5/6B/93
15 May 2002

National Standards Commission

12 Lyonpark Road, North Ryde NSW

Notification of Change

Certificate of Approval No 5/6B/93

Change No 1

The following changes are made to the approval documentation for the

Endress & Hauser Model M-Point DQ 600 Bulk Mass Flowmetering System

submitted by GEC Alsthom Australia
25 Princes Road
Regents Park NSW 2143.

1. In Certificate of Approval No 5/6B/93 dated 26 February 1998, the following Condition of Approval should be added:

   "This approval expires in respect of new instruments on 1 July 2003."

2. In Certificate of Approval No 5/6B/93 and its Technical Schedule both dated 26 February 1998, all references to the submittor should be amended to read:

   "Endress & Hauser Australia Pty Ltd
   Unit 12, RydeLink Business Park
   277 Lane Cove Road
   North Ryde NSW 2113"

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.

National Standards Commission

Certificate of Approval

No 5/6B/93

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

Endress & Hauser Model M-Point DQ 600 Bulk Mass Flowmetering System

submitted by GEC Alsthom Australia
25 Princes Road
Regents Park NSW 2143.

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.

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CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 July 2001, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/93 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.

Special: (for Provisional Variant 4)

This approval becomes subject to review on 1 January 1999, and then every year thereafter.

Instruments purporting to comply with this approval shall be marked NSC No P5/6B/93 and only by persons authorised by the submittor.

The submittor is to provide the Commission with copies of the results of all verification/certification tests.

In the event of unsatisfactory performance or of suitable results not being received by the Commission, this approval may be withdrawn.

DESCRIPTIVE ADVICE

Pattern: approved 10 June 1996

. A bulk mass flowmetering system using an Endress & Hauser model M-Point DQ 600 flow sensor of 25 mm nominal diameter.

Variants: approved 3 December 1997

1. With certain other Endress & Hauser model flow sensors.
2. With the flow sensor and/or the flow transmitter as intrinsically safe components.
3. With an Endress & Hauser model Promass 63M compact mass flowmeter.

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Variant: provisionally approved 3 December 1997

4. For use with liquids having a density between 1055 and 2500 kg/m^3.

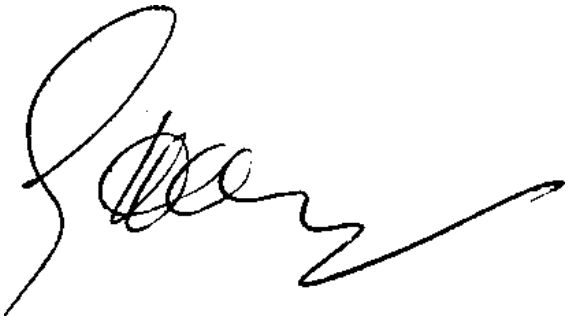
Technical Schedule No 5/6B/93 describes the pattern and variants 1 to 4.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/93 dated 26 February 1998
Technical Schedule No 5/6B/93 dated 26 February 1998 (incl. Test Procedure)
Figures 1 to 6 dated 26 February 1998

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/93

Pattern: Endress & Hauser Model M-Point DQ 600 Bulk Mass Flowmetering System.

Submittor: GEC Alsthom Australia
25 Princes Road
Regents Park NSW 2143.

1. Description of Pattern

A bulk mass flowmetering system incorporating an Endress and Hauser model M-Point DQ 600 flow sensor of DN 25 (25 mm) nominal diameter (Table 1) and an Endress & Hauser microprocessor-based flow transmitter. The flow sensor and the flow transmitter form the mass flowmeter.

The system is approved for the delivery of liquids having a density between 654 and 1055 kg/m^3, with the exception of liquefied gases and milk.

The maximum and minimum flow rates are 300 kg/min and 30 kg/min respectively. The minimum measured quantity is 30 kg.

1.1 Flowmetering System Component Structure

A typical system is shown in Figure 1.

(i) Supply Tank

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

A low-level detection device may be fitted.

(ii) Pump

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

Positive displacement type, centrifugal type, or submersible turbine type pumps may be fitted.

(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 pressure in, and immediately downstream of, the meter to prevent vaporisation. The minimum operating pressure is marked on the instrument.

