



- Glass window for optimum viewing
- Rugged black plastic case
- Black knife-edge pointer for precision reading

## Frequency Meter Specifications

|                                    |                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Accuracy</b>                    | 45-55Hz $\pm 0.3$ Hz (120V-240V)<br>55-65Hz $\pm 0.3$ Hz (120V-240V)<br>380-420Hz $\pm 1.2$ Hz (120V-240V) |
| <b>Movement</b>                    | Small core magnet, self-shielding                                                                          |
| <b>Suspension</b>                  | Pivot and jewel                                                                                            |
| <b>Tracking</b>                    | $\pm 3\%$                                                                                                  |
| <b>Shielding</b>                   | Calibration is unaffected by magnetic panel mounting.                                                      |
| <b>Center Scale Value</b>          | 50/60/400Hz                                                                                                |
| <b>Power Consumption</b>           | 1.6VA                                                                                                      |
| <b>Max. Input Voltage (10 sec)</b> | 150, 120V normal<br>280, 240V normal                                                                       |
| <b>Dial</b>                        | Each dial arc is calibrated to track the specific type of movement used.                                   |
| <b>Operating Temperature</b>       | -4°F to +149°F (-20°C to +65°C)                                                                            |
| <b>Case</b>                        | High density black plastic                                                                                 |
| <b>Pointer</b>                     | Knife-edge, with black matte finish                                                                        |
| <b>Scale Length</b>                | Model 2182: 1.88" (47.2mm)<br>Model 2183: 2.48" (63.0mm)<br>Model 2184: 3.68" (93.5mm)                     |
| <b>Net Weight</b>                  | Model 2182: 5oz (0.14kg)<br>Model 2183: 6oz (0.17kg)<br>Model 2184: 9oz (0.26kg)                           |
| <b>Warm-up Time</b>                | 5 minutes                                                                                                  |

## Watt Meter Specifications

|                              |                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Accuracy</b>              | $\pm 2\%$ F.S.; Compensated Meters: $\pm 3\%$ F.S.                                                        |
| <b>Movement</b>              | Dynamometer                                                                                               |
| <b>Suspension</b>            | Pivot and jewel                                                                                           |
| <b>Tracking</b>              | $\pm 3\%$                                                                                                 |
| <b>Shielding</b>             | Calibration is unaffected by magnetic panel mounting.                                                     |
| <b>Response Time</b>         | 1.5 seconds maximum                                                                                       |
| <b>Overload (1 sec.)</b>     | 10 times F.S.                                                                                             |
| <b>Overload (Continuous)</b> | 1.5 times F.S.                                                                                            |
| <b>Repeatability</b>         | 2%                                                                                                        |
| <b>Dial</b>                  | Each dial arc is calibrated to track the specific type of movement used.<br>$\pm 15\%$ of meter impedance |
| <b>Resistance</b>            | -4°F to +149°F (-20°C to +65°C)                                                                           |
| <b>Operating Temperature</b> | High density black plastic                                                                                |
| <b>Case</b>                  | Knife-edge, with black matte finish                                                                       |
| <b>Pointer</b>               | Model 2173: 2.48" (63.0mm)                                                                                |
| <b>Scale Length</b>          | Model 2174: 3.68" (93.5mm)                                                                                |
| <b>Net Weight</b>            | Model 2173: 9oz (0.26kg)<br>Model 2174: 13oz (0.37kg)                                                     |

