Consumer and Corporate Affairs | Consommation et corporations

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RE-ISSUE

**NOTICE OF APPROVAL**
**AVIS D'APPROBATION**

E-150

Ottawa, August 11, 1977

Westinghouse Mechanical Demand Registers, MKIa, II and IIIa

(E-150 dated April 7, 1977 is cancelled.)

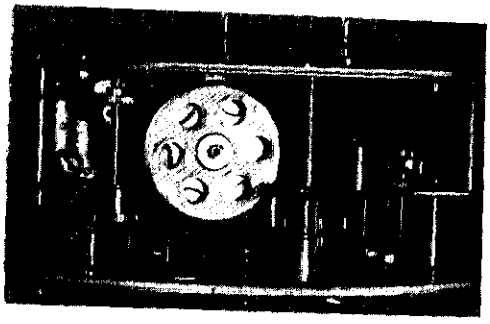
| | |
|---|---|
| Full Scale Demand: | As required according to the rating of the watt hour meter on which it is to be mounted, subject to the limitations of Table 1. |
| Register Ratios: | All register ratios as used on approved single and polyphase watt hour meters. |
| Number of kWh Dials: | 4 or 5 |
| Test Dial: | On single phase types. Not all polyphase models will have a test dial. |
| Time Interval: | 15, 30 and 60 minutes. |
| Frequency: | 60 Hz |
| Timing Motor Voltages: | 120, 240, 480. |
| Scale Multipliers: | In all cases the multiplier (dial constant) applies to both kWh and kW demand readings. |
| Optional Equipment: | End of Interval Switch. |

Demand Meter Full Scale Limits (Table 1)

| Meter | Full Scale Value | |
|---|---|---|
| | Lower Limit | Upper Limit |
| Single-phase | 0.5 x V x Im x 1 | 1.05 x V x Im x 1 |
| 2 el. & 2½ el. delta | 0.5 x V x Im x $\sqrt{3}$ | 1.05 x V x Im x $\sqrt{3}$ |
| Network | 0.5 x V x Im x 2 | 1.05 x V x Im x 2 |
| 2½ el. & 3 el. Y | 0.5 x V x Im x 3 | 1.05 x V x Im x 3 |

V = Rated Voltage
Im = Maximum Rated Current

# GEAR TRAIN



# MKIa DEMAND REGISTER

## REGISTER NAME PLATE

These registers may be used on either the D4 line of meters with a base speed of 500 r/h or the earlier D line meters having a base speed of 1000 r/h.

## Description

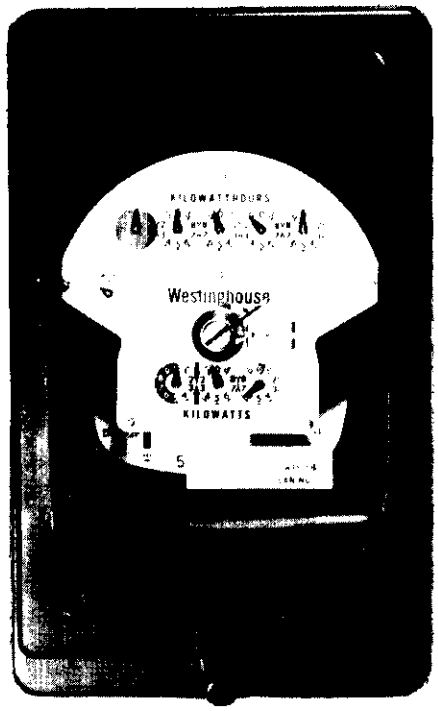
Mark Ia

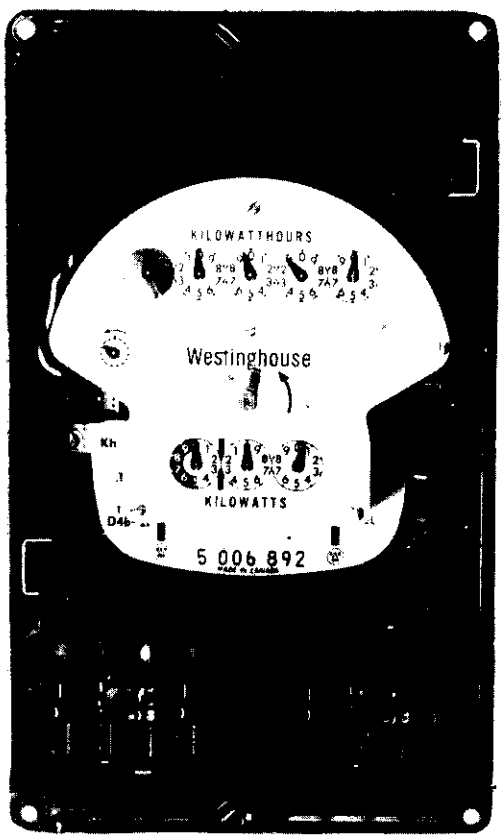
The Mark Ia demand register has a standard kilowatt hour gear train plus a demand gear train. Both gear trains are driven by the disk shaft.

