DEPARTMENT OF TRADE AND COMMERCE

STANDARDS BRANCH

OTTAWA May 9, 1968.

NOTICE OF APPROVAL

FOR

DRESSER MEASUREMENT DIVISION "ROOTSMETER"
ROTARY-TYPE POSITIVE DISPLACEMENT
GAS METER

This approval supersedes Circular G-26-1, dated December 6, 1966.

	Apparatus		
	Max. Pressure P.S.I.G.		Max. Displacement
Model	Static	Operating	Cu. Ft./Hr.
3M125*	125	125	3,000
5M125**	125	125	5,000
7M125*	125	125	7,000
11M125*	125	125	11,000
16M125	125	125	16,000
23M125	125	125	23,000
38M125	125	125	38,000
56M125	125	125	56,000
102M125	125	125	102,000
102M300	300	300	102,000
2M900	1200	900	2,000
3M1200***	1200	1200	3,000
4.6M900	1200	900	4,600
8M400	600	400	8,000
11.5M400	600	400	11,500
19M400	600	400	19,000

* These meters are available with either cast iron or aluminum impellers. Meters with aluminum impellers will have green nameplates and letters. "AL" will be appended to the model designation.

** Available only with aluminum impellers.

*** Available only with aluminum 3-lobe, spiral impellers.

Description

Except for the model 3M1200, all "Rootsmeter" rotary positive-displacement gas meters consist of two two-lobed straight impellers or rotors contained in a cylindrical housing enclosed by head plates at both ends. In the model 3M1200 the two-lobed impellers are replaced by two three-lobed spiral impellers. Two pressure sealed domes, bolted through these head plates, enclose the timing gears which fix the position of the impellers to each other and provide for their contrarotation. The larger of the two end domes also contains the reduction gearing for the read-out counter or the instrument drive shaft. Both end-domes serve as oil sumps for the splash lubrication of the gears. Bullseye-type oil sight gauges are provided so that the oil can be maintained at the correct level. The size, strength and thickness of the construction materials used for the case, end-domes and gearing of these meters depends on the requirements for capacity and working pressures.

In operation, the flow of gas causes the impellers to rotate thus measuring the volume by each rotor sweeping out the compartment formed by half the wall of the cylindrical housing and the surface of half the corresponding rotor. The rotational speed of the impeller is proportional to the flow of gas through the meter and the measured volume closely approximates the volume of the measuring chambers times the number of impeller revolutions, except at low speeds where the small amount of slippage of the gas begins to have a more appreciable effect.

The meters are normally equipped with a counter type register which indicates the volume of gas in 100 cu. ft. increments at meter, or line conditions of temperature and pressure. The last dial of the register has no numerals but it is subdivided into 10 equal increments, each representing one cu. ft. volume for 3M, 5M, 7M and 11M meters, and 10 cu. ft. volume for larger capacity meters. One of the ten lines on this dial is wider so that complete number of revolutions of this dial may be established when testing the meter.

The counter registers have five digits for meters up to, and inclusive, 11M models, and six digits for higher capacity meters. Both Veeder-Root and Durant counter registers are approved. The latter is illustrated in this circular.

The meters may be equipped with an instrument drive gear box in place of the counter register for models 3M, 5M, 7M, and 11M, or in addition to the counter for larger capacity meters. Meter model 3M1200 is available with instrument drive only.

The output shaft rotation of the instrument drive corresponds to 10 cu. ft. per rev. for 3M, 5M, 7M and 11M models, and to 100 cu. ft. per revolution for larger capacity meters.

The rotary meter measures gas volume at line conditions and when these fluctuate and billing volume refers to other than meter conditions, suitable and approved, volume correcting devices shall be used to account for changes in volume caused by the effects of temperature, pressure and supercompressibility. Pressure connections to these correcting devices shall be taken from the inlet side of the meter.

While the selection of the size of the meter, type of readout and installation usually governs the choice of vertical or horizontal flow line positioning, the meters types 8M400, 11.5M400 and 19M400 are at present available with top inlet only.

All meters operating on pressure of 400 psig or greater require a critical flow restricting orifice to prevent meter overspeeding. This orifice is normally placed between the flanges connecting the meter to the gas line on the downstream side.