## Specifications for other meters

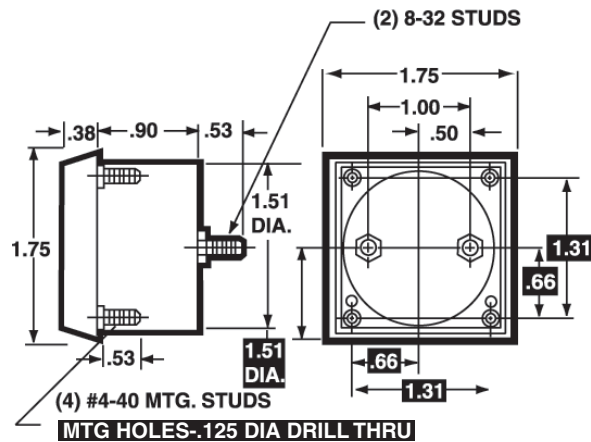
|                              |                                                                                                                                                                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accuracy</b>              | $\pm 2\%$ F.S. Iron Vane, $\pm 3\%$ F.S. Rectified                                                                                                                                                                                               |
| <b>Movement</b>              | Models 2152, 2153, 2154: Iron-vane, magnetically damped. 2121 and 2121T: small core magnet, all others Annular, self-shielding                                                                                                                   |
| <b>Suspension</b>            | Pivot and jewel except for "T" models which have taut band movement                                                                                                                                                                              |
| <b>Tracking</b>              | $\pm 3\%$                                                                                                                                                                                                                                        |
| <b>Shielding</b>             | Calibration is unaffected by magnetic panel mounting.                                                                                                                                                                                            |
| <b>Response Time</b>         | 1.5 seconds maximum                                                                                                                                                                                                                              |
| <b>Overload (1 sec.)</b>     | 10 times F.S.                                                                                                                                                                                                                                    |
| <b>Overload (Continuous)</b> | 1.5 times F.S.                                                                                                                                                                                                                                   |
| <b>Repeatability</b>         | 2% pivot and jewel, 0.5% taut band                                                                                                                                                                                                               |
| <b>Dial</b>                  | Each dial arc is calibrated to track the specific type of movement used.<br>$\pm 15\%$ of meter impedance                                                                                                                                        |
| <b>Resistance:</b>           | -4°F to +149°F (-20°C to +65°C)                                                                                                                                                                                                                  |
| <b>Operating Temperature</b> | High density black plastic                                                                                                                                                                                                                       |
| <b>Case</b>                  | Knife-edge, with black matte finish                                                                                                                                                                                                              |
| <b>Pointer</b>               | Model 2121 & 2121T: 1.25" (31.7mm)                                                                                                                                                                                                               |
| <b>Scale Length</b>          | Model 2152: 1.86" (47.2mm)<br>Model 2122, 2122T, 2142: 2.07" (52.7mm)<br>Model 2153: 2.48" (63.0mm)<br>Model 2123, 2123T, 2143: 2.75" (69.8mm)<br>Model 2154: 3.68" (93.5mm)<br>Model 2124, 2124T, 2144: 4.09" (103.9mm)                         |
| <b>Net Weight</b>            | Model 2121 & 2121T: 2oz (0.06kg)<br>Model 2152: 5oz (0.14kg)<br>Model 2153: 6oz (0.17kg)<br>Model 2122, 2122T, 2142: 7oz (0.20kg)<br>Model 2123, 2123T, 2143: 8oz (0.23kg)<br>Model 2154: 9oz (0.26kg)<br>Model 2124, 2124T, 2144: 11oz (0.31kg) |

