National Standards Commission

Supplementary Certificate of Approval

No S178

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

Smith Model Accuload Flowmetering System Controller

submitted by   Email Limited
Cnr Canterbury and Liverpool Roads
Kilsyth VIC 3137.

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.

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1/6/91.
This approval expires in respect of new instruments on 1/6/92.

Instruments purporting to comply with this approval shall be marked NSC No S178 and only by persons authorised by the submittor. Instruments incorporating a component purporting to comply with this approval shall be marked NSC No S178 in addition to the approval number of the instrument.

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 penaltie 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.

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

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

DESCRIPTIVE ADVICE

Pattern: provisionally approved 26/6/84 - approved 27/5/86

.   Smith model Accuload flowmeter indicator and system controller for use in bulk flowmetering systems.

Technical Schedule No S178 describes the pattern.

Variant: approved 11/2/91

1.   With remote logic controller.

Technical Schedule No S178 Variation No 1 describes variant 1.

FILING ADVICE

Supplementary Certificate of Approval No S178 dated 17/7/86 is superseded by this Certificate and may be destroyed. The documentation for this approval now comprises.

    Supplementary Certificate of Approval No S178 dated 22/3/91
    Technical Schedule No S178 dated 17/7/86 (incl. Test Procedure)
    Technical Schedule No S178 Variation No 1 dated 22/3/91
    Figures 1 to 4 dated 17/7/86

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No S178

Pattern: Smith Model Accuload Flowmetering System Controller

Submittor: Email Limited
              Electronics and Petroleum Equipment Division
              Cnr Canterbury and Liverpool Roads
              Kilsyth   Vic   3137

1.   Description of Pattern

(i)   Smith model Accuload flowmetering system controller (Figure 1) with digital indication of volume delivered, preset volume remaining and preset batch volume. Electronic temperature compensation is incorporated and requires the use of a Smith 100 ohm platinum resistance probe. The instrument accepts pulsed signals from the flowmetering transducer and provides control signals to the flowmetering system (Figure 2).

(ii)   The instrument may be used to deliver a volume compensated to 15°C, of a petroleum product of a specified density between 0.5 kg/L and 1.3 kg/L.

(iii)   The volume indicator has one of the following formats:

              99999 LITRES   in   1 L increments
              999.99 KILOLITRES in   10 L increments
              9999.9 KILOLITRES in 100 L increments

A prominent notice states the units for which the display is set.

(iv)   The input signal to the instrument is a rectangular waveform having the following parameters:

              Zero level voltage : 0 to 1.98 V
              High level voltage : 2.63 to 50 V
              Input pulse rate   : 0 to 2000 Hz
              Duty cycle   : 10/90 to 90/10 (ON/OFF % ratio)

(v)   The flowmetering transducer generates a minimum of 20 pulses per unit volume and a maximum of 1000 pulses per unit volume. This may be an Email model WE-1 pulse generator (Figure 3) or other Commission-approved pulse generator.

(vi)   The flow rate (L/min) of the flowmeter shall be less than 120000 pulses per minute produced by the pulse generator divided by the number of pulses per unit volume.

(vii)   The instrument may be connected to a digital flow control valve (Figure 4).

1.1   Operating Procedure

(i)   With the indicator displaying READY and the date, a delivery is preset by first depressing the SET button and then the pre-determined quantity to be delivered using the front keypad.

(ii)   Depressing the START button initiates the delivery of the above preset quantity. All operator controls, except STOP, are inhibited and if all other loading system conditions are satisfied, flow will begin.

(iii)   The three displays of the indicator (from left to right) become as follows:

        an up-counter, showing the quantity being delivered (5-digit);
        a down-counter showing the quantity remaining to be delivered (5-digit);
        and
        a continuous display of the entered preset quantity.

        Note: In Weights and Measures mode the VOLUME DELIVERED and PRESET VOLUME
                REMAINING indicators become up-counters in the format as programmed
                in Command Code 53 (refer Table 1).

(iv)   The transaction is completed at the end of delivery and upon depressing the
        PRINT button. Note: The transaction may comprise more than one delivery.

