



Australian Government

**National Measurement
Institute**

12 Lyonpark Road, North Ryde NSW 2113

**Cancellation
Certificate of
Approval No 5/6B/92**

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

Micro Motion Model CMF300 Mass Flowmetering System

submitted by Fisher Rosemount Pty Ltd
(now Emerson Process Management)
471 Mountain Highway
Bayswater VIC 3153.

has been cancelled in respect of new instruments as from 1 July 2005.

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, appearing to be 'J. H. T.', written in a cursive style.

National Standards Commission



Certificate of Approval

No 5/6B/92

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

Micro Motion Model CMF300 Bulk Flowmetering System

submitted by Fisher Rosemount Pty Ltd
471 Mountain Highway
Bayswater VIC 3153.

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 January 2001, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No5/6B/92 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 3)

This approval becomes subject to review on 20 February 1998, and then every year thereafter.

Instruments purporting to comply with this approval shall be marked NSC No P5/6B/92 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 suitable results not being received, this approval may be withdrawn.

DESCRIPTIVE ADVICE

Pattern: approved 20 December 1995

- A bulk flowmetering system using a Micro Motion model CMF300 flow sensor for mass flow measurement of certain liquids having a density between 654 and 1055 kg/m³.

Variants: approved 20 December 1995

1. With certain other Micro Motion flow sensors.
2. For volumetric flow measurement.

Variant: provisionally approved 20 February 1997

3. For use with liquids having a density between 1055 and 2500kg/m³.

Technical Schedule No 5/6B/92 describes the pattern and variants 1 to 3.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 5/6B/92 dated 17 March 1997

Technical Schedule No 5/6B/92 dated 17 March 1997 (incl. Test
Procedure)

Figures 1 to 7 dated 17 March 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/92

Pattern: Micro Motion Model CMF300 Mass Flowmetering System.
Submitter: Fisher-Rosemount Pty Ltd
471 Mountain Highway
Bayswater VIC 3153.

1. Description of Pattern

A bulk mass flowmetering system incorporating a Micro Motion model CMF300 (#) flow sensor and a Micro Motion model RFT9739 (#) microprocessor-based transmitter. The flow sensor and the transmitter form the mass flowmeter.

The system is approved for use with liquids having a density between 654 and 1055 kg/m³, with the exception of liquefied gases under pressure and milk.

The system is approved for use for a flow rate range of 340 to 3400 kg/min. The minimum quantity is 800 kg.

(#) The model numbers listed above are the basic model numbers only — the full model numbers may have a variety of additional alphanumeric characters which designate non-metrological features. For example, the full model number of the flow sensor may be in a form such as CMF300 M 355 N U and the full model number of the transmitter may be in a form such as RFT9739 R 1 E U Y.

1.1 The Flowmetering System (Figure 1)

(i) Supply Tank

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

(ii) Pump

The pump is fitted in a **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 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 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/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.

(v) Flow Sensor (Figure 2)

A Micro Motion model CMF300 (#) flow sensor, comprised of a pair of U-shaped flow tubes in a welded enclosure, is used. Provision is made for a pressure gauge to be connected downstream of the flow sensor.

The flow sensor determines mass flow of the fluid and sends this information to the transmitter where it is processed and converted into an output signal directly proportional to mass flow.

(#) Refer to the footnote on page 1.

(vi) Transmitter (Figure 3)

A Micro Motion model RFT9739 (#) microprocessor-based transmitter is used. Figure 3 shows the transmitter in its approved enclosures, viz. field-mount housing (with display), field-mount housing (without display), and rack-mount housing.

(#) Refer to the footnote on page 1.

(vii) Indicating System

A Micro Motion model DRT digital indicator (Figure 4) or another compatible Commission-approved electronic indicator is used. The indicator displays in units of mass.

(viii) 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, on the flow sensor:

Manufacturer's name or mark	
Meter model	
Serial number	
NSC approval number	5/6B/92
Maximum flow rate	
Minimum flow rate	
Minimum quantity	
Density range	... to... kg/m ³

1.3 Sealing and Verification/Certification Provision

Provision is made for sealing the cover of the transmitter 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

A bulk flowmetering system using any Micro Motion flow sensor listed in Table 1.