## Dimensions

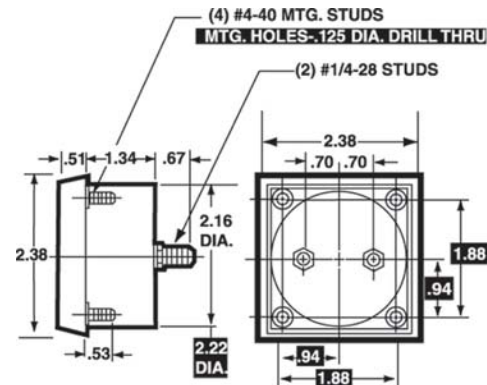
1 = Panel Meter Cut-out Dimensions

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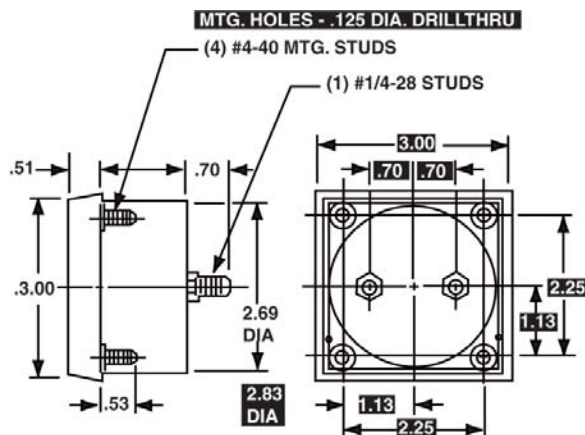
1-1/2"-Models 2121, 2121T, 2141,



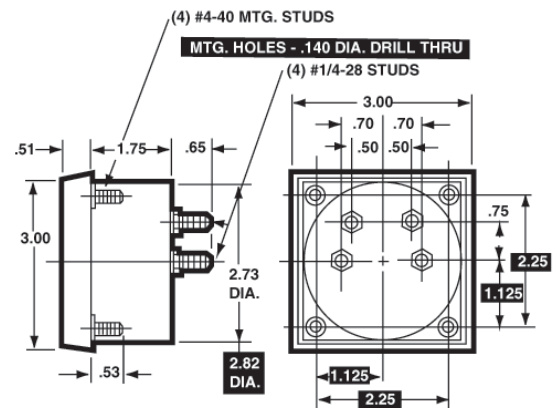
2-1/2"-Models 2122, 2122T, 2142, 2152, 2182



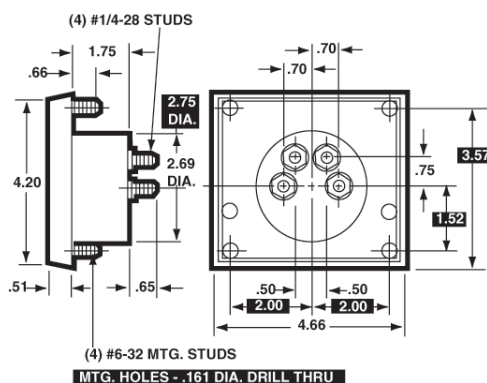
3-1/2"-Models 2123, 2123T, 2143, 2153, 2183



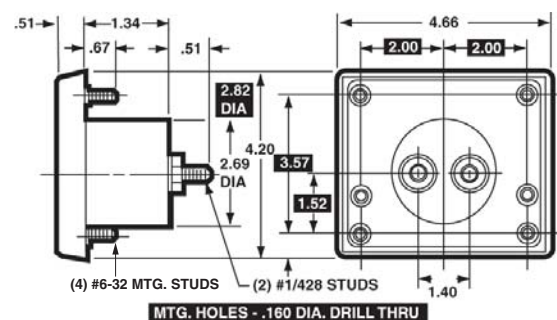
3-1/2"-Model 2173



4-1/2"-Model 2174



4-1/2"-Model 2124, 2124T, 2144, 2154, 2184





# Century Style Analog Panel Meters

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## Ordering Information

### AC Milliammeters, Iron-Vane Movement

| Range | Approx. Impedance (ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|-------|----------------------------------|-------------------------------|-------------------|-------------------|
|       |                                  | 2-1/2" Model 2152             | 3-1/2" Model 2153 | 4-1/2" Model 2154 |
| 0-10  | 1,650                            | 17680                         | <>                | 17760             |
| 0-50  | 80                               | 17681                         | 17716             | 17761             |
| 0-100 | 17.2                             | 17682                         | 17717             | 17762             |
| 0-250 | 3.15                             | 17683                         | 17718             | 17763             |
| 0-500 | 0.9                              | 17684                         | 17719             | 17764             |

