DEPARTMENT OF CONSUMER AND CORPORATE AFFAIRS

STANDARDS BRANCH

G-38

OTTAWA, January 30, 1969.

NOTICE OF APPROVAL

FOR

CANADIAN METER COMPANY, BASE VOLUME INDEX, TYPE 3

Apparatus

Model and Pressure Element Designation	Static Pressure Range		
BP 30 Special	0 - 24" w.g.	to	0 - 5 psig.
BP 30	0 - 12 psig.	to	0 - 15 "
BP 45	0 - 25 "	to	0 - 30 "
BP 60	0 - 35 "	to	0 - 45 "
BP 120	0 - 90 "	to	0 - 100 "
BP 180	0 - 125 "	to	0 - 165 "
BP 300	0 - 230 "	to	0 - 300 "
BP 360	0 - 270 "	to	0 - 350 "
BP 600	0 - 500 "	to	0 - 600 "
BP 1200	0 - 1000 "	to	0 - 1200 "

Temperature Range	Base Temperature	Cam Factor
-10°F to +150°F	70°F	0.8333
-20°F to +140°F	60°F	0.8333
-40°F to +110°F	60°F or 70°F	0.7500
-50°F to +110°F *	60°F or 70°F	0.7500

* Effective compensation range is -40°F to +110°F.

Identification of Approved Front Counters

Currently Used Counters	Plastic Replacement Counters	Advance of Lowest Digit per Counter Shaft Rev.
12836G001	12836G103	1/10
12836G002	12836G104	1
12836G003	12836G105	10
12836G005	12836G108	10
12836G023 *	12836G113 *	10
12836G024 *	12836G114 *	1
12836G067	12836G107	1

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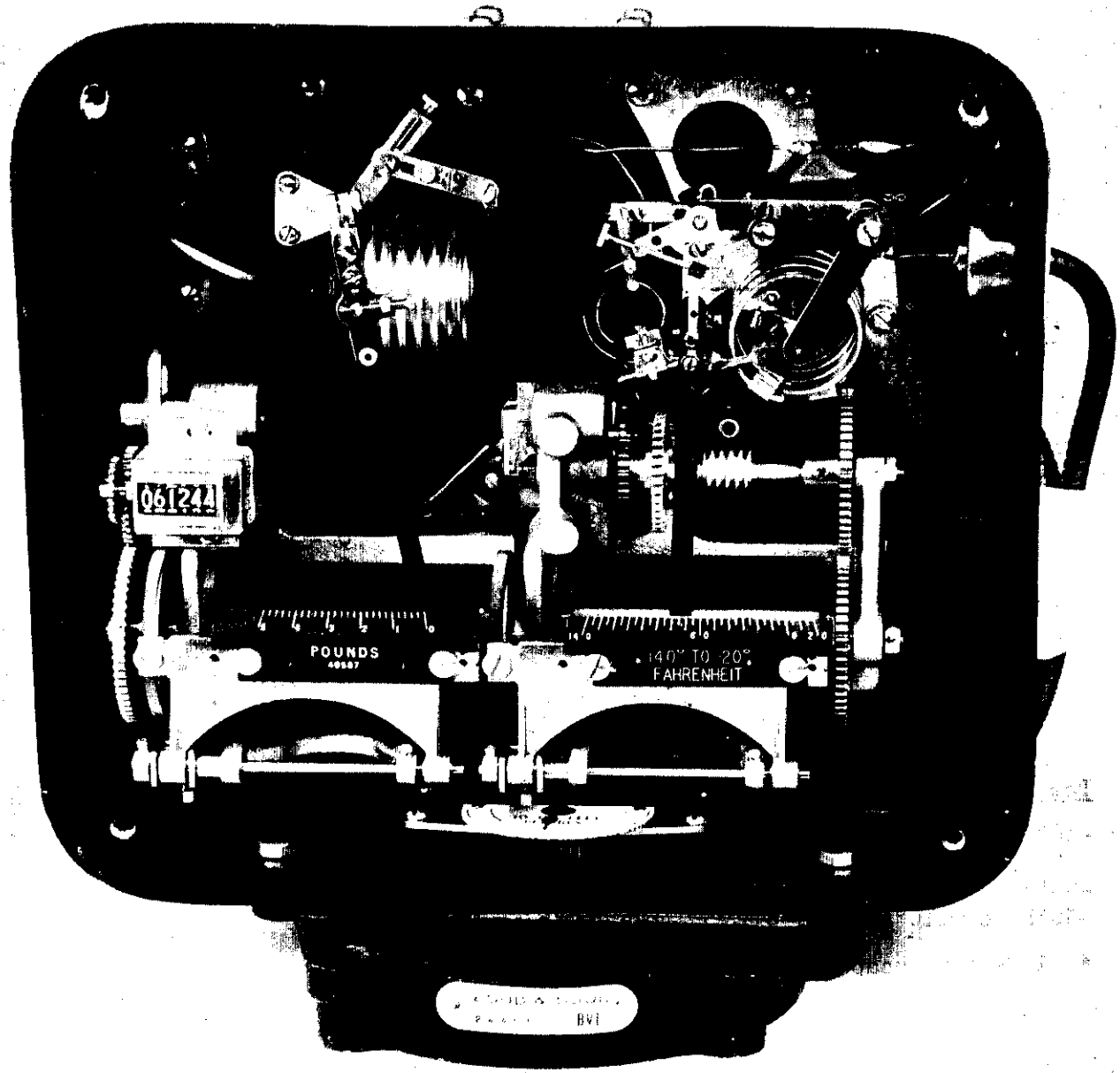
CANADIAN METER COMPANY BASE VOLUME INDEX, TYPE 3



