



DEPARTMENT OF TRADE AND COMMERCE
STANDARDS BRANCH

G-24

OTTAWA May 19, 1966

NOTICE OF APPROVAL

FOR

CANADIAN METER COMPANY "VARICO" FLOW COMPUTER

Apparatus

Differential Pressure:-

- (1) Series "FS" and "SS" 'Dri-Flo', Bellows Differential Units;
Differential ranges 0-20, 0-50, 0-100, 0-200 inches w.g.
Working pressures 1000, 2000, 3000, 4000 and 5000 p.s.i.
 - (11) Series 'A-70' and 'A-88' Mercury, Float Type Manometers:
Differential ranges 0-10, 0-20, 0-50*, 0-100* and
0-200 inches w.g.
- Working pressures:-
- Series 'A-70' 750 and 1,000 p.s.i.
 - Series 'A-88' 1800, 3000 and 5000 p.s.i.

* Only these ranges are available with Series 'A-88' high working pressures of 3,000 and 5,000 p.s.i.

Static Pressure:-

- (1) Helical 'Ambrac' up to 500 p.s.i.
- (11) Helical Stainless Steel 0-25 to 0-5000 p.s.i.

Flowing Gas Temperature

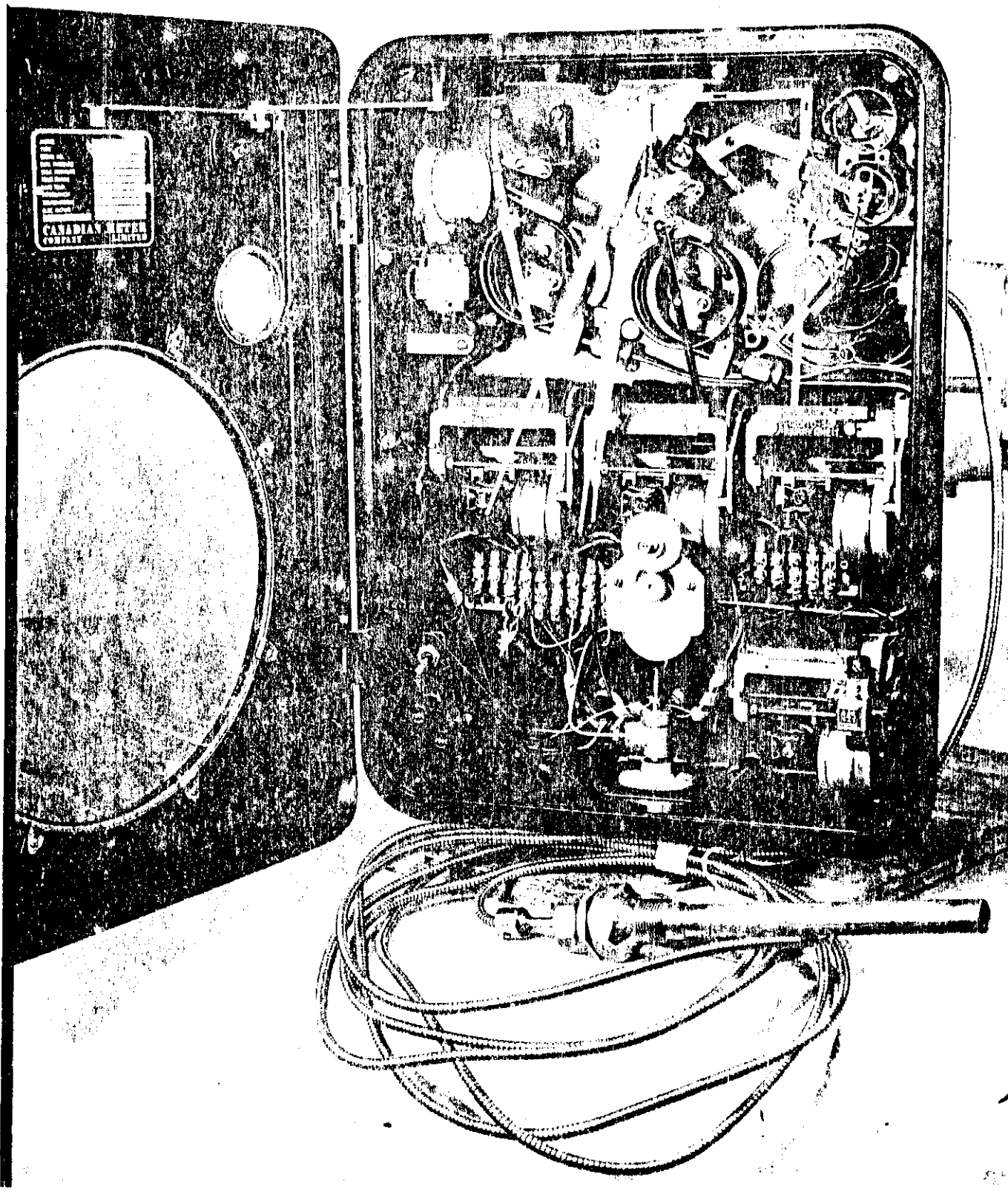
Class 1A fully compensated system only
Capillary: Armoured stainless steel
Standard length 15 feet
Maximum length 200 feet
Temperature ranges: 0° to 150°F and -30° to +120°F

