

National Standards Commission



Certificate of Approval

No 5/6B/68

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

Daniel Model PT Turbine Flowmetering System

submitted by Process and Analytical Engineering Pty Ltd
 3/1 Fisher Place
 Narwee NSW 2209.

- This Certificate is issued upon completion of a review of NSC Provisional approval No P5/6B/68.

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 1/11/95.

This approval expires in respect of new instruments on 1/11/96.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/68 and only by persons authorised by the submitter. Instruments currently P5/6B/68 and which comply with this approval may be remarked at their next verification.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the drawings and specification 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 29/10/90

- A Daniel model PT turbine flowmetering system.

Variants: approved 29/10/90

1. With a model LR turbine flowmeter.
2. With a model RIM turbine flowmeter.

Technical Schedule No 5/6B/68 describes the pattern and variants 1 and 2.

FILING ADVICE

The documentation for this approval comprises.

Certificate of Approval No 5/6B/68 dated 2/4/91
Technical Schedule No 5/6B/68 dated 2/4/91 (incl. Test Procedure)
Figures 1 to 7 dated 2/4/91



National Standards Commission

TECHNICAL SCHEDULE No 5/6B/68

Pattern: A Daniel Model PT Turbine Flowmetering System.

Submittor: Process and Analytical Engineering Pty Ltd
3/1 Fisher Place
Narwee NSW 2209.

1. Description of Pattern

A bulk flowmetering system using a Daniel model PT turbine flowmeter of 100 mm nominal bore and which is approved for use with liquids having a kinematic viscosity range between 0.4 and 7.0 mm²/s at maximum and minimum flow rates of 4 700 L/min and 950 L/min respectively when interfaced with a Commission-approved Email Omega 2000 or 3000 series flowmetering system indicator/controller incorporating multi-point linearisation facility.

If used with any other indicator/controller, the minimum flow rate of the system shall be not less than 1 570 L/min.

1.1 Loading-rack Flowmetering System (Figures 1 to 4)

The system comprises:

- (i) A supply tank, optionally with a low-level detection device.
- (ii) A pump of either positive displacement or centrifugal type - in the latter case the pump is mounted lower than the minimum level of 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.

The system is constructed with the meter operating at sufficient back-pressure in, and immediately downstream of, the meter to minimise vaporisation.

- (iii) Non-return valves or an arrangement of the components and piping to ensure that the system remains full of liquid at all times, and that reverse flow or syphoning is prevented.
- (iv) A Daniel model PT 100 mm turbine flowmeter (Figure 5) with single or dual pickup coils for producing an electrical output signal.

The output signal is interfaced via a preamplifier to any Commission-approved model of the Email Omega 2000 or 3000 series of bulk flowmetering indicator/controllers incorporating multi-point linearisation facility (as described in the documentation of NSC approval No S191) which has input characteristics compatible to the preamplifier or the turbine output.

- (v) A meter run consisting of flow conditioners of at least 10 pipe diameters and 5 pipe diameters in length installed respectively upstream and downstream of the meter; the upstream conditioner includes straightening vanes.

The meter may be mounted horizontally or vertically with any of the outlet arrangements shown in Figures 1 to 4. When mounted vertically, the meter run is also vertical.

- (vi) An outlet control valve located downstream of the meter with no intermediate outlet (except for air-bleeding purposes). Provision shall be made for fitting a pressure gauge downstream of the meter.
- (vii) Top-loading outlet arrangement (Figures 1 to 3) - 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 shut-off 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

Bottom-loading arrangement (Figure 4) - a dry-break coupling located at the delivery point of the pipework.

1.2 Markings

The following information shall be clearly and permanently marked on one or more permanently attached nameplates:

Manufacturer's name or mark	
Model number	
Serial number	
NSC approval number	5/6B/68
Maximum flow rate L/min
Minimum flow rate L/min #
Minimum delivery L
Viscosity range or type of liquid for which the meter is verified	
Operating (air) temperature range	-10°C to +45°C

Determined by the indicator/controller used - see cl. 1.

