

# National Standards Commission



## Certificate of Approval

**No 5/6B/69A**

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

Satam Model ZC.17.24/24 Bulk Flowmetering System

submitted by National Valve & Engineering Co Pty Ltd  
31A Manton Road  
Huntingdale VIC 3167.

This Certificate is issued upon completion of a review of NSC approval No 5/6B/69.

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. Binh'. The signature is written in a cursive style with a large initial 'J'.

### CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/3/96.

This approval expires in respect of new instruments on 1/3/97.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/69A 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.

### DESCRIPTIVE ADVICE

**Pattern:** approved 18/2/91

- . A Satam model ZC.17.24/24 bulk flowmetering system.

**Variants:** approved 18/2/91

1. With certain other ZC.17 series flowmeters as listed in Table 1.
2. With a Veeder-Root model 76181-320 pulse generator.
3. With a Veeder-Root VR7890 series indicator/printer.

**Variant:** provisionally approved 18/2/91 - approved 18/6/91

4. As a vehicle-mounted aircraft fuelling/defuelling system.

Technical Schedule No 5/6B/69A describes the pattern and variants 1 to 4.

### FILING ADVICE

The documentation for this approval comprises:

- Certificate of Approval No 5/6B/69A dated 23/9/91
- Technical Schedule No 5/6B/69A dated 23/9/91 (incl. Table 1 and Test Procedure)
- Figures 1 to 7 dated 23/9/91



# National Standards Commission

## TECHNICAL SCHEDULE No 5/6B/69A

**Pattern:** Satam Model ZC.17.24/24 Bulk Flowmetering System.

**Submittor:** National Valve & Engineering Co Pty Ltd  
31A Manton Road  
Huntingdale VIC 3167.

### 1. Description of Pattern

A bulk flowmetering system using a Satam model ZC.17.24/24 flowmeter (Figure 1 and Table 1) which is approved for use with liquids having a kinematic viscosity range of 0.5 to 12.5 mm/s. The system shall be used with maximum and minimum flow rates such that the ratio between maximum and minimum does not exceed 5:1, and within the range of 400 L/min to 40 L/min.

#### 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.

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 any other arrangement of the components and piping to prevent reverse flow and to keep the system full of liquid at all times.
- (iv) A Satam model ZC.17.24/24 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) A Veeder-Root VR7887 series zero start indicator.
- (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
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 Variants

### 2.1 Variant 1

With certain other ZC17 series flowmeters used with maximum and minimum flow rates such that the ratio between maximum and minimum does not exceed 5:1, within the flow rate ranges as listed in Table 1.

Figure 5 shows a model ZC.17.80/150 meter.

TABLE 1

Meter Model	No. of Capsules	Pipeline Size mm (inch)	Flow Rate L/min		Minimum Quantity L
			Maximum	Minimum	
ZC.17.24/24	Single	51 (2.0)	400	40	100
ZC.17.24/48	Single	51 (2.0)	800	80	200
ZC.17.80/80	Single	76 (3.0)	1 330	130	300
ZC.17.80/150	Double	102 (4.0)	2 500	250	500
ZC.17.80/250	Triple	152 (6.0)	4 100	410	1000

### Approved Models and Capacities

### 2.2 Variant 2

With a Veeder-Root model 76181-320 pulse generator (as described in the documentation of NSC approval No S216) interfaced with any compatible Commission-approved electronic bulk flowmeter indicator, and either with or without the mechanical indicator of the pattern.

### **2.3 Variant 3**

The pattern with a Veeder-Root VR7890 series indicator/printer, and either with or without a Veeder-Root VR7889 series preset indicator, in which case a flow rate control valve shall be fitted to ensure that the instrument operates with maximum and minimum flow rates such that the ratio between maximum and minimum does not exceed 3:1, and within the flow rate range given in Table 1 for the model of meter used.

Such instruments may be marked with the nominal operating flow rate (mid-point of the 3:1 range) instead of the maximum and minimum flow rates.

Instruments may also be fitted with the pulse generator described in Variant 2.

### **2.4 Variant 4**

A vehicle-mounted aircraft fuelling/defuelling system which incorporates up to 4 hoses each fitted with aircraft pressure nozzles.

