



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

STANDARDS BRANCH - DIRECTION DES NORMES

NOTICE OF APPROVAL

G-57

OTTAWA August 15, 1969.

DRESSER MEASUREMENT DIVISION
ROOTS, ROTARY TEMPERATURE COMPENSATED,
POSITIVE DISPLACEMENT GAS METER

Apparatus

<u>Model Designation</u>	<u>Max. Static Pressure * psig</u>	<u>Max. Displacement cu.ft./hr</u>
3M125-TC	125	3,000
5M125-TC	125	5,000
7M125-TC	125	7,000
11M125-TC	125	11,000

*NOTE: These meters are not equipped with an instrument drive for auxiliary pressure correcting devices and they are intended, and APPROVED FOR USE ON LOW PRESSURE ONLY of approximately seven ounces per square inch or less.

Temperature Compensation Range	-20°F to +100°F
Base Temp. (Compensated Volume)	60°F
Meters Ambient Temperature Range	-40°F to +140°F

Description

The Roots temperature compensated, positive displacement rotary gas meters consist of two two-lobed, straight aluminum impellers, or rotors, contained in a cylindrical metering casing, formed of a one piece casting of gray iron. The metering chamber is closed at the ends by headplates of cast iron, and by gas tight end-covers sealed with O-rings. All rotating parts are carried by the two headplates. One end cover contains the timing gears which fix the relative position

of the impellers to each other and provide for their contrarotation, while the other cover, at the counter end of the meter, encloses a radial type magnetic coupling. A plastic, see-through dome, screwed to the latter cover contains the temperature compensation mechanism, gear reduction unit, two odometer type registers and five discs or dials, intended for test purposes, as shown on the illustration, drawing #DO45970.

Gears and bearings at each end of the meter are continuously lubricated with oil by dip and splash method, the oil being supplied from three independent sumps formed by the two end covers and the T-C unit plastic cover. Each sump is provided with visual type oil level indicator and with plugged filling and draining holes.

The temperature compensation is accomplished by a mechanical computer utilizing intermittent integration. The compensating unit is driven through a radial type magnetic coupling. The temperature sensor consists of a spiral bi-metal element installed in a sealed well containing a heat conductive silicone compound. The well extends from the end of the meter end cover through the headplate and into the gas stream at the meter inlet. The well is sealed by O-rings to prevent gas leakage to outside and leakage of oil through the headplate into the meter. The temperature compensating unit also incorporates a temperature indicator which reveals approximate temperature of the flowing gas.

The meters are equipped with two seven-digit counter-type registers. A combination nameplate and counter mask covers the lowest two digits so that the volume registration is in 100 cu. ft. increments for both temperature compensated and uncompensated volume.

The Series 125-TC meters may be mounted in either horizontal or vertical gas lines which carry clean and dry gas. Preferred installation, however, is in a vertical pipe line due to self-cleaning action of the meter. In vertical lines the flow through the meter must always be downward. The oil level sight gauges are interchangeable and their proper location depends on the mounting position of the meter. The manufacturer recommends that the meter out-of-level shall not exceed 1/16 of an inch per foot in any direction. The level can be checked in two directions at one of the pipe flanges, or at the machined stacking pads on the meter body.

The accuracy of the meter and its temperature compensation may be checked in the field according to the following procedure:

.....3/

The meter accuracy (uncompensated) may be checked with a bell prover or a transfer prover, using the test dials visible through the end of the plastic cover.

The TC unit accuracy may be checked at any constant temperature by following the procedure outlined below:

1. Drain the oil and remove the plastic end-cover from the TC unit.
2. Remove the two screws holding the combination nameplate and counter mask, then reverse the mask. This uncovers the right hand digit of the counters, permitting a reading in increments of one (1) cubic foot.
3. Run at least 1,000 cubic feet through the meter recording:
 - a. Uncompensated counter difference
 - b. Compensated counter difference
 - c. Flowing temperature with a laboratory thermometer calibrated to 1/2° increments. Read the temperature at 5 min. intervals and average the readings.

4. Calculate the actual correction factor
$$F_a = \frac{\text{Compensated Difference} - \text{cu. ft.}}{\text{Uncompensated Difference} - \text{cu. ft.}}$$

5. Calculate the theoretical correction factor

$$F_t = \frac{(460 + T \text{ base})}{(460 + T \text{ avg.})} = \frac{(460 + 60)}{(460 + T \text{ avg.})}$$

6. Calculate accuracy of TC unit.

$$\% \text{ accuracy} = \frac{F_a}{F_t}$$

Apart from the provision of temperature compensation the basic design features of the T-C meters are similar to those of Roots-Meters previously approved under Circulars G-26, G-26-1 and G-26-2.

