

National Standards Commission



Certificate of Approval

No 5/6B/50A

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

Daniel Model 1450-15-SP-2 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.

This Certificate is issued upon completion of a review of NSC approvals Nos 5/6B/36, 5/6B/38, 5/6B/39, 5/6B/40, 5/6B/41, 5/6B/49, 5/6B/50, 5/6H/11 and 5/6J/1.

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1 June 1999.
This approval expires in respect of new instruments on 1 June 2000.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/50A and only by persons authorised by the submittor.

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

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.

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

DESCRIPTIVE ADVICE

Pattern: approved 5 May 1994

- A bulk flowmetering system using a Daniel model 1450-15-SP-2 flowmeter.

Variants: approved 5 May 1994

1. As a loading-rack flowmetering system.
2. As a modular flowmetering system.
3. As a drum-filling flowmetering system.
4. As a bulk flowmetering system using certain other Daniel (or Tokheim) flowmeters.

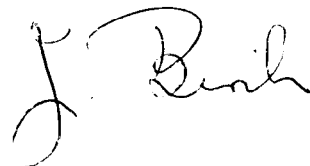
Technical Schedule No 5/6B/50A describes the pattern and variants 1 to 4.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/50A dated 16 September 1994
Technical Schedule No 5/6B/50A dated 16 September 1994 (incl. Table 1
and Test Procedure)
Figures 1 to 6 dated 16 September 1994

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/50A

Pattern: Daniel Model 1450-15-SP-2 Bulk Flowmetering System.

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

1. Description of Pattern

A bulk flowmetering system using a Daniel model 1450-15-SP-2 flowmeter which is approved for use with liquid having a kinematic viscosity range between 0.5 and 12.5 mm²/s.

The system is approved for use for a flow rate range of 45 L/min to 227 L/min. The minimum quantity is 50 litres.

1.1 Pipeline Flowmetering System (Figure 1)

NOTE: The flowmeter, and any other Daniel component listed below, may also be known as a Tokheim component of the same model number.

(i) Supply Tank

A supply tank.

(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 1) the liquid level in the supply tank. 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 Daniel 683-**, 1505-** or 1506-** series gas purger/strainer assembly is fitted as close as practical to the meter inlet (Figure 2).

*** Approved models may have a '15', '20', '3J' or '40' suffix. The model 1505 may alternatively have a '60' suffix.

The gas purger/strainer assembly may be omitted 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 meter. An alternative strainer assembly may be used.

(v) Meter

A Daniel model 1450-15-SP-2 38 mm rotary vane offset flowmeter (Figure 2). A Daniel model 1553-(**) 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.

(**) May have a '15', '20', '30' or '40' suffix.

A Daniel model 1510 calibrator assembly mounted on top of the meter is used for calibration of the meter.

(vi) Indicating System

Any combination of the following assemblies:

- (a) A Daniel model 1541 or a Veeder-Root 1624 or 7887 series zero start indicator.
- (b) A Daniel model 1542 or a Veeder-Root 7085 or 7890 series zero-start indicator (Figure 2) with ticket printer.
- (c) A Daniel model 1540 or a Veeder-Root 1646 or 7889 series preset counter with a Daniel 1550, 1600 or 1800 series preset-counter-operated outlet control valve (Figure 3). The preset counter may cause the outlet control valve to close in two stages. A pressure relief pipe may be fitted between the valve and the gas purger/strainer. The preset counter is marked PRESET INDICATION NOT IN USE FOR TRADE.
- (d) A swivel adapter fitted under the indicator and/or rate of flow tachometer and/or a rigid extension drive from the meter to the indicator and ticket printer.
- (e) Any compatible Commission-approved pulse generator, electronic bulk flowmeter controller/indicator (which may incorporate a volume conversion for temperature device), and flow control valve.

NOTE: Where systems include a pulse generator and electronic indicator, the pulse generator shall be driven directly from the output shaft of the meter; it shall not be driven via a mechanical indicator nor via reduction gear trains.

The use of a right-angled drive would be considered as direct as long as the drive consists of two bevel gears with a 1:1 ratio and provided the right-angled drive is before the drive to any mechanical indicator.

Where the pulse generator is not driven directly, any electronic indicator connected to it shall be marked NOT IN USE FOR TRADE.

(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.

1.2 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/50A
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.

In addition, preset counters (other than those complying with clause 2.3 Variant 3) shall be marked PRESET INDICATION NOT IN USE FOR TRADE.

1.3 Sealing and Verification/Certification Provision

Provision is made for sealing the indicator or indicator/ticket printer and the calibration device of the meter. Provision is made for a verification/certification mark to be applied.