1.3 Verification Provision

Provision is made for a verification mark to be applied.

2. Description of Variants

2.1 Variant 1

With a model LR turbine flowmeter of 100 mm nominal bore.

2.2 Variant 2

With a model RIM turbine flowmeter of 100 mm nominal bore which shall only be mounted horizontally.

TEST PROCEDURE

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

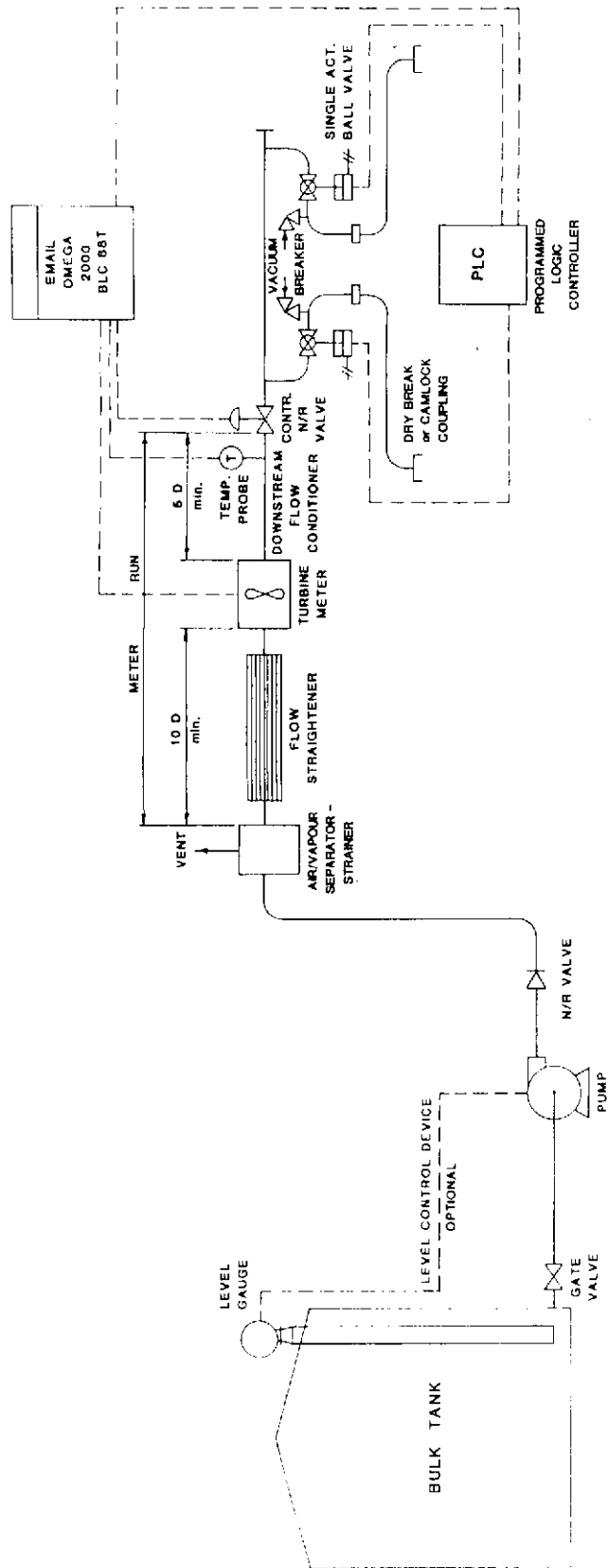
Maximum Permissible Errors at Verification/Certification

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.

