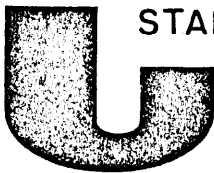




Department of consumer and corporate affairs / Ministère de la consommation et des corporations



STANDARDS BRANCH - DIRECTION DES NORMES

NOTICE OF APPROVAL

G - 71

OTTAWA December 22, 1970.

CANADIAN METER COMPANY, MODEL "VPT-1"  
VOLUME, PRESSURE AND TEMPERATURE GAUGE

This approval supersedes Circulars S-GA.270 and S-GA.270 (Issue 2)

Apparatus

Static pressure ranges	From 0-5 up to 0-1,200 psig
Temperature range	-30°F to +120°F
Thermal system	Class VB, mercury filled, case compensated, with armoured capillary up to 15 ft. and stainless steel sensing element.
Volume increments	1,000, 2,000 or 10,000 cu. ft. per cycle
Chart	Circular, 8 inch size
Chart rotation	24 hrs., 7 days or 31* days per revolution

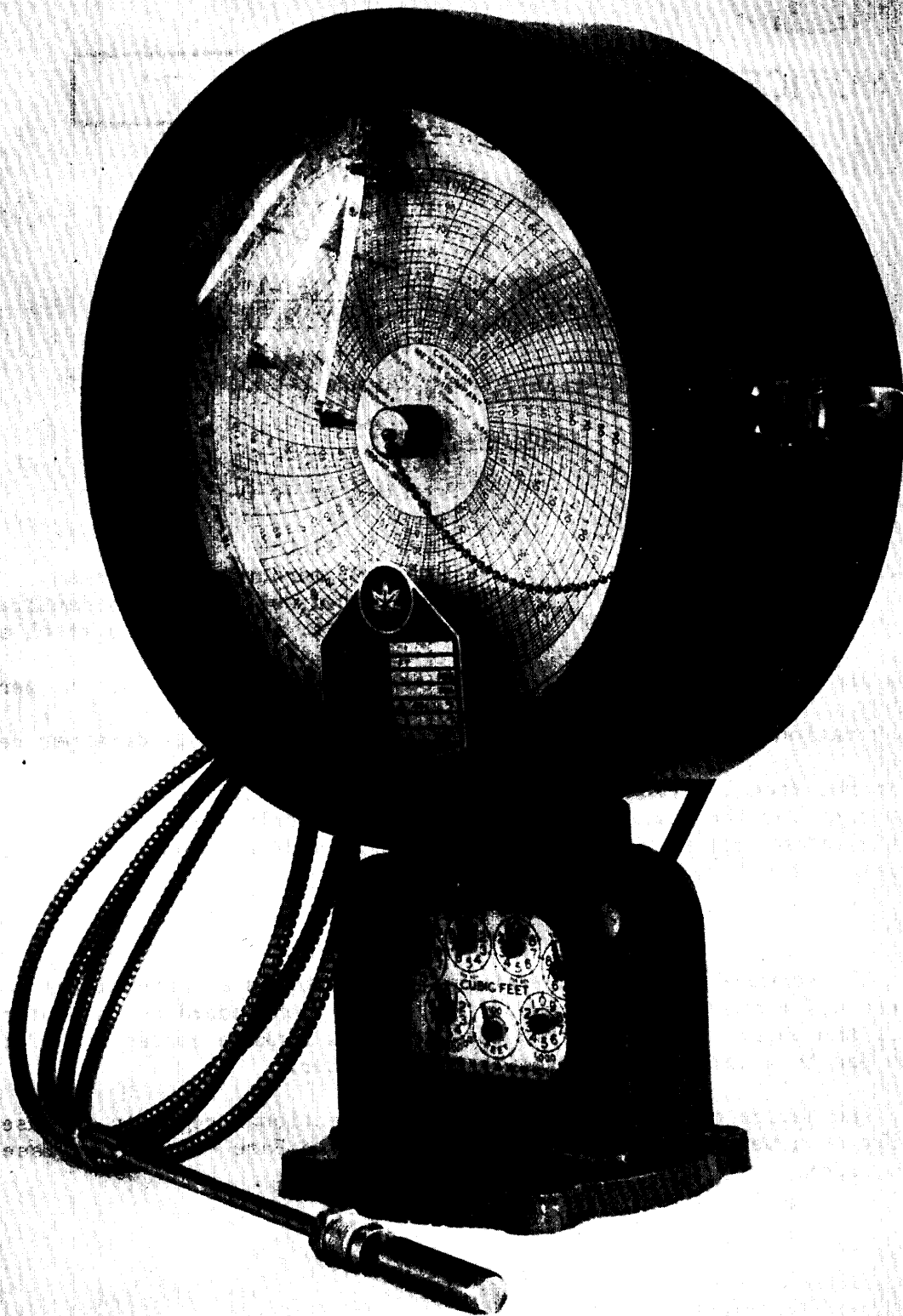
\* This rotational period may produce a "painted" chart record when the capacity for the volume increments is not properly selected for the anticipated rate of flow, or rapid pressure and/or temperature fluctuations exist in the line.

