

# CURRENT MEASUREMENT PROBES

## MINIFLEX® SERIES



### MODEL MA114

*Provides a welcomed solution when accessing electrical conductors in tight places or clamping onto cable bundles*



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### FEATURES

- 14-inch flexible sensor capable of clamping around a 3.93 inch cable or bundle
- Waterproof sensor rated to IP67
- User selectable ranges of (3, 30, 300 and 3000) Amps
- 600 V CAT IV, 1000 V CAT III rated
- Not affected by magnetic saturation, provides excellent linearity and low phase shift
- Battery or USB powered for long term use
- Red LED indicates overload condition
- Positive click locking sensor eliminates disconnection errors
- Banana plug termination compatible with multimeters, data loggers and other instruments

| MODEL                         | MA114                                                                                                                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ELECTRICAL</b>             |                                                                                                                                                                                                                     |
| Nominal Range                 | 3 A <sub>AC</sub> ; 30 A <sub>AC</sub> ; 300 A <sub>AC</sub> ; 3000 A <sub>AC</sub>                                                                                                                                 |
| Measurement Range             | 3 A Range: (0.5 to 3) A <sub>AC</sub> ,<br>30 A Range: (2 to 30) A <sub>AC</sub> ,<br>300 A Range: (5 to 300) A <sub>AC</sub> ,<br>3000 A Range: (50 to 3000) A <sub>AC</sub>                                       |
| Transformation Ratio          | Voltage Output                                                                                                                                                                                                      |
| Output Signal                 | 3 A Range: 1 V/A (1 mV/mA) (3 V <sub>AC</sub> @ 3 A),<br>30 A Range: 100 mV/A (3 V <sub>AC</sub> @ 30 A),<br>300 A Range: 10 mV/A (3 V <sub>AC</sub> @ 300 A),<br>3000 A Range: 1 mV/A (3 V <sub>AC</sub> @ 3000 A) |
| Phase Shift                   | ≤ 1 ° (0.5 ° typical)                                                                                                                                                                                               |
| Overload                      | 3 A Range: 4.5 A,<br>30 A Range: 45 A,<br>300 A Range: 450 A,<br>3000 A Range: 4500 A                                                                                                                               |
| Frequency Range               | 3 A Range: 10 Hz to 10 kHz,<br>(30, 300, 3000) A Range: 10 Hz to 20 kHz                                                                                                                                             |
| Load Impedance                | ≥ 1 MΩ                                                                                                                                                                                                              |
| Working Voltage               | 600 Vrms (CAT IV), 1000 Vrms (CAT III)                                                                                                                                                                              |
| Power Supply                  | (2) 1.5 V AA batteries or LR6 alkaline,<br>+5 V <sub>DC</sub> with Type B micro-USB                                                                                                                                 |
| Battery Life                  | 300 hours typical.<br>Approximately 1800 10-minute measurements.                                                                                                                                                    |
| Output Termination            | 1.6 ft (0.5 m) lead<br>with (2) 4 mm safety banana plugs                                                                                                                                                            |
| <b>MECHANICAL</b>             |                                                                                                                                                                                                                     |
| Sensor Length                 | 14 in (35.6 cm)                                                                                                                                                                                                     |
| Cable Length                  | 6.5 ft (2 m)                                                                                                                                                                                                        |
| Maximum Conductor Size        | Ø 3.93 in (10 cm)                                                                                                                                                                                                   |
| Dimensions                    | (4.7 x 2.3 x 1.4) in (12 x 5.8 x 3.6) cm                                                                                                                                                                            |
| Weight                        | Approximately 10.58 oz (300 g)                                                                                                                                                                                      |
| <b>ENVIRONMENTAL</b>          |                                                                                                                                                                                                                     |
| Operating Temperature         | (14 to 131) °F (-10 to 55) °C                                                                                                                                                                                       |
| Storage Temperature           | (-40 to 158) °F (-40 to 70) °C                                                                                                                                                                                      |
| Operating Relative Humidity   | (0 to 95) % RH @ 95 °F (35 °C)                                                                                                                                                                                      |
| <b>SAFETY</b>                 |                                                                                                                                                                                                                     |
| Safety Rating                 | IEC 61010-2-32 Type B, 1000 V CAT III,<br>600 V CAT IV, Pollution Degree 2                                                                                                                                          |
| Electromagnetic Compatibility | IEC 61326-1                                                                                                                                                                                                         |
| Ingress Protection            | IP54 (electronic unit), IP67 (flexible sensor)                                                                                                                                                                      |
| Double Insulation             | Yes                                                                                                                                                                                                                 |