Synchronous Motor Drives, Type 117

(manufactured by Cramer Controls Corporation, Centrebrook, Conn., U.S.A.)

- Supply 115 volts, 60 cycles
- Ambient temperature ranges:-
- (1) Standard Model .. -40°F to +131°F
- (11) Low Temp. Model .. -40°F to +185°F

CANADIAN METER COMPANY "VARICO" FLOW COMPUTER



CANADIAN METER COMPANY LIMITED

Motor output shaft rotational speeds:

- (1) 0.3, 3 and 30 rev. per minute
- (11) 1/12 rev. per hour (used as chart drive)

Chart Drive Rotational Speeds:

- (1) 24 and 48 hours per revolution
- (11) 7 and 8 days per revolution

Description

The 'Varico' Flow Computer is basically a recording and integrating orifice meter, available in three models, functionally designated as Single Integrating, Double Integrating and Triple Integrating.

The Triple Integrating 'Varico' Flow Computer combines three primary elements for measuring and recording the differential and static pressures, and the flowing gas temperature, with suitable integrating mechanisms which continuously solve the flow equation and provide the read-out of the totalized volume in cubic feet at specified base conditions, irrespective of the variations in the values of the flow parameters.

The totalizing and the automatic compensation is achieved through the employment of cylinder type integrators driven by suitably interconnected, 3 r.p.m., synchronous motors.

Four cylindrical cams are used in the Triple Integrating Flow Computer, three for the flow parameters and the fourth one for dialing in a 'U' Factor, or a unit orifice coefficient. Each integrating cam mechanism is equipped with a mercury switch which activates the motor that drives the following cam. The mercury switch operated by the 'U' Factor cam energizes the motor which drives the Integrated Volume Counter. This counter may incorporate a mercury pulse switch for the remote transmission of the counter reading and in such case the requirements contained in the Approval Circular # S-GA.291 (Amended) shall apply.

In operation the Triple Integrating Flow Computer solves the orifice meter flow equation:

$$Q_h = C'' \sqrt{h_w \times P_f \times F_{tf}}$$

where $C'' = \frac{C'}{F_{tf}}$

C' = Orifice flow constant (Ref. A.G.A. Rep. #3)