2.2 Variant 2

With the RFT9739 transmitter configured to convert mass to volume at 15^oC and the DRT digital indicator, or another compatible Commission-approved electronic indicator, configured to display in units of volume (Table 1), in which case the system shall include a Micro Motion model DMS liquid density and temperature monitoring indicator (Figure 5), or another compatible Commission-approved electronic indicator, and an external 100 ohm platinum resistance temperature detector (RTD), located immediately at the inlet or outlet of the flow sensor.

Figures 6 and 7 show typical systems for this variant.

The transmitter calculates volume from the fluid mass and fluid density.

This variant is used to convert mass to volume at 15^oC for any liquid fuel within the ranges:

Liquid density	654 to 1055 kg/m ³
Liquid temperature	0 ^o C to 45 ^o C

The density to density at 15^oC conversion is based on Table 53B (Generalised Products) of the ASTM-IP Petroleum Measurement Tables.

In addition to the markings specified in cl. **1.2 Markings** of this Technical Schedule, instruments purporting to comply with this variant shall also be marked with the following:

Liquid temperature range	0 ^o C to 45 ^o C
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The volume indicator (indicator facia) shall be marked "Volume delivered converted to 15^oC" or "Reference temperature 15^oC".

2.3 Variant 3

For use with liquids having a density between 1055 and 2500 kg/m³.

NOTE: This extended density range may be used in conjunction with the pattern and with variant 1 (for mass flowmeters), but shall not be used for variant 2 (mass to volume conversion).

Refer to the Special Conditions of Approval for the variant.

TABLE 1

Sensor Model	Size mm	Mass Flow Rate		Volume Flow Rate		Minimum Quantity	
		Maximum	Minimum	Maximum	Minimum	kg	L
		kg/min		L/min			
CMF050(#)	10	118	18	100	10	25	20
CMF100(#)	25	453	45	385	38	90	75
CMF200(#)	40	1463	146	1235	123	290	245
CMF300(#)	80	3400	340	4000	400	800	680

(#) Refer to the footnote on page 1.

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 date plate. For volume indication only the test for compensated mode is applicable.

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 $\pm 0.3\%$ for mass and $\pm 0.5\%$ for volume.