Consult factory for NIST Calibration prices.

| CAT. #  | DESCRIPTION                                                                            |
|---------|----------------------------------------------------------------------------------------|
| 2153.41 | MiniFlex® 14 in Model MA114 (3 A/1 mV/mA, 30 A/100 mV/A, 300 A/10 mV/A, 3000 A/1 mV/A) |

# CURRENT MEASUREMENT PROBES

## GENERAL PURPOSE PROBES SELECTION CHART

| Series                                                                             | Model  | Ratio  | Measurement Range                 |                               | Output Signal |                                                      | Phase Shift** | Maximum Conductor Size             |                              | Output Connection | CAT. #  |
|------------------------------------------------------------------------------------|--------|--------|-----------------------------------|-------------------------------|---------------|------------------------------------------------------|---------------|------------------------------------|------------------------------|-------------------|---------|
|                                                                                    |        |        | AC                                | DC                            | Current       | Voltage                                              |               | Ø Cable                            | Bus Bar                      |                   |         |
|   | MN01   | 1000:1 | (2 to 150) A                      | —                             | 1 mA/A*       | —                                                    | N / A         | 0.39 in (10 mm)                    | N / A                        | Leads             | 2129.17 |
|                                                                                    | MN02   | 1000:1 | 50 mA to 100 A<br>50 mA to 90 A   | —                             | 1 mA/A*       | —                                                    | N / A         | 0.39 in (10 mm)                    | N / A                        | Leads             | 2129.20 |
|                                                                                    | MN05   | —      | 5 mA to 10 A<br>(1 to 100) A      | —                             | —             | 1 mV/mA<br>1 mV/A                                    | N / A         | 0.39 in (10 mm)                    | N / A                        | Leads             | 2129.19 |
|                                                                                    | MN09   | —      | (1 to 150) A                      | —                             | —             | 100 mV <sub>DC</sub> / A <sub>AC</sub>               | N / A         | 0.39 in (10 mm)                    | N / A                        | Leads             | 2129.21 |
|    | MN134  | —      | 1 mA to 10 A                      | —                             | —             | 100 mV <sub>AC</sub> / A <sub>AC</sub>               | < 10°         | 0.39 in (10 mm)                    | N / A                        | Leads             | 2129.22 |
|                                                                                    | MN185  | 1000:1 | 50 mA to 120 A                    | —                             | 1 mA/A        | —                                                    | < 3.5 °       | 0.47 in (12 mm)                    | N / A                        | Jacks             | 100.185 |
|  | MN255  | —      | (0.1 to 24) A<br>(0.1 to 240) A   | —                             | —             | 100 mV/A<br>10 mV/A                                  | < 2.5 °       | 0.78 in (20 mm)                    | N / A                        | Leads             | 2115.81 |
|                                                                                    | MN261  | —      | (0.1 to 24) A<br>(0.5 to 240) A   | —                             | —             | 100 mV/A<br>10 mV/A                                  | < 6 °         | 0.78 in (20 mm)                    | N / A                        | BNC               | 2115.82 |
|                                                                                    | MN291  | —      | (0.5 to 240) A                    | —                             | —             | 100 mV <sub>DC</sub> / A <sub>AC</sub>               | N / A         | 0.78 in (20 mm)                    | N / A                        | Leads             | 2115.84 |
|                                                                                    | MN307  | —      | 10 mA to 12 A                     | —                             | —             | 100 mV/A                                             | < 2.5 °       | 0.78 in (20 mm)                    | N / A                        | Leads             | 2116.23 |
|                                                                                    | MN312  | 1000:1 | (0.1 to 200) A                    | —                             | 1 mA/A*       | —                                                    | < 2.5 °       | 0.78 in (20 mm)                    | N / A                        | Jacks             | 2116.24 |
|                                                                                    | MN352  | —      | (0.1 to 150) A                    | —                             | —             | 10 mV/A                                              | < 2.5 °       | 0.78 in (20 mm)                    | N / A                        | Jacks             | 2116.26 |
|                                                                                    | MN353  | —      | (0.1 to 150) A                    | —                             | —             | 10 mV/A                                              | < 2.5 °       | 0.78 in (20 mm)                    | N / A                        | Leads             | 2116.27 |
|                                                                                    | MN373  | —      | (0.01 to 2.4) A<br>(0.1 to 200) A | —                             | —             | 1000 mV/A<br>10 mV/A                                 | < 3 °         | 0.78 in (20 mm)                    | N / A                        | Leads             | 2116.28 |
|                                                                                    | MN375  | —      | (0.1 to 10) A                     | —                             | —             | 100 mV/A                                             | < 1.5 °       | 0.78 in (20 mm)                    | N / A                        | Leads             | 2115.41 |
|                                                                                    | MN379  | —      | 5 mA to 6 A<br>(0.1 to 120) A     | —                             | —             | 200 mV/A<br>10 mV/A                                  | < 4 °         | 0.78 in (20 mm)                    | N / A                        | Leads             | 2153.01 |
|                                                                                    | MN379T | —      | 5 mA to 6 A<br>(0.1 to 120) A     | —                             | —             | 200 mV/A<br>10 mV/A                                  | < 4 °         | 0.78 in (20 mm)                    | N / A                        | Lead w / BNC      | 2153.02 |
|  | SL206  | —      | 10 mA to 1.5 A<br>50 mA to 60 A   | 10 mA to 2 A<br>50 mA to 80 A | —             | 1 mV/mA <sub>AC/DC</sub><br>10 mV/A <sub>AC/DC</sub> | < 1 °         | 0.46 in (12 mm)                    | N / A                        | Leads             | 1201.45 |
|  | MD301  | 1000:1 | (2 to 500) A                      | —                             | —             | 1 mV <sub>DC</sub> / A <sub>AC</sub>                 | N / A         | 1.18 in (30 mm)<br>(2 x 500) kcmil | (2.48 x 0.20) in (63 x 5) mm | Leads             | 1201.07 |
|                                                                                    | MD305  | 1000:1 | (1 to 600) A                      | —                             | 1 mA/A        | —                                                    | < 1 °         | 1.18 in (30 mm)<br>(2 x 500) kcmil | (2.48 x 0.20) in (63 x 5) mm | Leads             | 1201.36 |