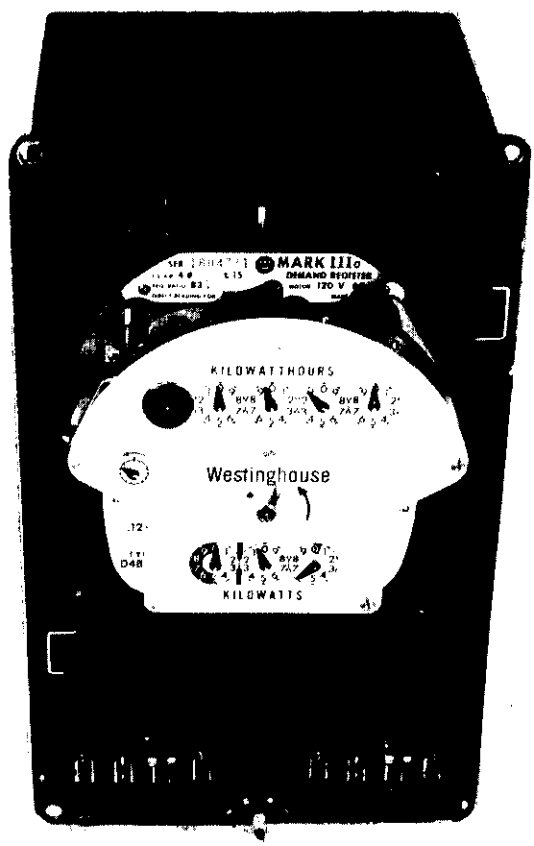
The interval is accomplished by a synchronous motor and a gear train which turns a cam. The cam pivots an arm which engages a clutch. The clutch when engaged turns a pusher. The pusher contacts a demand pointer. The pointer has enough friction to hold it at any point of the scale to which it is pushed. During the time interval, the pointer pusher is driven up-scale at a rate proportional to the load on the watt hour meter. If the demand of the interval exceeds that of previous intervals, the pusher moves the pointer up-scale to the point representing the new maximum demand. The pusher is returned to zero at the end of each interval by the action of the cam on a sector gear.

The Mark Ia is a dual range register. The range is changed by reversing the scale which mechanically changes the gear ratios to correspond to the scale in use. The scale plate has a tab on the inner circumference, on one side only, so that when the scale is used with the tab to the right side (facing meter) a pin shaft is depressed and the proper gear ratio for the scale is meshed, with the scale plate reversed the pin shaft is pressed forward by a spring thus changing the gear ratio to the correct ratio for the scale in use. The full scale values must conform to the limits defined in Table 1.

# WESTINGHOUSE MK III DEMAND REGISTER



The base speed of the "D" line meters on which these registers are used is either 1000 r.p.h. or 500 r.p.h., and the disk shaft has a single lead worm that meshes with a 100 tooth pinion.

Mark II

The Mark II demand register is a cumulative demand register and differs in several aspects from the Mark Ia and Mark IIIa registers. There is a standard kilowatt hour gear train and a demand gear train. Both gear trains are driven by the disk shaft. The cumulative demand gear train drives a pusher arm at a rate proportional to the load on the watt hour meter during a time interval. The pusher arm pushes an indicator arm and advances it according to the load on the watt hour meter. At the end of the time interval the pusher arm returns to zero by cam action of the resetting mechanism. Since the indicator arm is not attached to the pusher arm, it remains at the point on the scale to which it has been pushed and is held there by friction. Because of a clutch and cam arrangement the demand pointers remain at their previous reading during this time. To obtain the maximum average demand for a set period the reader must note the reading indicated by the demand pointers then push and release the demand button. Pressing and releasing this button causes the demand gear train and indicator arm to return to zero position and advances the demand pointers an amount equivalent to the maximum average demand for the period. The difference in reading of the demand dials before and after the resetting operation gives the maximum kilowatt demand for the demand period. A dial on the right facing the register gives an indication of the maximum demand between demand periods. A dial on the left of the face indicates the approximate time interval remaining.

Mark IIIa

The Mark IIIa demand register has a standard kilowatt hour gear train plus a demand gear train. Both gear trains are driven directly by the meter disc shaft. The demand gear train drives a pusher which is arranged to drive the demand dial pointers through suitable gear ratios. A clutch in the demand gear train opens and allows the pusher to return to zero at the end of a time interval. Since the demand dial pointer mechanism is not attached to the pusher, the demand dial pointers remain at the points on the scale to which they have been pushed.

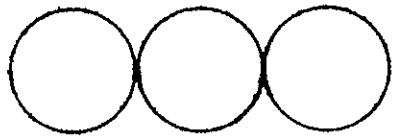
Since the pusher is geared directly to the disk shaft, it is driven up-scale proportional to the load on the watt hour meter. At the end of the time interval, the pusher is returned to zero by means of the reset mechanism. The demand dial pointers can be reset to zero by the mechanical reset device in the meter cover.

The demand dials located on the lower half of the dial plate indicate the demand. Each dial has a decimal marking depending on the full-scale capacity of the register. The decimal is located as follows:

KW FULL SCALE
0 to 9.6

KW FULL SCALE
9.61 to 96.0

KW FULL SCALE
ABOVE 96.0



Detailed descriptions, drawings and the manufacturers specifications are given in Westinghouse Manuals.

Mark Ia : 1.L.42-302.11B
Mark II : 1.L.42-302.2D
Mark IIIa : 1.L.42-302.4a

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