



# **Australian Government**

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## **National Standards Commission**

12 Lyonpark Road, North Ryde NSW 2113 Australia

### **Cancellation**

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

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

Avery Hardoll Model BM250 Bulk Flowmetering System

submitted by    Gilbarco Australia Limited  
                      (formerly Gilbarco Aust. Ltd)  
                      20 Highgate Street  
                      Auburn    NSW    2144

has been cancelled in respect of new instruments as from 1 May 2004.

Signed by a person authorised under Regulation 60  
of the National Measurement Regulations 1999 to  
exercise the powers and functions of the Commission  
under this Regulation.

A handwritten signature in black ink, appearing to be 'J. H. T.', is written over a faint, circular official stamp.

## National Standards Commission



### Certificate of Approval

**No 5/6B/80A**

Issued under Regulation 9  
of the  
National Measurement (Patterns of Measuring 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           Gilbarco Aust. Ltd  
                              12-38 Talavera Road  
                              North Ryde   NSW   2113.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

#### CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 April 2001, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/80A and only by persons authorised by the submitter.

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

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation 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.

### DESCRIPTIVE ADVICE

**Pattern:** approved 29 March 1996

- An Avery Hardoll model BM250 bulk flowmetering system.

**Variants:** approved 29 March 1996

1. As a loading-rack flowmetering system.
2. As a modular flowmetering system.
3. With certain other Avery Hardoll BM series flowmeters.

Technical Schedule No 5/6B/80A describes the pattern and variants 1 to 3.

**Variant:** approved 18 July 1997

4. With certain Avery Hardoll CM series flowmeters.

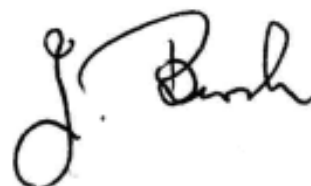
Technical Schedule No 5/6B/80A Variation No 1 describes variant 4.

### FILING ADVICE

Certificate of Approval No 5/6B/80A dated 10 July 1996 is superseded by this Certificate, and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 5/6B/80A dated 22 October 1997  
Technical Schedule No 5/6B/80A dated 10 July 1996 (incl. Table 1 &  
Test Procedure)  
Technical Schedule No 5/6B/80A Variation No 1 dated 22 October 1997  
(incl. Table 2 & Notification of Change)  
Figures 1 to 4 dated 10 July 1996  
Figure 5 dated 22 October 1997

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.





## National Standards Commission

### TECHNICAL SCHEDULE No 5/6B/80A

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

**Submitter:** Gilbarco Aust. Ltd  
12-38 Talavera Road  
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<sup>2</sup>/s 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) Tank

A supply tank, optionally with a low-liquid level device.

###### (ii) Pump

The pump may be fitted in either a **suction lift** or **suction head** (flooded suction) installation, i.e. either above or below (Figure 2) 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 shall be fitted in **suction head** installations.

Submersible turbine type pumps may also be used, either alone or in systems which incorporate centrifugal type pumps fitted in **suction lift** installations.

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) Non-return Valve

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) Gas Purger/Strainer**

A gas purger/strainer assembly fitted as close as practical to the meter inlet. The gas purger is approved on the condition that the pump is operated under a positive suction head.

The gas purger/strainer assembly may be modified for use as a strainer only where the tank has automatic alarming of low-liquid level, or has a float-operated shut-off valve in the pump supply, or has other means to prevent gas entering the system.

**(v) Meter**

An Avery Hardoll model BM250 rotary vane, single capsule flowmeter (Figure 1). A back pressure valve may be incorporated in the outlet of the meter. Provision shall be made for a pressure gauge to be connected downstream of the meter.

**(vi) Indicating System**

The flowmetering system is fitted with either:

- (a) An Avery Hardoll model Masterload bulk flowmeter control system as described in the documentation of NSC Approval No S262A - when the Masterload is fitted with a preset facility, the system must include a solenoid operated flow control valve; or
- (b) An Avery Hardoll mechanical calibrating assembly (Figure 1) and with either of the following:
  - A Veeder-Root VR788700 zero start indicator; or
  - A Veeder-Root VR789000 indicator/printer.

**(vii) Transfer Device**

A transfer device in the form of a positive shut-off component such as a manually or automatically-operated control valve located downstream of the meter with no intermediate outlet. A flow rate control valve may be fitted.

**1.2 Sealing Provision**

Provision is made for sealing the indicator or indicator/ticket printer, and the calibration device of the meter.