FIGURE 5/6B/92 - 1

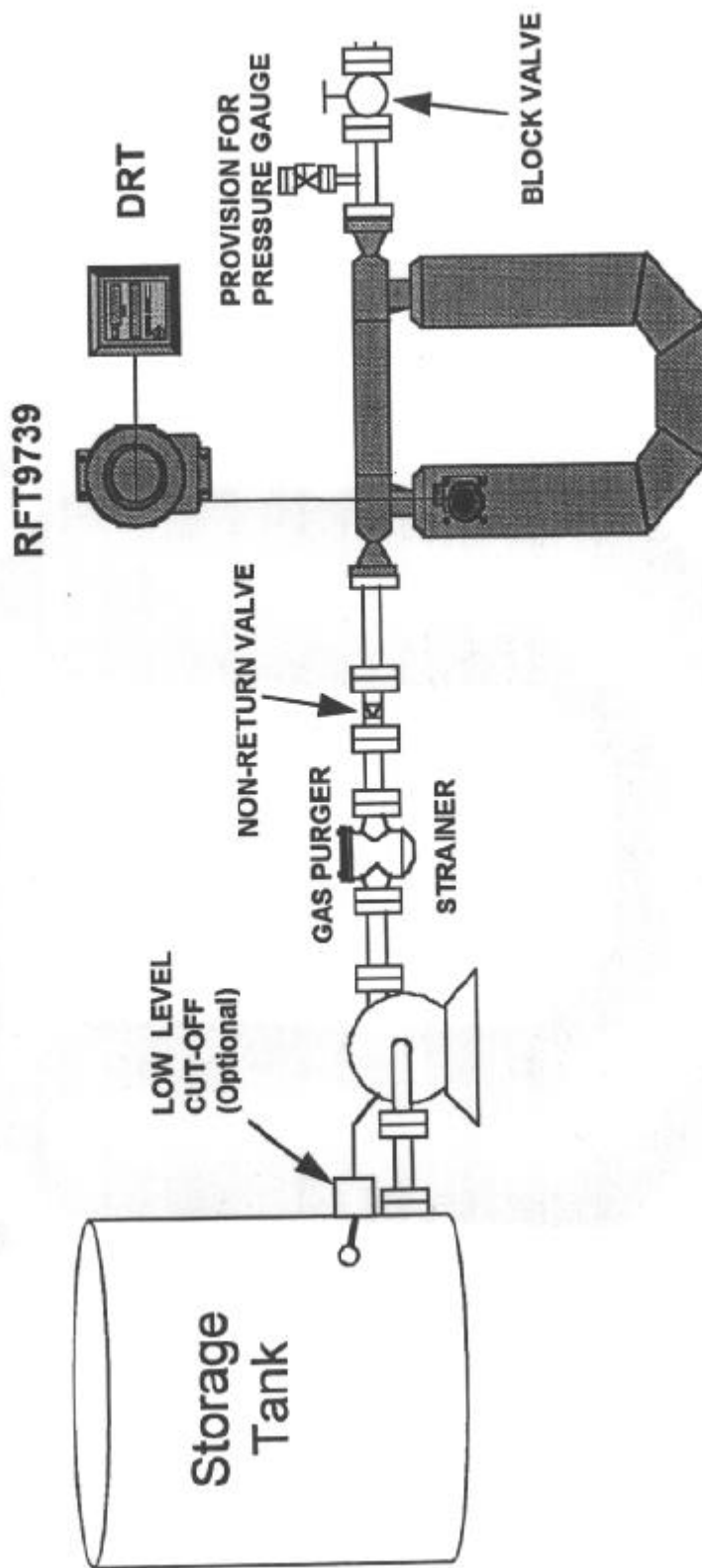