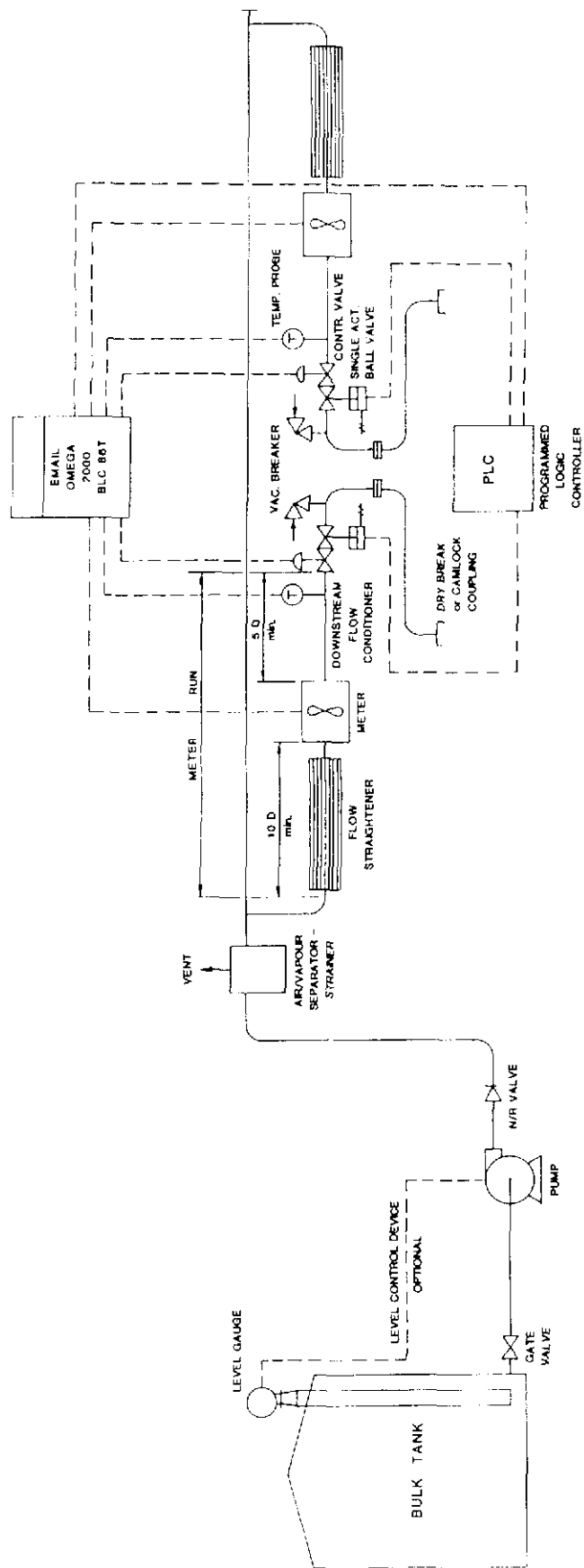
FIGURE 5/6B/68 - 1



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