

# ATO-400P

## Micro-ohm Meter



**Vanguard Instruments Company**

[www.vanguard-instruments.com](http://www.vanguard-instruments.com)

# Accurately

## FEATURES

- Digital resistance reading from 1 micro-ohm to 300 Milli-ohms
- Built-in 2.5-inch wide thermal printer for printing test reports
- Stores 4,000 readings
- Computer interface via RS-232C or USB port
- Test current from 10–400A



1. RUN TEST 02/14/09  
2. SETUP 15:12:46  
3. CAL CHECK



# ATO-400P

## Microprocessor-controlled Accuracy and Reliability

The ATO-400P micro-ohmmeter is specifically designed for sub-station applications to measure EHV circuit-breaker contact resistances, bushing contact joints, or any low resistance. This microprocessor-controlled micro-ohmmeter can accurately measure low resistances ranging from 1 micro-ohm to 300 milli-ohms at any test current from 10A to 400A. Resistance readings are displayed directly in micro-ohms or milli-ohms. No calculation is required to compensate for lead resistances. A custom switching power supply helps keep the ATO-400P's weight low at 43 lbs (19.5 kg) and makes it an ideal unit for field use. For greater flexibility in the field, the ATO-400P comes with a built-in 2.5-inch wide thermal printer used for printing test reports.

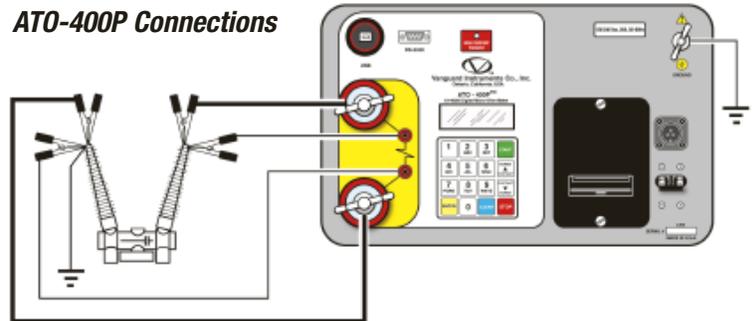
The ATO-400P outputs an un-filtered direct current from 10A to 400A to the resistance load being measured. A rugged, 16-key alpha-numeric keypad is used to control the unit. The burn-in time for a typical resistance test can be selected from 5 seconds to 60 seconds. An Auto Test Mode is also available and can be initiated simply by applying the sensor cables' leads across the two points of interest. This feature is very convenient when measuring a sequence of several resistance values in a breaker contact.

The ATO-400P features a back-lit LCD screen (20 characters by 4 lines) that is viewable in both bright sunlight and low-light levels. The unit can store up to 63 records (each may contain up to 64 readings) in Flash EEPROM. The built-in 2.5-inch wide thermal printer can be used to print test reports. Stored test reports can be recalled for review, or they can be transferred to a PC via the built-in RS-232C or USB interface ports. A Windows® XP/Vista-based software application is also provided with each unit and can be used to transfer test records to a PC. Test records can also be reviewed, printed or exported in text or Microsoft® Excel format via the software application.

The ATO-400P is furnished with two #1/0 15-foot test cables. Custom test cable lengths are available as an option. Heavy-duty, welding-type, C-clamps are also available as an optional accessory. These can be used to connect the test cable leads to a wide variety of bushing sizes, bus-bars and other conductors requiring low-resistance test contacts.

The ATO-400P's power supply is thermally protected and the contact-sensing inputs are protected against static-discharge damage.

