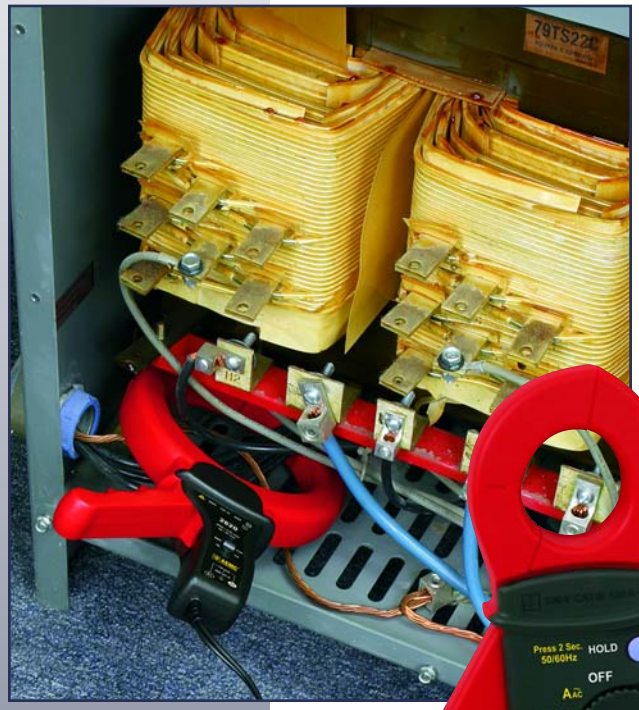
LEAKAGE CURRENT METERS AND PROBES



- Check for leakage and locate insulation breakdowns on live circuits
- TRMS leakage current clamp-on meter
- AC leakage current probe
- Artificial neutral

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

TRMS Leakage Current Meter Model 565

FEATURES

- Check for leakage and locate insulation breakdowns on live circuits
- Measures leakage current up to 600mA with up to 10µA resolution
- Measures current up to 100Arms
- Measures up to 600VAC/DC
- Measures Hz on either V or A inputs
- Measures Resistance and Continuity
- Hold feature freezes Value
- Max feature keeps track of highest measured In-rush value
- Zero button ideal for measuring relative values
- Filter to isolate 50/60Hz fundamental from harmonics
- Compatible with VDE 0404

APPLICATIONS

- Ground fault current measurement
- Electrical safety compliance testing
- Medical device safety testing
- Process loop monitoring
- General AC load monitoring
- Industrial troubleshooting

The TRMS Clamp-On Leakage Current Meter Model 565 is designed to measure low AC currents, which are typically leakage currents in ground conductors. Low currents are measured using either the 60mA or the 600mA range. The high sensitivity of the probe (10µA and 100µA) is possible through special jaw construction and, in particular, critical shielding of the jaws. At low measurement levels, this shielding out of the noise is critical for low sensitivity, accuracy and stability.

Leakage current may be measured on a ground conductor and through the vector sum on multi-conductors. On a grounded system, clamp around the two or three conducting legs (not the ground conductor). The vector sum of the load currents will cancel out, leaving the leakage current measured.

The Model 565 may be used as a standard clamp-on meter measuring to 100Arms, as well as VAC and VDC, resistance and continuity (with a buzzer). In mAAC and AAC, a low-pass filter, which will ignore all harmonic currents, can be activated. In this mode, only the fundamental signal is measured. The difference between the full frequency signal (WIDE displayed on LCD) and Filtered mode (50/60Hz displayed on LCD) essentially corresponds to the current attributable to harmonics.

The Model 565 is ergonomic in design and fits well in the hand, facilitating one hand operation. The jaw size is compact yet designed to accommodate the most common conductors up to 1" (26mm) in diameter.