The supply to the meter may be from a vehicle-mounted tank (Figure 6) or from a pressurised inground hydrant system (Figure 7).

For systems that are capable of being used for either fuelling or defuelling, there are a series of interlocks that prevent fuel from returning to the supply tank during fuelling. The interlocks also ensure that defuelling cannot begin until the instrument has been rezeroed and that any liquid that is defuelled from the aircraft is metered.

The inground hydrant systems include a pressure-relief mechanism to allow the pressure nozzles to be disconnected.

## **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  $\pm 0.3\%$ .

# National Standards Commission



## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6B/69A

CHANGE No 1

The following change is made to the approval documentation for the

Satam Model ZC.17.24/24 Bulk Flowmetering System

submitted by National Valve & Engineering Co Pty Ltd  
31A Manton Road  
Huntingdale VIC 3167.

In Technical Schedule No 5/6B/69A dated 23/8/91, clause 1.4 **Markings** is amended by changing the reference to 'NSC Approval Number' to read '5/6A/69A'.

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 be 'S. O' followed by a stylized flourish.

# National Standards Commission



## NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 5/6B/69A

CHANGE No 2

The following changes are made to the approval documentation for the

Satam Model ZC.17.24/24 Bulk Flowmetering System

submitted by National Valve & Engineering Co Pty Ltd  
31A Manton Road  
Huntingdale VIC 3167.

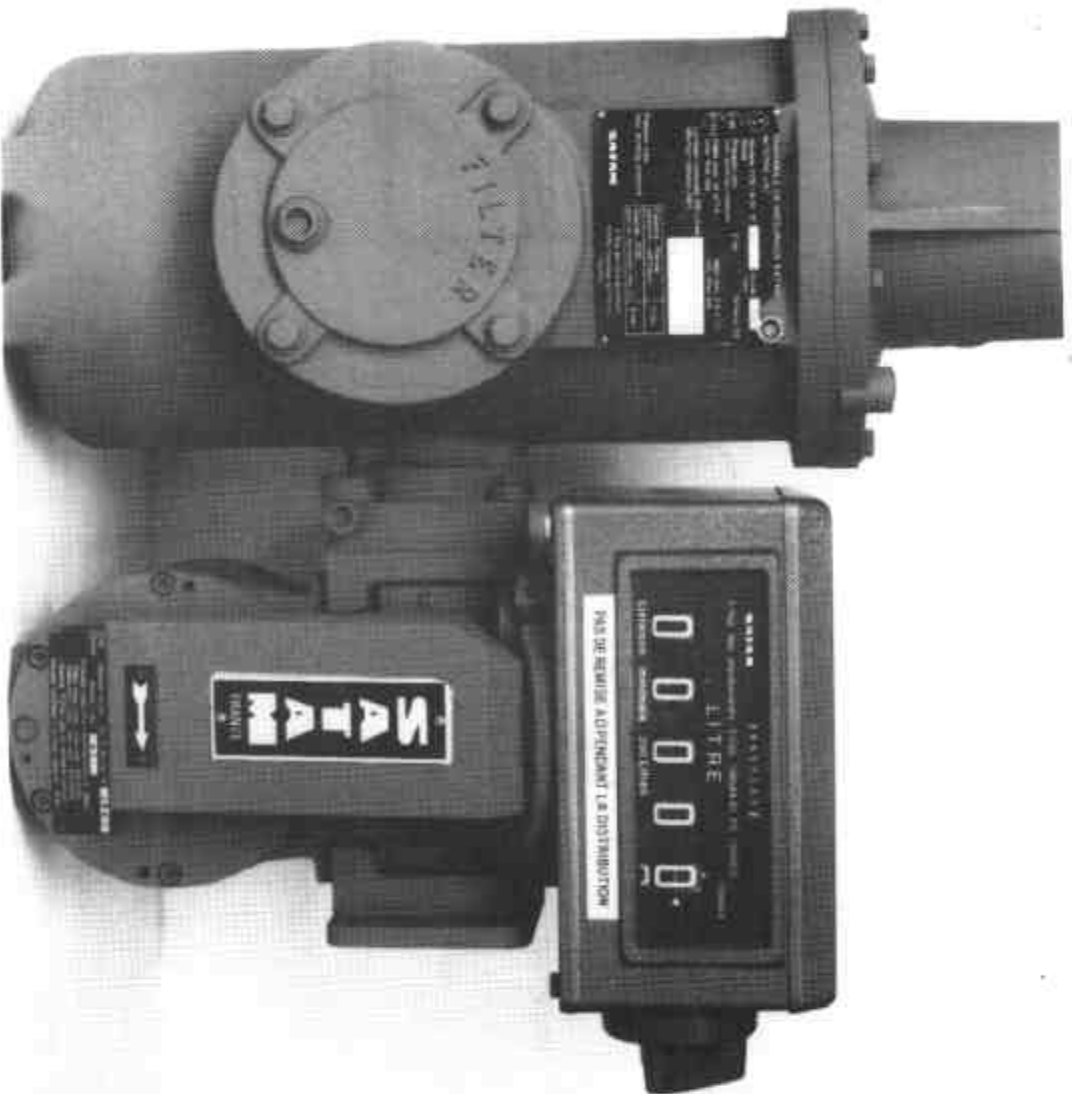
Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Measuring Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.