\*Output protection for open secondary.

\*\*Phase shift indicated at maximum rating.

Note: Model MN185 are not CE compliant. MN200 & MN300 series are UL approved except MN379.

Consult factory for NIST Calibration price.

# CURRENT MEASUREMENT PROBES

## GENERAL PURPOSE PROBES SELECTION CHART

| SERIES                                                                              | MODEL | RATIO  | MEASUREMENT RANGE                                      |                                | OUTPUT SIGNAL |                                   | PHASE SHIFT**   | MAXIMUM CONDUCTOR SIZE |                                         | OUTPUT CONNECTION | CAT. #  |
|-------------------------------------------------------------------------------------|-------|--------|--------------------------------------------------------|--------------------------------|---------------|-----------------------------------|-----------------|------------------------|-----------------------------------------|-------------------|---------|
|                                                                                     |       |        | AC                                                     | DC                             | CURRENT       | VOLTAGE                           |                 | Ø CABLE                | BUS BAR                                 |                   |         |
|    | MR415 | —      | (0.5 to 400) A                                         | (0.5 to 600) A                 | —             | 1 mV/A                            | ≤ 1.5 °         | 1.18 in (30 mm)        | 2 bus bar (1.24 x 0.39) in (31 x 10) mm | 5 ft (1.5 m) Lead | 1200.80 |
|                                                                                     | MR416 | —      | (0.5 to 40) A (0.5 to 400) A                           | (0.5 to 60) A (0.5 to 600) A   | —             | 10 mV/A 1 mV/A                    | ≤ 2.2 ° ≤ 1.5 ° | 1.53 in (39 mm)        | 2 bus bar (1.95 x 0.19) in (50 x 5) mm  | 5 ft (1.5 m) Lead | 1200.82 |
|                                                                                     | MR526 | —      | (0.5 to 100) A (0.5 to 1000) A                         | (0.5 to 150) A (0.5 to 1400) A | —             | 10 mV/A 1 mV/A                    | ≤ 2 ° ≤ 1.5 °   | 1.53 in (39 mm)        | 2 bus bar (1.95 x 0.19) in (50 x 5) mm  | 5 ft (1.5 m) Lead | 1200.83 |
|   | SR601 | 1000:1 | (0.1 to 1200) A                                        | —                              | 1 mA/A*       | —                                 | < 0.5 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Jacks             | 2113.43 |
|                                                                                     | SR604 | 1000:1 | (0.1 to 1200) A                                        | —                              | 1 mA/A*       | —                                 | < 0.5 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Leads             | 2113.44 |
|                                                                                     | SR651 | —      | (0.1 to 1200) A                                        | —                              | —             | 1 mV/A                            | < 0.5 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Jacks             | 2113.45 |
|                                                                                     | SR701 | 1000:1 | 1 mA to 1000 A                                         | —                              | 1 mA/A*       | —                                 | < 0.7 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Jacks             | 2116.29 |
|                                                                                     | SR704 | 1000:1 | 1 mA to 1000 A                                         | —                              | 1 mA/A*       | —                                 | < 0.7 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Leads             | 2116.30 |
|                                                                                     | SR752 | —      | (0.1 to 1000) A                                        | —                              | —             | 1 mV/A                            | < 0.7 °         | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Leads             | 2116.32 |
|                                                                                     | SR759 | —      | 1 mA to 1 A 10 mA to 10 A (0.1 to 100) A (1 to 1000) A | —                              | —             | 1000 mV/A 100 mV/A 10 mV/A 1 mV/A | < 1 °           | 2.05 in (52 mm)        | (1.95 x 0.19) in (50 x 5) mm            | Leads             | 2116.33 |
|  | K100  | —      | 0.1 mA to 3 A                                          | 0.05 mA to ± 4.5 A             | —             | 1 mV/mA                           | N / A           | 0.18 in (4.5 mm)       | N / A                                   | Plugs             | 1200.67 |
|                                                                                     | K110  | —      | (0.1 to 300) mA                                        | (0.05 to ± 450) mA             | —             | 10 mV/mA                          | N / A           | 0.18 in (4.5 mm)       | N / A                                   | Plugs             | 2111.73 |
|  | LM102 | 1000:1 | 50 mA to 200 A                                         | —                              | 1 mA/A*       | —                                 | < 3 °           | 0.63 in (16 mm)        | N / A                                   | Leads             | 2153.04 |
|                                                                                     | LM103 | —      | (0.1 to 200) A                                         | —                              | —             | 1 mV/A                            | < 3 °           | 0.63 in (16 mm)        | N / A                                   | Leads             | 2153.05 |