Measuring leakage current on a ground wire with the TRMS Leakage Current Meter Model 565

SPECIFICATIONS

MODEL	565	
ELECTRICAL		
mA AC Current (TRMS, Auto-Ranging)		
Measurement Range	0 to 600mA	
Resolution 60mA	0.01mA (10µA)	
Resolution 600mA	0.1mA (100µA)	
Accuracy 50 to 60Hz	1.2% of Reading ± 5cts	
Accuracy 50 to 500Hz	2.5% of Reading ± 5cts	
Accuracy 500Hz to 3kHz	3.5% of Reading ± 10cts	
AC Current (TRMS, Auto-Ranging)		
Measurement Range	10 to 100A	
Resolution 10A	0.001A (1mA)	
Resolution 100A	0.01A (10mA)	
Accuracy 50 to 60Hz	1.2% of Reading ± 5cts	
Accuracy 50 to 500Hz	2.5% of Reading ± 5cts	
Accuracy 500Hz to 3kHz	3.5% of Reading ± 10cts	
AC Voltage (TRMS)		
Measurement Range	0 to 600V	
Resolution	0.1V	
Accuracy 50 to 60Hz	1.0% of Reading ± 5cts	
Accuracy 50 to 500Hz	1.2% of Reading ± 5cts	
Accuracy 500Hz to 3kHz	2.5% of Reading ± 10cts	
DC Voltage		
Measurement Range	0 to 600V	
Resolution	0.1V	
Accuracy	1.0% of Reading ± 3cts	
Frequency (Auto-Ranging)		
Function	A-Hz	V-Hz
Resolution 0 to 100Hz	0.1Hz	0.1Hz
Resolution 100Hz to 1kHz	1Hz	1Hz
Sensitivity	10mArms min	5Vrms min
Accuracy	0.5% of Reading ± 2cts	
Resistance		
Measurement Range	0 to1kΩ	
Resolution	0.1Ω	
Accuracy	1.0% of Reading ± 3cts	
Continuity		
Measurement Range	0 to1kΩ	
Resolution	0.1Ω	
Buzzer	<35Ω ± 25Ω	
Overload Protection	660Vrms/150Arms – OL is displayed and buzzer will sound	
Nominal Sample Rate	Two measurements per second (approx.)	
MAX Sample Rate	100ms	
Filter	On (50/60Hz only); Off (Full frequency range)	
In-Rush	Max 100ms sample time	
Power Source	Two 1.5V AAA batteries	
Battery Life	45 hrs (approx.)	
Power-Off	10 min approx with user override	
Low Battery Indication	is displayed when battery voltage is low	
MECHANICAL		
Dimensions	8.5 x 2.5 x 1.18" (218 x 64 x 30mm)	
Jaw Opening	1.10" (28mm)	
Maximum Conductor Size	1" (26mm)	
Weight	10 oz (280g) with batteries	
DISPLAY		
Display Type	Four digit LCD	
Backlight	LED with 180 sec Auto-Off	
ENVIRONMENTAL		
Operating Temperature	32° to 104°F (0° to 40°C); <80% RH (non-condensing)	
Storage Temperature	14° to 140°F (-10° to 60°C); <70% RH (non-condensing)	
SAFETY		
Safety Rating	EN 61010-1 Ed. 2001, EN 61010-2-032 Ed. 2003, 600V, Cat. III	
Double Insulation ⧈	Yes	
CE Mark	Yes	

CONSTRUCTION

The Model 565 includes two color-coded test leads, soft carrying case and user manual.

AC Leakage Current Probe Model 2620

FEATURES

- Very high sensitivity
- Differential or leakage current from 500µA
- Current up to 400A
- Two switch-selectable measurement ranges: 4AAC/400AAC
- Large inside jaw diameter (>4") allows use on large or multiple conductors
- Work with single-, dual- and three-phase networks
- Connect directly to DMMs on mV or VAC range

APPLICATIONS

- Preventive maintenance
- Equipment troubleshooting on electrical distribution systems
- High accuracy low-current measurements
- Measure fault currents on three-phase, three-wire systems

The Model 2620 measures leakage current shunted to ground caused by insulation faults. It enables the operator to locate failures when they occur, or anticipate them before they occur, without shutting down equipment or spending hours troubleshooting.