Description

The Volume-Pressure-Temperature Gauge combines a conventional pressure and temperature recorder with a volume pen record on the outer edge of the chart. The latter is obtained by a linkage connection of the volume pen to a cam drive located in the register.

The device may be furnished with a conventional register for use directly on a meter, or be mounted on an approved Base Pressure or Base Volume Index.

CANADIAN METER COMPANY, MODEL "VPT-1" VOLUME, PRESSURE AND TEMPERATURE GAUGE



The V.P.T. Gauge may be used on any suitable and approved diaphragm, rotary or turbine type meter to provide the necessary information for the evaluation of the applicable multipliers listed below.

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 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

$$Q_s = Q_d P_m T_m (F_{pv})^2$$

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

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

$P_m$  = Pressure multiplier

$$= \frac{\text{Weighed average existing gauge pressure} + \text{barometric pressure}}{\text{Absolute pressure base}}$$

$T_m$  = Temperature multiplier

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

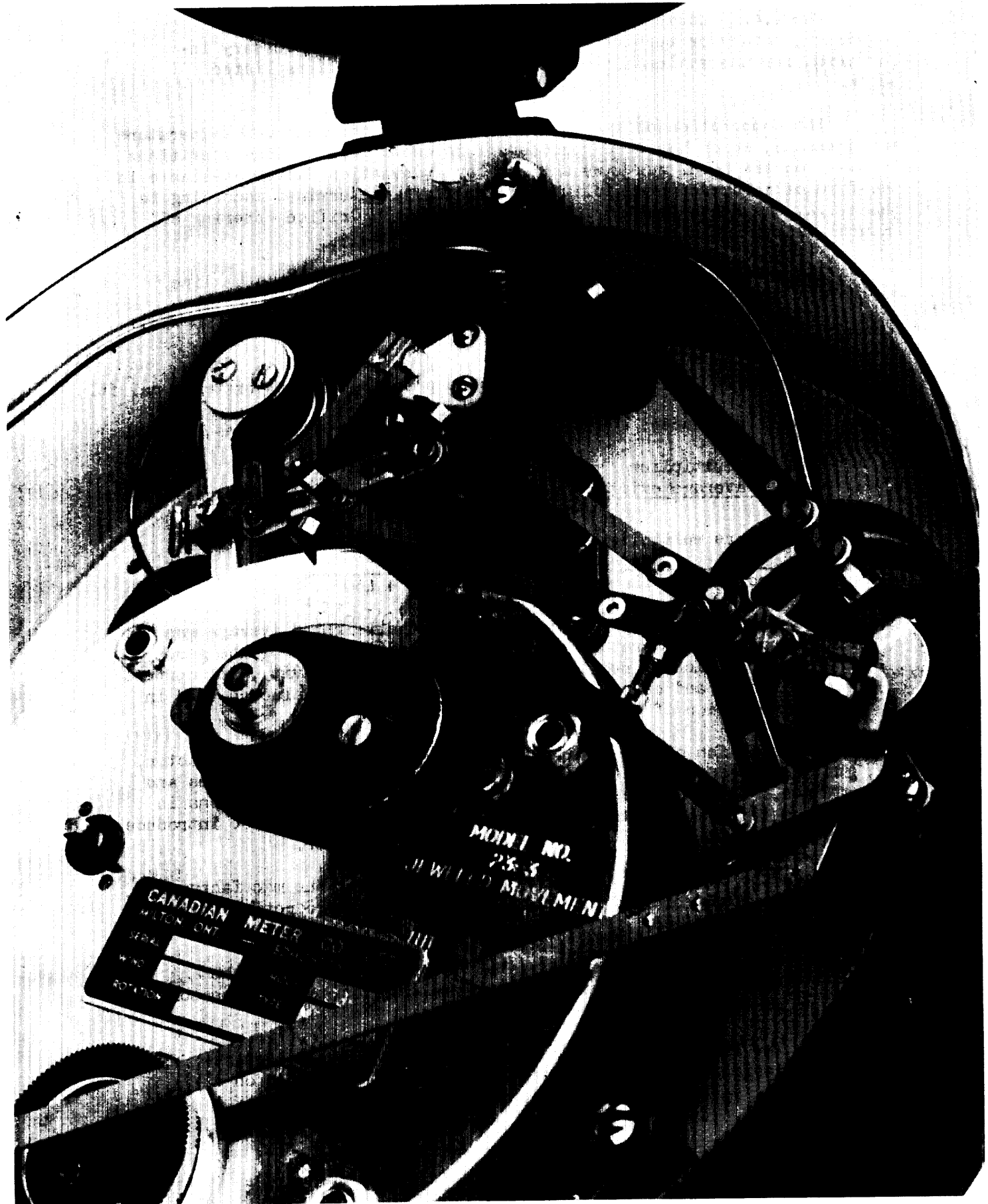
$F_{pv}$  = Supercompressibility factor based upon the weighted average gas pressure and temperature and the normal composition of the gas. The composition is represented by its specific gravity, its content of nitrogen and carbon dioxide and its calorific value as used in the derivation of  $F_{pv}$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

