



# Australian Government

---

## National Standards Commission

12 Lyonpark Road, North Ryde NSW 2113 Australia

### Cancellation

### Certificate of Approval No 5/6B/95

This is to certify that the approval for use for trade granted in Certificate No 5/6B/95 issued 4 June 1997 in respect of the

Smith Model *PRIME 4* Bulk Flowmetering System

now submitted by     Diamond Key International Pty Limited  
                              110 Henderson Road  
                              Rowville   VIC   3178

has been cancelled in respect of new instruments as from 1 July 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. G. T.', written in a cursive style.

## National Standards Commission



### Certificate of Approval

**No 5/6B/95**

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

Smith Model *PRIME 4* Bulk Flowmetering System

submitted by            Email Petroleum Systems  
                                 88-94 Canterbury Road  
                                 KilsythVIC 3175.

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 November 2001, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/95 and only by persons authorised by the submittor.

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.

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

#### DESCRIPTIVE ADVICE

**Pattern:** approved 22 October 1996

- A Smith model *PRIME 4* bulk flowmetering system.

**Variant:** approved 22 October 1996

1. As a pipeline flowmetering system.

Technical Schedule No 5/6B/95 describes the pattern and variant 1.

#### FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/95 dated 4 June 1997

Technical Schedule No 5/6B/95 dated 4 June 1997 (incl. Test Procedure)

Figures 1 to 3 dated 4 June 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/95

**Pattern:** Smith Model *PRIME 4* Bulk Flowmetering System.

**Submittor:** Email Petroleum Systems  
88-94 Canterbury Road  
Kilsyth VIC 3175.

#### 1. Description of Pattern

A bulk flowmetering system using a Smith model *PRIME 4* (#) positive displacement flowmeter of 100 mm nominal diameter (Figure 1) which is approved for use with a liquid having a kinematic viscosity between 0.5 and 12.5 mm<sup>2</sup>/s.

The system is approved for use for a flow rate range of 190 to 2850 L/min for normal operation, but may be used for short periods up to an extended maximum flow rate of 3400 L/min. The minimum quantity is 75 litres.

(#) The model number listed above is the basic model number only – the full model number includes a variety of additional alphanumeric characters e.g. *PRIME 4-B-V-1-0-1*.

#### 1.1 Loading-rack Flowmetering System (Figure 1)

##### (i) Tank

A supply tank which may be situated either above or below ground.

##### (ii) Pump

The pump is fitted in a **positive suction head** (flooded suction) installation, i.e. below the liquid level in the supply tank (Figure 1).

Positive displacement type, centrifugal type, or submersible turbine type pumps may be used. Systems which incorporate submersible turbine type pumps may in addition include centrifugal type pumps fitted above the liquid level in the supply tank as supplementary pumps.

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 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 practicable 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, or has other means to prevent gas entering the system.

**(v) Meter**

A Smith model *PRIME 4* (#) 100 mm positive displacement flowmeter with integral pulse generator/transmitter, having output proportional to volume throughput.

The pulse generator/transmitter can be configured either as a single or dual channel pulse output; in the latter case, the integrity of the system can be checked for pulse transmission errors by using the second channel.

Figure 2 shows a meter with alternative housings for the pulse generator/transmitter connection.

The flowmeter may be mounted horizontally or vertically (Figure 1) and the flow may be in either the standard or the reverse flow direction.

Provision is made for fitting a pressure gauge downstream of the flowmeter.

**Pulse output specifications:** Supply voltage: 5 to 13 volts  
Pulse output: 13 pulses/litre (nominal K-factor)

**(vi) Indicating System**

The output signal from the flowmeter is interfaced to any Commission-approved model of the Email BLC series controller (as described in the documentation of NSC Approval No S191A), or to any other compatible Commission-approved electronic indicator/controller/conversion device.

### **(vii) Transfer Device**

The manually or automatically-operated 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.

### **1.2 Markings**

Each measuring system shall carry placed together either on the indicating device or on a data plate, the following information:

Pattern approval mark in the form	NSC No 5/6B/95
Manufacturer's identification mark or trade mark	
Meter model	
Serial number of the instrument	
Year of manufacture	
Accuracy class (in the form 0,3 or 0,5)	
Maximum flow rate	..... L/min
Minimum flow rate	..... L/min
Minimum quantity	..... L
Liquid temperature range	
Liquid pressure range	
Type of liquid for which the system is verified (*)	

(\*) – This may be located separately, e.g. on a metal tag sealed to the instrument.