It is designed specifically for locating low current faults on high current loads. The detector is a sensitive AC current transformer capable of measuring differential or leakage current as low as 500µA, and may be used to measure current up to 400A continuous.

The Model 2620 provides two output ranges: 1mV/mAAC or 1mV/AAC. The output leads are terminated with standard 4mm banana plugs capable of interfacing with any standard multimeter. The use of a digital multimeter with analog bargraph is recommended; Digital to provide accurate readings, and an analog bargraph to track trends.

The Model 2620 measures leakage currents on single or multi-phase systems. Currents measured may be in or out of phase, balanced or unbalanced.

Principle (*see page 8*): when clamping around all conductors, the net magnetic field at any instant in time will be zero if all the conductors surrounded by the leakage current detector are supplying all the current delivered to and received from the load. If any current is diverted through any alternate path, such as an insulation breakdown to ground, the net loss will be detected producing an output proportional to the amplitude of the fault current.

The Model 2620 may also be used as a highly accurate clamp-on current probe. With its 4" jaw opening and range of 500µA to 200A, the Model 2620 provides a versatile way to analyze unbalanced current measurements, leakage values on grounding conductors and ground loop currents.

Model 2620 checking for ground fault currents

SPECIFICATIONS

MODEL		2620	
ELECTRICAL			
		4A Range	**400A Range**
Current Range		500µA to 4A	500mA to 400A
Output Signal		1mV/mA (4V max)	1mV/A (400mV max)
Accuracy	500µA to 10mA	3% of Reading ± 1mV	–
	10mA to 100mA	0.5% of Reading ± 0.5mV	–
	100mA to 4A	0.5% of Reading ± 0.5mV	–
	500mA to 10A	–	0.5% of Reading ± 0.5mV
	10A to 100A	–	0.35% of Reading ± 0.5mV
	100A to 400A	–	0.35% of Reading ± 1mV
Phase Shift	10mA to 100mA	<15°	–
	100mA to 4A	<10°	–
	10A to 100A	–	<1°
	100A to 400A	–	<0.6°
Load Impedance (DMM)		1MΩ min	
Frequency Range		48 to 1000Hz	
Output Termination		5 ft (1.5m) Lead with 4mm safety banana plugs	
MECHANICAL			
Dimensions		11.22 x 6.89 x 1.77" (285 x 175 x 45mm)	
Jaw Opening		4.4" (112mm)	
Maximum Conductor Size		4.4" (112mm)	
Weight		2.87 lbs (1300g)	
ENVIRONMENTAL			
Operating Temperature		-14° to 131°F (-10° to 55°C); 0 to 85% RH (non-condensing)	
Storage Temperature		-40° to 158°F (-40° to 70°C); 0 to 85% RH (non-condensing)	
SAFETY			
Safety Rating		EN 61010-2-032, 600V Cat. III	
Double Insulation ⧈		Yes	
CE Mark		Yes	

CONSTRUCTION

Note: See Artificial Neutral Model AN-1 for ungrounded systems

Artificial Neutral Model AN-1

The Artificial Neutral Model AN-1 generates a momentary grounded artificial neutral to allow the measurement of fault currents on ungrounded three-phase systems.

The Artificial Neutral is grounded intermittently through a relay driven by an internal electronic timer. This periodic grounding technique performs three functions – limits the possibility of insulation faults within the instrument, allows for better discrimination of actual fault current and limits instrument overheating.

Relay closure time is switch selectable, Fast (0.5 seconds) or Slow (2.3 seconds), so that the ground fault clamp can be used on a meter with either an analog or digital display. An internal buzzer, also driven by the relay, is activated each time the neutral connection is grounded. Three LEDs, one for each phase, show the presence of each of the three phases prior to measurement. A fourth green LED indicates that the instrument is operating.

