

National Standards Commission



Certificate of Approval

No 5/6B/84

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

Brooks Model PAR=I=TY TURBO Bulk Flowmetering System

submitted by Shell Refining (Australia) Pty Ltd
 Geelong Refinery
 Corio VIC 3214.

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/6/97.
This approval expires in respect of new instruments on 1/6/98.

Instruments purporting to comply with this approval shall be marked
NSC No 5/6B/84 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 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.

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

DESCRIPTIVE ADVICE

Pattern: approved 8/5/92

- A bulk flowmetering system using a Brooks model PAR=I=TY TURBO turbine flowmeter.

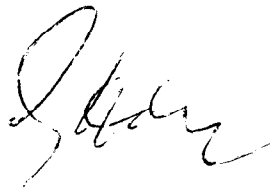
Technical Schedule No 5/6B/84 describes the pattern.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/84 dated 9/10/92
Technical Schedule No 5/6B/84 dated 9/10/92 (incl. Test Procedure)
Figures 1 to 4 dated 9/10/92

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/84

Pattern: Brooks Model PAR=I=TY TURBO Bulk Flowmetering System.

Submitter: Shell Refining (Australia) Pty Ltd
Geelong Refinery
Corio VIC 3214.

1. Description of Pattern

A bulk flowmetering system using a Brooks model PAR=I=TY TURBO turbine flowmeter of 80 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 2650 L/min and 450 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 800 L/min.

The minimum quantity is 1000 litres.

1.1 Pipeline Flowmetering System (Figure 1)

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 Brooks model PAR=I=TY TURBO 80 mm turbine flowmeter (Figure 2) 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 3 and 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.

1.2 Loading-rack Flowmetering System (Figures 3 and 4)

- (i) Top-loading outlet 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 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

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

1.3 Sealing and Verification/Certification Provision

Provision is made for sealing the calibration facilities of the system.

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

1.4 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/84
Maximum flow rate L/min
Minimum flow rate L/min #
Minimum quantity L
Viscosity range or product for which the meter is verified

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

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. Instruments should be tested using the liquid with which they will be used and which is marked on the data plate.

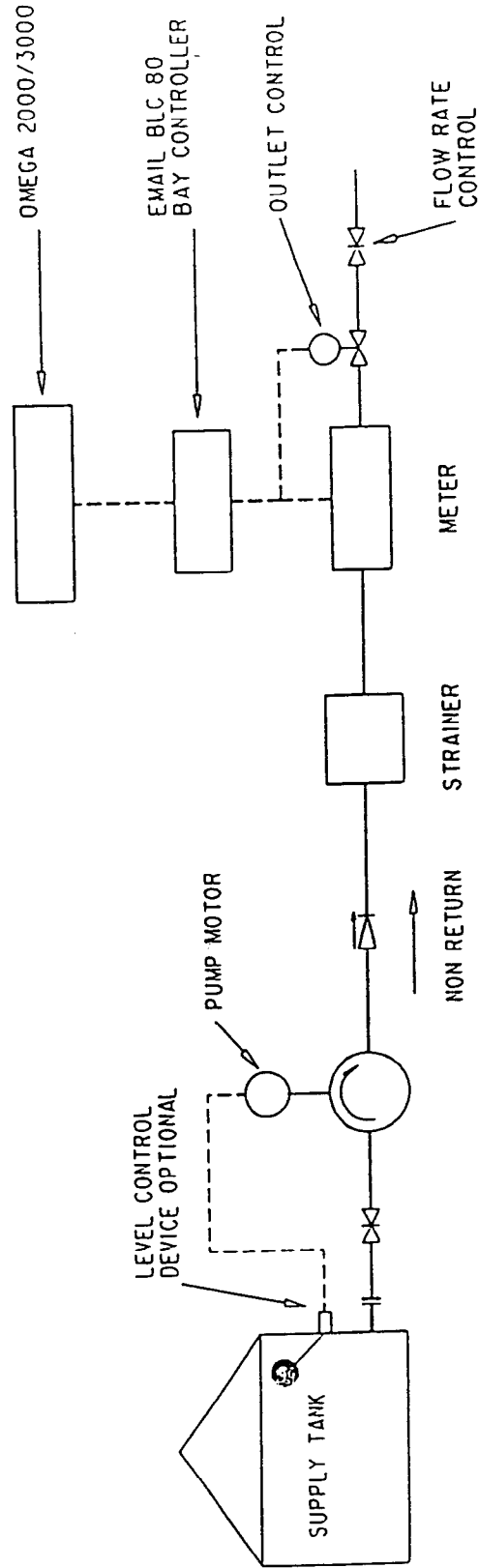
Maximum Permissible Errors at Verification/Certification

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.