Technical Schedule No 5/6B/69A dated 23/8/91 is amended as follows:

- (a) In clause 1. **Description of Pattern**, amend the units of kinematic viscosity to read " $\text{mm}^2/\text{s}$ ".
- (b) In clause 1.4 **Markings**, amend the reference to 'NSC Approval Number' to read "5/6B/69A". (Note this amendment replaces Notification of Change No 1 dated 15/11/91.)
- (c) In clause 2.3 **Variant 3**, amend the 2nd paragraph by deleting "... (mid-point of the 3:1 range) ...".

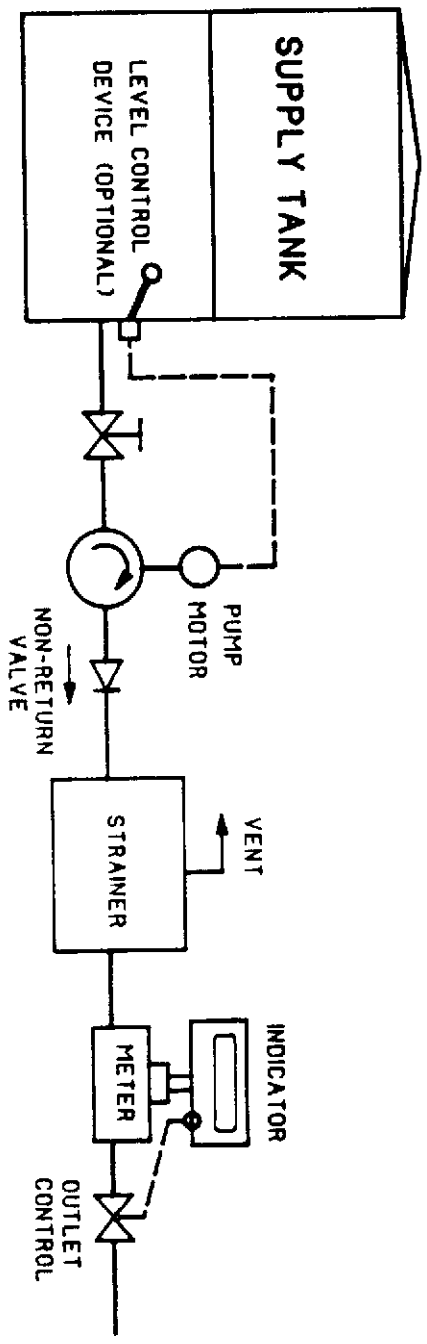


FIGURE 5/6B/69A - 1



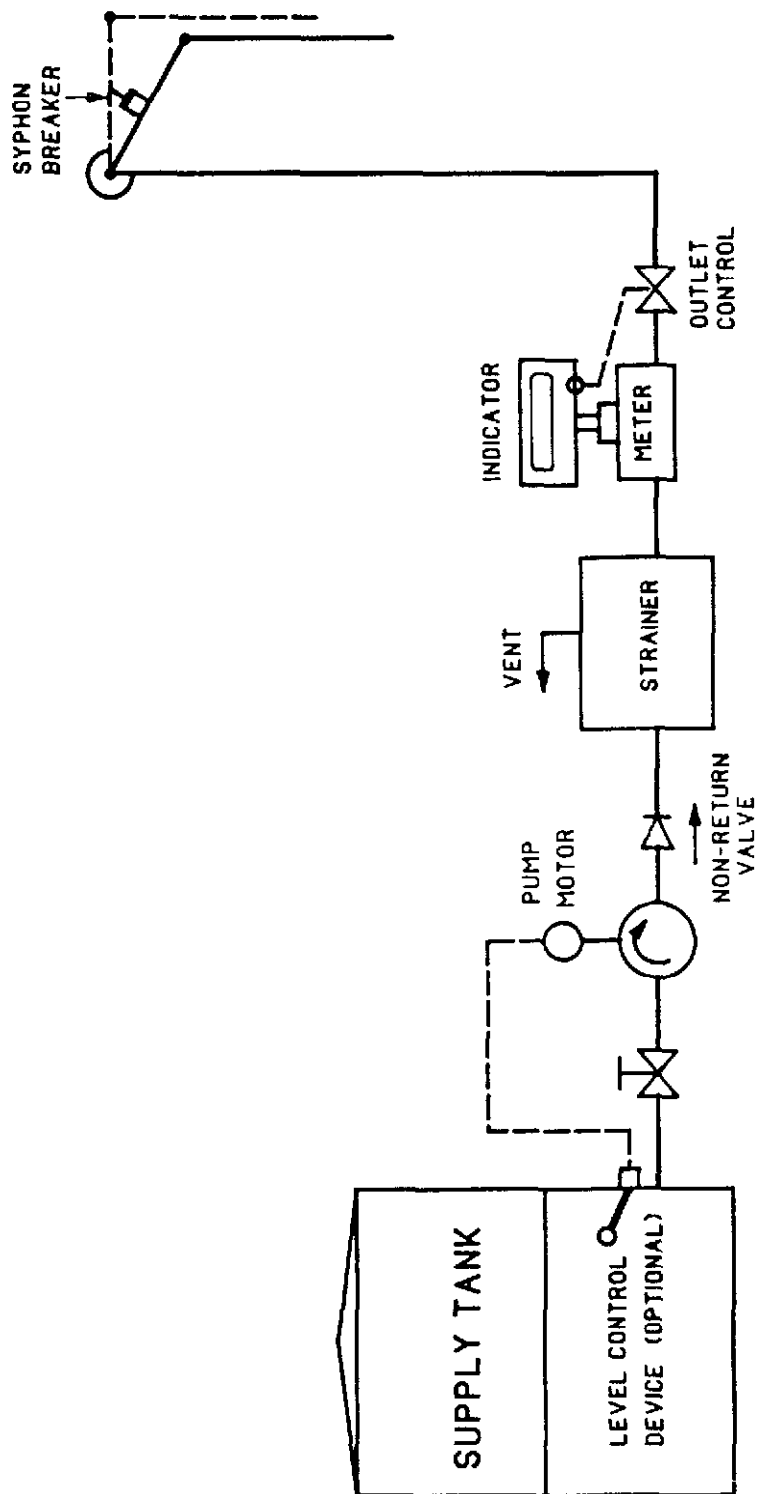
Salam Model ZC.17.24/24 Flowmeter

FIGURE 5/6B/69A - 2



Typical Pipeline Flowmetering System