**1.3 Verification/Certification Provision**

Provision is made for a verification/certification mark to be applied.

## 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/80A
Maximum flow rate	..... L/min
Minimum flow rate	..... L/min
Minimum quantity	..... L #
Type of liquid for which the meter is verified	.....
Maximum operating pressure	..... kPa

# May be located separately, e.g. on a metal tag sealed to the instrument.

## 2. Description of Variants

### 2.1 Variant 1

As a loading-rack flowmetering system (Figure 3) which 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. 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.

### 2.2 Variant 2

As a modular flowmetering system (Figure 4) which is similar to the pipeline and loading-rack systems, except that it is a module of metering components in its own assembly rather than built into another structure. It may be portable, including being vehicle-mounted.

The system may contain the pump, together with a pressure control valve (if necessary), and a hose; in the latter case, the transfer device is in the form of either a nozzle or dry-break coupling at the end of a flexible hose.

The pump is fitted in a **suction head** (flooded suction) installation, i.e. the pump is located lower than the minimum height of the liquid in the supply tank. A non-return valve is located between the pump and the meter, or the components and piping are arranged to keep the system full of liquid at all times.

Any nozzle used shall have an integral outlet control valve. 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.

### 2.3 Variant 3

With certain other BM series flowmeters 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
BM350	Double	102 (4.0)	2500	220	500
BM650	Triple	102 (4.0)	3000	300	1000
BM750	Triple	152 (6.0)	3000	300	1000
BM850	Triple	152 (6.0)	3850	385	1000

Approved Models and Capacities

## TEST PROCEDURE

Instruments should be tested in accordance with any tests included in the approval documentation for the indicator, and in accordance with any relevant tests specified in 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.



## TECHNICAL SCHEDULE No 5/6B/80A

### VARIATION No 1

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

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

#### 1. Description of Variant 4

With certain Avery Hardoll CM series flowmeters as listed in Table 2.

A model CM2000 (#) is shown in Figure 5.

TABLE 2

Meter Model (#)	No. of Capsules	Pipeline Size mm (inch)		Flowrate L/min			Minimum Quantity L
				Maximum	Minimum	Intermittent	
CM1000	Single	63	(2.5)	1000	100	—	100
CM1400	Single	76	(3.0)	1400	140	1450	140
CM2000	Double	76	(3.0)	2000	200	—	200
CM2500	Double	102	(4.0)	2500	250	2800	250
CM3000	Triple	102	(4.0)	3000	300	—	300
CM4000	Triple	152	(6.0)	4000	400	4250	400

