

# Rectangular Style Analog Panel Meters

- UL Recognized - File # E91015  
Except for the Wattmeters & Frequency Meters
- Plastic case with Glass Window
- Calibration not affected when mounted on steel
- Three popular sizes:  
2-1/2", 3-1/2", 4-1/2"



For Specifications and Dimensions see the last pages

## Ordering Information

| Frequency, Self-Shielding Movement |         | Not  |                    |                    |
|------------------------------------|---------|--|--------------------|--------------------|
| Range                              | Voltage | Model / Size and Catalog Number  |                    |                    |
|                                    |         | 2-1/2"<br>Model 187  | 3-1/2"<br>Model 87 | 4-1/2"<br>Model 89 |
| 45-55 Hz                           | 120V    | 35136  | 35142              | 35148              |
| 55-65 Hz                           | 120V    | 35138  | 35144              | 35150              |
| 380-420 Hz                         | 120V    | 35140  | 35146              | 35152              |
| 45-55 Hz                           | 240V    | 35137  | 35143              | 35149              |
| 55-65 Hz                           | 240V    | 35139  | 35145              | 35151              |
| 380-420 Hz                         | 240V    | 35141  | 35147              | 35153              |



# Rectangular Style Analog Panel Meters

## Ordering Information

| 4-20 mA Process Meters, Dial Indicates 0-100% |             |       |                          |             |
|---|-------------|-------|--------------------------|-------------|
| Size  | Style       | Model | Approx. Impedance (Ohms) | Catalog No. |
| 3-1/2"  | Rectangular | 27    | 5.0                      | 35023       |
| 4-1/2"  | Rectangular | 29    | 5.0                      | 35024       |

| Wattmeters, Self Shielding Movement |         |      | Not  |                    |                    |
|-------------------------------------|---------|------|---|--------------------|--------------------|
| Range                               | Maximum |      | Model / Size and Catalog Number   |                    |                    |
|                                     | Volts   | Amps | 2-1/2"<br>Model 177   | 3-1/2"<br>Model 77 | 4-1/2"<br>Model 79 |
| 0-20                                | 150     | .400 | < >   | < >                | 10714              |
| 0-75                                | 150     | 1.0  | 10860   | 10650              | 10720              |
| 0-150                               | 150     | 2.0  | < >   | < >                | 10730              |
| 0-300                               | 150     | 4.0  | < >   | < >                | 10740              |
| 0-600                               | 300     | 4.0  | < >   | 10680              | 10750              |
| 0-750                               | 150     | 10.0 | 10900   | 10690              | 10760              |
| 0-1500                              | 300     | 10.0 | 10910   | 10700              | 10770              |
| 0-3000                              | 300     | 20.0 | 10920   | 10710              | 10780              |

< > Available on special order

## Ordering Information

| DC Voltmeters, Self-Shielding Movement   |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 127                | 3-1/2" Model 27 | 4-1/2" Model 29 |
| 0-1.5  | 1000 Ohms per Volt               | 09020                           | 07290           | 07620           |
| 0-3  |                                  | 09030                           | 07300           | 07630           |
| 0-5  |                                  | 09040                           | 07310           | 07640           |
| 0-8  |                                  | 09050                           | < >             | 07650           |
| 0-10   |                                  | 09060                           | 07330           | 07660           |
| 0-15   |                                  | 09080                           | 07350           | 07670           |
| 0-25   |                                  | 09090                           | 07360           | 07680           |
| 0-30   |                                  | 09100                           | 07370           | 07690           |
| 0-50   |                                  | 09110                           | 07380           | 07700           |
| 0-100  |                                  | 09130                           | 07400           | 07710           |
| 0-150  |                                  | 09140                           | 07410           | 07720           |
| 0-200  |                                  | 09160                           | 07430           | 07730           |
| 0-250  |                                  | 09170                           | 07440           | 07740           |
| 0-300  |                                  | 09180                           | 07450           | 07750           |
| 0-500  | 2000 Ohms per Volt               | 09200                           | 07470           | 07760           |
| 0-750  |                                  | < >                             | 07490           | 07770           |
| 0-1000   |                                  | < >                             | 07495 *         | 07780 *         |
| 0-1500   |                                  | < >                             | 07520 *         | 07790 *         |
| 0-2000   |                                  | 09225 *                         | 07530 *         | 07800 *         |
| 0-2500   |                                  | < >                             | 07550 *         | 07810 *         |
| 0-3000   |                                  | < >                             | 07560 *         | 07820 *         |
| 0-4000   |                                  | < >                             | < >             | 07830 *         |
| 0-5000   |                                  | < >                             | 07600 *         | 07840 *         |
| < > Available on special order   |                                  |                                 |                 |                 |
| * External multipliers (Model 183) are furnished 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 |                                  |                                 |                 |                 |