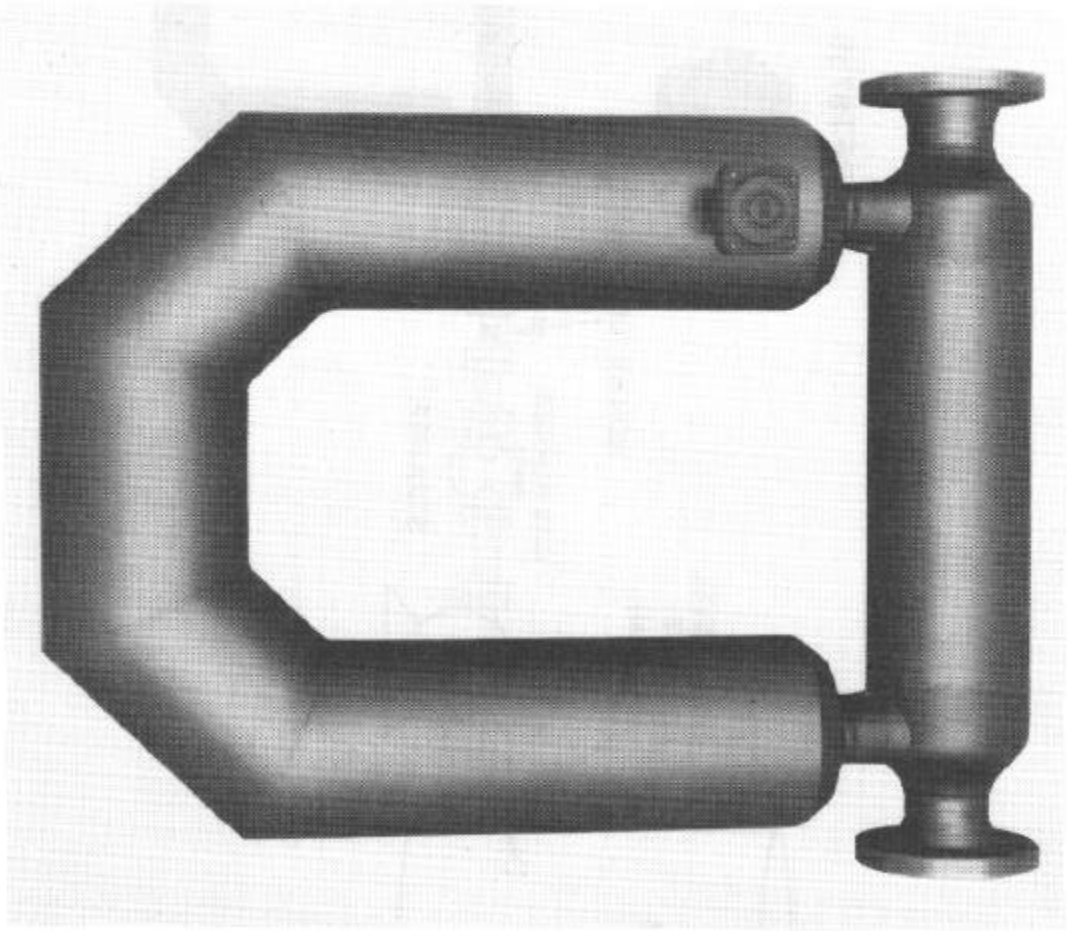
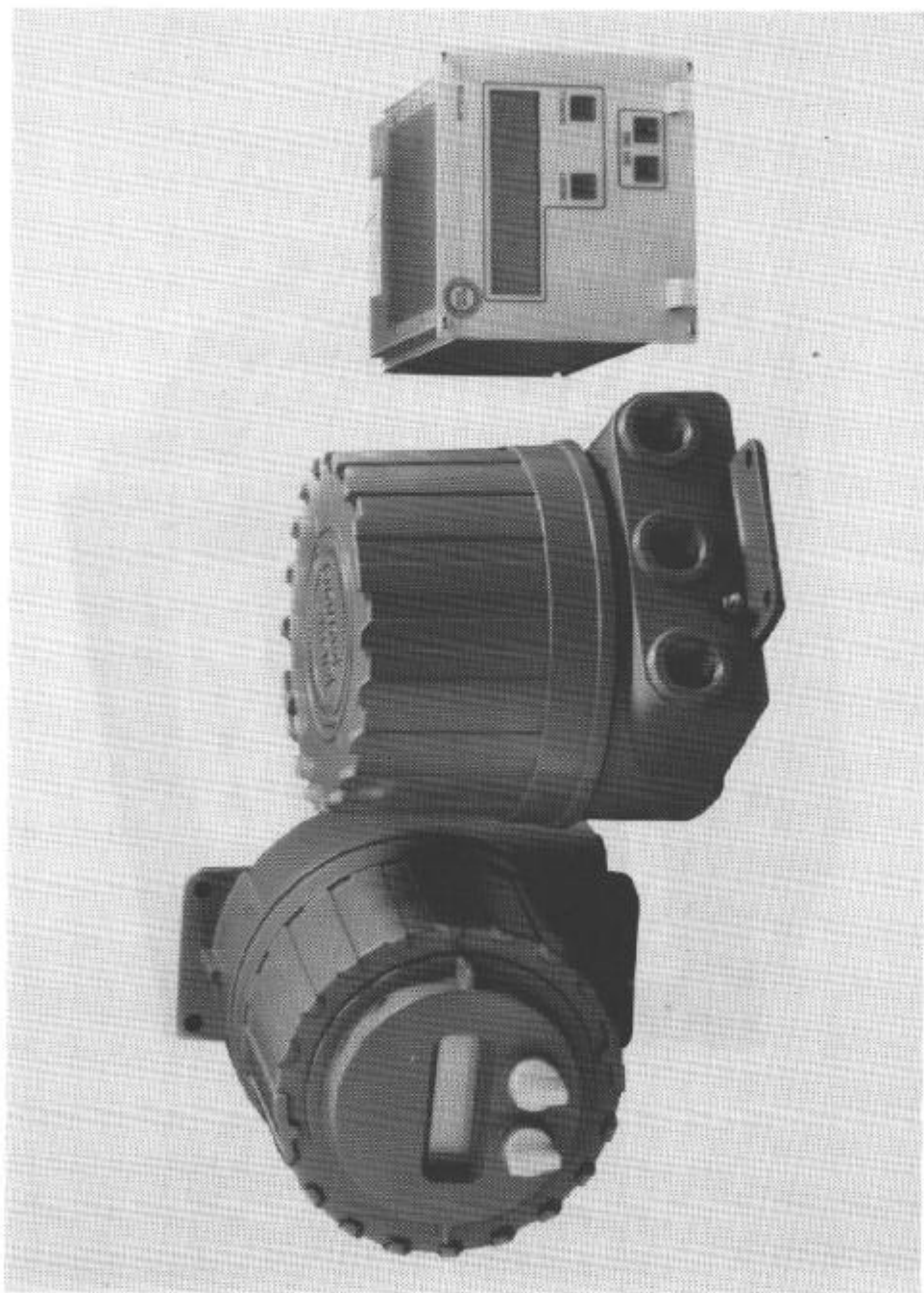