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 Daniel 1550 series outlet-control valve is installed at or upstream of the transfer device, which is 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 hose or 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 hose; or

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

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 consists of a gas purger/strainer, a meter and a transfer device. It may contain the pump, together with a pressure control valve (if necessary), and a hose reel; 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 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

As a drum-filling flowmetering system (Figure 5) which is similar to the pipeline and loading-rack systems except for the following:

- (i) The system uses either the Daniel model 1450-15-(*) 38 mm offset flowmeter of the pattern, or a model 1450-20-(*) 50 mm offset or model 1400-20-(*), 1415-20-(*), or 1430-20-(*) 50 mm inline flowmeter, which are approved for use at maximum and minimum flow rates of 454 L/min and 91 L/min respectively. (Figure 6 shows a typical inline flowmeter.)

NOTE: (*) Abbreviated model number - refer to Table 1 and its footnotes.

- (ii) The meter is fitted with a Daniel 1550 or 637 series outlet control valve and a Daniel model 1540 or a Veeder Root 1646, 7889 or 7891 series preset counter or 7892 series preset counter/printer.

The outlet control valve, which incorporates an integral anti-drain valve, may be closed manually or by the counter. A pressure relief pipe may be fitted between the valve and the gas purger/strainer.

The indicator is approved to repeat fixed deliveries of either 60, 200 or 205 litres, and is marked PRESET FOR BATCHES '#' LITRES or BATCHES '#' LITRES (where '#' equals one of the approved preset quantities). **Only the model 1450-15-(*) flowmeter shall be used for batches of 60 litres.**

Unlike the pattern, the preset counter of this variant need NOT be marked PRESET INDICATION NOT IN USE FOR TRADE.

- (iii) The system is arranged such that the meter operates at a constant flow rate ($\pm 5\%$ of nominal) within the maximum and minimum flow rate range.
- (iv) The outlet is either a drum-filling spear or a hose. If a spear is used, it is arranged to fully drain after each delivery so that the control valve is the transfer device. If a hose is used, it is fitted with a Commission-approved nozzle which has an anti-drain valve installed either in the nozzle or immediately before it, and having a retaining pressure of not less than 55 kPa; the nozzle is the transfer device.

2.4 Variant 4

A bulk flowmetering system using any Daniel flowmeter listed in Table 1. Only those models marked '#' in the table, and listed in cl. 2.3 Variant 3, are approved for drum-filling systems.

TEST PROCEDURE

Instruments should be tested in accordance with the Inspector's Handbook using the product with which they will be used and which is marked on the data plate. Tests should be conducted in conjunction with any tests specified in the approval documentation for any indicator and/or conversion device, etc. used.

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 registered 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*.

TABLE 1

Meter Model	Case	Pipeline Size mm (inch)	Flow Rate L/min		Minimum Quantity L
			Maximum	Minimum	
1450-15-(*) #	Single (CI)	38 (1.5) (OS)	227	45	50
1400-20-(*) #	Single (CI)	50 (2.0) (IL)	454	91	100
1450-20-(*) #	Single (CI)	50 (2.0) (OS)	454	91	100
1415-20-(*) #	Single (CS)	50 (2.0) (IL)	454	91	100
1430-20-(*) #	Single (CS)	50 (2.0) (IL)	454	91	100
1400-30-(*)	Single (CI)	75 (3.0) (IL)	1325	265	500
1450-30-(*)	Single (CI)	75 (3.0) (OS)	1325	265	500
1450-40-(*)	Single (CI)	100 (4.0) (OS)	2839	454	1000
2415-30-(*)	Dual (CS)	75 (3.0) (IL)	1325	265	500
2430-30-(*)	Dual (CS)	75 (3.0) (IL)	1325	265	500
2415-40-(*)	Dual (CS)	100 (4.0) (IL)	2839	454	1000
2430-40-(*)	Dual (CS)	100 (4.0) (IL)	2839	454	1000