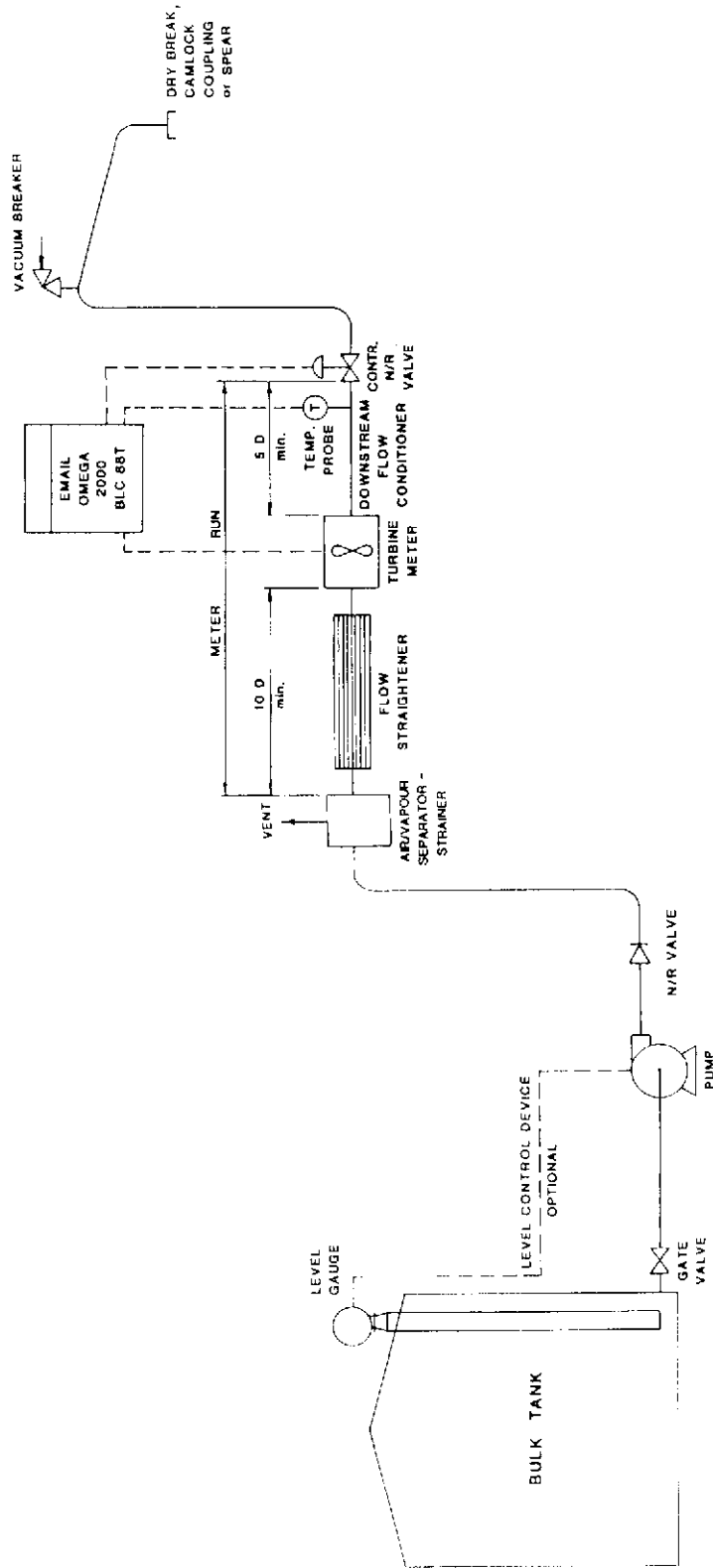
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FIGURE 5/6B/61 - 2