FIGURE 5/6B/92 - 2



Micro Motion Model CMF300 Flow Sensor

FIGURE 5/6B/92 -- 3



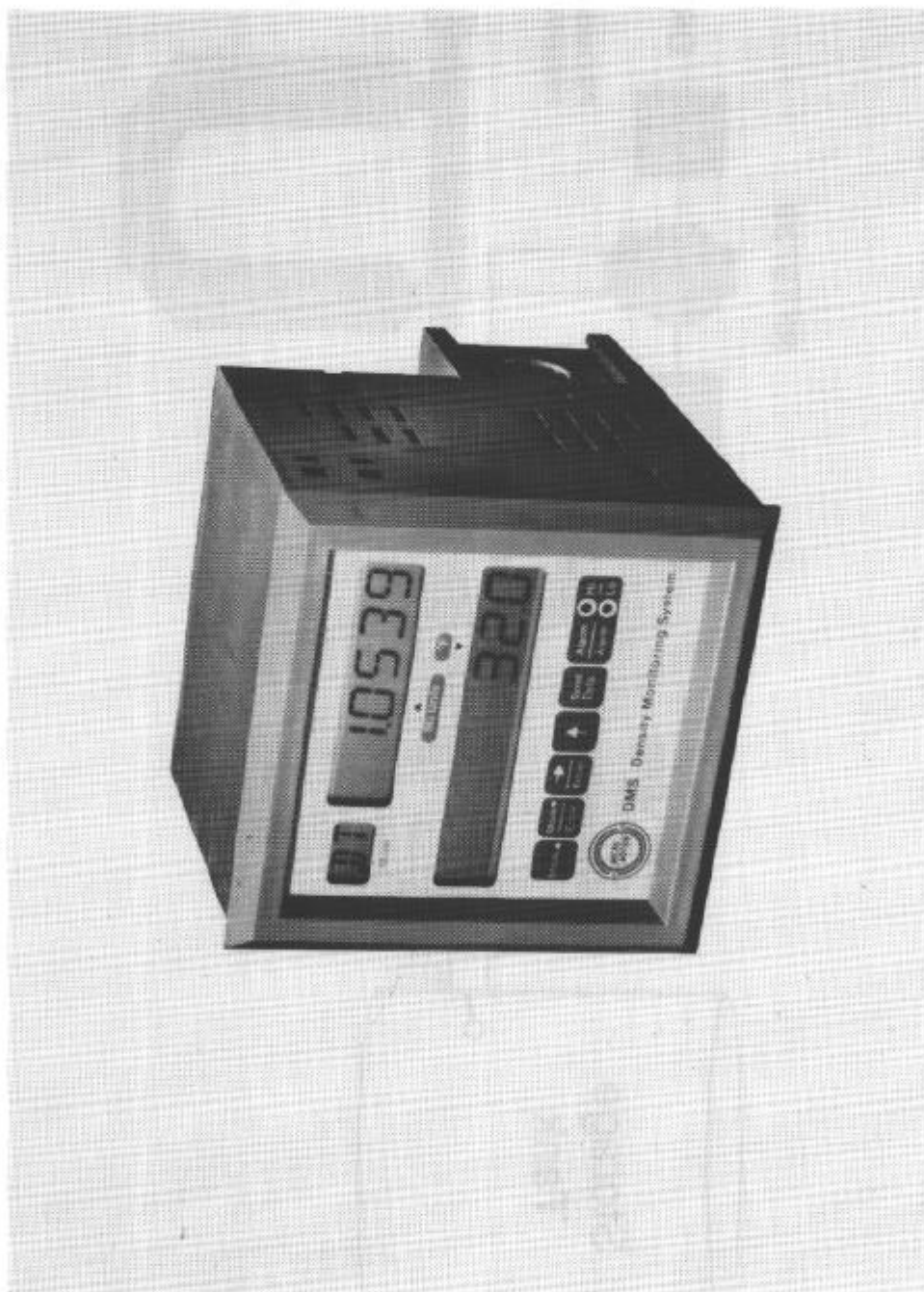