# Rectangular Style Analog Panel Meters

## Ordering Information

| <b>DC Millivoltmeters, Self-Shielding Movement</b> |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 127                | 3-1/2" Model 27 | 4-1/2" Model 29 |
| 0-50   | 10.0                             | 06990                           | 06930           | 06950           |
| 0-100  | 20.0                             | < >                             | 06940           | 06960           |
| < > Available on special order                     |                                  |                                 |                 |                 |

| <b>DC Taut-Band Microammeters, Self-Shielding Movement</b> |                                  |                                 |                  |                  |
|--|----------------------------------|---------------------------------|------------------|------------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                  |                  |
|  |                                  | 2-1/2" Model 127T               | 3-1/2" Model 27T | 4-1/2" Model 29T |
| 0-10   | 4900                             | 04246                           | 03839            | 03939            |
| 0-15   | 1960                             | 04248                           | 03841            | 03941            |
| 0-25   | 1960                             | 04251                           | 03851            | 03951            |
| 0-50   | 960                              | 04261                           | 03961            | 03961            |
| 0-100  | 500                              | < >                             | 03871            | 03971            |
| < > Available on special order                             |                                  |                                 |                  |                  |



# Rectangular Style Analog Panel Meters

## Ordering Information

| <b>DC Microammeters, Self-Shielding Movement</b> |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 127                | 3-1/2" Model 27 | 4-1/2" Model 29 |
| 0-50   | 1800                             | 04260                           | 03860           | 03960           |
| 0-100  | 1800                             | 04270                           | 03870           | 03970           |
| 0-200  | 1100                             | 04280                           | 03880           | 03980           |
| 0-500  | 90                               | < >                             | 03890           | 03990           |
| 25-0-25  | 1800                             | 04243                           | 03900           | 04000           |
| 50-0-50  | 1800                             | 04245                           | 03910           | 04010           |
| 100-0-100  | 1100                             | 04247                           | 03920           | 04020           |
| 500-0-500  | 43                               | < >                             | 03930           | 04030           |
| < > Available on special order                   |                                  |                                 |                 |                 |

| <b>DC Milliammeters, Self-Shielding Movement</b> |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 127                | 3-1/2" Model 27 | 4-1/2" Model 29 |
| 0-1  | 43.0                             | 05760                           | 04790           | 05070           |
| 0-1.5  | 43.0                             | < >                             | 04810           | 05080           |
| 0-3  | 2.0                              | 05790                           | 04820           | 05090           |
| 0-5  | 2.0                              | 05800                           | 04830           | 05100           |
| 0-10   | 10.0                             | 05810                           | 04840           | 05110           |
| 0-15   | 6.6                              | 05830                           | 04860           | 05120           |
| 0-20   | 5.0                              | < >                             | 04880           | 05130           |
| 0-25   | 4.0                              | 05860                           | 04890           | 05140           |
| 0-50   | 2.0                              | 05880                           | 04910           | 05150           |
| 0-75   | 1.3                              | < >                             | < >             | < >             |
| 0-100  | 1.0                              | 05910                           | 04940           | 05170           |
| 0-150  | .66                              | 05930                           | 04960           | 05180           |
| 0-200  | .5                               | 05940                           | 04980           | 05190           |
| 0-250  | .4                               | < >                             | 05000           | 05200           |
| 0-300  | .33                              | < >                             | 05010           | 05210           |
| 0-500  | .2                               | 05990                           | 05030           | 05220           |
| 0-750  | .13                              | < >                             | 05050           | 05230           |
| 0-1000   | .05                              | 06020                           | 05060           | 05240           |
| < > Available on special order                   |                                  |                                 |                 |                 |