'ternative Top-loading Arrangement

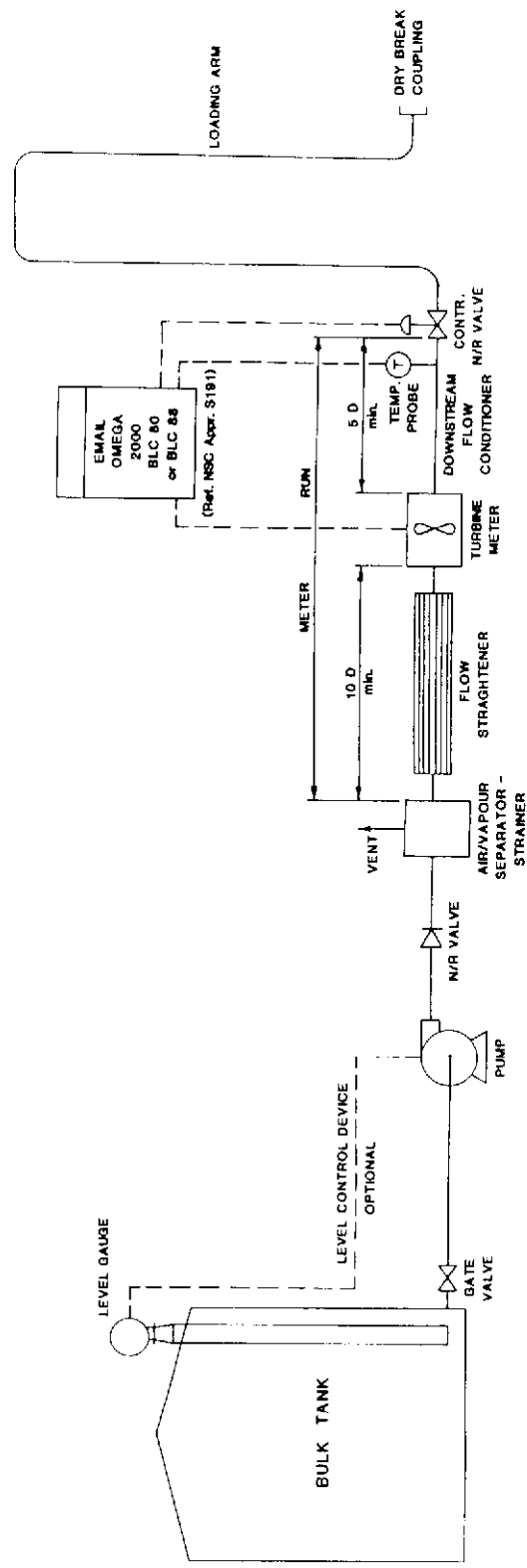
FIGURE 5/6B/68 - 3



Alternative Top-loading Arrangement

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FIGURE 5/6B/68 - 4