FIGURE 5/6B/69A - 3



Typical Loading-rack Flowmetering System

FIGURE 5/6B/69A - 4

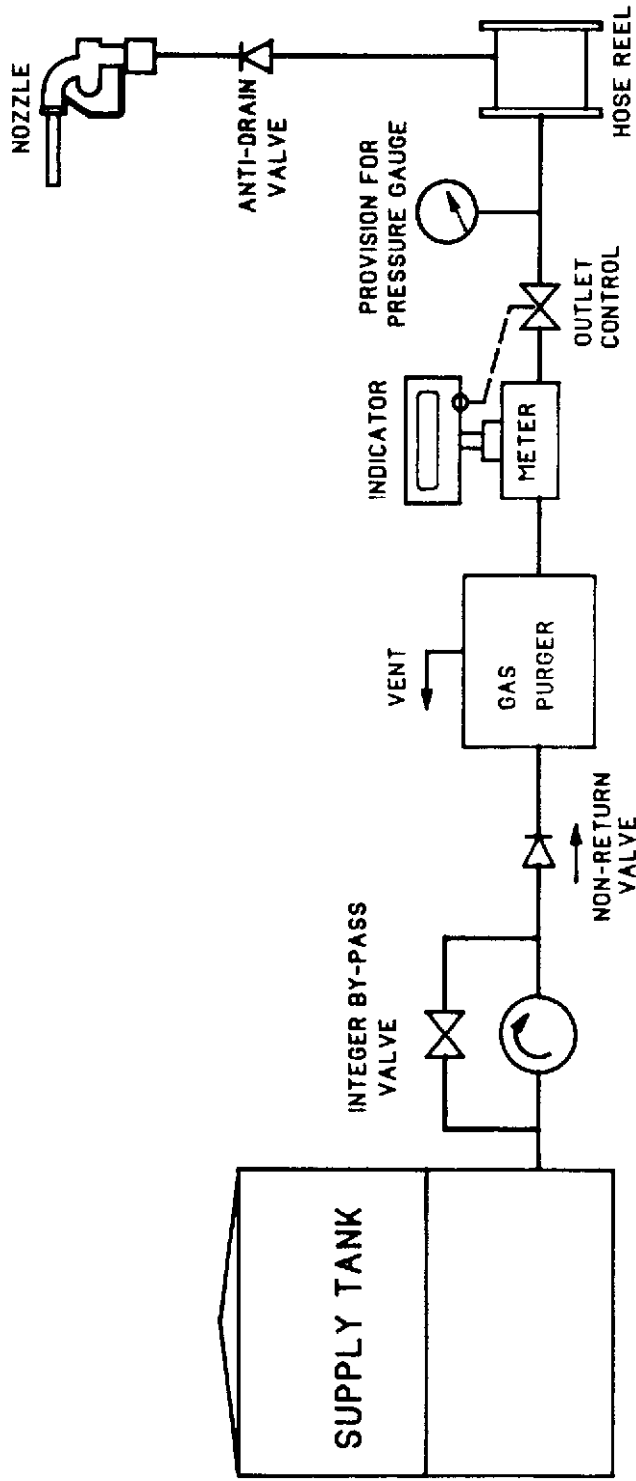
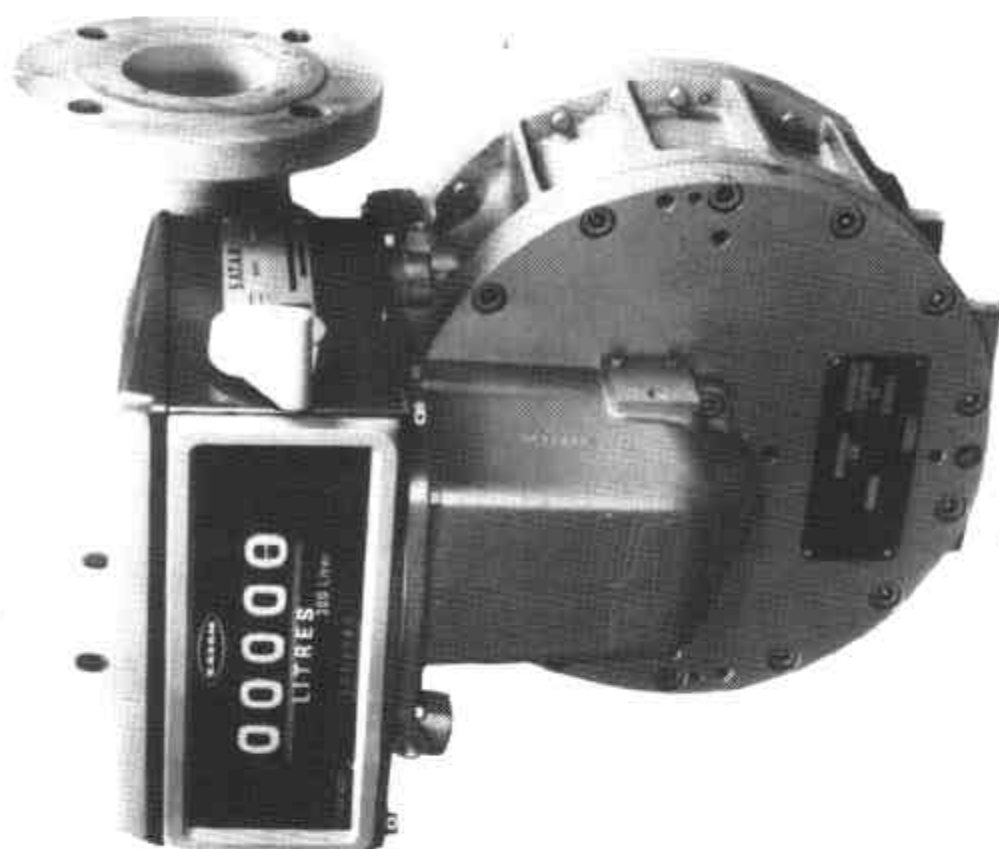
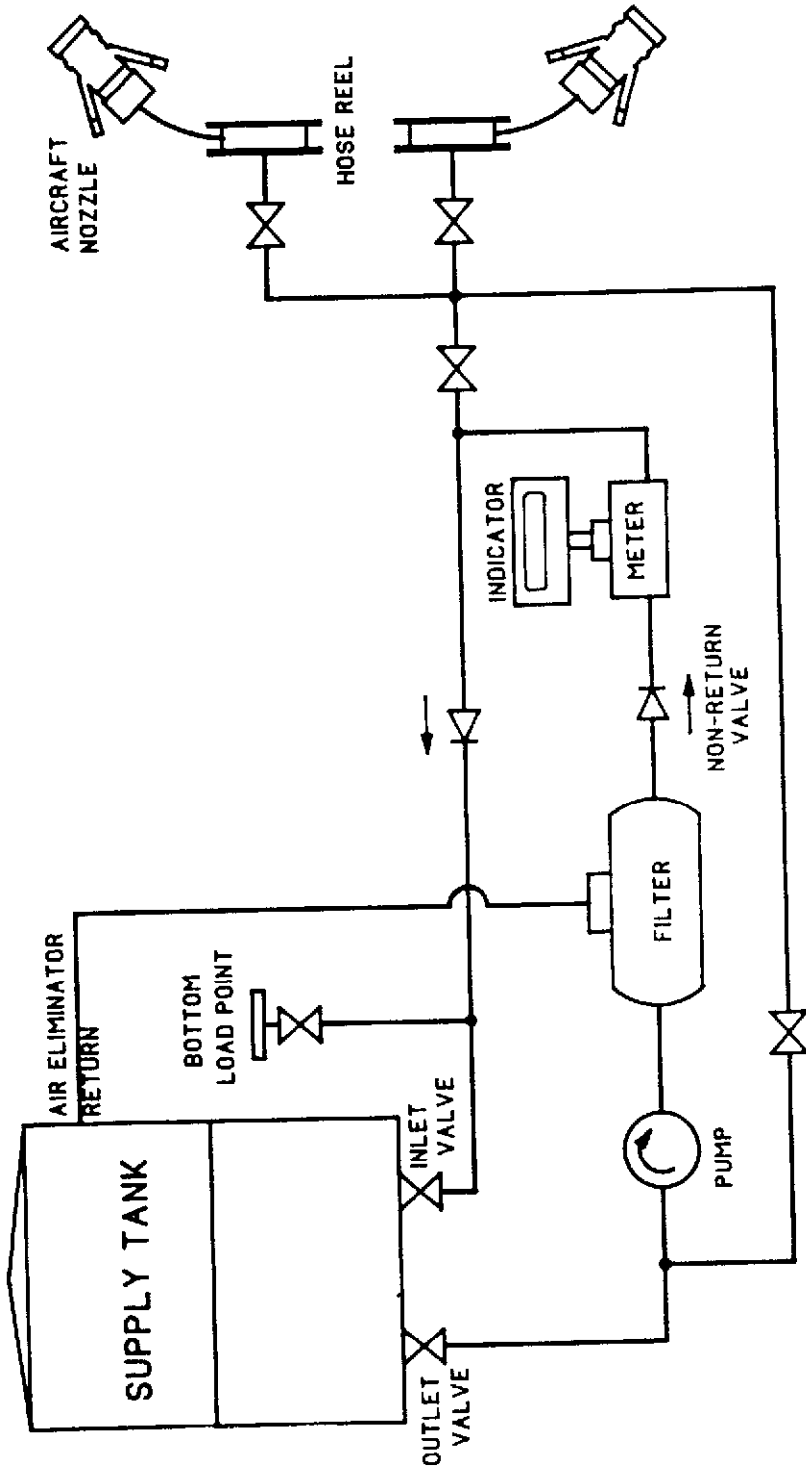