(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/Detector

A gas purger assembly or a gas purger/gas detector assembly is fitted as close as practical to the meter inlet (Figure 1). These assemblies may be omitted only where the tank has automatic alarming of low-liquid level, or has a float-operated shut-off valve in the pump supply, or has other means to prevent gas entering the meter. A strainer assembly may be used.

In addition any gas formed in the flowmeter is detected by monitoring the density of the liquid. When the density falls below a set limit due to the presence of gas, the flow will be automatically stopped by means of a downstream control valve or other means.

(v) Flowmeter

An Endress and Hauser model M-point DQ 600 C flow sensor (Figure 2) determines mass flow and density by measuring the effects of Coriolis forces on a pair of straight, parallel flow measuring tubes, which are oscillated at their resonant frequency by an electromagnetic excitation coil. The pipe oscillations are scanned at both the inflow and outflow sides of the pipes by two optical sensors.

Provision is made for a pressure gauge to be connected downstream of the flow sensor.

An Endress and Hauser model Procom II ZL 6072 C remote microprocessor-based flow transmitter (Figure 3) generates an oscillatory voltage to the electromagnetic excitation coil which causes the flow measuring tubes to vibrate. It also processes and converts signals from the optical sensors into an output signal directly proportional to mass flow rate.

The flow sensor and flow transmitter form the mass flowmeter.

(vi) Indicator

A Contrec model 405LR.10E ‘Flow Computer’ digital indicator Figure 4, or other compatible Commission-approved electronic indicator is used. The indicator displays in units of mass and may be in a ‘flameproof’ enclosure.

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The indicator operates with either AC mains supply or DC supply (12 to 28 V). If power is disconnected, the totaliser value and the last mass delivered are retained in a non-volatile memory. The AC supply version also has a battery back-up for indication recall.

When the power is applied, a display check is initiated causing all segments to illuminate for about 5 seconds, after which the last mass delivered is displayed.

Mass (resettable)	9999.99 in 0.01 kg increments
Totaliser	999999 in 1 kg increments

(vii) Transfer Device

A 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. A flow rate control valve may be fitted.

1.2 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/93
Maximum flow rate	..... kg/min
Minimum flow rate	..... kg/min
Minimum quantity	..... kg
Density range	... to ... kg/m^3
Minimum operating pressure	..... kPa

1.3 Sealing and Verification/Certification Provision

Provision is made for sealing the flow transmitter into its housing and for sealing the cover for the electronics of the flow sensor which contains the calibration functions of the instrument.

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

2. Description of Variants

2.1 Variant 1

With certain other Endress and Hauser model M-point DQ 600 C flow sensors as listed in Table 1. The flow sensors utilise the Procom II ZL 6072 C transmitter.

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2.2 Variant 2

With the flow sensor and/or the flow transmitter as intrinsically safe components in which case the 'C' suffix of the model becomes a 'Z'. Note that components may carry two nameplates, each bearing the different model numbers.

2.3 Variant 3

With an Endress and Hauser model Promass 63M (flow sensor and flow transmittor) compact mass flowmeter (Figures 5 and 6) which has the flow transmitter integral with the flow sensor. The flow sensor may be of any of the nominal diameters as listed in Table 1 of this approval.

2.4 Variant 4

For use with liquids having a density between 1055 and 2500 kg/m^3. Refer to the Special Conditions of Approval for this variant.

TABLE 1

Sensor Diameter	Pipeline Size mm	Flow Rate kg/min Maximum	Minimum	Minimum Measured Quantity kg
DN 8	8	30	6	6
DN 15	15	100	6	10
DN 25	25	300	30	30
DN 40	40	500	30	30
DN 50	50	1170	60	60
DN 80	80	3005	150	150