Micro Motion Model RFT9739 Transmitter

FIGURE 5/6B/92 - 4



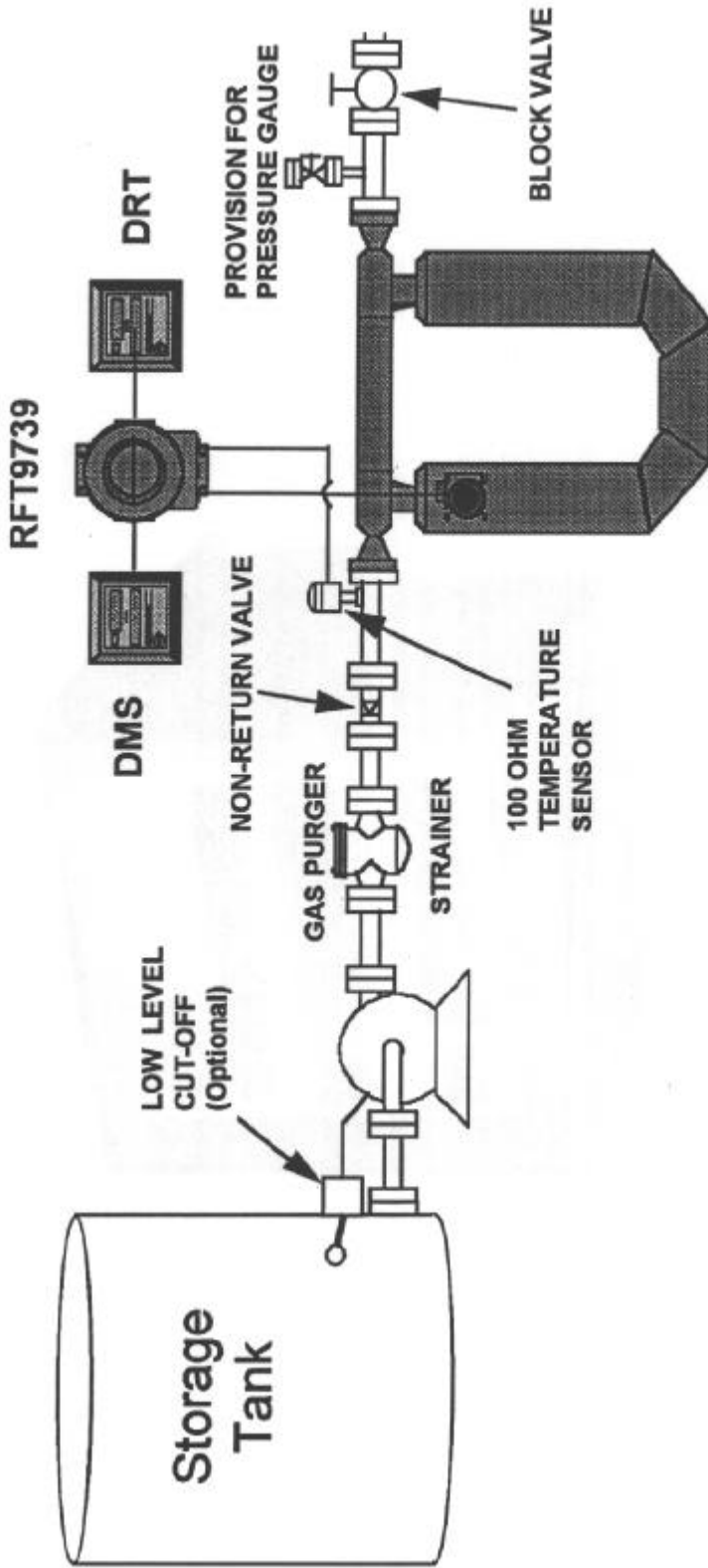
Micro Motion Model DRT Digital Indicator