# Rectangular Style Analog Panel Meters

## Ordering Information

| <b>DC Ammeters, Self-Shielding Movement</b>  |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 127                | 3-1/2" Model 27 | 4-1/2" Model 29 |
| 0-1  | .050                             | 01680                           | 00230           | 00450           |
| 0-1.5  | .033                             | 01690                           | 00240           | 00460           |
| 0-2  | .025                             | 01709                           | 00250           | 00470           |
| 0-3  | .0166                            | 01710                           | 00260           | 00480           |
| 0-5  | .010                             | 01720                           | 00270           | 00490           |
| 0-10   | .005                             | 01730                           | 00280           | 00500           |
| 0-15   | .0033                            | 01740                           | 00290           | 00512           |
| 0-25   | .0020                            | 01750                           | 00300           | 00520           |
| 0-30   | .0017                            | 01760                           | 00310           | 00530           |
| 0-50   | .001                             | 01770                           | 00320           | 00540           |
| 0-75   | 10.0                             | 01780 †                         | 00330 †         | 00550 †         |
| 0-100  | 10.0                             | 01790 †                         | 00340 †         | 00560 †         |
| 0-150  | 10.0                             | 01800 †                         | 00350 †         | 00570 †         |
| 0-200  | 10.0                             | 01810 †                         | < >             | 00580 †         |
| 0-250  | 10.0                             | < >                             | < >             | 00590 †         |
| 0-300  | 10.0                             | < >                             | 00380 †         | 00600 †         |
| 0-500  | 10.0                             | < >                             | 00390 †         | 00610 †         |
| 0-750  | 10.0                             | < >                             | 00400 †         | 00620 †         |
| 0-1000   | 10.0                             | < >                             | 00410 †         | 00630 †         |
| 15-0-15  | .0033                            | < >                             | < >             | 00640           |
| 30-0-30  | .0017                            | 01880                           | 00430           | 00650           |
| 50-0-50  | .001                             | 01890                           | 00440           | 00660           |
| <b>&lt; &gt; Available on special order</b>  |                                  |                                 |                 |                 |
| <b>† DC current meters are self-contained for ranges up to and including 50 amperes.</b>                     |                                  |                                 |                 |                 |
| Higher range DC current meters (50 mV) listed above are calibrated for 5' leads and require external shunts. |                                  |                                 |                 |                 |



# Rectangular Style Analog Panel Meters

## Ordering Information

| <b>AC Microammeters Rectifier Type, Self-Shielding Movement</b> |                                  |                                 |                 |                 |
|---|----------------------------------|---------------------------------|-----------------|-----------------|
| Range   | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|   |                                  | 2-1/2" Model 147                | 3-1/2" Model 47 | 4-1/2" Model 49 |
| 0-100   | 3400                             | < >                             | 04120           | 04160           |
| 0-200   | 2400                             | < >                             | < >             | 04170           |
| 0-300   | 1800                             | < >                             | 04140           | 04180           |
| 0-500   | 1200                             | < >                             | 04150           | 04190           |
| < > Available on special order                                  |                                  |                                 |                 |                 |

| <b>AC Milliammeters, Iron Vane Movement</b> |                                  |                                 |                 |                 |
|---|----------------------------------|---------------------------------|-----------------|-----------------|
| Range                                       | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|   |                                  | 2-1/2" Model 157                | 3-1/2" Model 57 | 4-1/2" Model 59 |
| 0-10  | 650.0                            | < >                             | 05440           | 05510           |
| 0-15  | 887.0                            | < >                             | 05499           | < >             |
| 0-25  | 270.0                            | < >                             | 05460           | 05530           |
| 0-50  | 80.0                             | 06130                           | 05470           | 05540           |
| 0-100                                       | 17.2                             | 06140                           | 05480           | 05550           |
| 0-250                                       | 3.1                              | 06150                           | 05490           | 05560           |
| 0-500                                       | .9                               | 06152                           | 05500           | 05570           |
| < > Available on special order              |                                  |                                 |                 |                 |