Note: Due to the difficulty in maintaining constant conditions to enable the
        programmed parameters to control the digital flow control valve, the exact
        preset value may not always be delivered, hence the preset is not for trade
        use and may only be used as a guide and to initiate a delivery.

1.2   Summary of Programmable Parameters

To confirm the programmed parameters in the Accuload, an access code is required
which allows entry into the program and/or Weights and Measures mode.   The
parameters are designated by Command Codes which are fully described in the manuals
and a summary of which is given in Table 1.

TABLE 1

Command Code	Description
23	Compensated total accumulative volume (not adjustable)
24	Uncompensated total accumulative volume (not adjustable)
40	Diagnostics (e.g. enter 1 to test the display)
53	The format of the preset and delivery display with regard to temperature compensation. code 0 – both preset and delivery without temperature compensation code 1 – preset is without and delivery is with temperature compensation code 2 – preset is with and delivery is without temperature compensation code 3 – both preset and delivery with temperature compensation.
57, 59, 61 & 63	Calibration factors corresponding to the flow rates given in Command Codes 56, 58, 60 and 62 respectively. Note, if only one calibration factor is used it must be entered in Command Code 57 and Command Codes 56, 58, 60 and 62 must be set to zero. (For other combinations refer to manual).

1.3   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	S178
Minimum delivery	 L
Type of liquid	....

In addition,

(i)   The preset indications shall be marked NOT FOR TRADE USE; and

(ii)   When programmed for temperature compensation;

(a)   The volume indicator shall be marked VOLUME DELIVERED CORRECTED TO 15°C; and

(b)   The instrument nameplate(s) shall include the following:

Liquid temperature compensation range   -15°C to +50°C
Liquid density for which temperature compensator is set .... kg/L

1.4   Verification Provision

Provision is made for the application of a verification mark.

TEST PROCEDURE No S178

The following tests should be conducted in conjunction with any tests specified in the approval documentation for the flowmeter to which this instrument is connected.

Note: If the Accuload is set to display temperature compensation volume, measure the temperature of the liquid and using the relevant temperature compensation tables compare the displayed compensation volume with the calculated compensation volume.

1.   Check and confirm the programmed parameters of the Accuload (refer to Table 1 or the manual).

2.   Referring to the operating procedure described in the Technical Schedule, initiate a delivery and compare the displayed volume against the actual volume delivered.

3.   During another delivery operate the STOP button and check that the START button is inoperative for a time delay of not less than 15 seconds and then complete the delivery and compare as above.