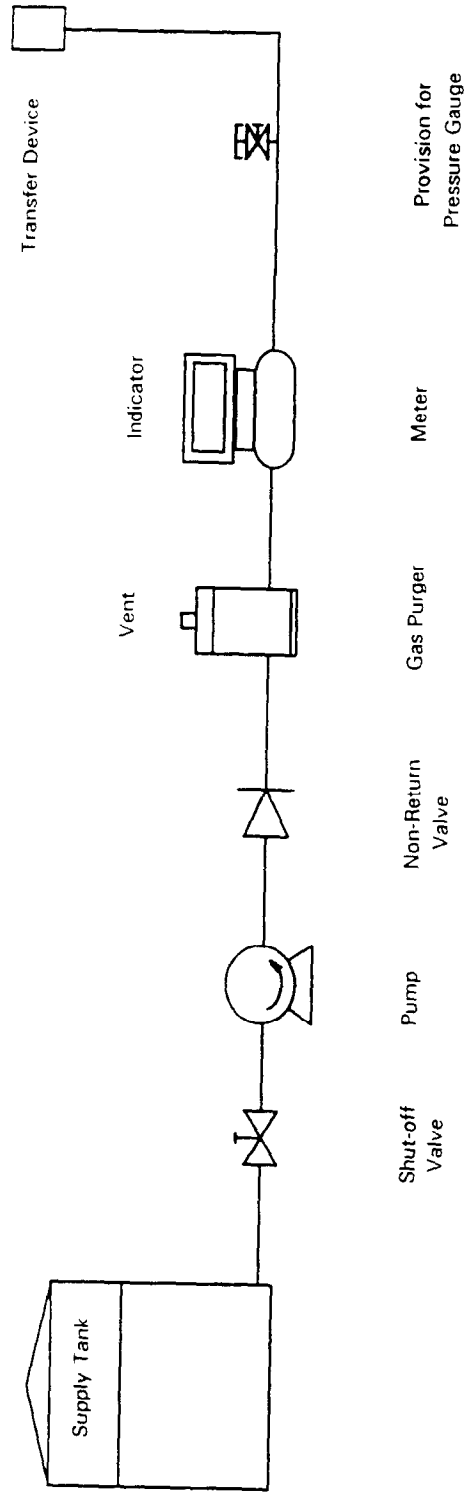
(CI)= Cast Iron, (CS)= Cast Steel, (OS)= Offset and (IL)= Inline.

Approved Models and Capacities

NOTE: (*) The meter models listed in Table 1 are the basic model numbers only - the full model numbers may have a variety of additional alphanumeric characters, e.g. the full model number of the pattern is 1450-15-SP-2, where:

- '1450' designates meter model.
- '15' designates capacity of the meter.
- 'SP' designates the meter's materials of construction, may be replaced by 'AF', 'SS' or 'SP-AL'.
- '2' designates accessory combinations fitted to the meter, e.g. preset valve, gas purger, strainer. May be any number from '1' to '15'.