TEST PROCEDURE

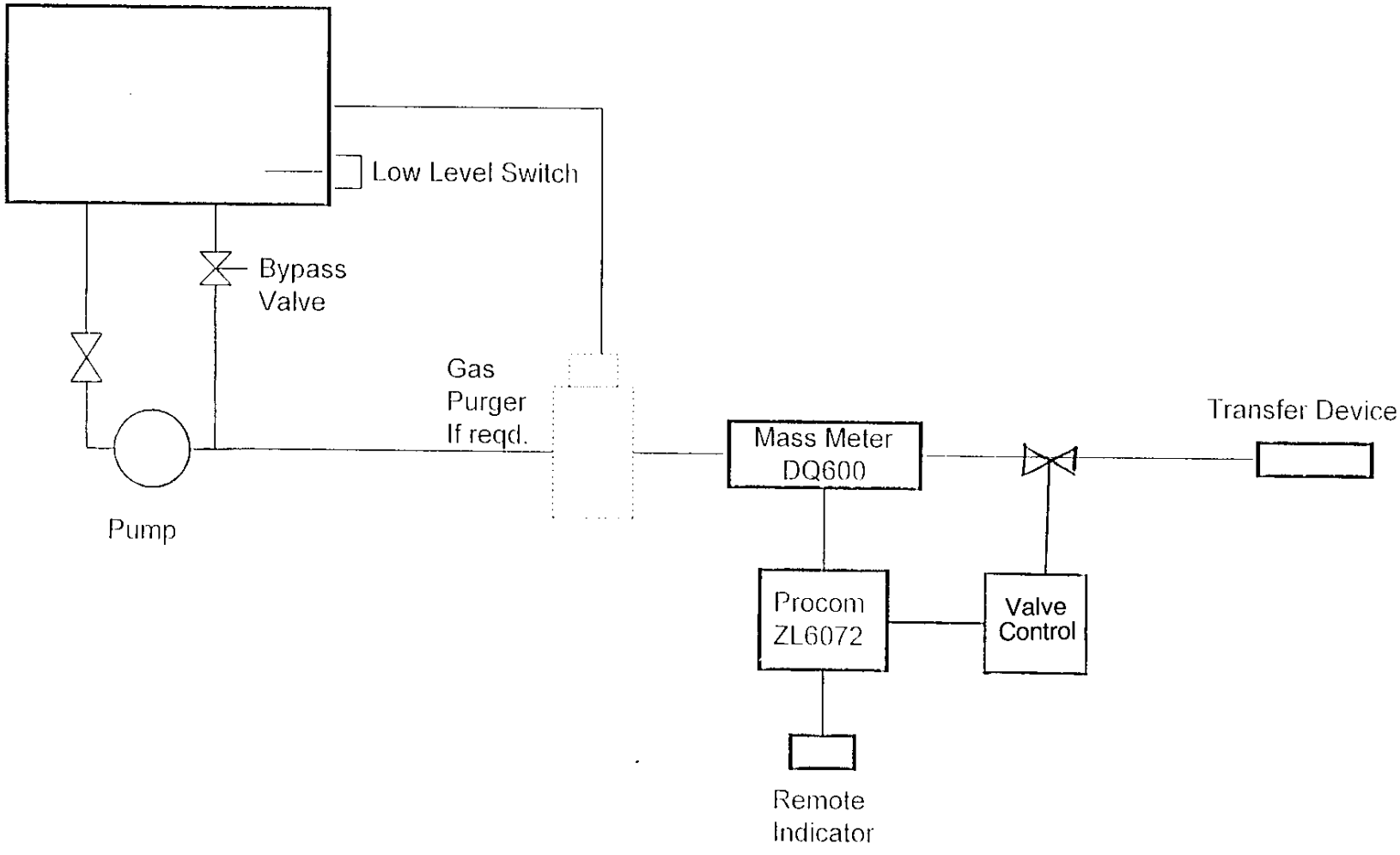
Instruments should be tested in accordance with the Inspector's Handbook using the liquid with which they will be used and which is marked on the data plate.

Maximum Permissible Errors at Verification/Certification

The maximum permissible error applied during a verification/certification test from normal flow rate to the minimum flow rate specified in the Certificate of Approval or Technical Schedule is ±0.3%.

Check that the operating pressure is above the minimum pressure marked (for all flowmeters).