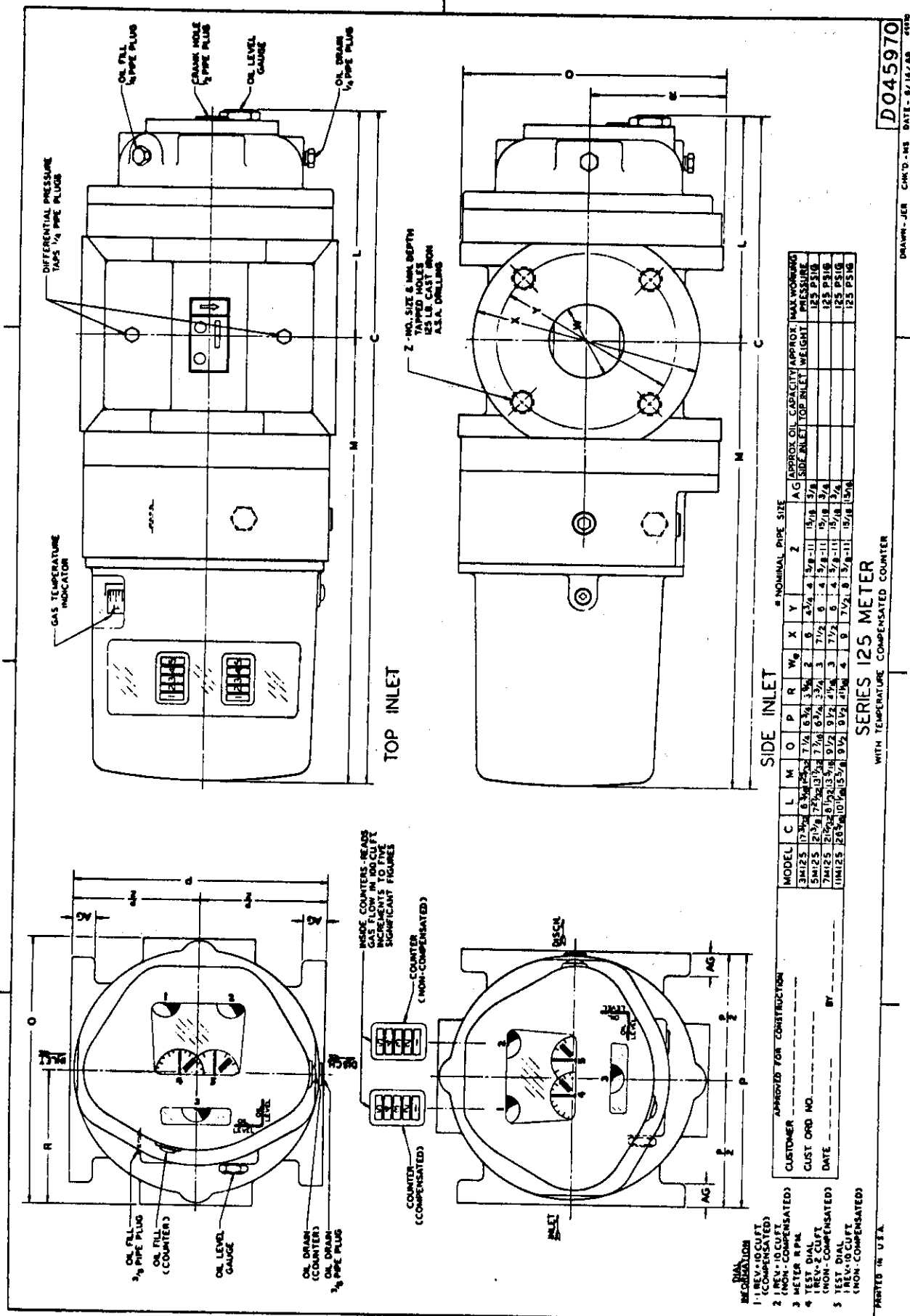
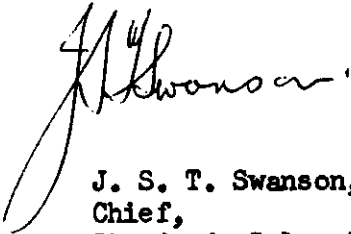


Fig. 3 - Dimensions, Series M125 Temperature Compensated Meter

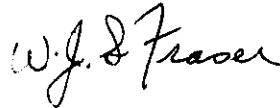
It must be noted particularly that these meters are APPROVED FOR USE ON LOW PRESSURES ONLY that is at pressures of approximately seven ounces or less.

Approval granted to:

Dresser Industries Canada Limited,
Toronto, Ontario.



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



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

Ref: SL-100-855N

ROOTS, ROTARY TEMPERATURE COMPENSATED, POSITIVE DISPLACEMENT GAS METER