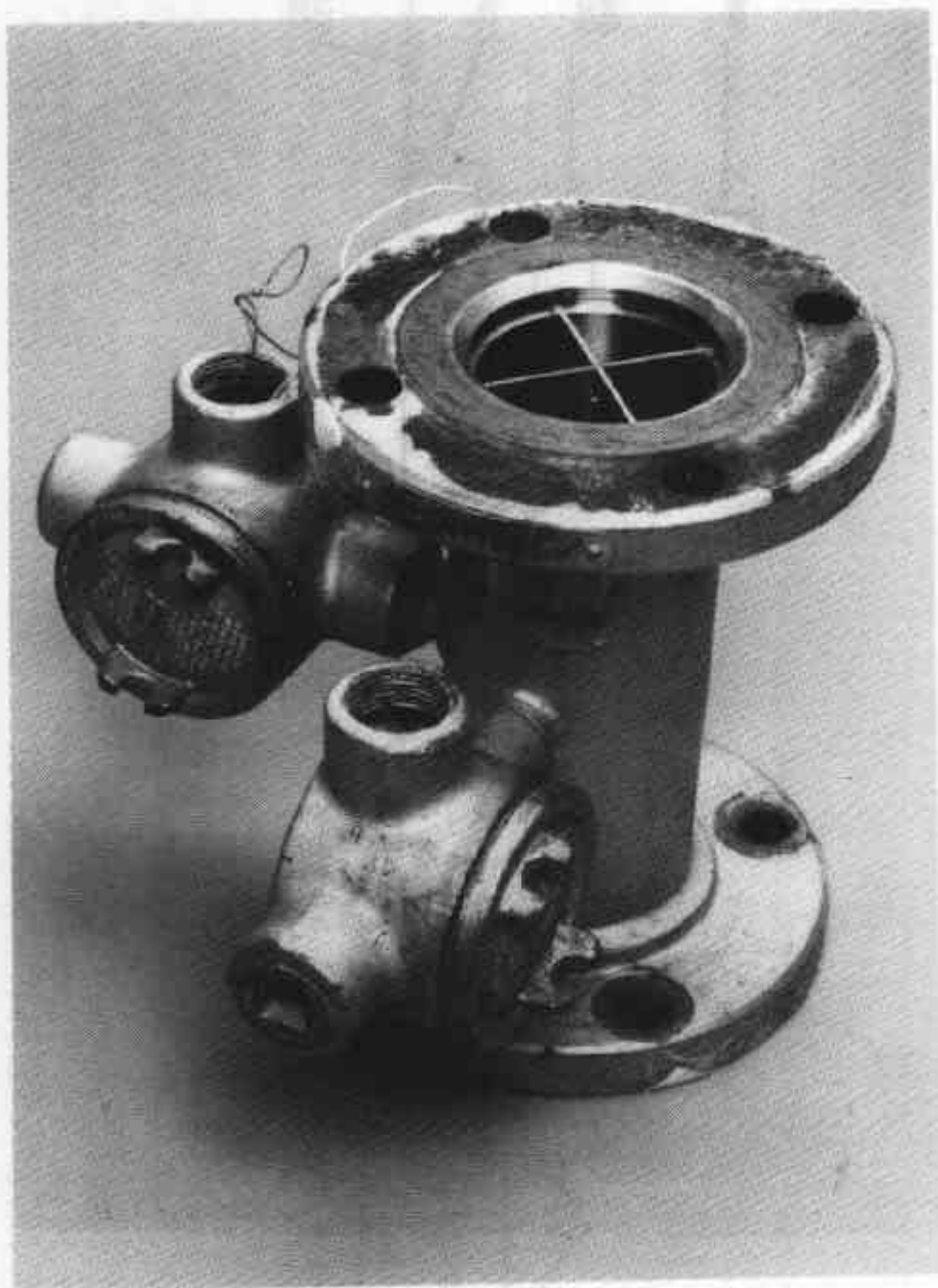
FIGURE 5/6B/84 - 1



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