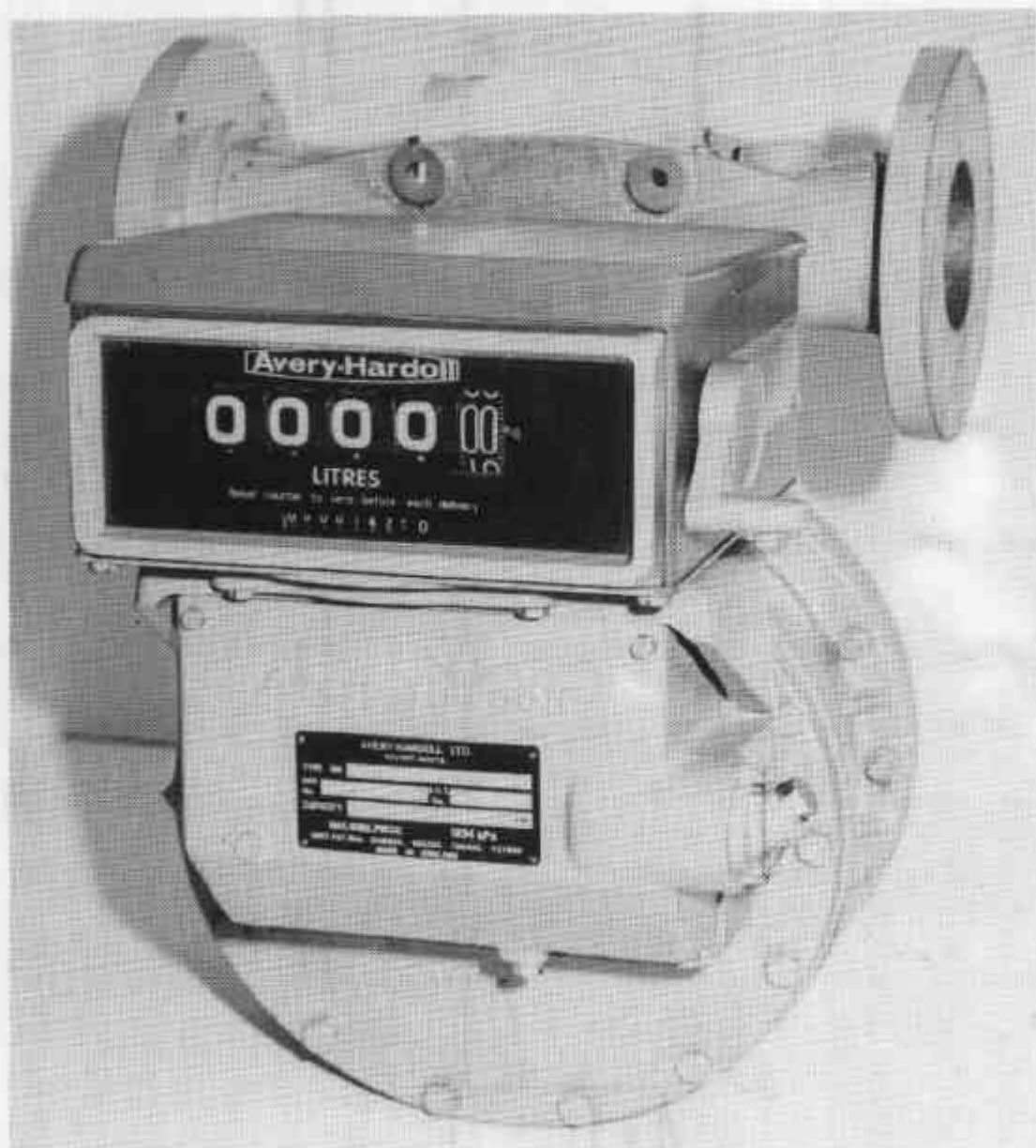
(#) The model numbers listed above are the basic model numbers only – the full model number includes a variety of additional alphanumeric characters e.g. CM\*\*2000\*\*\*\*\*.

#### NOTIFICATION OF CHANGE

In Technical Schedule No 5/6B/80A dated 10 July 1996, Table 1 on page 4 should be amended by adding a hash symbol (#) after the title 'Meter Model', and by adding the following footnote:

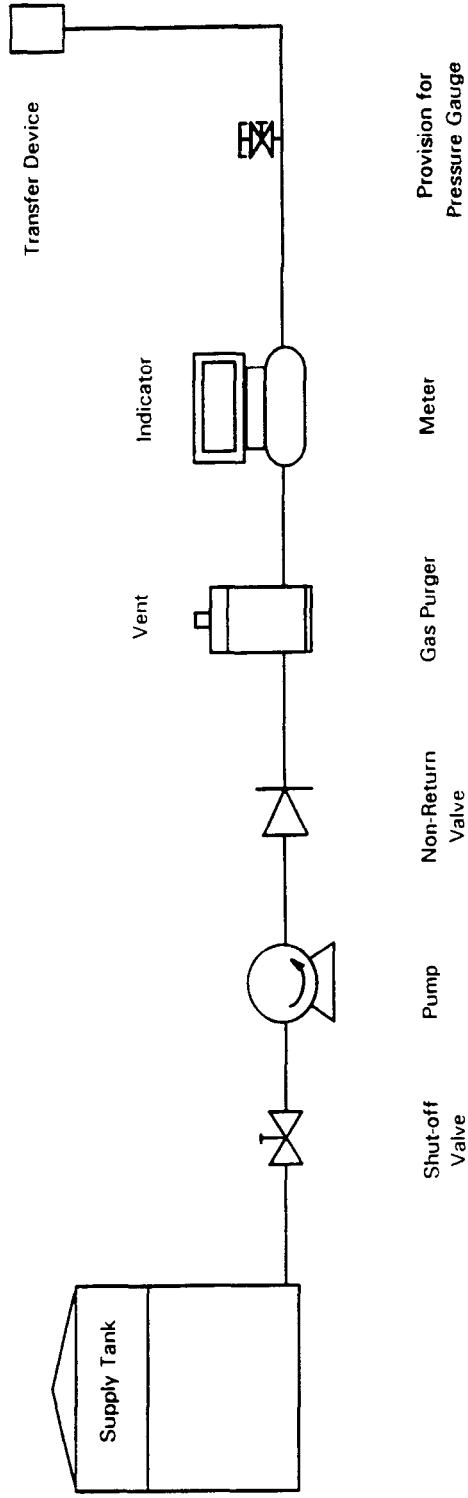
(#) The model numbers listed above are the basic model numbers only – the full model number includes a variety of additional alphanumeric characters e.g. BM\*\*250\*\*\*\*\*.