Bottom-loading Arrangement

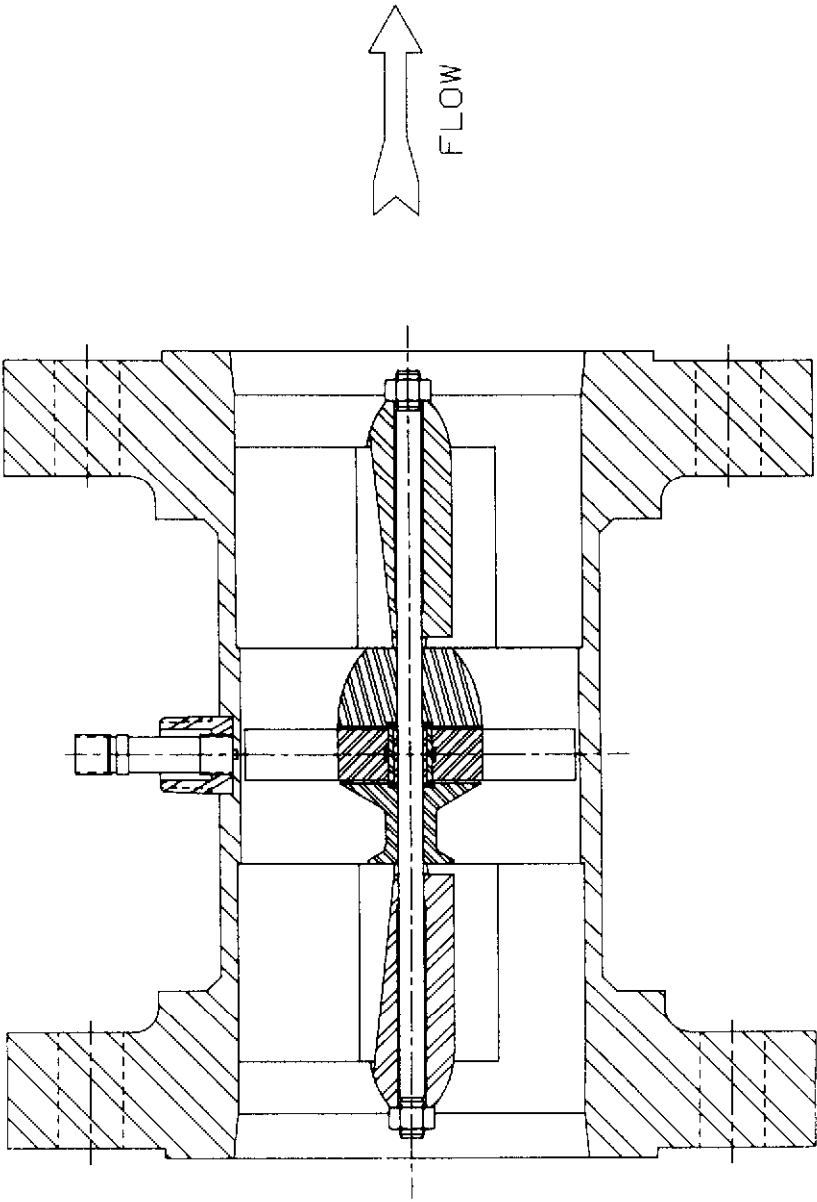


FIGURE 5/6B/68 - 5

Daniel Model PT Turbine Meter

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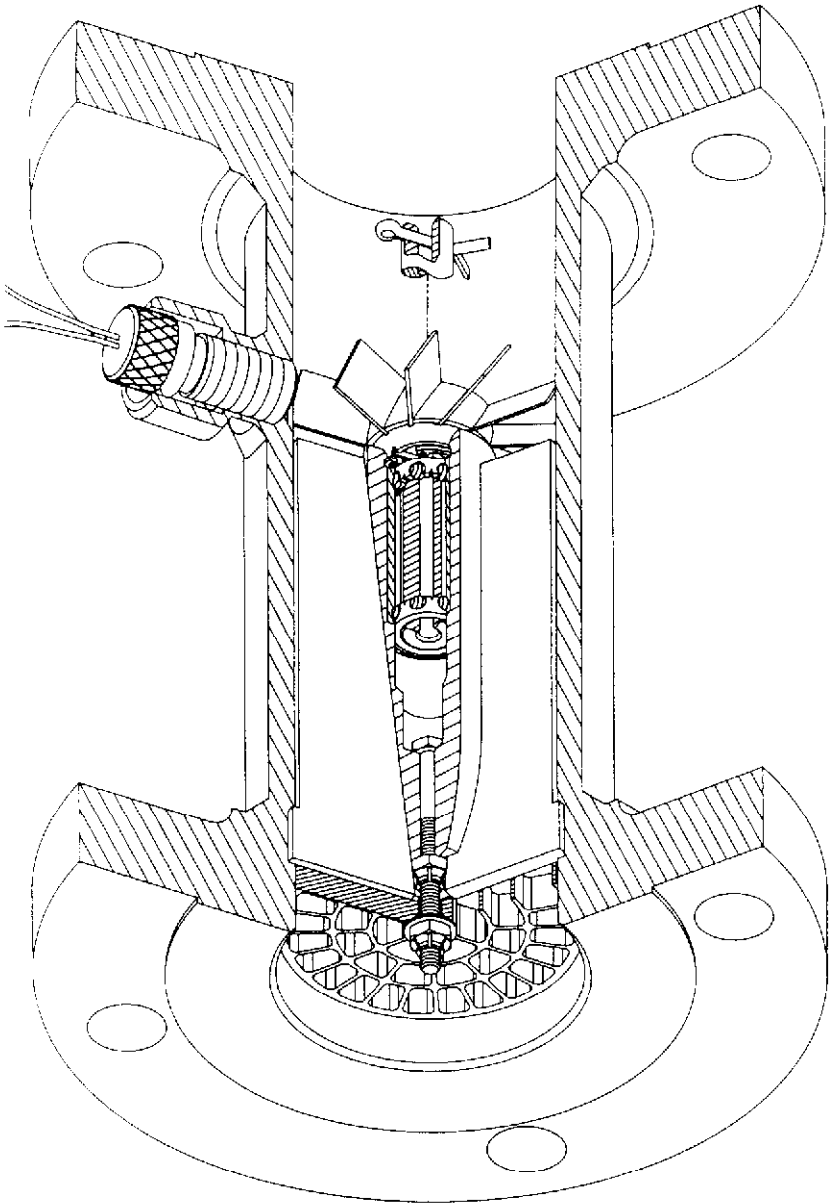