The selection of the weighted average supercompressibility factor,  $F_{pv}$ , must be based on a record of the flowing gas volumes, pressures and temperatures. If no continuous record is available, the variations in pressure and temperature normally existing at the meter must not introduce an error greater than  $\pm 0.5\%$  in the selected  $(F_{pv})^2$  factor.

Since the Circular S-GA.270 was issued in 1963, the manufacturer introduced the following modifications in the current production units of the V.P.T-1 Gauge:

- (1) The U.S. Gauge thermal system has been replaced by the American Meter temperature system with bimetal compensator at the Bourdon element.
- (11) The linkage system for the temperature pen has been re-designed and now includes a counterweight mounted on a

CANADIAN METER COMPANY, MODEL "VPT-1" VOLUME, PRESSURE AND TEMPERATURE GAUGE



shaft which is supported at one end by a plastic bearing plate.

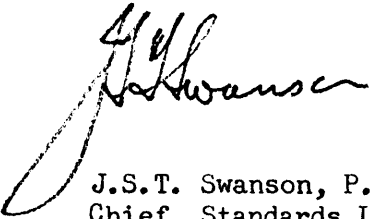
Any suitable and approved chart drive may be used in the V.P.T.-1 Gauge.

Each Volume-Pressure-Temperature Gauge shall have a nameplate containing the following information:

Manufacturer's name, Model designation and Serial number, Pressure and Temperature range, Base pressure and Base temperature and the capacity of the volume increment per cycle.

Approval granted to:

Canadian Meter Company Limited,  
Milton, Ontario and  
Edmonton, Alberta.



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



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

Ref: SL-100-3 F  
SE-85-40

CANADIAN METER COMPANY, MODEL "VPT-1" VOLUME, PRESSURE AND TEMPERATURE GAUGE