FIGURE 5/6B/93 - 1

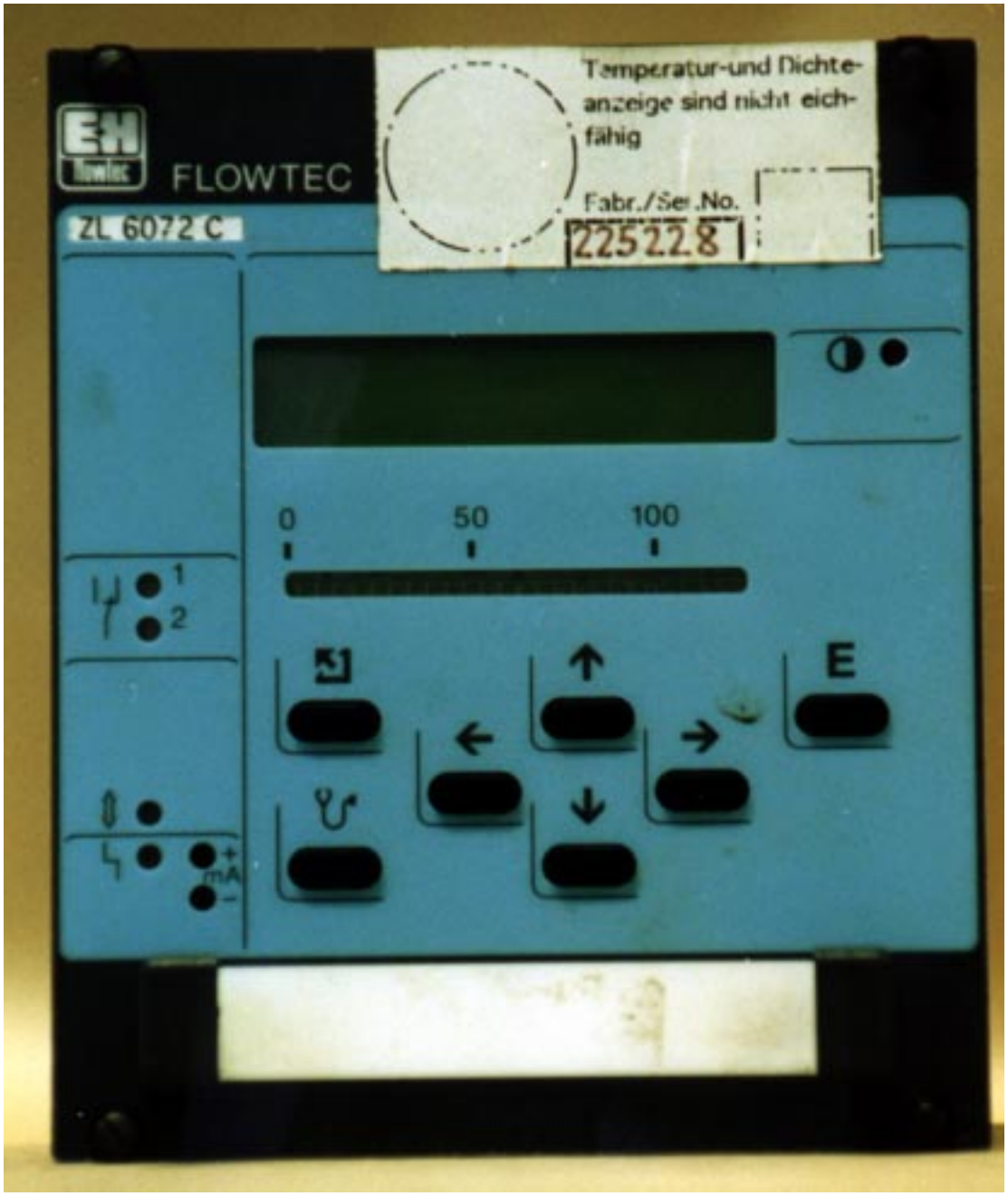


Typical Bulk Mass Flowmetering System Using M-point Flow Sensor

FIGURE 5/6B/93 - 2

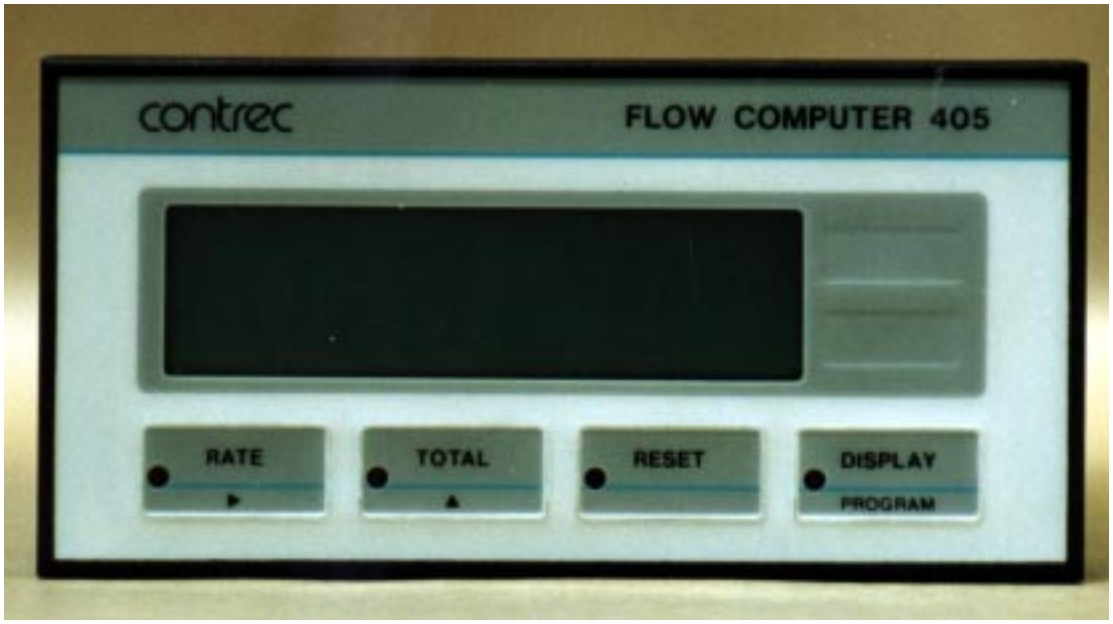