### AC Ammeters, Iron-Vane Movement

| Range | Approx. Impedance (ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|-------|----------------------------------|-------------------------------|-------------------|-------------------|
|       |                                  | 2-1/2" Model 2152             | 3-1/2" Model 2153 | 4-1/2" Model 2154 |
| 0-1   | .213                             | 17665                         | 17695             | 17740             |
| 0-1.5 | .105                             | 17666                         | <>                | <>                |
| 0-2   | .065                             | <>                            | 17697             | 17742             |
| 0-3   | .028                             | 17667                         | 17698             | 17743             |
| 0-5   | .008                             | 17668                         | 17699             | 17744             |
| 0-10  | .004                             | 17669                         | 17700             | 17745             |
| 0-10  | .008                             | <>                            | 35081†            | 35085†            |
| 0-15  | .0025                            | 17670                         | 17701             | 17746             |
| 0-25  | .002                             | 17671                         | 17702             | 17747             |
| 0-25  | .008                             | <>                            | 35082†            | 35086†            |
| 0-30  | .0015                            | 17672                         | 17703             | 17748             |
| 0-50  | .001                             | 17673                         | 17704             | 17749             |
| 0-50  | .008                             | <>                            | 35083†            | 35087†            |
| 0-75  | .0002                            | <>                            | 17710             | 17755             |
| 0-75  | .008                             | <>                            | 35084†            | 35088†            |
| 0-80  | .008                             | <>                            | 35036†            | <>                |
| 0-100 | .008                             | 17674†                        | 17706†            | 17751†            |
| 0-150 | .008                             | <>                            | 17707†            | 17752†            |
| 0-200 | .008                             | <>                            | 17708†            | 17753†            |
| 0-300 | .008                             | <>                            | 17709†            | 17754†            |

<> Available on special order.

† These meters are 5-amp meters, to be used with an external current transformer.

### AC Dual Range Ammeter/Voltmeter, Iron-Vane Movement

| Range  | Approx. Impedance (ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|--------|----------------------------------|-------------------------------|-------------------|-------------------|
|        |                                  | 2-1/2" Model 2152             | 3-1/2" Model 2153 | 4-1/2" Model 2154 |
| 0-150V | 15,030                           | -                             | 17694             | 17739             |
| 0-5A   | 0.021                            | -                             | 17694             | 17739             |

### AC Voltmeters, Iron-Vane Movement

| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|--------|----------------------------------|-------------------------------|-------------------|-------------------|
|        |                                  | 2-1/2" Model 2152             | 3-1/2" Model 2153 | 4-1/2" Model 2154 |
| 0-5    | 33                               | <>                            | 17725             | <>                |
| 0-10   | 133                              | 17685                         | 17726             | 17771             |
| 0-15   | 300                              | 17686                         | 17727             | 17772             |
| 0-25   | 833                              | 17687                         | 17728             | 17773             |
| 0-50   | 3,333                            | 17688                         | 17729             | 17774             |
| 0-100  | 16,666                           | <>                            | 17730             | 17775             |
| 0-150  | 25,000                           | 17690                         | 17731             | 17776             |
| 0-250  | 41,166                           | 17691                         | 17732             | 17777             |
| 0-300  | 50,000                           | 17692                         | 17733             | 17778             |
| 0-500† | 83,333                           | <>                            | 17734†            | 17779†            |

† External multipliers, Model 183 are furnished on AC meters having a range of 500 volts or higher. All others have self-contained multipliers.

<> Available on special order.

### AC Voltage Meters Rectifier Type, Self-Shielding Movement

| Range | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|-------|----------------------------------|-------------------------------|-------------------|-------------------|
|       |                                  | 2-1/2" Model 2142             | 3-1/2" Model 2143 | 4-1/2" Model 2144 |
| 0-5   | 2000 ohms per volt               | 17460                         | 17542             | 17640             |
| 0-10  |                                  | <>                            | 17543             | 17641             |
| 0-15  |                                  | <>                            | 17544             | 17642             |
| 0-50  |                                  | <>                            | 17545             | 17643             |
| 0-150 |                                  | 17462                         | 17546             | 17644             |
| 0-300 |                                  | <>                            | <>                | 17645             |

<> Available on special order.