* These counters are used with instruments incorporating a telemike impulse unit. (Ref. Circular S-GA.311).

Identification of Approved Back Counters

Currently Used Counters	Plastic Replacement Counters	Advance of Lowest Digit per Counter Shaft Rev.
11516G001	11516G011	1
11516G002	11516G012	10

Note: Some Base Volume Indexes of very early manufacture may include front counters identified by Nos. 12833, 12836 or 13137, and back counters identified by Nos. 11516 or 14393.

Description

The computation of the volume of a gas, at the contract temperature and pressure, which has been registered in cubic feet at line conditions is based on the ideal gas laws modified by a deviation factor available to us in the form of a Supercompressibility factor (Fpv), determined according to the A.G.A. Gas Measurement Committee Report No. 3, Orifice Metering of Natural Gas.

The general equation for converting the meter readings at line conditions to a contract base pressure and temperature is

$$Qs = Qd\ Pm\ Tm\ (Fpv)^2$$

Qs = Quantity of gas at the contract base pressure and temperature, cu. ft.

Qd = Actual (displaced) gas passed at existing meter conditions, cu. ft.

Pm = Pressure multiplier

$$= \frac{\text{Weighted average existing gauge pressure + barometric pressure}}{\text{absolute pressure base}}$$

Tm = Temperature multiplier

$$= \frac{\text{Temperature base + 460}}{\text{Weighted average flowing gas temperature + 460}}$$

Fpv = Supercompressibility factor based upon the weighted average gas pressure and temperature and the normal composition of the gas. The composition is represented by its specific gravity, its content of nitrogen and carbon dioxide and its calorific value as used in the derivation of Fpv values.

The Base Volume Index is designed to sense and indicate the line pressure and flowing temperature of the gas and automatically and continuously apply the momentary pressure and temperature multipliers thus eliminating the need for weighted multipliers. This function is achieved through the employment of cylinder type integrators, whose raised cams are properly shaped to effect the required correction.

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The device is driven directly from the meter to which it is attached in place of a standard register. The Base Volume Index does not make automatic correction for the Fpv factor.

The instrument consists of the following main components:

1. uncorrected, rear counter which indicates the volume passed through the meter at line conditions of temperature and pressure.

2. temperature measuring system with associated linkages and stylus pointer which indicates the gas flowing temperature, and in conjunction with the integrating drum actuates the gearing system for the drive of the pressure integrating cylinder.

3. pressure measuring system with its linkage and pointer, which indicates the line pressure, and in conjunction with the integrating cylinder actuates the gearing which drives the front counter.

4. the front counter which indicates the volume passed through the meter at declared base conditions.

The integrating cylinders for temperature and pressure have on their surfaces, suitably shaped, raised portions over which slide the styli of the indicating pointers.