FIGURE 5/6B/50A - 1



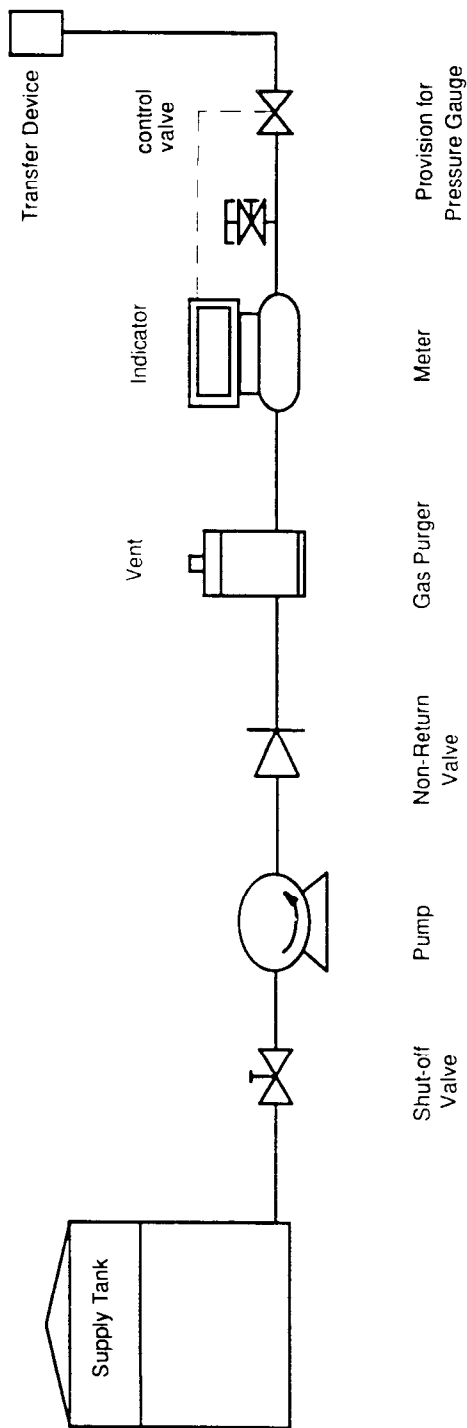
Typical Pipeline Flowmetering System

FIGURE 5/6B/50A - 2



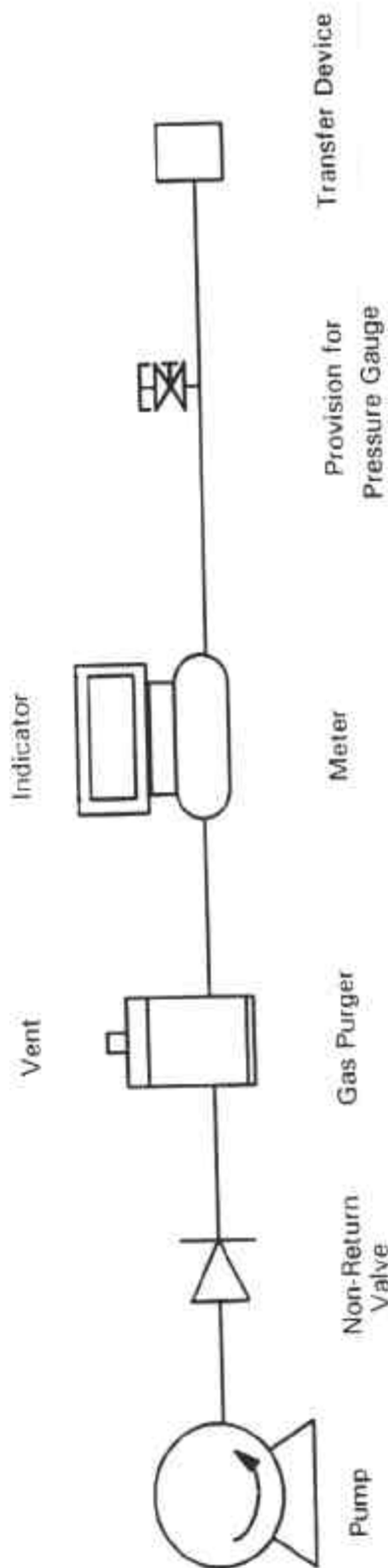
Daniel Model 1450-15-SP-2 Flowmeter With Gas Purger/Strainer
and Indicator/Ticket printer

FIGURE 5/6B/50A - 3



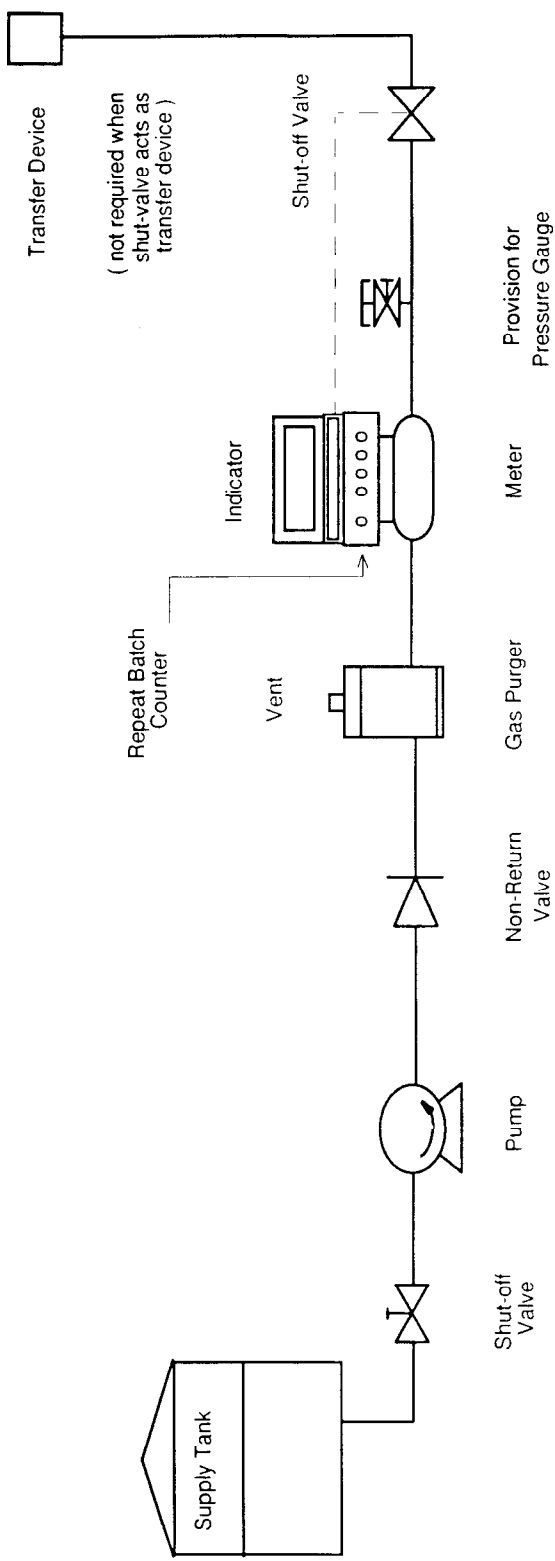
Typical Loading-rack Flowmetering System