## ATO-400P Connections



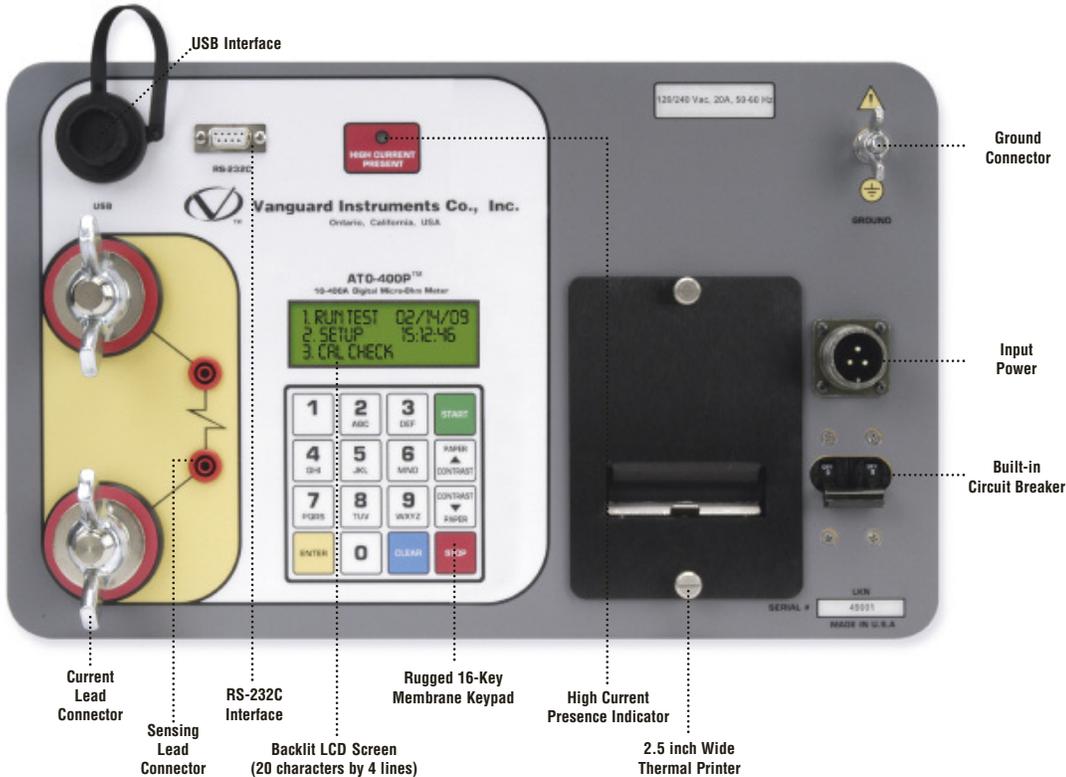
## Ordering Information ATO-400P

ATO-400P with 15-ft Test Cables  
ATO-400P Shipping Case  
15-foot Test Cable  
30-foot Test Cable  
C-Clamp Set (2 clamps)  
Alligator Clamp Set (2 clamps)  
2.5-inch Printer Paper

Part No: ATO-400P  
Part No: ATO-400P Case  
Part No: ATO-400P Cable-15ft  
Part No: ATO-400P Cable-30ft  
Part No: C-Clamps  
Part No: Alligator-Clamps  
Part No: Paper - TP3

# Special-Purpose Micro-ohmmeter

# Measure *Resistance from 1 micro-ohm to 300 milli-ohms*



Thermal Printer Output	
REC NUMBER 4	
TEST RESULTS	
DATE: 12/30/04	TIME: 09:24:07
COMPANY:	
STATION:	
CIRCUIT:	
MFR:	
MODEL:	
S/N:	
KVA RATING:	
OPERATOR:	
TEST CURRENT: 400 AMPS	
BURN-IN TIME: 5 Seconds	
TEST RESULT: 99.4 MICRO-OHMS	
@ 400.6 AMPS	
NOTES: _____	
TEST CURRENT: 10 AMPS	
BURN-IN TIME: 5 Seconds	
TEST RESULT: 99.6 MICRO-OHMS	
@ 9.9 AMPS	
NOTES: _____	
<small>VANGUARD INSTRUMENT CO., INC. REV. 0.88(C) 2004            1718 GREENLEAF CT            CHAPARRAL, CA 91791, USA            TEL: 909-923-9393 FAX: 909-923-9393            WWW.VANGUARD-INSTRUMENTS.COM            SERIAL NUMBER: 78524</small>	