National Standards Commission
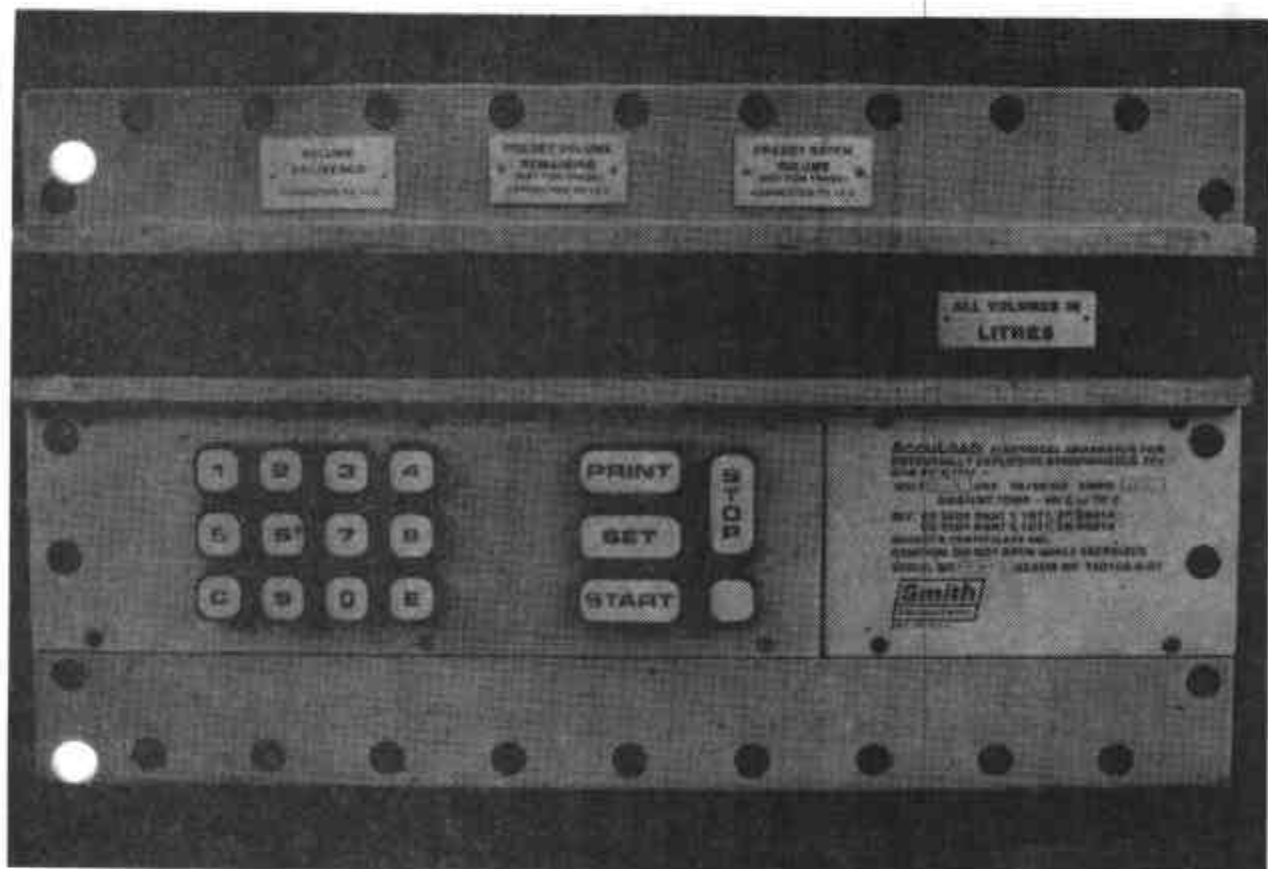
TECHNICAL SCHEDULE No S178

VARIATION No 1

Pattern: Smith Model Accuload Flowmetering System Controller.

Submittor: Email Electronics
Cnr Canterbury and Liverpool Roads
Kilsyth VIC 3137.