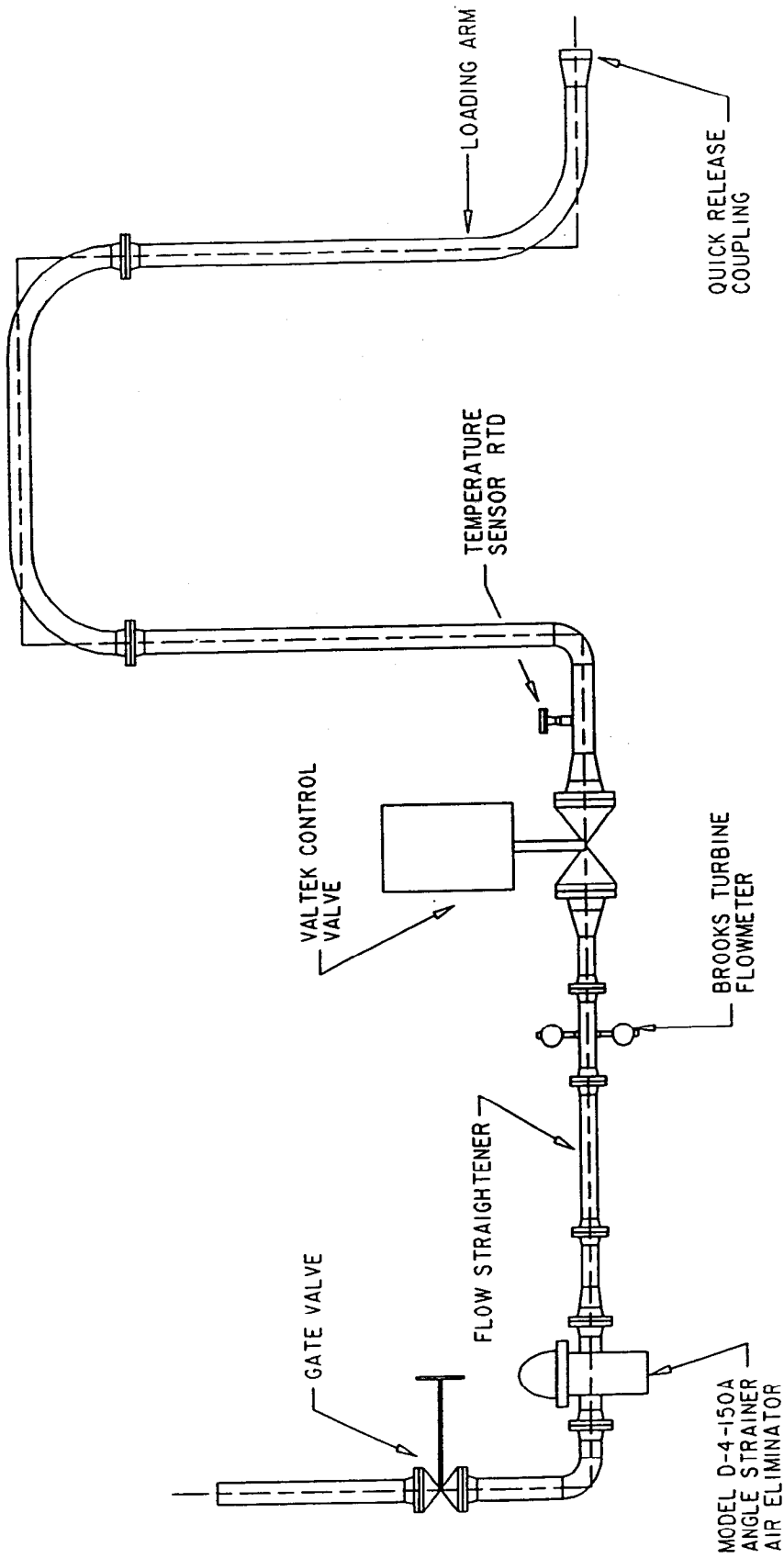
Brooks Model PAR=I=TY TURBO Flowmetering System