SPECIFICATIONS

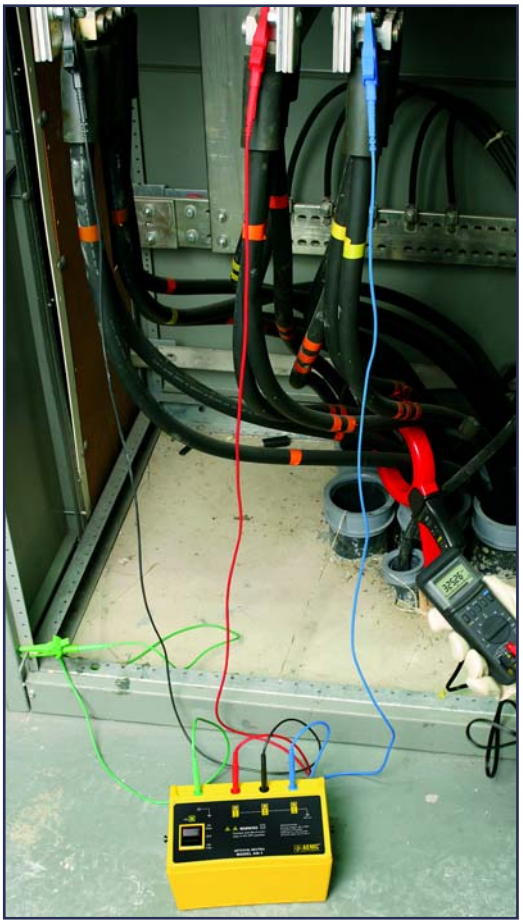
MODEL	AN-1
ELECTRICAL	
Working Voltage	30 to 600V
Frequency	45 to 65Hz
Resistance Per Phase	3.9kΩ ± 5%
Relay Duty Cycle	Slow: 500ms – Fast: 2.3 seconds
Power Source	Eight 1.5V AA batteries
MECHANICAL	
Dimensions	8.7 x 5.4 x 5.9" (220 x 136 x 150mm)
Weight	2.9 lbs (1.3kg)
Case	Fire resistant polycarbonate UL94 VO
Protection Index	IP20
ENVIRONMENTAL	
Operating Temperature	32° to 122°F (0° to 50°C); 10 to 90% RH (non-condensing)
Storage Temperature	-40° to 158°F (-40° to 70°C); 10 to 90% RH (non-condensing)
SAFETY	
Safety Rating	600V Cat. III
Double Insulation ▣	Yes
CE Mark	Yes

FEATURES

- Designed for ungrounded networks — provides intermittent path to ground for leakage current measurements
- Works from 30 to 600VAC
- Red LED phase fault indicator
- Switch selectable ground fault cycling of 500mS or 2.3 seconds
- Buzzer alerts each momentary fault
- Battery operated
- Double insulated, fire retardant case
- Four color-coded 5 ft 1000V rated leads supplied with alligator clips
- Works with Model 2620 and other leakage current probes

APPLICATIONS

- Troubleshoot faulty three-phase ungrounded devices
- Assist in leakage current measurements on ungrounded systems
- Create momentary ground conditions to detect fault currents



Model AN-1 creates a momentary ground to assist in fault current detection.

AC Current Probe Model SR759

FEATURES

- Measurement range of 1mA to 1200AAC
- Large jaw opening accommodates up to two 500MCM conductors
- Ergonomic design and easy operation
- Conforms to EN 61010, 600V Cat. III safety standard
- Low phase shift ideal for power measurements
- Available with mA or mV output signals
- Designed for DMMs, recorders, loggers, oscilloscopes, power and harmonic meters
- Output terminated with 4mm safety shrouded banana plugs on 5 ft (1.5m) leads
- CE Mark