FIGURE 5/6B/80A - 1



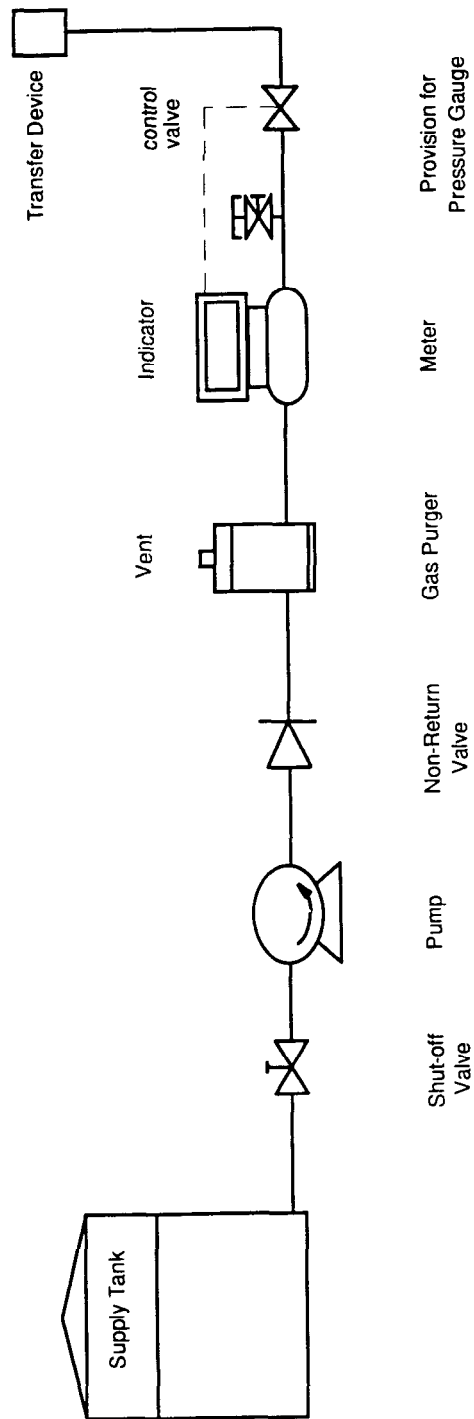
Avery Hardoll Model BM250 Flowmeter

FIGURE 5/6B/80A - 2



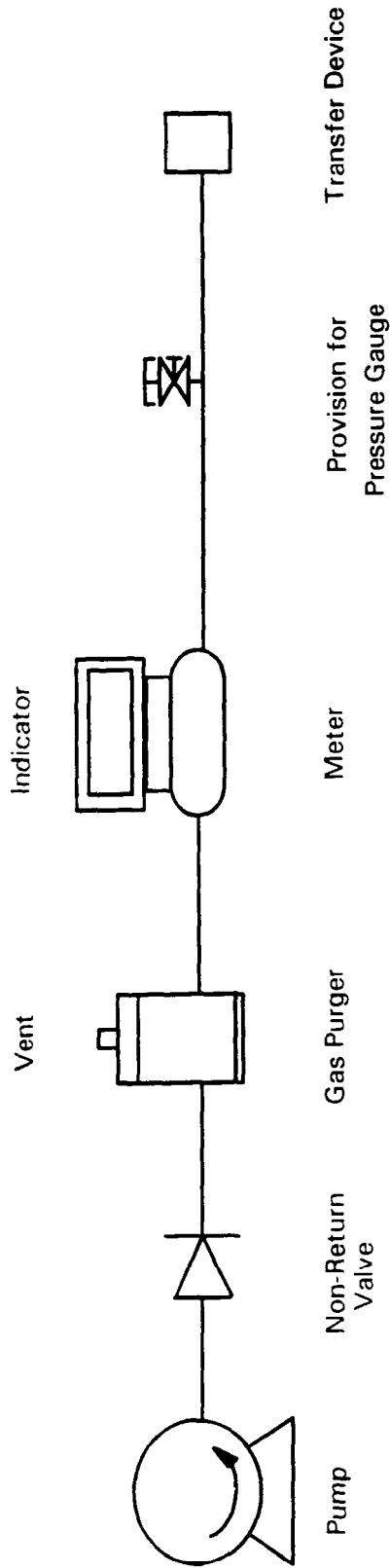
Typical Pipeline Flowmetering System