1.   Description of Variant 1

With a remote programmable logic controller or computer for data input to the Accuload system controller.
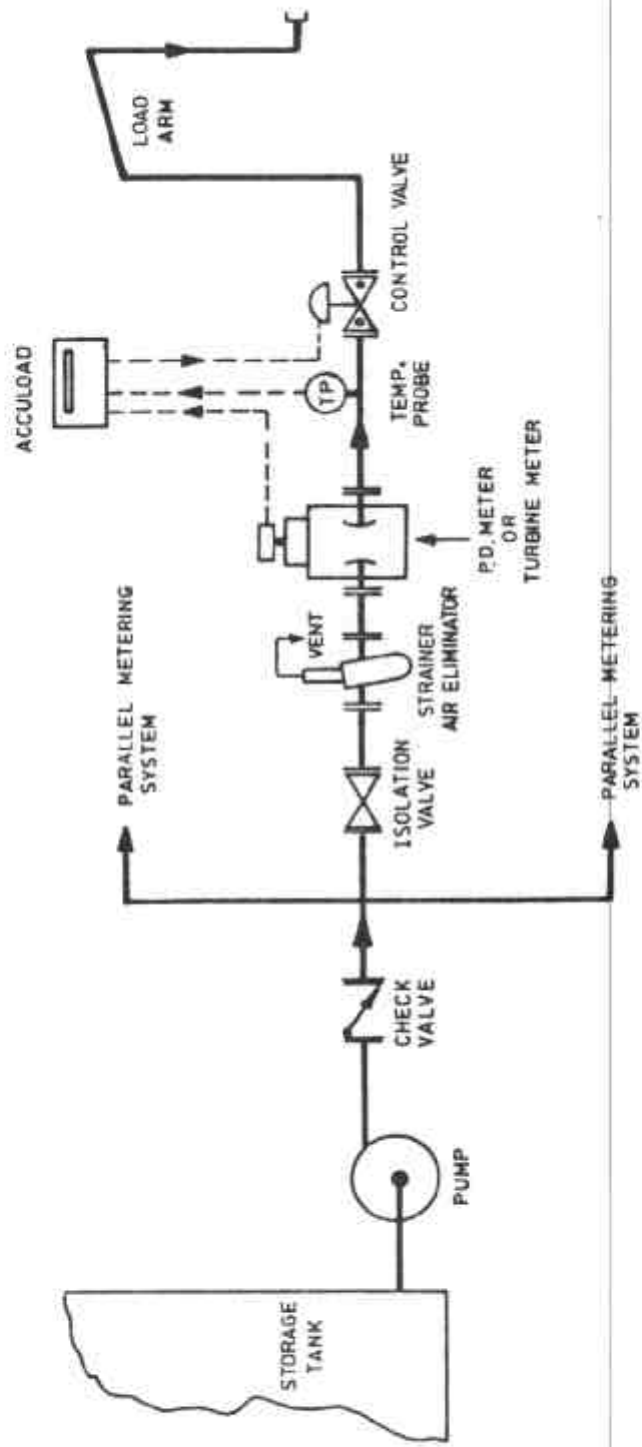
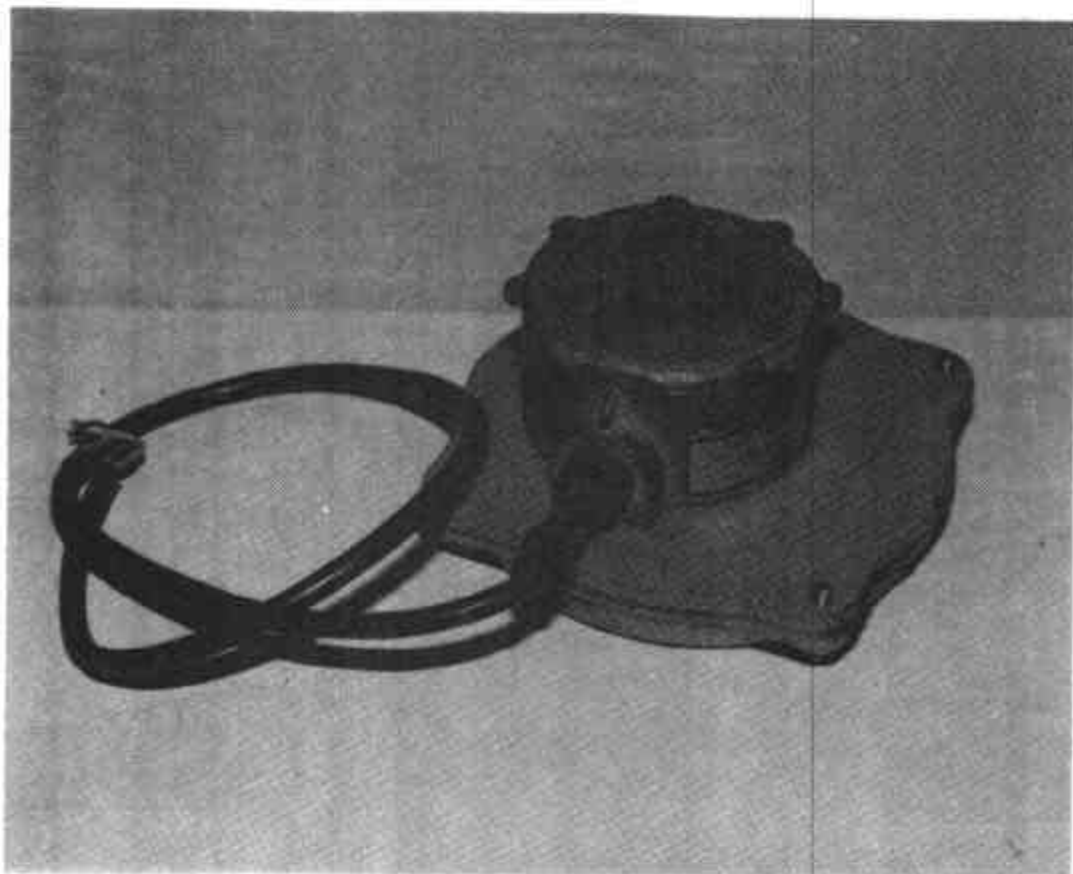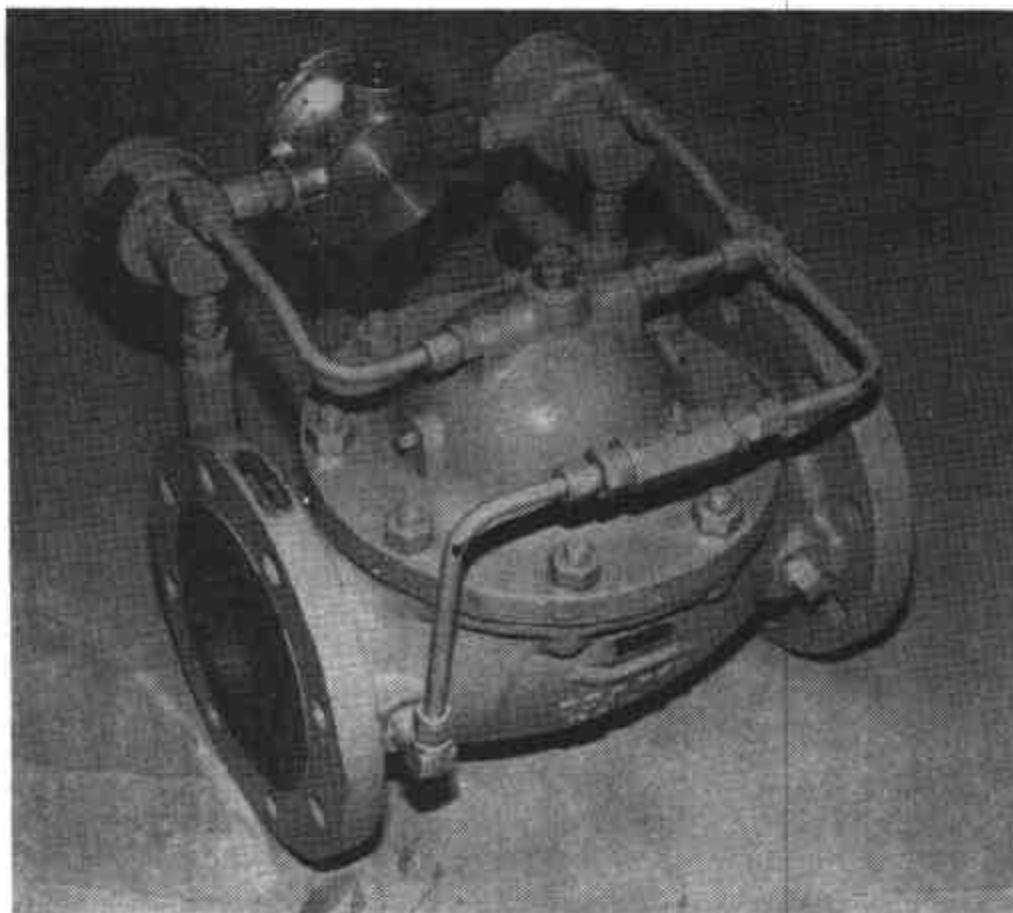FIGURE S178 - 1

Smith Acculood Controller

FIGURE S178 - 2

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17/7/86

Typical Flowmetering System

FIGURE S178 - 3

Email WE-1 Pulse Generator

FIGURE S178 - 4

Typical Digital Control Valve