Typical M-point Flow Sensor

FIGURE 5/6B/93 - 3



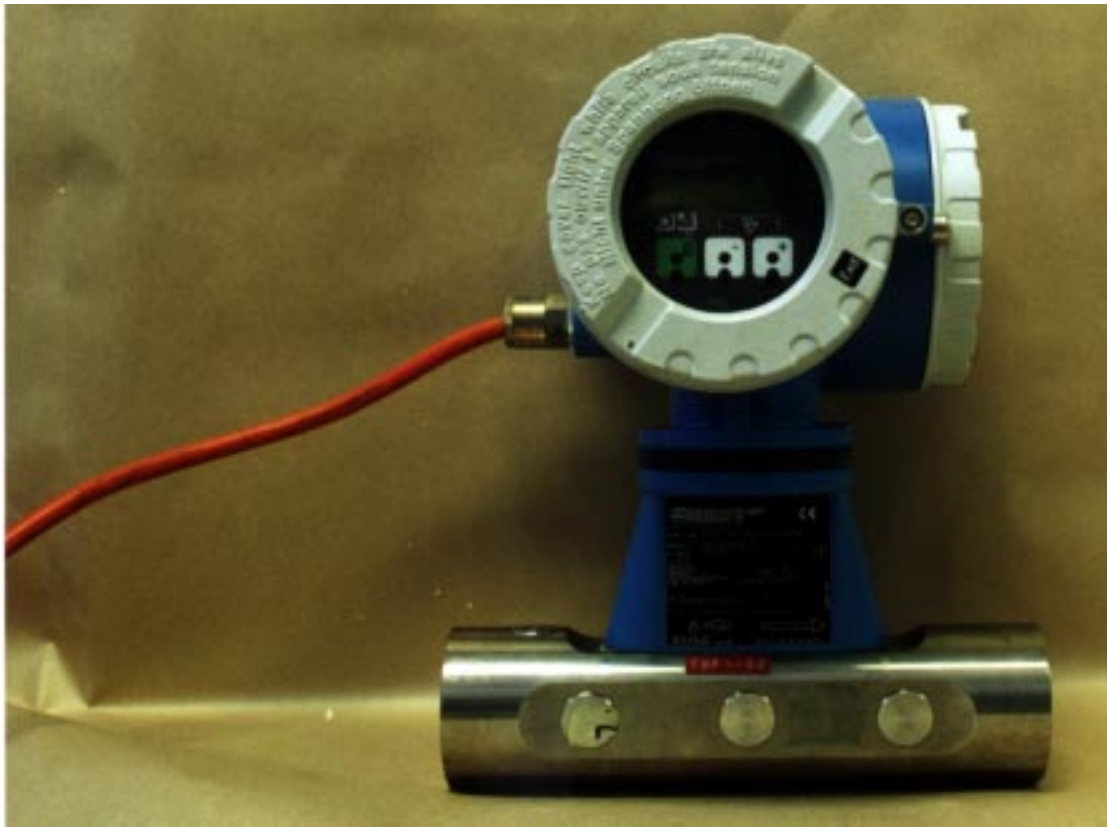
Flow Transmitter

FIGURE 5/6B/93 - 4



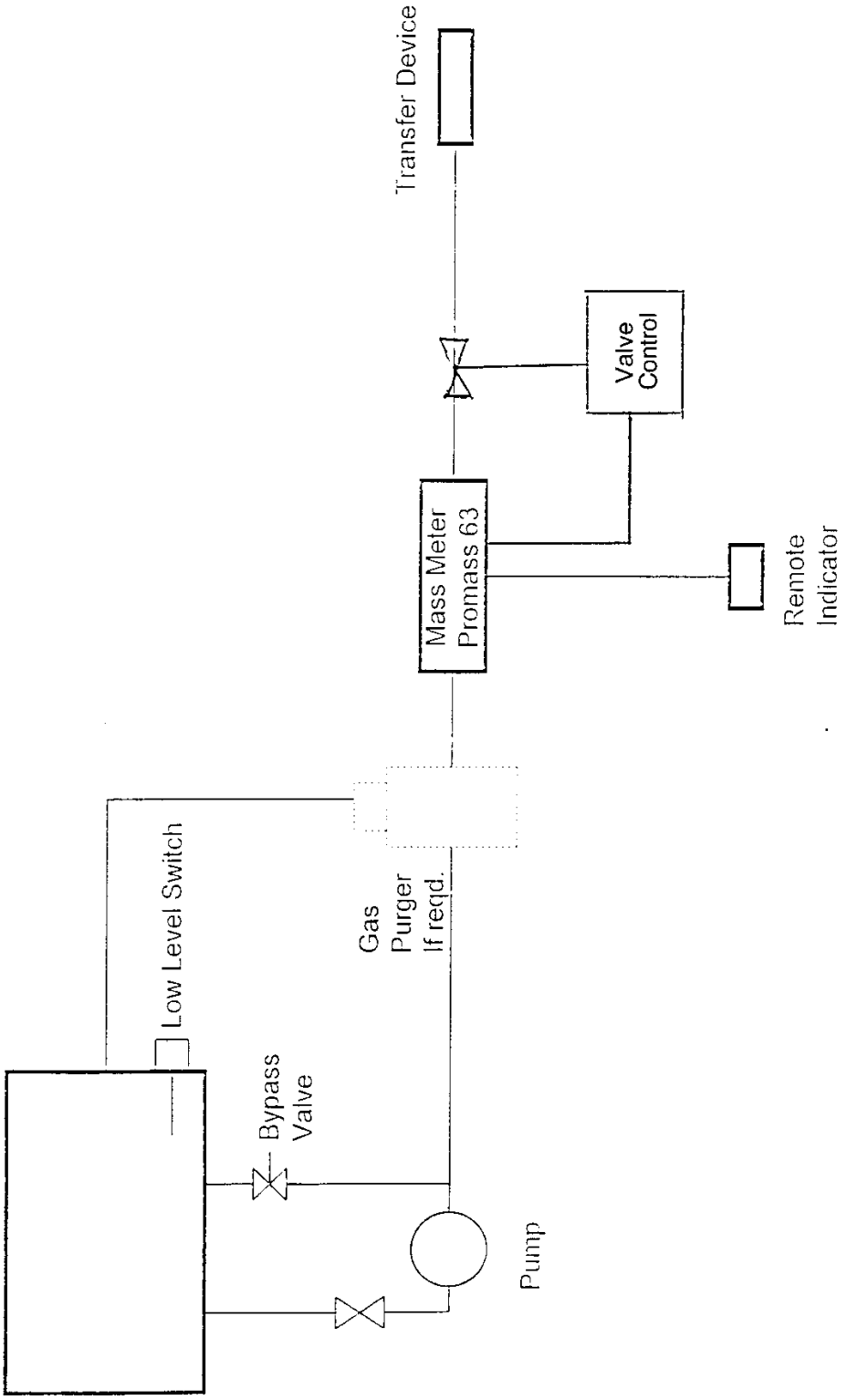
Contrec Model 405LR.10E Indicator

FIGURE 5/6B/93 - 5



Typical Promass Flow Sensor

FIGURE 5/6B/93 - 6



Typical Bulk Mass Flowmetering System Using Promass Flow Sensor