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# Overview of Products and Services from TESCO, Knopp and TESCO-PMI



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For REFC

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# Welcome to TESCO

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- TESCO – started 1904 – focused on and a leader in Meter equipment for meter shops, labs and field services, we are one year younger than Manila Electric Company.
- Knopp – started 1928 – now part of TESCO – focused on and the world wide leader in Transformer testing equipment up to 6,000 amps and 36,000 volts for electric Utilities around the globe
- TESCO – Power Measurement Inc. – started in 2014 – development and manufacturing facility focused on developing and producing new power measurement equipment for the electric utility industry. Now a part of TESCO and Knopp and will also become a manufacturer of products and provider of calibration and other meter service related services for our electric utility customers in the Philippines and the Pacific Rim.





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# Current Transformer Testing System

## KCTS-8000

The Knopp Current Transformer Testing System (Type KCTS-8000) is designed to measure the accuracy of instrument transformers having 1 or 5 ampere secondaries and primaries of up to 8000 amperes. The system uses a high accuracy multi-range current transformer as a reference standard. All ANSI standard burdens are included. The phase angle and ratio errors of the transformer-under-test (TUT) are measured by the built-in Knopp Automatic Transformer Comparator.





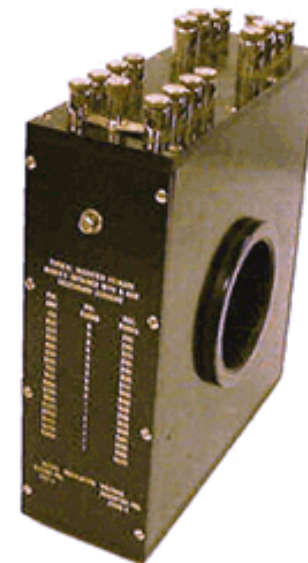
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# Precision Multirange Current Transformer

## P-5000 (and P-12000)

The P-5000 and P-12000 Precision transformers are laboratory standards. These unit's excellent accuracy and the Knopp One-to-One calibrating feature make these precision transformer well-suited as a standard for calibration work. These transformer Standards can provide a very accurate determination of the ratio and phase angle characteristics of current instrument transformers having ratios from 5 to 5,000 amperes for the P-5000 and up to 12,000 amps for the P-12000. These transformers can also accurately extend the range of a 5 ampere ammeter or wattmeter to cover all current values up to 5,000 and 12,000 amps respectfully.

The P-5000 provides eight self-contained primary ranges from 5 to 100 amperes. These ranges are brought out to binding posts on the top of the transformer. A 240 turn secondary is provided for use with these primary taps; other secondary taps are provided for other ranges. Ranges above 100 amperes are obtained by passing a primary conductor through the transformer window. Various primary ranges are obtainable by varying the number of through-turns and choosing from among the available secondary taps. The P-12000 operates in a similar fashion and all are traceable back to an international Standard as part of our ISO 17025 process.



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# Current Transformer Testing System

## KC-1500

The Knopp Type KC-1500 Current Transformer Testing System is designed to measure the accuracy of instrument transformers having 1 and 5 ampere secondaries and primaries of up to 1500 amperes. The KC-1500 is capable of testing transformers with 1 or 5 ampere secondaries. The system uses a high accuracy multi-range current transformer as a reference standard.

The system is well suited for utilities whose current transformer testing needs include primary currents up to and including 1500 amperes. The phase angle and ratio errors of the transformer-under-test (TUT) are measured by the built-in Knopp Automatic Transformer Comparator.





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# Automatic Transformer Comparators

The Knopp KATC Automatic Transformer Comparators (KATC series) provide the most convenient means available to measure instrument transformer ratio and phase angle errors. Some of the comparator features are:

- Reduced testing time - test results are typically available within three seconds
- Automatic operation (no manual "nulling" or adjustments required)
- Microprocessor control
- Auto ranging capability
- Digital display
- Calculation and display of ANSI accuracy class
- Fully protected circuitry
- RS-232C output
- Interchangeable with other Knopp comparators



KATC-C



KATC-C1

The KATC-C1 Automatic Transformer Comparator is an enhanced version of the popular KATC-C Comparator. Features of the KATC-C1 include:

- The ability to test transformers with 1 or 5 ampere secondaries
- Automatic sensing of 50 or 60 Hertz current
- Improved data handling capabilities including the ability to be controlled by a remote computer
- Improved resistance to damage from excessive test current



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# Voltage Transformer Testing System

## KVTS

The Knopp Voltage Transformer Testing System is designed to measure the accuracy of instrument transformers having 120 volt secondaries and up to 14,400 volt primaries (special order for up to 36,000 volt primaries is available). The system includes a control console which contains the control circuitry, ANSI standard burdens, and the Knopp Automatic Transformer Comparator. The Knopp precision and loading transformer set is also included (as pictured) and is connected to the console via a special cable.





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# Precision Multirange Voltage Transformer

The Type WP-14000 Transformer is a laboratory standard. The accuracy and the Knopp one-to-one calibrating feature make this device well-suited as a standard for precision calibration work. This transformer makes possible very accurate determination of the ratio and phase angle characteristics of voltage instrument transformers having ratings from 120 to 14,400 volts. This transformer also makes it possible to accurately extend the range of a 120 volt voltmeter or wattmeter to cover all voltage values up to 14,400 volts.

The WP-1400) Transformer, like other Knopp Precision Multirange Transformers, has excellent ratio and phase angle characteristics with respect to both inter-range accuracy and overall accuracy. Knopp also provides a WP-36000 Transformer provides the same level of accuracy for customers that want to extend their testing capability up to 36,600 volts.