FIGURE 5/6B/50A - 4



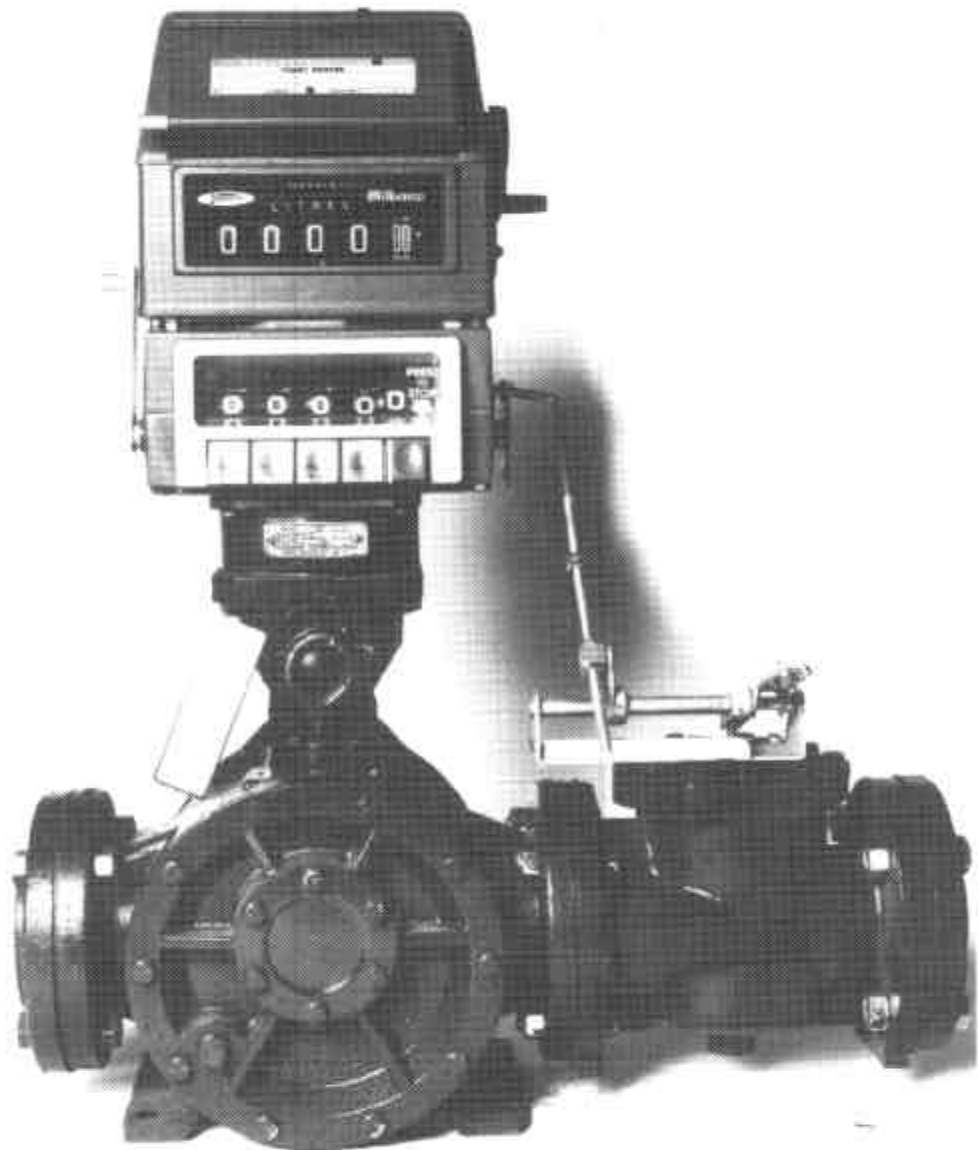
Typical Modular Flowmetering System

FIGURE 5/6B/50A - 5



Typical Drum-filling Flowmetering System

FIGURE 5/6B/50A - 6



Typical Daniel Inflowmeter