FIGURE 5/6B/68 - 6

Model LR Turbine Flowmeter

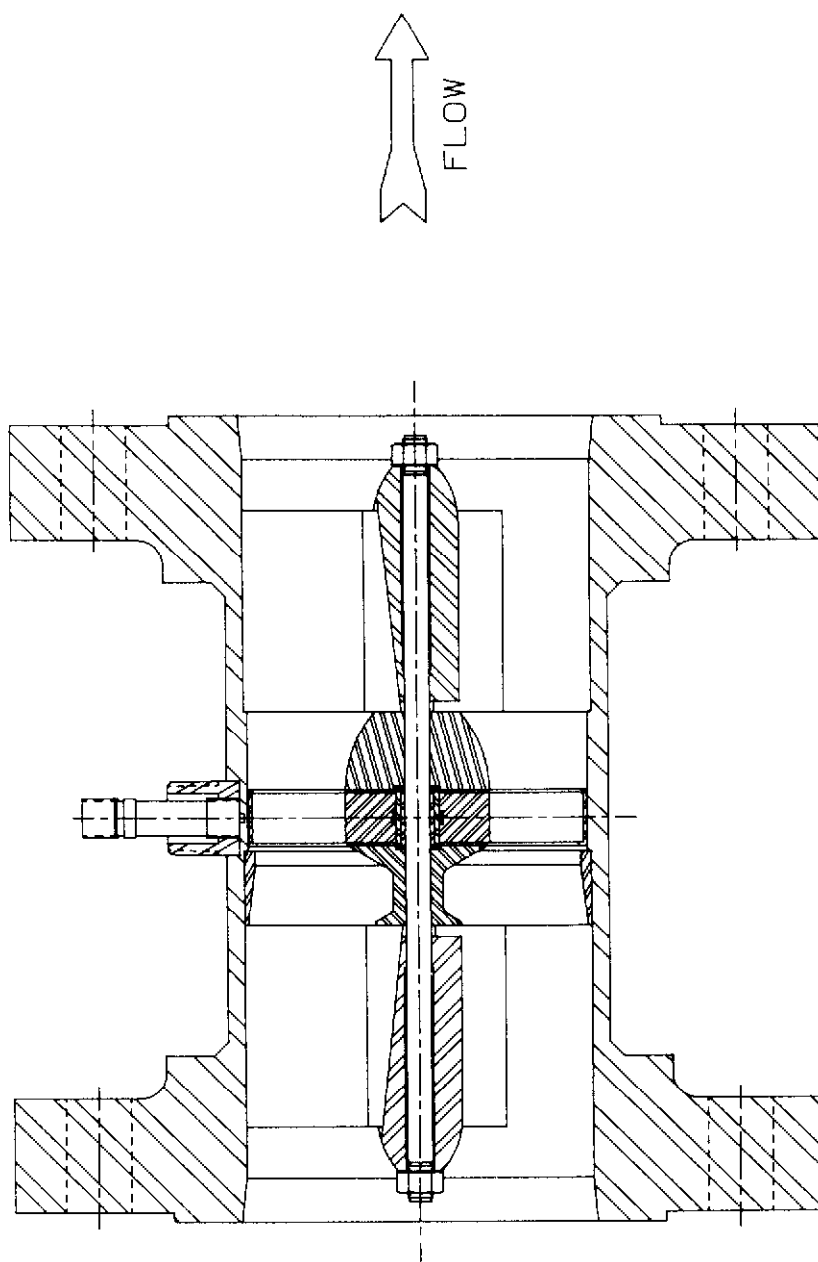


FIGURE 5/6B/68 - 7

Model RIM Turbine Flowmeter