\*Output Protection for open secondary.

\*\*Phase shift indicated at maximum rating.

Note: All SR probes listed on this chart are UL approved, however not all SR series probes are UL approved; please consult factory.

Consult factory for NIST Calibration price.

## OUTPUT TERMINATIONS

### Lead with BNC

Insulated 6.5 ft (2 m) coaxial cable with insulated BNC connector rated 600 Vrms



### Jacks

Two standard safety banana jacks (4 mm)



### Leads

Double/reinforced 5 ft (1.5 m) leads with 4 mm safety banana plug



### Shrouded Banana Plugs

Two 4 mm safety banana plugs; standard ¾ in (19 mm) spacing



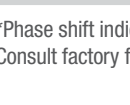
# CURRENT MEASUREMENT PROBES

## AMPFLEX® AND MINIFLEX® PROBES - SELECTION CHARTS

| SERIES                                                                            | MODEL             | RATIO | MEASUREMENT RANGE            | OUTPUT SIGNAL                        | MAXIMUM CONDUCTOR SIZE | CAT. #  |
|-----------------------------------------------------------------------------------|-------------------|-------|------------------------------|--------------------------------------|------------------------|---------|
|  | MF 300-10-2-10-HF | —     | (30 / 300) A                 | 100 mV/A, 10 mV/A                    | 2.95 in (75 mm)        | 2126.84 |
|                                                                                   | MF 3000-14-1-1-HF | —     | 3000 A                       | 1 mV/A                               | 3.93 in (100 mm)       | 2126.86 |
|  | MA114             | —     | (3 / 30 / 300 / 3000) A      | 1 mV/mA, 100 mV/A<br>10 mV/A, 1 mV/A | 4 in (101 mm)          | 2153.41 |
|  | 300-24-2-10       | —     | (30 / 300) A                 | 100 mV/A, 10 mV/A                    | 7.48 in (190 mm)       | 2112.88 |
|                                                                                   | 1000-24-1-1       | —     | 1000 A                       | 1 mV/A                               | 7.48 in (190 mm)       | 2112.39 |
|                                                                                   | 1000-24-2-1       | —     | (100 / 1000) A               | 10 mV/A, 1 mV/A                      | 7.48 in (190 mm)       | 2112.98 |
|                                                                                   | 1000-36-2-1       | —     | (100 / 1000) A               | 10 mV/A, 1 mV/A                      | 11 in (280 mm)         | 2113.00 |
|                                                                                   | 3000-24-1-1       | —     | 3000 A                       | 1 mV/A                               | 7.48 in (190 mm)       | 2112.46 |
|                                                                                   | 3000-36-1-1       | —     | 3000 A                       | 1 mV/A                               | 11 in (280 mm)         | 2112.48 |
|                                                                                   | 3000-24-2-1       | —     | (300 / 3000) A               | 10 mV/A, 1 mV/A                      | 7.48 in (190 mm)       | 2113.05 |
|                                                                                   | 3000-48-2-1       | —     | (300 / 3000) A               | 10 mV/A, 1 mV/A                      | 15 in (381 mm)         | 2112.01 |
|                                                                                   | 6000-36-2-0.1     | —     | (600 / 6000) A               | 1 mV/A, 0.1 mV/A                     | 11 in (280 mm)         | 2113.21 |
|  | 30000-24-2-0.1    | —     | (3000 / 30,000) A            | 1 mV/A, 0.1 mV/A                     | 7.48 in (190 mm)       | 2113.33 |
|                                                                                   | 24-3001           | —     | 300 A / 3000 A <sub>AC</sub> | 10 mV/A, 1 mV/A                      | 7.48 in (190 mm)       | 2120.81 |