FIGURE 5/6B/69A - 5



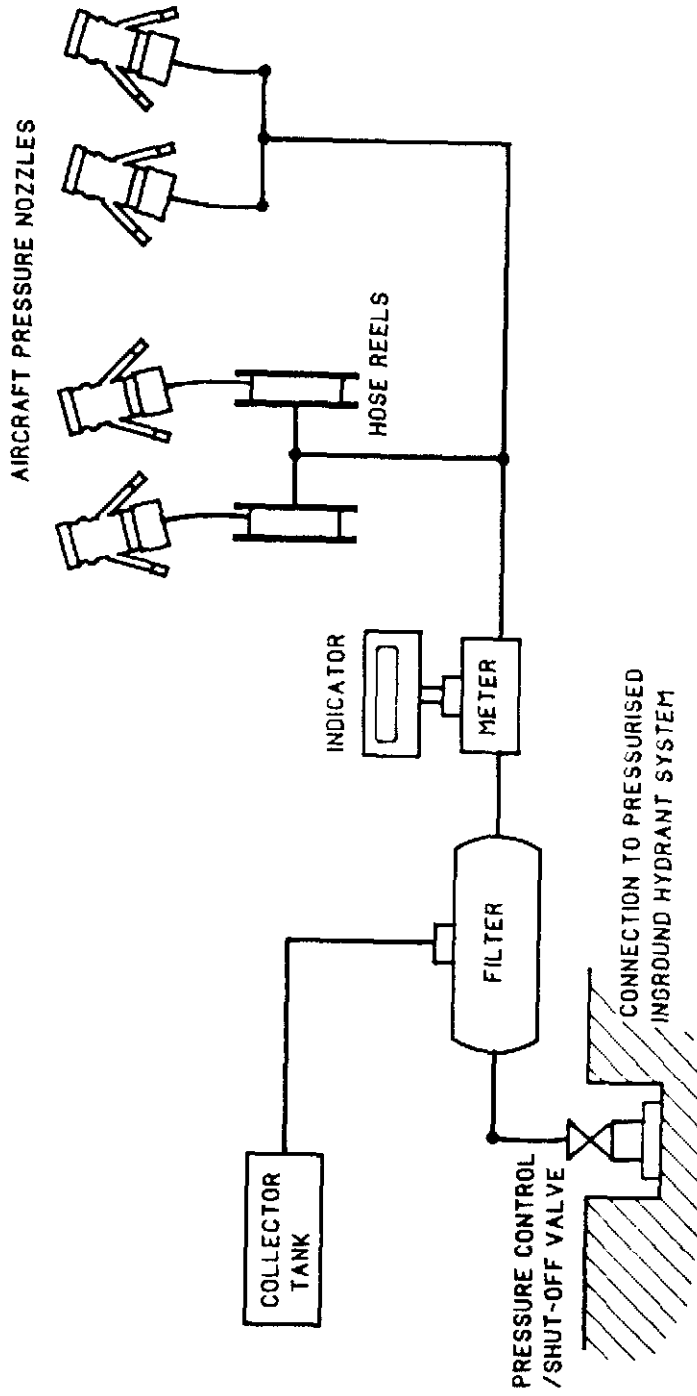
Satam Model ZC.17.80/80 Flowmeter

FIGURE 5/6B/69A - 6



Variant 4 - Typical Vehicle-mounted  
Aircraft Flowmetering System

FIGURE 5/6B/69A - 7



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Variant 4 - Typical Inground Hydrant Supply  
Aircraft Flowmetering System