## SPECIFICATIONS

<b>TYPE</b>	Portable micro-ohmmeter
<b>PHYSICAL SPECIFICATIONS</b>	16.8"W x 12.6"H x 10.6"D (42.6 cm x 32.0 cm x 27 cm); Weight: Less than 43 lbs (19.5 kg)
<b>INPUT POWER</b>	100 – 240 Vac, 50/60 Hz
<b>RESISTANCE READING RANGE</b>	1 micro-ohm – 300 milli-ohms (1 micro-ohm resolution); Accuracy: $\pm 1\%$ reading, $\pm 1$ count
<b>TEST CURRENT RANGE</b>	Thermally-protected DC power supply, 10 Amperes – 400 Amperes, selectable in 1A steps
<b>TEST DURATION</b>	5 seconds – 60 seconds, selectable
<b>DISPLAY</b>	Back-lit LCD Screen (20 characters by 4 lines); viewable in bright sunlight and low-light levels
<b>PRINTER</b>	Built-in 2.5-inch wide thermal printer
<b>KEYPAD</b>	Rugged membrane keypad (10 alpha-numeric keys, 6 function keys)
<b>INTERNAL TEST RECORD STORAGE</b>	Stores 63 records of up to 64 readings
<b>COMPUTER INTERFACES</b>	One RS-232C port, One USB port
<b>PC SOFTWARE</b>	Windows® XP/Vista-based software is included with purchase price
<b>SAFETY</b>	Designed to meet IEC61010 (1995), UL61010A-1, CSA-C22.2 standards
<b>ENVIRONMENT</b>	Operating: -10°C to 50°C (15°F to 122°F); Storage: -30° C to 70°C (-22°F to 158°F)
<b>HUMIDITY</b>	90% RH @ 40°C (104°F) non-condensing
<b>ALTITUDE</b>	2,000m (6,562 ft) to full safety specifications
<b>CABLES</b>	15-foot (#1/0 AWG) test cables, ground cable, power cord
<b>OPTIONS</b>	Transportation case, custom test cable lengths, C-clamps
<b>WARRANTY</b>	One year on parts and labor

Note: The above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F). Specifications are subject to change without notice.

### **Vanguard Instruments Company, Inc.**

Vanguard Instruments Co., (VIC), was founded in 1991. Currently, our 28,000 square-foot facility houses Administration, Design & Engineering, and Manufacturing operations. From its inception, VIC's vision was, and is to develop and manufacture innovative test equipment for use in testing substation EHV circuit breakers and other electrical apparatus.

The first VIC product was a computerized circuit-breaker analyzer, which was a resounding success. It became the forerunner of an entire series of circuit-breaker test equipment. Since its beginning, VIC's product line has expanded to include microcomputer-based, precision micro-ohmmeters, single and three-phase transformer winding turns-ratio testers, winding-resistance meters, transformer tap-changing controllers, megaohm resistance meters, and a variety of other electrical utility maintenance support products.

VIC's performance-oriented products are well suited for the utility industry. They are rugged, reliable, accurate, user friendly, and most are computer controlled. Computer control, with innovative programming, provides many automated testing functions. VIC's instruments eliminate tedious and time-consuming operations, while providing fast, complex, test-result calculations. Errors are reduced and the need to memorize long sequences of procedural steps is eliminated. Every VIC instrument is competitively priced and is covered by a liberal warranty.

**Vanguard products are available from:**



**Vanguard Instruments Company, Inc.**

1520 S. Hellman Ave. • Ontario, California 91761 USA • P 909-923-9390 • F 909-923-9391  
[www.vanguard-instruments.com](http://www.vanguard-instruments.com)