Consult factory for NIST Calibration price.

## OSCILLOSCOPE & BNC TERMINATED PROBES

| MODEL                                                                                                   | MEASUREMENT RANGE                                |                                   | OUTPUT SIGNAL                 | PHASE SHIFT*       | MAXIMUM CONDUCTOR SIZE |                                               | OUTPUT CONNECTION         |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------|-------------------------------|--------------------|------------------------|-----------------------------------------------|---------------------------|
|                                                                                                         | AC                                               | DC                                |                               |                    | Ø CABLE                | BUS BAR                                       |                           |
| <br>SL261            | 100 mA to 10 A<br>(1 to 100) A                   |                                   | 100 mV/A<br>10 mV/A           | < 1.5 °            | 0.46 in<br>(12 mm)     | N / A                                         | 6.5 ft (2 m) Lead w / BNC |
| <br>MN261            | (0.1 to 24) A<br>(0.5 to 240) A                  | —                                 | 100 mV/A<br>10 mV/A           | < 2.5 °            | 0.78 in<br>(20 mm)     | N / A                                         | 6.5 ft (2 m) Lead w / BNC |
| <br>SR661            | (0.1 to 12) A<br>(0.1 to 120) A<br>(1 to 1200) A | —                                 | 100 mV/A<br>10 mV/A<br>1 mV/A | < 1 °              | 2.05 in<br>(52 mm)     | (1.96 x 0.19) in<br>(50 x 5) mm               | 6.5 ft (2 m) Lead w / BNC |
| <br>MN251T<br>MN379T | (0.5 to 240) A                                   | —                                 | 1 mV/A                        | ≤ 2.5 °            | 0.78 in<br>(20 mm)     | (0.78 x 0.19) in<br>(20 x 5) mm               | 10 ft (3 m) Lead w / BNC  |
|                                                                                                         | (0.005 to 6) A<br>(0.1 to 120) A                 | —                                 | 200 mV/A<br>10 mV/A           | ≤ 4 °<br>≤ 2.2 °   | 0.78 in<br>(20 mm)     | (0.78 x 0.19) in<br>(20 x 5) mm               | 10 ft (3 m) Lead w / BNC  |
| <br>MH60             | (0.5 to 100) A                                   | (0.5 to 100) A                    | 10 mV/A                       | < 1 °              | 1.02 in<br>(26 mm)     | N / A                                         | 6.6 ft (2 m) Lead w / BNC |
| <br>MR417            | (0.5 to 40) A<br>(0.5 to 400) A                  | (0.5 to 60) A<br>(0.5 to 600) A   | 10 mV/A<br>1 mV/A             | ≤ 2.2 °<br>≤ 1.5 ° | 1.18 in<br>(30 mm)     | 2 bus bar<br>(1.24 x 0.39) in<br>(32 x 10) mm | 6.6 ft (2 m) Lead w / BNC |
| <br>MR527            | (0.5 to 100) A<br>(0.5 to 1000) A                | (0.5 to 150) A<br>(0.5 to 1400) A | 10 mV/A<br>1 mV/A             | ≤ 2.2 °<br>≤ 1.5 ° | 1.53 in<br>(39 mm)     | 2 bus bar<br>(1.96 x 0.19) in<br>(50 x 5) mm  | 6.6 ft (2 m) Lead w / BNC |

\*Phase shift indicated at maximum rating. Note: All probes are rated 600 V CAT III and CE compliant. Not all models are UL approved; please consult factory.  
Consult factory for NIST Calibration price.