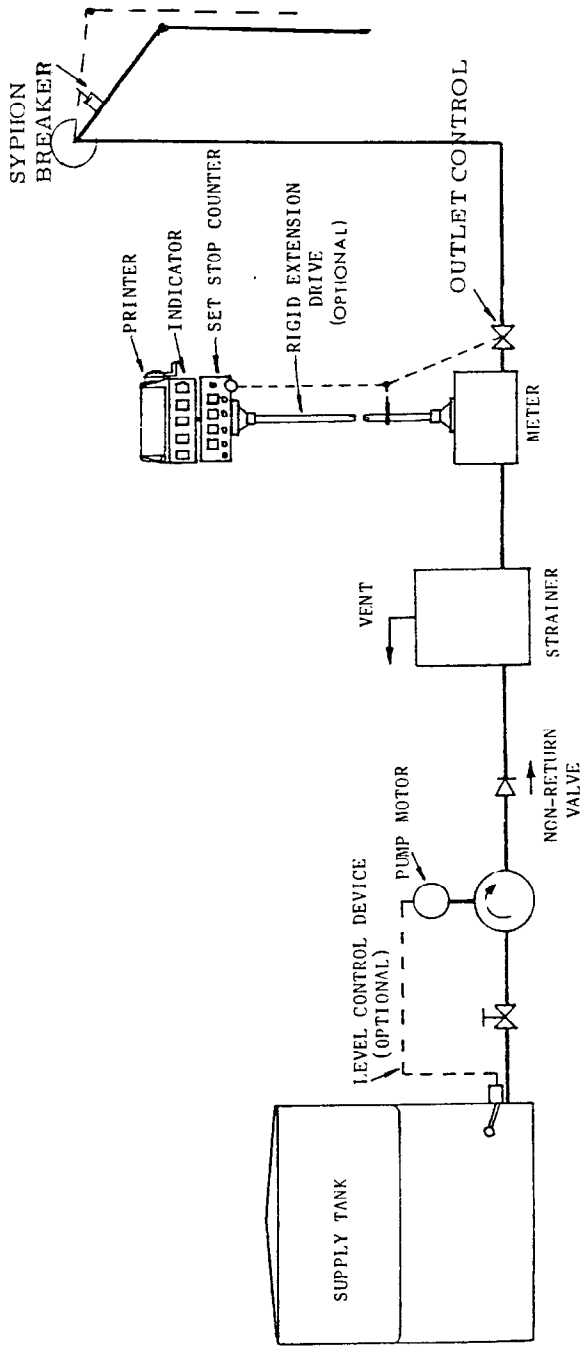


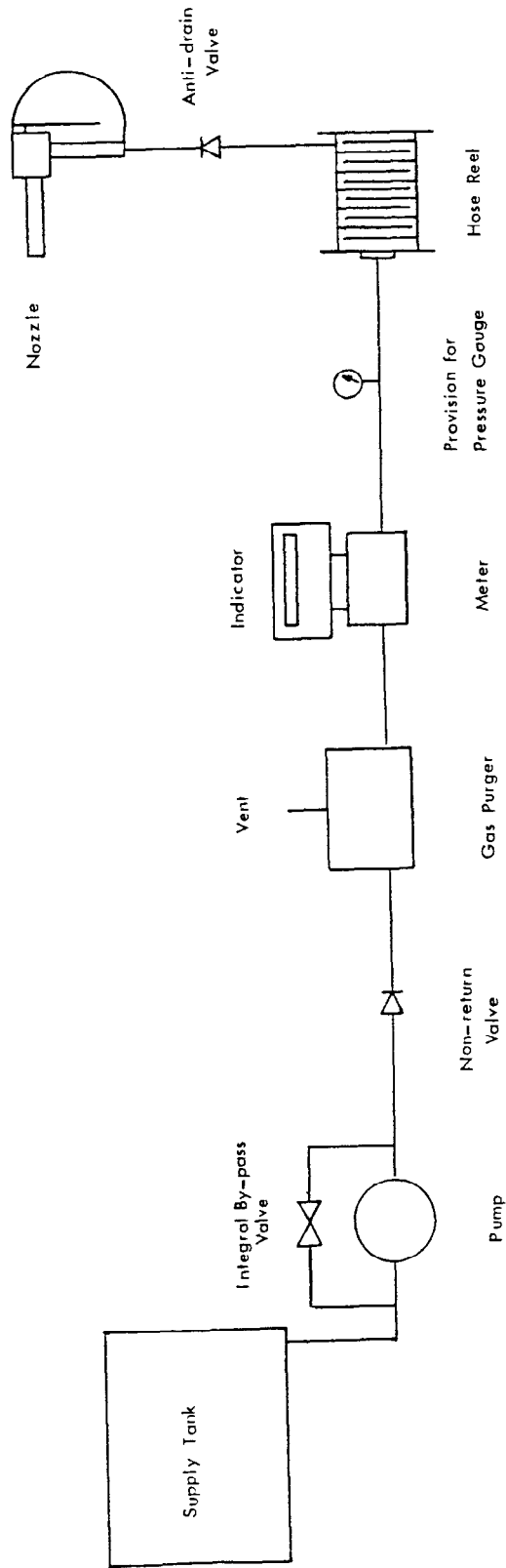
Figure 5/68/80 - 3



Loading-rack System

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Figure 5/6B/80 - 4



Vehicle-mounted System