FIGURE 5/6B/84 - 2



Brooks Model PAR=I=TY TURBO Flowmeter

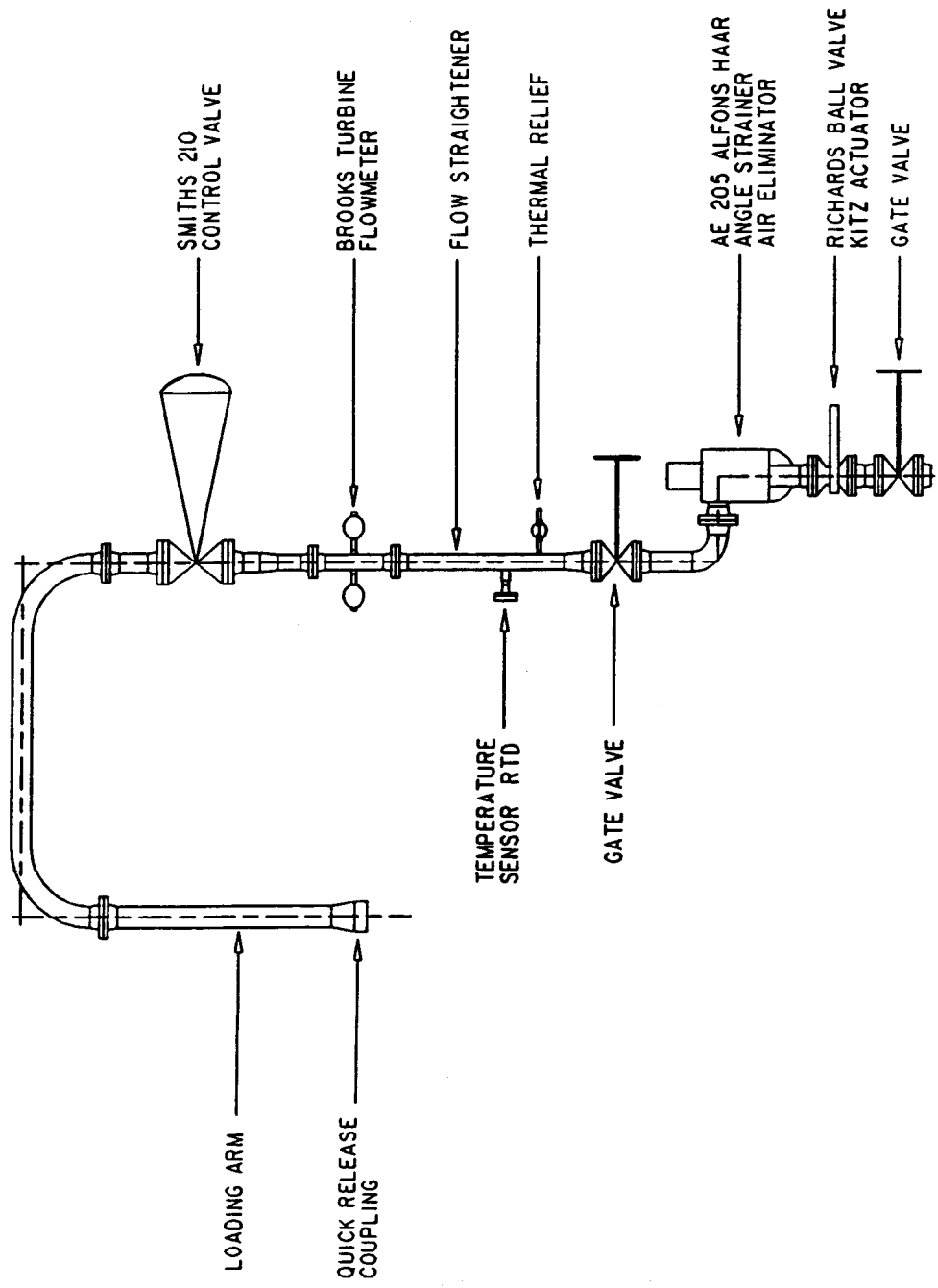
FIGURE 5/6B/84 - 3



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Typical Horizontal-mounting Installation

FIGURE 5/6B/84 - 4



Typical Vertical-mounting Installation