# Rectangular Style Analog Panel Meters

## Ordering Information

| <b>AC Milliammeters Rectifier Type, Self Shielding Movement</b> |                                  |                                 |                 |                 |
|---|----------------------------------|---------------------------------|-----------------|-----------------|
| Range   | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|   |                                  | 2-1/2" Model 147                | 3-1/2" Model 47 | 4-1/2" Model 49 |
| 0-1   | 600                              | < >                             | 06850           | 06880           |
| 0-2   | 400                              | < >                             | 06860           | 06890           |
| 0-5   | 200                              | < >                             | 06870           | 06900           |
| < > Available on special order                                  |                                  |                                 |                 |                 |

| <b>AC Ammeters, Iron Vane Movement</b>   |                                  |                                 |                 |                 |
|--|----------------------------------|---------------------------------|-----------------|-----------------|
| Range  | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|  |                                  | 2-1/2" Model 157                | 3-1/2" Model 57 | 4-1/2" Model 59 |
| 0-1  | .213                             | 02270                           | 01120           | 01290           |
| 0-1.5  | .105                             | < >                             | 01130           | 01302           |
| 0-2  | .065                             | 02290                           | 01140           | 01310           |
| 0-3  | .028                             | 02300                           | 01145           | 01320           |
| 0-5  | .008                             | 02310                           | 01160           | 01330           |
| 0-10   | .004                             | 02320                           | 01170           | 01340           |
| 0-15   | .0025                            | 02330                           | 01180           | 01350           |
| 0-25   | .002                             | 02340                           | 01190           | 01360           |
| 0-30   | .0015                            | 02350                           | 01200           | 01370           |
| 0-50   | .001                             | 02360                           | 01210           | 01380           |
| 0-75   | .0002                            | < >                             | 03434           | 03436           |
| 0-75   | .008                             | 02370 †                         | < >             | < >             |
| 0-100  | .008                             | 02380 †                         | 01230 †         | 01400 †         |
| 0-150  | .008                             | 02390 †                         | 01240 †         | 01410 †         |
| 0-200  | .008                             | < >                             | 01250 †         | 01420 †         |
| 0-250  | .008                             | 02410 †                         | 01260 †         | 01430 †         |
| 0-300  | .008                             | 02420 †                         | 01270 †         | 01440 †         |
| 0-500  | .008                             | 02422 †                         | 01280 †         | 01450 †         |
| < > Available on special order   |                                  |                                 |                 |                 |
| † These meters are 5 amp meters with scales as indicated and require external donut transformers |                                  |                                 |                 |                 |





# Rectangular Style Analog Panel Meters

## Ordering Information

| AC Voltmeters Rectifier Type, Self Shielding Movement |                                  |                                 |                 |                 |
|---|----------------------------------|---------------------------------|-----------------|-----------------|
| Range   | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|   |                                  | 2-1/2" Model 147                | 3-1/2" Model 47 | 4-1/2" Model 49 |
| 0-1   | 2000 Ohms per Volt               | < >                             | 08120           | 08300           |
| 0-3   |                                  | < >                             | 08130           | 08310           |
| 0-5   |                                  | < >                             | < >             | 08320           |
| 0-10  |                                  | < >                             | < >             | 08330           |
| 0-15  |                                  | < >                             | < >             | 08340           |
| 0-50  |                                  | < >                             | < >             | 08350           |
| 0-100   |                                  | < >                             | 08180           | 08360           |
| 0-150   |                                  | < >                             | 08190           | 08370           |
| 0-300   |                                  | < >                             | < >             | 08371           |

< > Available on special order

| AC Voltmeters, Iron Vane Movement |                                  |                                 |                 |                 |
|-----------------------------------|----------------------------------|---------------------------------|-----------------|-----------------|
| Range                             | Approx. Impedance (Ohms) @ 60 Hz | Model / Size and Catalog Number |                 |                 |
|                                   |                                  | 2-1/2" Model 157                | 3-1/2" Model 57 | 4-1/2" Model 59 |
| 0-1.5                             | 3                                | < >                             | < >             | 08710           |
| 0-3                               | 12                               | < >                             | 08540           | 08720           |
| 0-5                               | 33                               | 09390                           | 08550           | 08730           |
| 0-10                              | 133                              | 09400                           | 08566           | 08740           |
| 0-15                              | 300                              | 09420                           | 08580           | 08750           |
| 0-25                              | 833                              | 09440                           | 08599           | 08760           |
| 0-50                              | 3,333                            | 09450                           | 08610           | 08770           |
| 0-100                             | 16,166                           | 09460                           | 08620           | 08780           |
| 0-150                             | 25,000                           | 09470                           | 08630           | 08790           |
| 0-250                             | 41,166                           | 09490                           | 08650           | 08800           |
| 0-300                             | 50,000                           | 09500                           | 08660           | 08810           |
| 0-500                             | 83,333                           | 09520 †                         | 08680 †         | 08820 †         |
| 0-750                             | 125,000                          | < >                             | 08690 †         | 08830 †         |
| 0-1000                            | 166,666                          | < >                             | 08700 †         | 08840 †         |