AC Current Probe Models MN103 & MN114

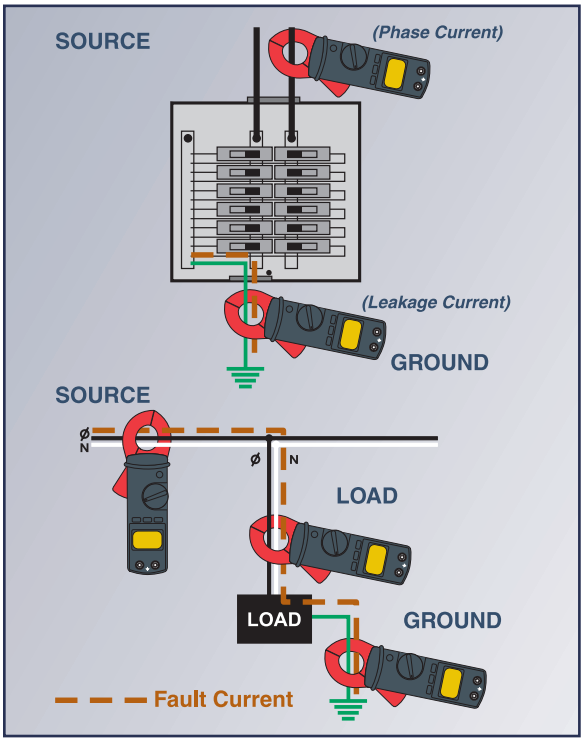
FEATURES

- Small, compact and very tough AC probes
- "Clothes pin" shape makes them ideal for use in tight areas, such as breaker panels, controller panel, or outlets
- Measurements from 1mA to 100AAC (Model MN103)
- Measurements from 1mA to 10AAC (Model MN114)
- Excellent companion to all DMMs. Permits very low AC current measurements.
- Output terminated with 4mm safety shrouded banana plugs on 5 ft (1.5m) leads

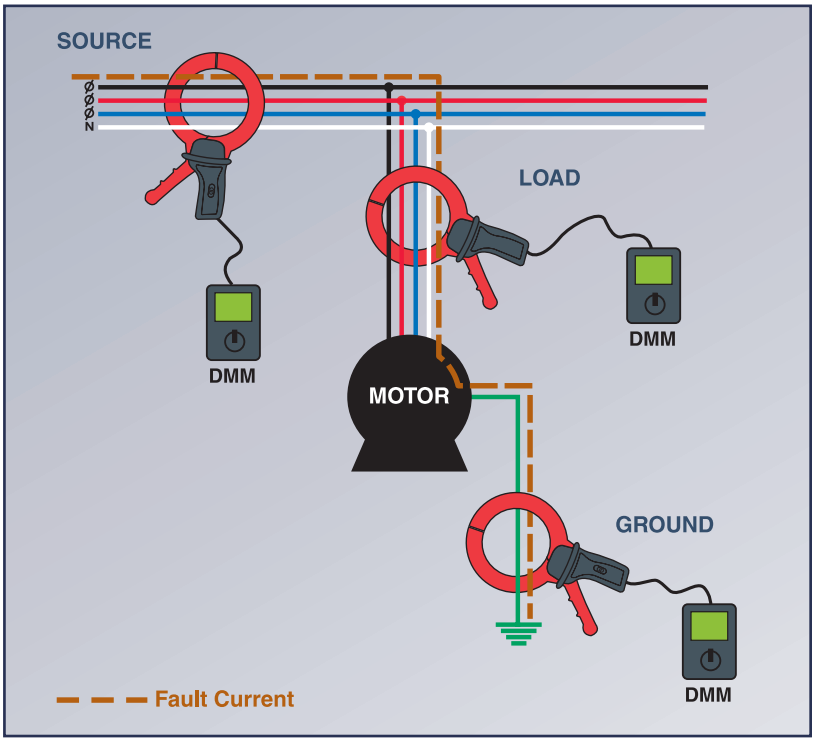
SPECIFICATIONS

MODELS	SR759	MN103	MN114
ELECTRICAL			
Measurement Range	1mA to 1AAC 10mA to 10AAC 0.1 to 100AAC 1 to 1000AAC	1mA to 10AAC 1A to 100AAC	1mA to 10AAC
Output Signal	1000mVAC/AAC (1V @ 1A) 100mVAC/AAC (1V @ 10A) 10mVAC/AAC (1V @ 100A) 1mVAC/AAC (1V @ 1000A)	1mVAC/mAAC (100mV @ 100A)	100mVAC/AAC (1V @ 10A)
MECHANICAL			
Maximum Conductor Size	2.05"Ø (52mm)	0.47"Ø (12mm)	0.47"Ø (12mm)
Maximum Bus Bar Size	One 1.95 x 0.19" (50 x 5mm)	–	–
Output Termination	5 ft (1.5m) Lead	5 ft (1.5m) Lead	5 ft (1.5m) Lead