### **1.3 Sealing Provision**

No sealing is required for the flowmeter. Provision is made for sealing the indicator/controller as described in its NSC approval documentation.

### **1.4 Verification/Certification Provision**

Provision is made for the application of a verification/certification mark.

## 2. Description of Variant 1

As a pipeline flowmetering system (Figure 3) which has the 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.

The output signal from the flowmeter is interfaced to a compatible Commission-approved electronic indicator/controller/conversion device.

### TEST PROCEDURE

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

#### Maximum Permissible Errors at Verification/Certification

The instrument is approved as accuracy classes 0.3 (pipeline installations) and 0.5 (loading-rack installations).

The maximum permissible errors applicable are:

**For class 0.3:**        $\pm 0.3\%$  for converted volume;  
                           $\pm 0.2\%$  for unconverted volume; and  
                           $\pm 0.1\%$  for the conversion device.

**For class 0.5:**        $\pm 0.5\%$  for converted volume;  
                           $\pm 0.3\%$  for unconverted volume; and  
                           $\pm 0.2\%$  for the conversion device.



**National Standards Commission**  
**Notification of Change**  
**Certificate of Approval No 5/6B/95**  
**Change No 1**

The following change is made to the approval documentation for the

Smith Model *PRIME 4* Bulk Flowmetering System

submitted by Email Petroleum Systems  
88-94 Canterbury Road  
Kilsyth VIC 3137.

In Certificate of Approval No 5/6B/95 and its Technical Schedule both dated 4 June 1997, all references to the submitter should be amended to read;

Diamond Key International Pty Limited  
110 Henderson Road  
Rowville VIC 3178.

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.

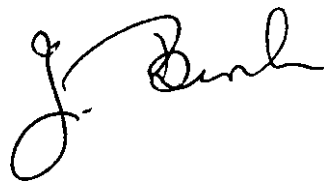
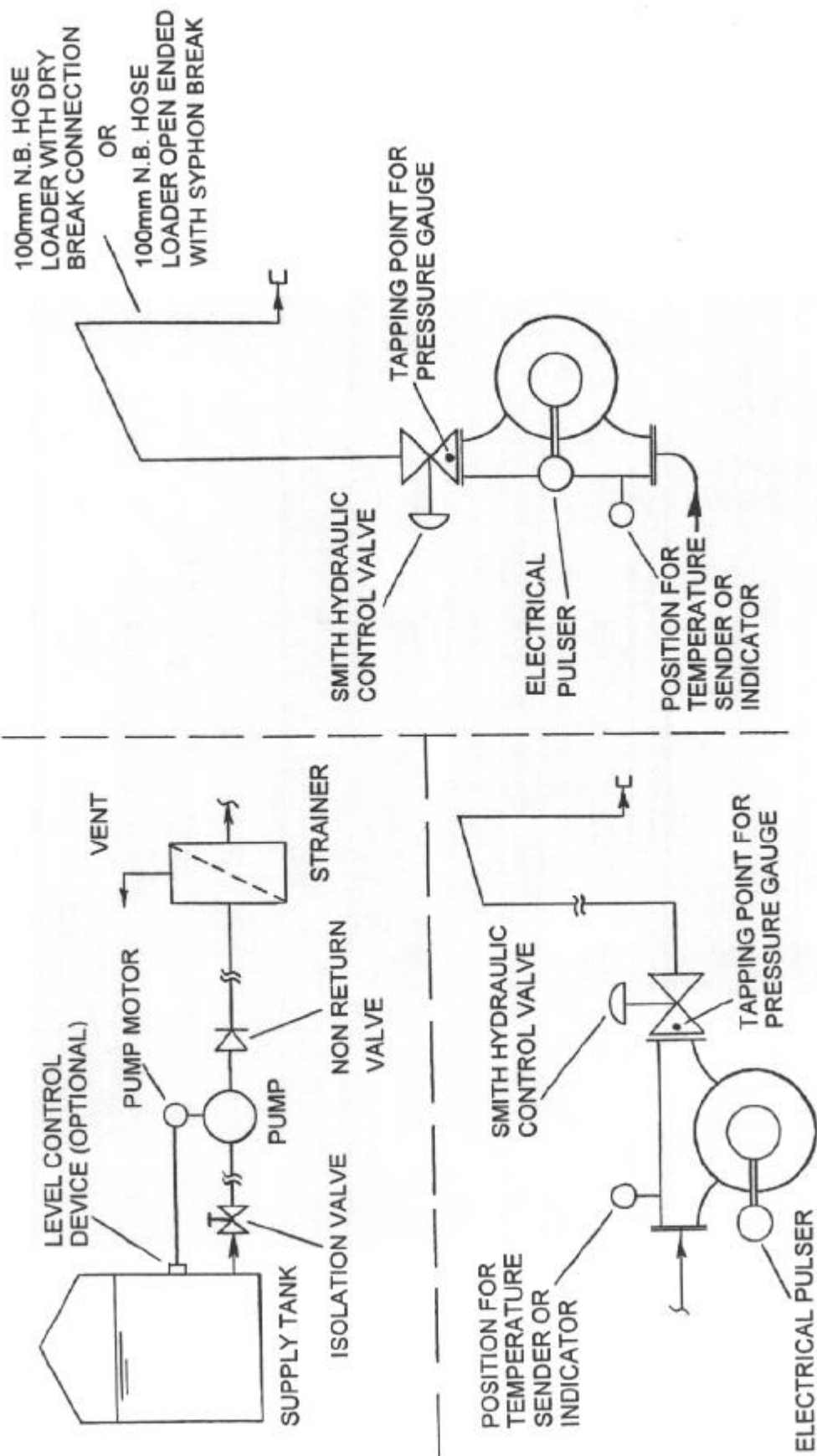