FIGURE 5/6B/92 - 5



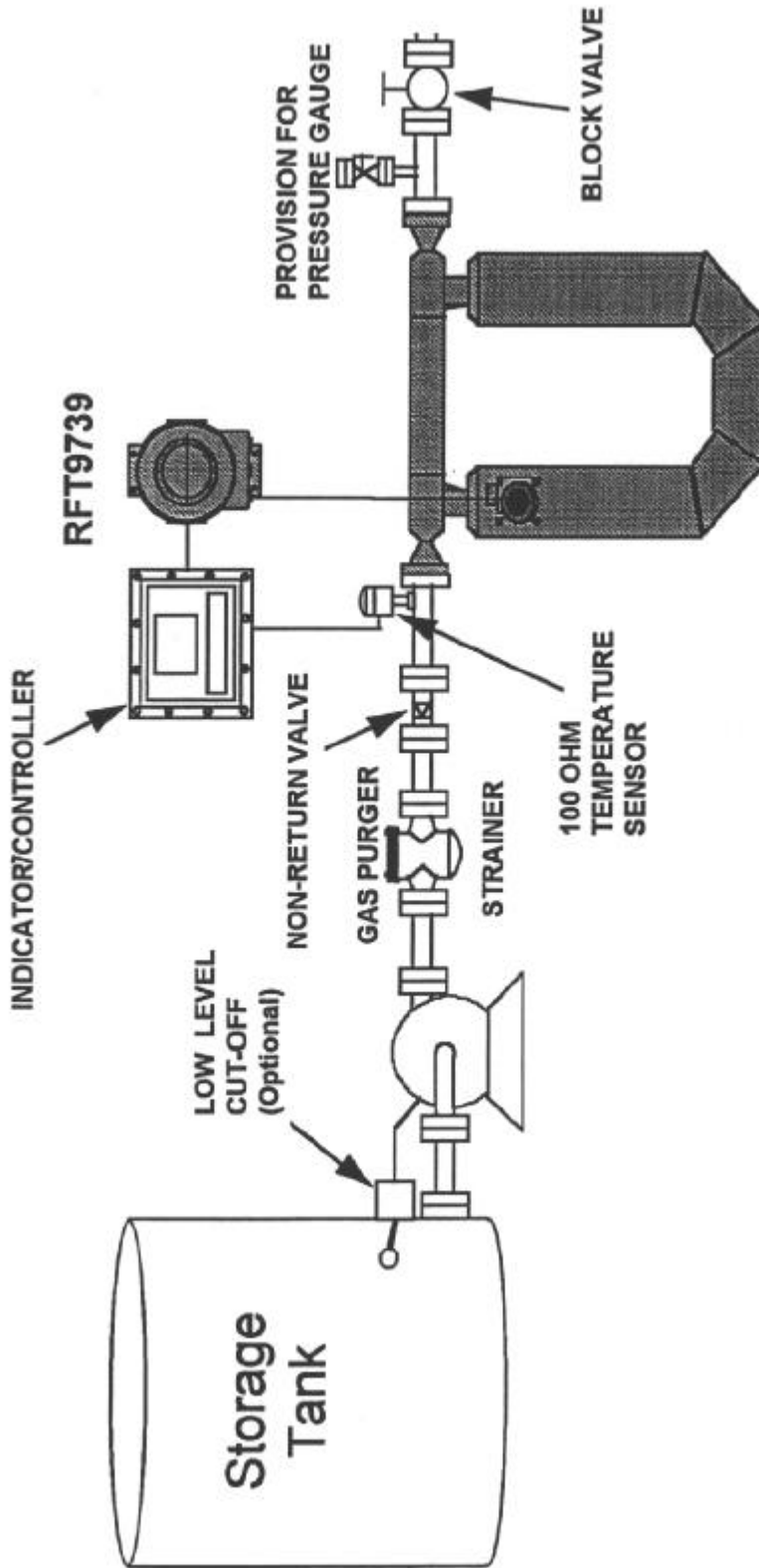
Micro Motion Model DMS Density Monitoring Indicator

FIGURE 5/6B/92 - 6



Typical Flowmetering System — Variant 2

FIGURE 5/6B/92 - 7



Alternative Flowmetering System — Variant 2