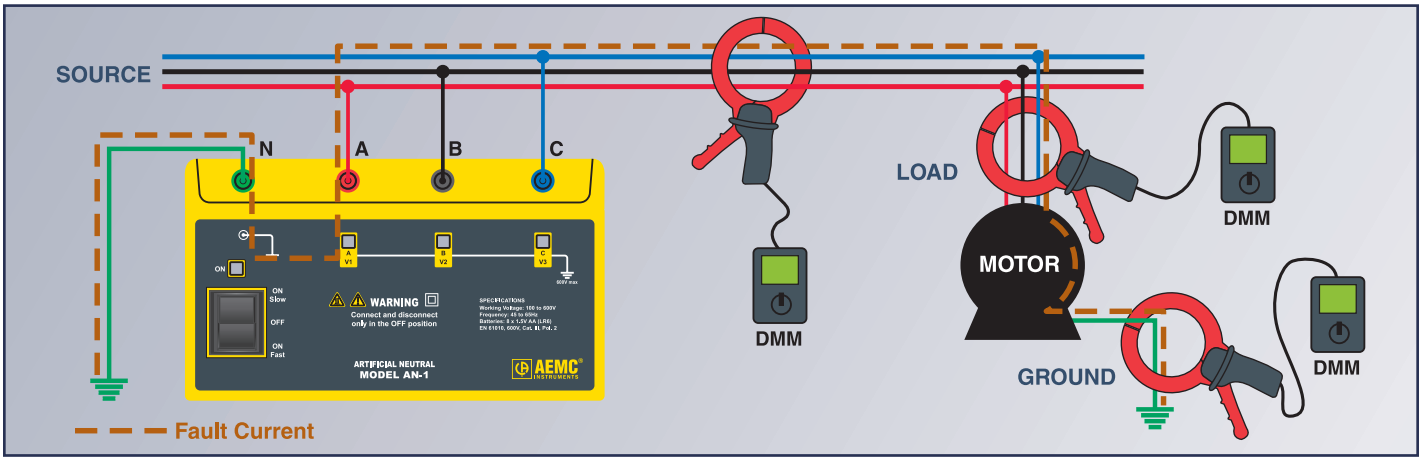
Typical Points for Measuring Leakage Current



On single phase systems, the Model 565 will measure leakage current at the source, the load or the ground.



On multi-phase systems, the Model 2620 can be used with a standard multimeter to measure leakage current at the source, the load or at the ground.



On ungrounded networks, the Model AN-1 generates a momentary grounded artificial neutral. Leakage current measurements can then be made, using a leakage current clamp and a multimeter, between the Model AN-1 and the load.

ORDERING INFORMATION — CATALOG NO.

TRMS Leakage Current Meter Model 565 (TRMS,100A, 600VAC/DC, Hz, Ohms, Continuity) ..... **Cat. #2117.56**
Includes test leads, soft carrying case, two 1.5V AAA (LR03) batteries and user manual

AC Leakage Current Probe Model 2620 (4A, 1V/A & 400A, 1mV/A output) ..... **Cat. #2125.52**
Includes user manual

Artificial Neutral Model AN-1 ..... **Cat. #1971.01**
Includes user manual

Other Low Current Probes

AC Current Probe Model SR759 (Lead – 1/10/100/1000A) ..... Cat. #2116.33
AC Current Probe Model MN103 (Lead – 1mV/mA – 10A max & 1mV/A – 100A max) ..... Cat. #1031.02
AC Current Probe Model MN114 (Lead – 100mV/A – 10A max) ..... Cat. #2110.71

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