### DC Milliammeters, Self-Shielding Movement

| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |                   |
|--------|----------------------------------|-------------------------------|-------------------|-------------------|-------------------|
|        |                                  | 1-1/2" Model 2121             | 2-1/2" Model 2122 | 3-1/2" Model 2123 | 4-1/2" Model 2124 |
| 0-1    | 43.0                             | 17825                         | 17430             | 17510             | 17600             |
| 0-3    | 2.0                              | <>                            | 17431             | 17511             | 17601             |
| 0-5    | 2.0 (20)†                        | 17826                         | 17432             | 17512             | 17602             |
| 0-10   | 10.0 (2.2)†                      | 17827                         | 17433             | 17513             | 17603             |
| 0-15   | 6.6 (2.2)†                       | 17828                         | 17434             | <>                | <>                |
| 0-20   | 5.0                              | <>                            | <>                | 17515             | <>                |
| 0-25   | 4.0 (6.0)†                       | 17829                         | 17436             | 17516             | 17606             |
| 0-50   | 2.0 (3.0)†                       | 17830                         | 17437             | 17517             | 07607             |
| 0-100  | 1.0 (1.5)†                       | 17832                         | 17438             | 17518             | 07608             |
| 0-150  | .66 (1.0)†                       | 17833                         | 17439             | 17519             | 17609             |
| 0-200  | .50 (.75)†                       | 17834                         | 17440             | 17520             | 17610             |
| 0-250  | .40 (.60)†                       | 17835                         | 17441             | 17521             | 17611             |
| 0-300  | .33 (.50)†                       | 17836                         | 17442             | 17522             | 17612             |
| 0-500  | .20 (.30)†                       | 17837                         | 17443             | 17523             | 17613             |
| 0-750  | .13                              | <>                            | <>                | 17524             | 17614             |
| 0-1000 | .05                              | <>                            | 17444             | <>                | 17615             |

<> Available on special order.

† Resistances of Model 2121 shown in ( )

### DC Microammeters, Self-shielding Movement

| Range     | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |                   |
|-----------|----------------------------------|-------------------------------|-------------------|-------------------|-------------------|
|           |                                  | 1-1/2" Model 2121             | 2-1/2" Model 2122 | 3-1/2" Model 2123 | 4-1/2" Model 2124 |
| 0-50      | 1800 (5500)*                     | 17815                         | 17418             | 17499             | 17589             |
| 0-100     | 1800                             | 17816                         | 17420             | 17501             | 17591             |
| 0-200     | 1100                             | 17818                         | 17422             | 17503             | 17593             |
| 0-500     | 90 (190)*                        | 17819                         | 17424             | 17505             | 17595             |
| 25-0-25   | 1800 (5500)*                     | 17820                         | <>                | 17506             | 17596             |
| 50-0-50   | 1800                             | 17821                         | 17425             | 17507             | 17597             |
| 100-0-100 | 1100                             | 17822                         | 17426             | 17508             | 17598             |
| 500-0-500 | 43                               | 17823                         | 35063             | 17509             | 17599             |

\* Resistances of Model 2121 shown in ( )

<> Available on special order.