FIGURE 5/6B/80A - 3



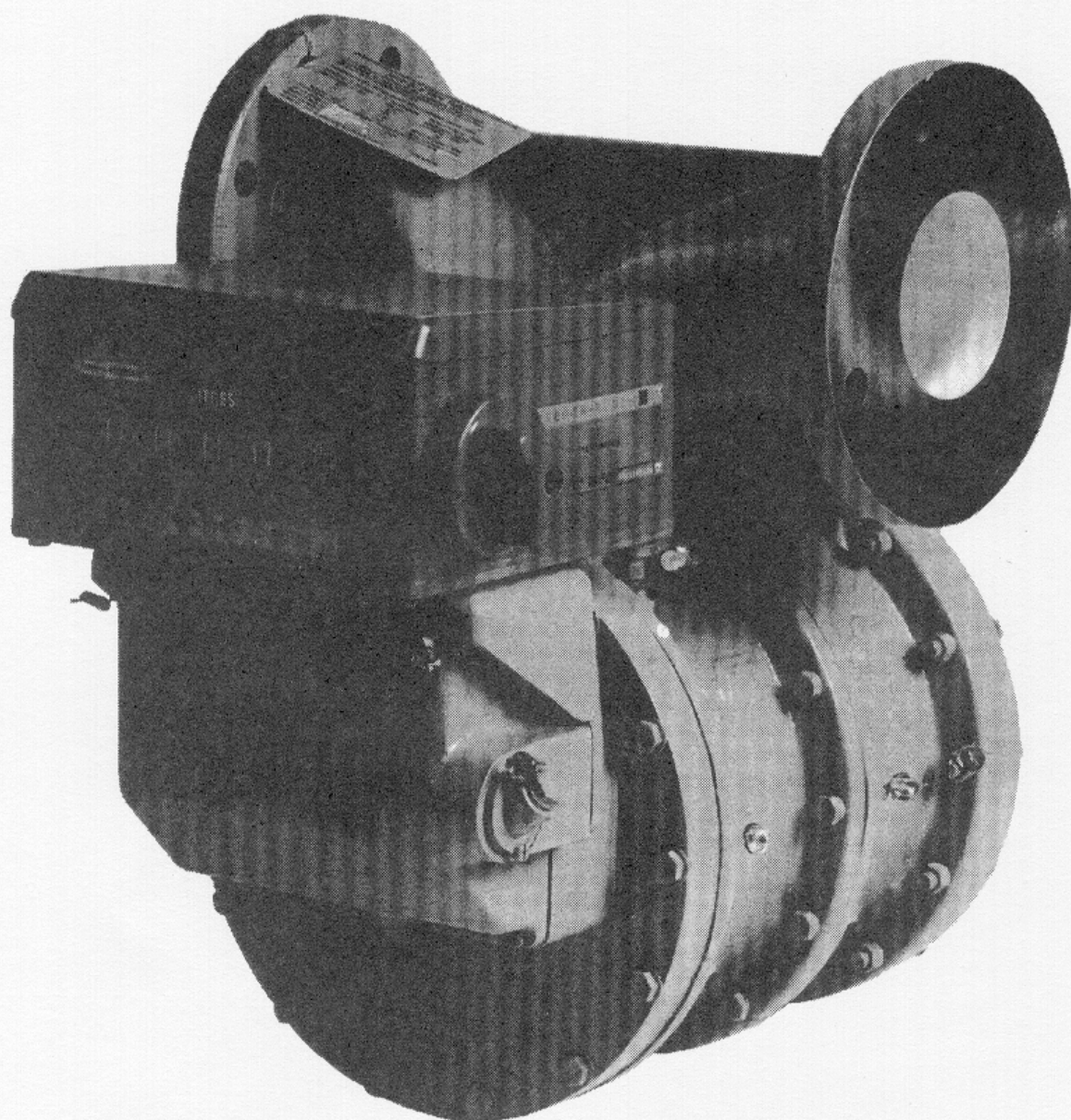
Typical Loading-rack Flowmetering System

FIGURE 5/6B/80A - 4



Typical Modular Flowmetering System

FIGURE 5/6B/80A – 5



Avery Hardoll Model CM2000 Flowmeter