Meters manufactured by Dresser Measurement Division, Connersville, Indiana, U.S.A., and distributed in Canada by Dresser Industries Canada Limited shall carry the American nameplates, illustrated on Fig. 1 for high pressure meters, and on Fig. 2 for meters with working pressure up to 125 psig.

Rotary meters assembled in Canada by Dresser Industries Canada Limited shall carry the Canadian nameplate illustrated on Fig. 3.

For more detailed information on rotary meters refer to Technical Bulletin No. 3 and illustrated data sheet.

Approval granted to

Dresser Industries Canada Limited,
Toronto,
Ontario.

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Chief, Standards Laboratory,
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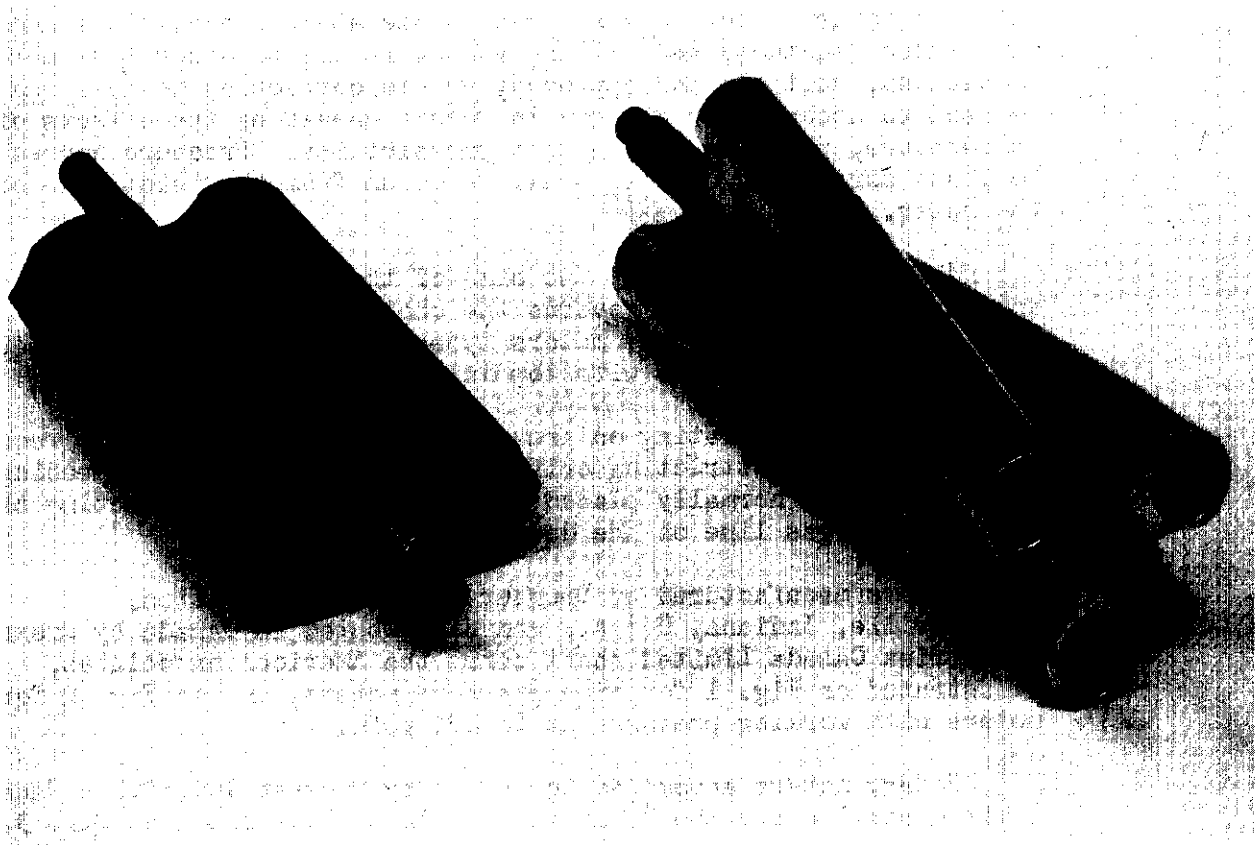
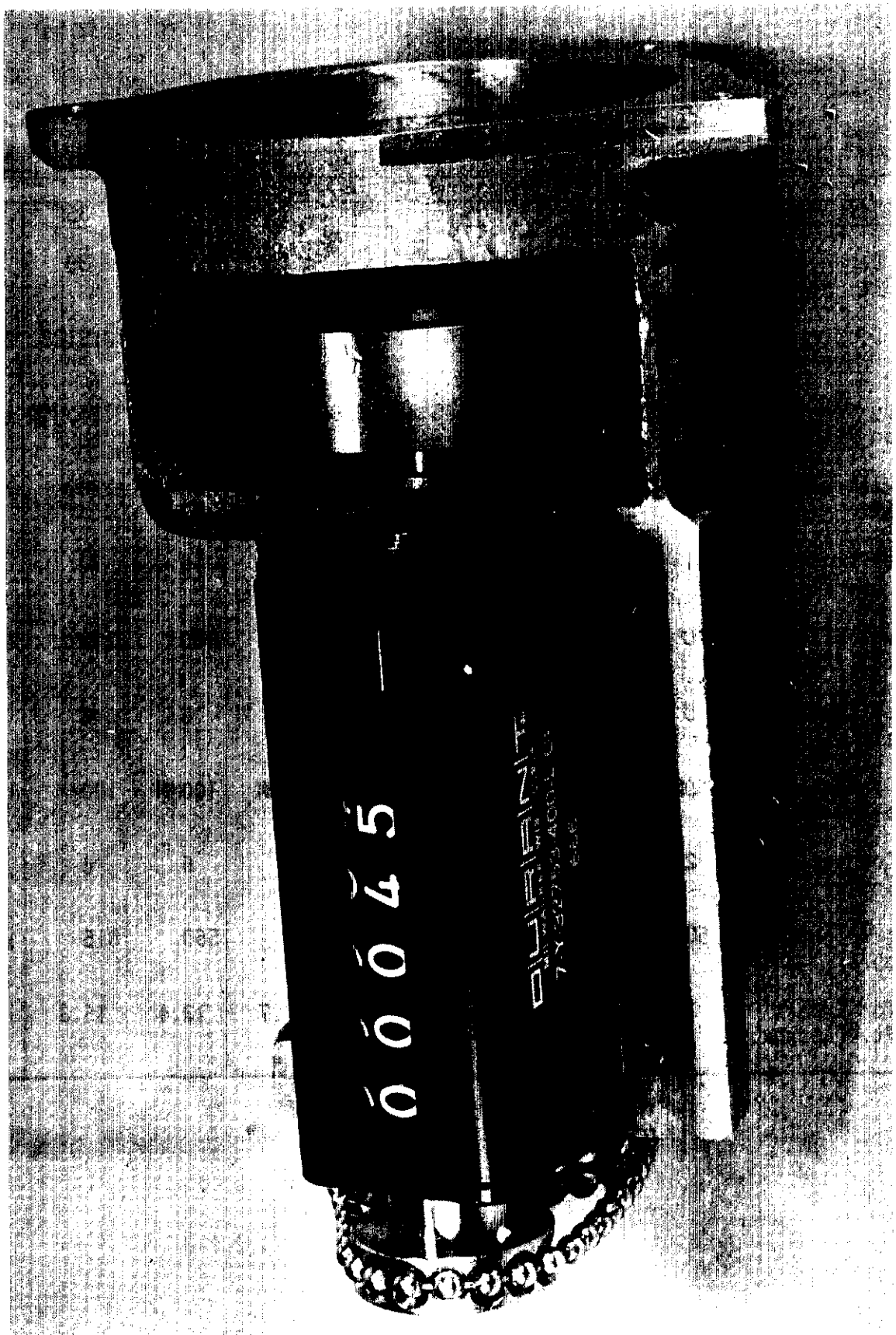
Ref. SL-100-855 M