FIGURE 5/6B/95 - 1

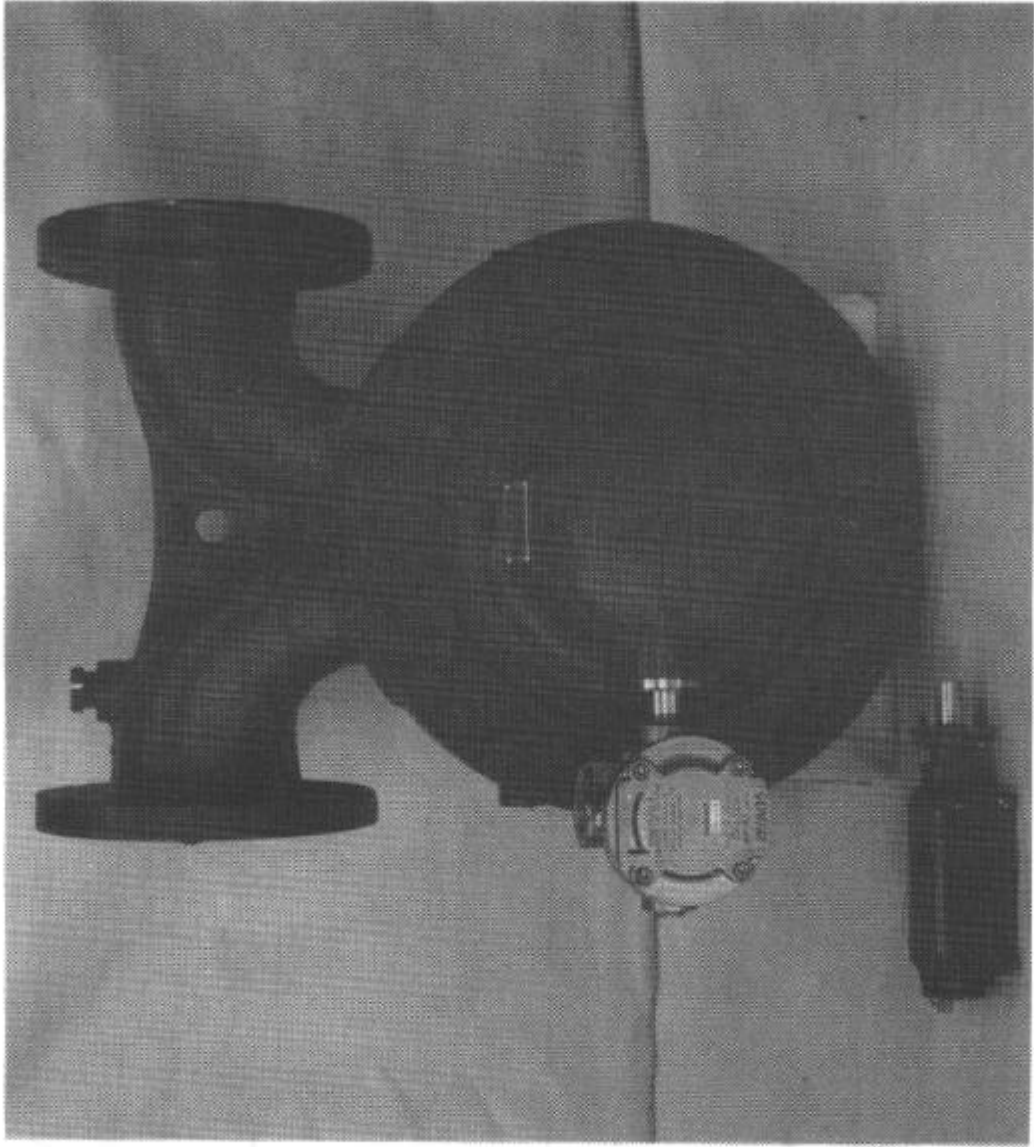


HORIZONTAL MOUNTING OF SMITH PRIME METER

VERTICAL MOUNTING OF SMITH PRIME METER

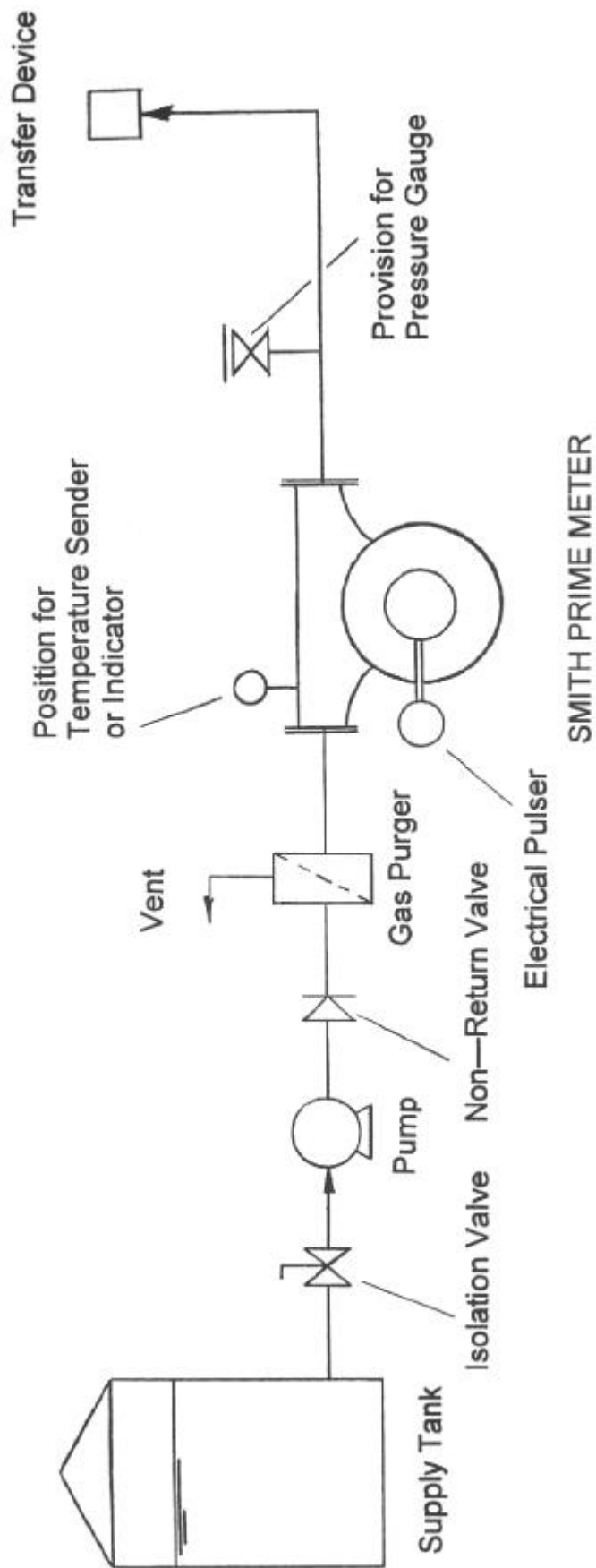
Typical Loading-rack Flowmetering Systems

FIGURE 5/6B/95 - 2



Smith Model PRIME 4 Flowmeter

FIGURE 5/6B/95 - 3



Typical Pipeline Flowmetering System