† 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

# Rectangular Style Analog Panel Meters

| <b>Specifications</b>        |   |
|------------------------------|---|
| <b>Accuracy</b>              | ±2% full scale (iron-vane), ±3% (rectifier)   |
| <b>Wattmeters:</b>           | ±2% full scale; Compensated meters: ±3% full scale  |
| <b>Movement</b>              | Model 57, 59, 157 Iron-vane, magnetically damped<br>Wattmeters: Dynamometer<br>All others: Annular, rectifier type, self-shielding  |
| <b>Suspension</b>            | Pivot and jewel; "T" styles: taut band  |
| <b>Tracking</b>              | ±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 %, tautband: .5%  |
| <b>Dial</b>                  | Sharp clear scale. Each dial arc is calibrated to track the specific type of movement used  |
| <b>Resistance</b>            | ±15% of meter impedance   |
| <b>Pointer</b>               | Spade pointer with black, matte finish  |
| <b>Scale Length</b>          | Models 177 & 157: 1.6" (40.6mm)<br>Models 147, 127 & 127T: 1.8" (45.7mm)<br>Models 57 & 77: 2.3" (58.4mm)<br>Models 27, 27T & 47: 2.5" (63.5mm)<br>Models 59 & 79: 3.50" (89.0mm)<br>Models 29, 29T & 49: 3.9" (99.0mm)           |
| <b>Net Weight</b>            | Models 57 & 157: 5 oz. (0.14 kg)<br>Model 127, 127T & 147: 7 oz. (0.20 kg)<br>Models 27, 27T, 47 & 59: 8 oz. (0.23 kg)<br>Models 77 & 177: 9 oz. (0.26 kg)<br>Models 29, 29T & 49: 11 oz. (0.31 kg)<br>Model 79: 12 oz. (0.34 kg) |

# Rectangular Style Analog Panel Meters

| <b>Frequency Meter Specifications</b> |   |
|---------------------------------------|---|
| <b>Accuracy</b>                       | 45-55 Hz $\pm$ 0.3 Hz (120V-240V)   |
|                                       | 55-65 Hz $\pm$ 0.3 Hz (120V-240V)   |
|                                       | 380-420 Hz $\pm$ 1.2 Hz (120V-240V)   |
| <b>Movement</b>                       | Small core magnet, self-shielding   |
| <b>Suspension</b>                     | Pivot and jewel   |
| <b>Shielding</b>                      | Calibration is unaffected by magnetic panel mounting  |
| <b>Center Scale Value</b>             | 50/60/400 Hz  |
| <b>Power Consumption</b>              | 1.6 VA  |
| <b>Warm-up Time</b>                   | 5 minutes   |
| <b>Max. Input: Voltage (10 sec)</b>   | 150, 120V normal  |
|                                       | 280, 240V normal  |
| <b>Dial</b>                           | Sharp clear scale.<br>Each dial arc is calibrated to track the specific type of movement used |
| <b>Case</b>                           | High density black plastic  |
| <b>Operating Temperature</b>          | -4°F to + 149°F (-20°C to + 65°C)   |
| <b>Pointer</b>                        | Spade pointer with black, matte finish  |
| <b>Scale Length</b>                   | Model 187: 1.8" (45.7mm)  |
|                                       | Model 89: 3.5" (89.0mm)   |
|                                       | Model 87: 3.9" (99.0mm)   |
| <b>Net Weight</b>                     | Model 187: 5 oz. (0.14 kg)  |
|                                       | Model 87: 8 oz. (0.23 kg)   |
|                                       | Model 89: 11 oz. (0.31 kg)  |

# Rectangular Style Analog Panel Meters

## Dimensions

3-1/2" Model 27 & 27T, 47, 57, & 87



3-1/2" Model 77



4-1/2" Model 29 & 29T, 49, 59, & 89



4-1/2" Model 79



2-1/2" Model 177



2-1/2" Model 127 & 127T, 147, 157, & 187

