Consumer and Corporate Affairs | Consommation et corporations

Standards | Normes

NOTICE OF APPROVAL
AVIS D'APPROBATION

G-39-3

Ottawa, August 9, 1977

CANADIAN METER COMPANY,
BASE PRESSURE INDEX TYPE 5

This approval is supplementary to the Circular G-39-2, dated May 6, 1976.

Apparatus

Canadian Meter Company Base Pressure Index Type 5 as covered under the Notice of Approval G-39-2. Except for the modification described below, all details of the device are the same as outlined in the aforementioned circular.

Modification

The rear uncorrected counter has been relocated and is now facing the front of the device as shown on the illustration.

The terms of identification of the counters "FRONT" and "REAR" are no longer used. The counters are now identified by the terms "CORRECTED" and "UNCORRECTED".

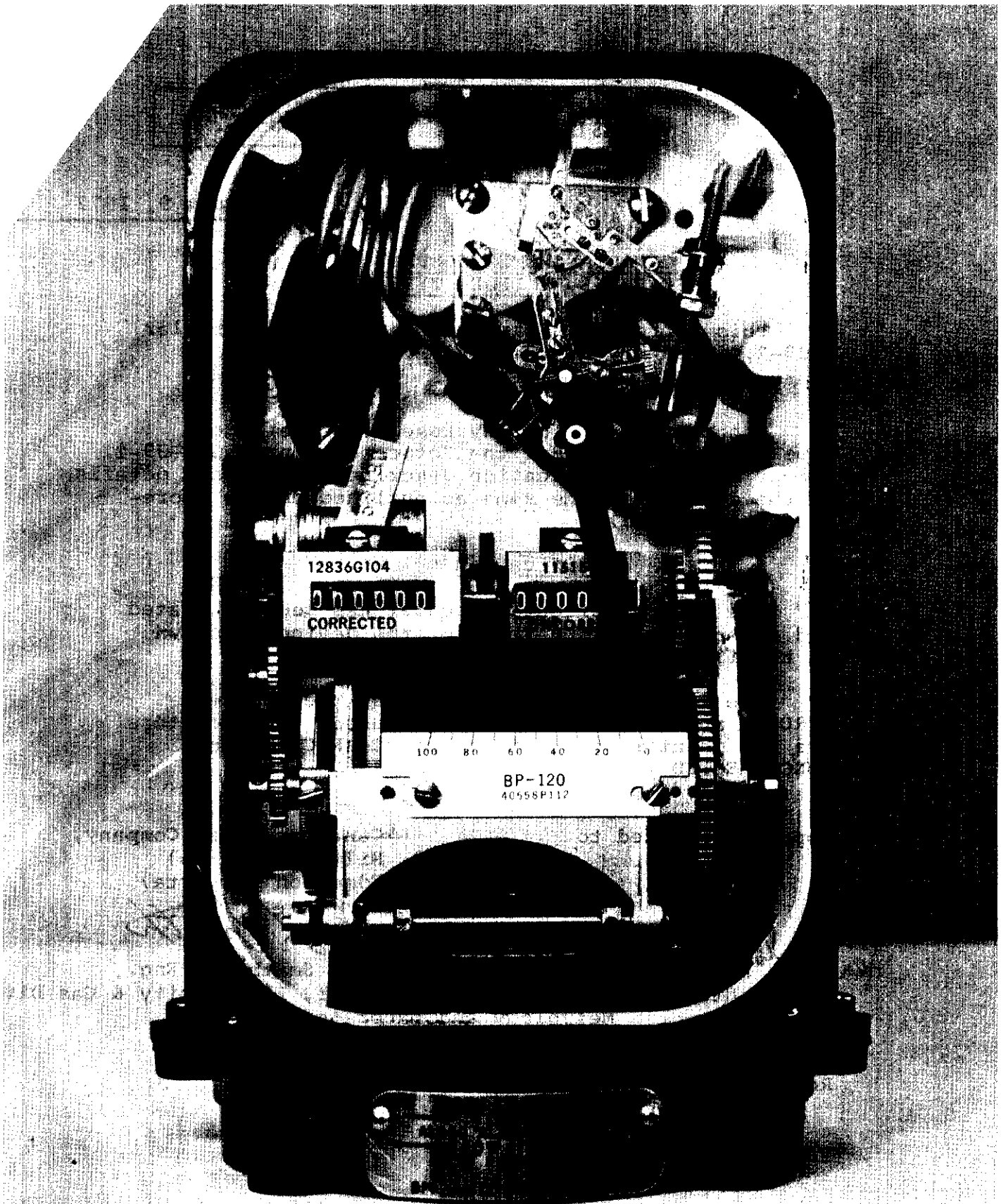
Approval granted to:

Canadian Meter Company,
Milton (Ontario)
Edmonton (Alberta)

for J. L. Armstrong, P. Eng.,
Chief, Standards Laboratory,
Metrology and Laboratory Services

D.L. Smith, P. Eng.,
Chief, Electricity & Gas Division

Ref: 6635-C6-42


12836G104
CORRECTED
100 80 60 40 20 0
BP-120
40558P112

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 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 the Fpv values.

The Base Temperature Index is designed to sense and indicate the gas temperature, and to continuously and automatically apply the momentary temperature multiplier.

The Base Temperature Index does not automatically correct for supercompressibility and assumes that the base contract pressure and the pressure of the metered gas are the same. Another approved device is required if the registered volume has to be corrected to the base pressure conditions.

The device is driven directly from the meter to which it is attached in place of a standard register.

The instrument consists of the following main components:

(1) uncorrected, rear counter which indicates the volume passed through the meter at line temperature.

(2) temperature measuring system with associated linkage and stylus pointer which indicates the gas flowing temperature and in conjunction with the integrating drum actuates the gearing which drives the front counter.

(3) the front counter which indicates the volume passed at declared base temperature.

The integrating cylinder has on its surface a raised portion over which slides the stylus of the indicating pointer. During the time the stylus is on the raised portion a gearing arrangement engages the micrometer wheel which is permanently geared to the front counter.

..../3

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 the calibration. This factor is eliminated by suitable gear ratio between the micrometer wheel and the front counter and it does not enter into computation of the overall correcting factor.

In the usual construction of this instrument a shaft, inserted through brackets, supports the integrating cylinder. Recently the manufacturer introduced trunnion type bearings which permit adjustments to minimize end play and afford better freedom of rotation of the integrating cylinder. Both versions of support are approved.

Appropriate multipliers for each counter 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.

Each instrument shall have a nameplate, mounted on the inside of the front cover, containing the information as to Type designation, Serial number, Temperature range, Base temperature and Cam factor.

This Approval Circular brings up to date the information on Base Temperature Index previously approved under S-GA.168.

Note: For further details refer to temperature integration section in the Technical Bulletin Number 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 and Gas Division,
Standards Branch.

Ref: SL-100-187(J)
SL-100-829