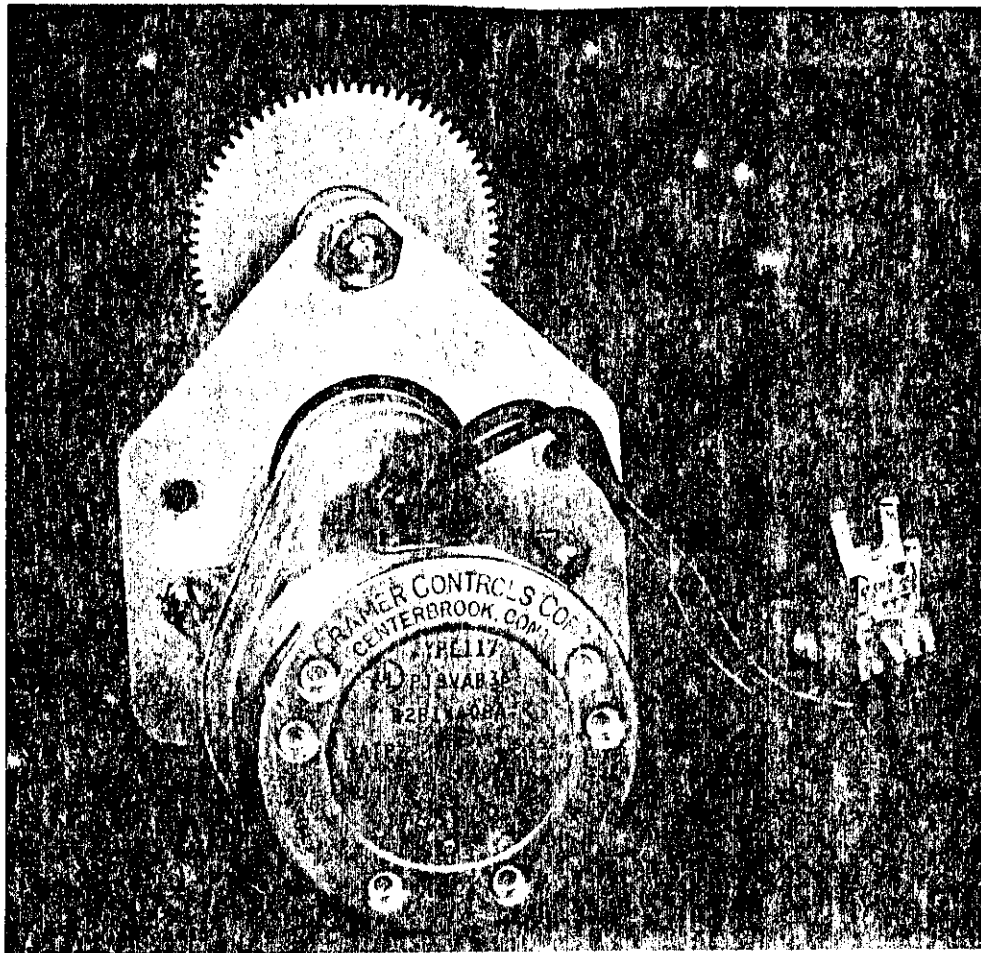
Q_h = Quantity rate of flow at base conditions, cubic feet per hour

h_w = Differential pressure in inches of water

P_f = Absolute static pressure in p.s.i.

F_{tf} = Flowing temperature factor

CANADIAN METER COMPANY "VARICO" FLOW COMPUTOR



In the Double Integrating Flow Computer the temperature measuring system and its integrating mechanism is omitted and the applicable flow equation becomes

$$Q_h = C' \sqrt{h_w \times P_f}$$

A separate, independent temperature recorder would normally be used on installations where Double Integrating Flow Computers are used.

The Single Integrating Flow Computer solves the flow equation with only the differential pressure considered as variable, so that

$$Q_h = C' \sqrt{h_w}$$

Separate static pressure and temperature recorders would be used where the Single Integrating Computers are installed.

For the description of the primary elements approved with Varico Flow Computers refer to Circulars SD-GA.38, SD-GA.51 and S-GA.182.

For more detailed description of the "Varico" Flow Computers refer to Technical Bulletin No. 7.

Approval granted to: Canadian Meter Company Limited,
Milton and Edmonton.

W. J. S. Fraser

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