3M1200 Roots meter impeller comparison

Left to Right: 3M125 cast iron impeller
3M1200 aluminum impeller

SERIES 125 ROOTS METERS - STANDARD METERS WITH READOUT IN CUBIC FEET									
	MODEL								
PHYSICAL DATA	3M	5M	7M	11M	16M	23M	38M	56M	102M
Maximum Capacity MCFH (Dial Rate)	3	5	7	11	16	23	38	56	102
Counter Displacement per Revolution	.02217	.03603	.06074	.09870	0.1765	0.2620	0.5128	0.8825	2.0940
Planetary Gear Reduction Ratio	451.000 to 1	277.538 to 1	164.645 to 1	101.320 to 1	566.500 to 1	381.625 to 1	195.000 to 1	113.317 to 1	47.755 to 1
Counter Increments Cu. Ft.	100	100	100	100	100	100	100	100	100
Test Dial Increments - Cu. Ft.	1	1	1	1	10	10	10	10	10
Instrument Drive Rate Cu.Ft./Rev.	10	10	10	10	100	100	100	100	100
Number of Counter Digits	5	5	5	5	6	6	6	6	6
Maximum Volume Registration Cu.Ft.	10MM	10MM	10MM	10MM	100MM	100MM	100MM	100MM	100MM
Flange Connection Size - Inches	2	3	3	4	4	6	6	8	10
Shipping Weight - Lbs. (Approx.)	50	70	130	165	400	560	815	1215	2450
Crated for Export Volume $Ft.^3$(Approx.)	1.03	1.13	2.0	2.2	9.7	13.4	15.3	27.1	54.5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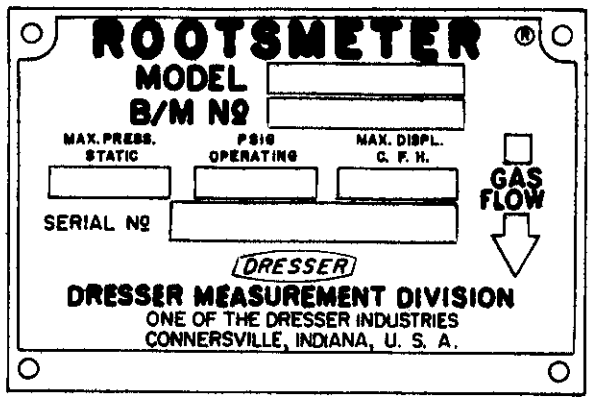

Fig. 1

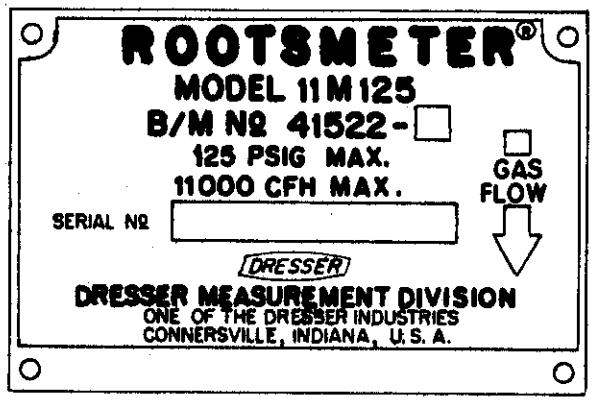

Fig. 2

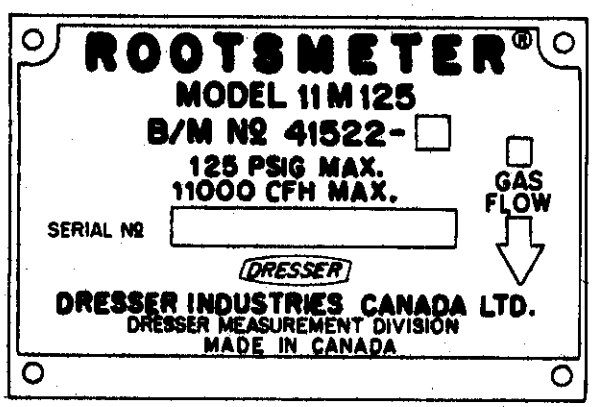

Fig. 3

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