## Taut Band DC Microammeters, Self-shielding Movement

| Range | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                    |                    |
|-------|----------------------------------|-------------------------------|--------------------|--------------------|
|       |                                  | 2-1/2" Model 2122T            | 3-1/2" Model 2123T | 4-1/2" Model 2124T |
| 0-5   | 5750                             | -                             | 17495              | 17585              |
| 0-10  | 4900                             | 17415                         | 17496              | 17586              |
| 0-15  | 1960                             | 17416                         | 17497              | 17587              |
| 0-25  | 1960                             | 17417                         | 17498              | 17588              |
| 0-50  | 960                              | 17419                         | 17500              | 17590              |
| 0-100 | 500                              | 17421                         | 17502              | 17592              |
| 0-200 | 234                              | 17423                         | <>                 | 17594              |

<> Available on special order

## DC Ammeters, Self-shielding Movement

| Range   | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |                   |
|---------|----------------------------------|-------------------------------|-------------------|-------------------|-------------------|
|         |                                  | 1-1/2" Model 2121             | 2-1/2" Model 2122 | 3-1/2" Model 2123 | 4-1/2" Model 2124 |
| 0-1     | .050                             | 17800                         | 17400             | 17475             | 17565             |
| 0-1.5   | .003                             | <>                            | 17401             | 17476             | <>                |
| 0-2     | .025                             | 17801                         | 17402             | 17477             | 17567             |
| 0-3     | .0166                            | 17802                         | 17403             | 17478             | 17568             |
| 0-5     | .010                             | 17803                         | 17404             | 17479             | 17569             |
| 0-10    | .005                             | 17805                         | 17405             | 17480             | 17570             |
| 0-15    | .0033                            | 17806†                        | 17406             | 17481             | 17571             |
| 0-25    | .0020                            | 17807†                        | 17407             | 17482             | 17572             |
| 0-30    | .0017                            | <>                            | 17408             | 17483             | 17573             |
| 0-50    | .001                             | 17808†                        | 17409             | 17484             | 17574             |
| 0-100   | 10.0                             | <>                            | 17410†            | 17485†            | 17575†            |
| 0-150   | 10.0                             | <>                            | <>                | 17486†            | 17576†            |
| 0-200   | 10.0                             | <>                            | 17412†            | 17487†            | 17577†            |
| 0-300   | 10.0                             | <>                            | -                 | 17488†            | 17578†            |
| 0-500   | 10.0                             | <>                            | -                 | 17489†            | 17579†            |
| 2-0-2   | .025                             | <>                            | -                 | 35064             | -                 |
| 5-0-5   | .010                             | <>                            | -                 | 35072             | -                 |
| 15-0-15 | .0033                            | <>                            | -                 | 17490             | -                 |
| 30-0-30 | .0017                            | <>                            | -                 | 17491             | -                 |

†1-1/2" DC current meters are self-contained through 10 amps; higher ranges are supplied as 50mV meters and require an external shunt from page C3. 2-1/2", 3-1/2" and 4-1/2" meters are self-contained through 50 amps. Higher ranges are 50 mv and require use of an external shunt from page C3.

## Wattmeters/Dynamometer Type, Not

| Range  | Maximum |       | Model/Size and Catalog Number |                   |
|--------|---------|-------|-------------------------------|-------------------|
|        | Volts   | Amps  | 3-1/2" Model 2174             | 4-1/2" Model 2174 |
| 0-10   | 150     | .175  | 17875*                        | 17890*            |
| 0-20   | 150     | .400  | 17876                         | 17891*            |
| 0-30   | 150     | 0.650 | 17877*                        | 17892*            |
| 0-30   | 300     | 0.300 | 17879*                        | 17894*            |
| 0-50   | 300     | 0.500 | 17880*                        | 17895*            |
| 0-75   | 150     | 1.0   | 17881                         | 17896             |
| 0-150  | 150     | 2.0   | 17882                         | 17897             |
| 0-300  | 150     | 4.0   | 17883                         | 17898             |
| 0-600  | 300     | 4.0   | 17884                         | 17899             |
| 0-750  | 150     | 10.0  | 17885                         | 17900             |
| 0-1500 | 300     | 10.0  | 17886                         | 17901             |
| 0-300  | 300     | 20.0  | 17887                         | 17902             |

\* Compensated wattmeters: calibrated for either magnetic or non-magnetic panels and for a frequency of 25-125Hz.