During the time the stylus is on the raised portion, the gearing is engaged to provide the drive for the micrometer wheel. The engaging levers carry suitable scales for calibration purposes. The temperature micrometer wheel is permanently attached to the pressure integrating cylinder and the pressure micrometer wheel is geared to the front counter.

For technical reasons the temperature integrating cylinder introduces, in addition to the required temperature factor, a cam factor as listed above, and it must be taken into account during calibration of the temperature integrator alone. This factor is however eliminated by suitable gearing between the pressure micrometer wheel and the front counter and it does not enter into computation of the overall correcting factor.

In normal construction of this instrument a shaft is inserted through brackets to support cylindrical cams for integration. Recently the manufacturer introduced trunnion type bearings which permit adjustments to minimize end play and afford better freedom of rotation of the cam. Both versions of support are approved.

Proper multipliers are selected for each counter and these are stamped on a coefficient plate together with the meter drive shaft rate in cubic feet per revolution and the serial number of the instrument. The coefficient plate is visible through a window in the front cover.

The selection of a weighted average Fpv factor for use on the corrected index reading must be based on a record of the flowing volumes, temperatures and pressures. If no continuous record is available and an Fpv is selected (other than a factor of one) the variations in pressure and temperature normally existing at the meter must be such as to create no more than a ± 0.5% error in the $(Fpv)^2$ used.

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Base Volume Indexes may be used on any approved diaphragm or rotary type positive displacement gas meter, provided the instrument baseplate fits the meter properly and carries its designation.

Base Volume Indexes may be used in conjunction with any approved Volume and Pressure Gauge, or 'Telemike' or 'Telecount' Transmitter manufactured by the Canadian Meter Company Limited.

Each instrument shall have a nameplate, mounted on the inside of the front cover, containing the information as to Type and Model designation, Serial number, Pressure and Temperature Ranges, Applicable Atmospheric pressure, Base pressure, Base temperature and applicable cam factor for temperature integrating cylinder.

This Approval Circular consolidates and brings up to date the information on Base Volume Indexes previously approved under SD-GA.8, SD-GA.140, S-GA.206, S-GA.269 and S-GA.307.

Note: For more complete description of operation refer to the Technical Bulletin No. 2.

Approval granted to: Canadian Meter Company Limited,
Milton,
Ontario.

(or)

Edmonton, Alberta.

J.S.T. Swanson,
Chief, Standards Laboratory,
Standards Branch.

W.J.S. Fraser,
Chief, Electricity & Gas Division,
Standards Branch.

Ref: SL-100-187 (J)

Consommation et Corporations Canada
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Legal Metrology Laboratories
Telephone: (613) 990-8614

Your file Votre référence
:

Our file Notre référence
G-6635-C6-41
December 17, 1984
AML-G-10

Canadian Meter Company
3037 Derry Road, West
Milton, Ontario
L9T 2X6

Attn: Mr. G. Wilson
Quality Control Manager

Re: Modified Pressure Indicating Scales on Canadian Meter Company Base Volume Index, Type 3.

Dear Mr. Wilson:

This letter is in response to your letter dated December 10, 1984, regarding a modification to the type/models of meters described above, which are currently approved in Notices of Approval G-38 and G-38-1. I am advised that the Gas Laboratory has evaluated the modification, of replacing the approval pressure scales having regular spaced minor graduations with scales indicating the zero, mid and maximum of the pressure range for the device. The conclusion is that it may be regarded as insignificant, in relation to the approval provisions of the Gas Inspection Act.

Accordingly, pursuant to the authority delegated to me by the Director under section 7 of the Gas Inspection Regulations;

1. your letter is hereby acknowledged as satisfying the notification requirements of subjection 7(2) of the regulations; and

2. the proposed alteration is hereby accepted, in accordance with subsection 7(3) of the Regulations, as being an immaterial one and hence included within the approval.

All recipients of Notices of Approval under the Gas Inspection Act are being informed of this decision by copy of this letter. For our records you are requested to advise us of the starting serial number when the change is initiated in production.

Yours truly,

W.R. Virtue
Chief,
Legal Metrology Laboratories

WRV:kl
cc: Mailing List (Gas Approvals)

Canada