## Percent Motor Load Meters, Self-shielding Movement

| Type        | Rating | Model/Size and Catalog Number |           |                |           |
|-------------|--------|-------------------------------|-----------|----------------|-----------|
|             |        | 3-1/2" Model #                | Catalog # | 4-1/2" Model # | Catalog # |
| DC (Note 1) | 30 mV  | 2123                          | 17564     | 2124           | 17637     |
| AC (Note 2) | 5 amps | 2153                          | 17711     | 2154           | 17756     |

- These DC meters require an external shunt from page C3, and an 8 to 10  $\Omega$  2W wire-wound potentiometer (customer supplied).
- These AC meters require use of a current transformer from page C5.

## Frequency Meters, Self-shielding Movement

| Range      | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|------------|----------------------------------|-------------------------------|-------------------|-------------------|
|            |                                  | 2-1/2" Model 2182             | 3-1/2" Model 2183 | 4-1/2" Model 2184 |
| 45-55 Hz   | 120V                             | 3511B                         | 35124             | 35130             |
| 55-65 Hz   | 120V                             | 35120                         | 35126             | 35132             |
| 380-420 Hz | 120V                             | 35122                         | 35128             | 35134             |
| 45-55 Hz   | 240V                             | 35119                         | 35125             | 35131             |
| 55-65 Hz   | 240V                             | 35121                         | 35127             | 35133             |
| 380-420 Hz | 240V                             | 35123                         | 35129             | 35135             |

## DC Millivoltmeters, Self-shielding Movement

| Range   | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |
|---------|----------------------------------|-------------------------------|-------------------|-------------------|
|         |                                  | 2-1/2" Model 2122             | 3-1/2" Model 2123 | 4-1/2" Model 2124 |
| 0-5     | 10.0                             | 17472                         | 17540             | 17636             |
| 50-0-50 | 20.0                             | <>                            | 17541             | 17635             |

<> Available on special order

## DC Voltage Meters, Self-shielding Movement

| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model/Size and Catalog Number |                   |                   |                   |
|--------|----------------------------------|-------------------------------|-------------------|-------------------|-------------------|
|        |                                  | 1-1/2" Model 2121             | 2-1/2" Model 2122 | 3-1/2" Model 2123 | 4-1/2" Model 2124 |
| 0-5    |                                  | 17840                         | 17445             | 17525             | 17618             |
| 0-8    |                                  | <>                            | <>                | <>                | 17619             |
| 0-10   |                                  | 17842                         | 17446             | 17527             | 17620             |
| 0-15   |                                  | 17843                         | 17447             | 17528             | 17621             |
| 0-25   |                                  | 17844                         | 17448             | 17529             | 17622             |
| 0-30   |                                  | 17845                         | 17449             | 17530             | 17623             |
| 0-50   | 1000 ohms per volt               | 17846                         | 17450             | 17531             | 17624             |
| 0-100  |                                  | 17848                         | 17451             | 17532             | 17625             |
| 0-150  |                                  | 17849                         | 17452             | 17533             | 17626             |
| 0-200  |                                  | <>                            | <>                | 17534             | 17627             |
| 0-250  |                                  | <>                            | <>                | 17535             | <>                |
| 0-300  |                                  | -                             | 17455             | 17536             | 17629             |
| 0-300  | 2000 ohms per volt               | 17580                         | <>                | <>                | <>                |
| 0-500  |                                  | 17851*                        | 17456             | 17537             | 17630             |
| 0-750  |                                  | <>                            | <>                | 17538             | 17631             |
| 0-1000 |                                  | <>                            | 17458*            | 17539*            | 17322*            |

\*External multipliers (Model 183) are furnished on 1-1/2" DC meters 500 volts or higher; on 2-1/2" DC meters 750 volts or higher; and on 3-1/2" and 4-1/2" DC meters 1000 volts or higher. All others have self-contained multipliers.

<> Available on special order.