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# ANSI Standard Burden Sets

Testing and calibrating instrument transformers often requires standard burdens of reliable accuracy and stability, and burdens that are immune to stray fields and harmonics. The burden sets Knopp offers have been carefully designed to meet these requirements. They provide the standard burdens required for the testing of current and voltage transformers for metering service, and for the testing (within the current rating provided by the sets) of current transformers for relaying applications, all as called for by ANSI/IEEE C57.13-2016.

***All the current burden sets are designed to be used with external leads consisting of a 5-foot pair of #8 copper conductors. This becomes very significant at the lower burden values, since the external leads constitute a significant part of the total burden.***

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## ANSI Standard Burden Sets ***Voltage and Current***



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# Loading Transformer: CL-6

This readily portable Knopp Loading Transformer weighs only 60 pounds and measures 12" long, 9" wide, and 10" high. Its sturdy enclosure provides protection and adequate ventilation. Two convenient carrying handles are provided.

The insulating terminal panel is rigidly secured to the transformer frame, and heavy-current, bus-bar-type terminals are securely bolted to the panel. The two output terminals each have two connection surfaces, one on a vertical plane and one on a horizontal plane, for maximum convenience in connecting the heavy current leads and in changing, when necessary, the series-parallel links. The links and the output connections cannot interfere with each other. All terminals and connection links are plated

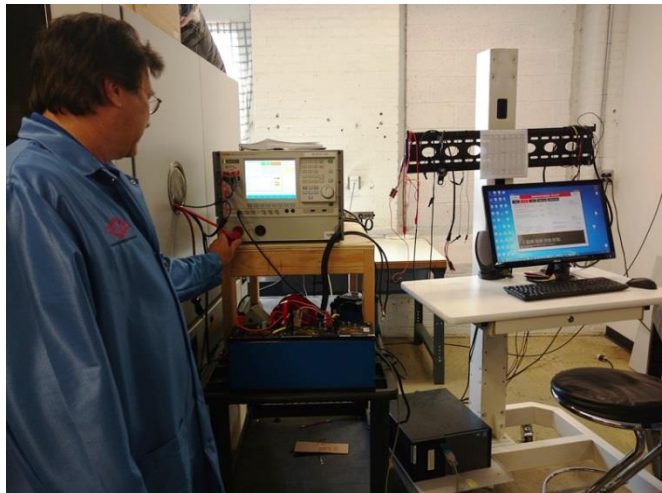
Both the primary and the secondary are insulated for a 4,000 volt, 60 cycle, one-minute test. A grounding stud is provided on the enclosure.



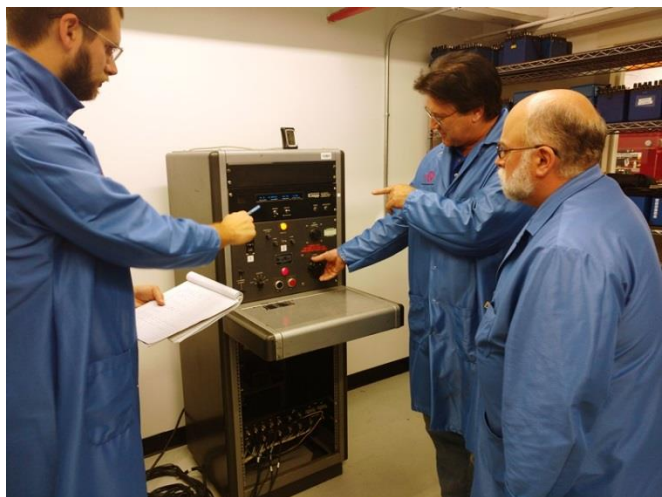


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# ISO 17025 Lab



TESCO has been ISO 9001 certified since 1999 and in late 2017 decided to obtain ISO 17025 accreditation for our Calibration Laboratory in Bristol, Pennsylvania. We believe that this accreditation will provide additional confidence and rigor to our standards calibration and measurement capabilities for ourselves in our continual development environment as well as for our customers who rely on us to calibrate TESCO and other energy measurement equipment.



We are also working hard to obtain the same accreditation for our west coast lab at our Knopp facility and at our Cebu facility (TESCO-PMI) in the Philippines. All three facilities will manufacture, service and provide calibration services for our transformer and meter testing customers. Each will have the same capability for testing and providing traceability to an international standard for Meter and Meter Accuracy testing equipment as well as Transformers and Transformer testing equipment .





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# Multi-Position Meter Test Boards





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# Next Generation Meter Testing Equipment



- Multi-Position Qualification Boards
- Meter Engineering Boards
- Single and Multi-Position Test Boards





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# 2100 Desktop Meter Station

**METER FORMS:** FORM SELECTABLE 1, 2, 3, 4, 5/45, 6/36, 8, 9, 12, 14, 15, 16

**VOLTAGES:** VOLTAGE SELECTABLE 120/208/240/277 VA; 480 VA (OPTIONAL)

**DIMENSIONS:** 12" X 11" X 10" (STANDARD MODEL); 12" X 13" X 10" (DISCONNECT & BUILT-IN LOAD MODELS) (W X D X H)

**TILT CHASSIS (CATALOG NO. 2100-T):** TILTS TO VERTICAL FOR ELECTROMECHANICAL METERS

**INTERNAL LOAD (CATALOG NO. 2100-I):** 0.5 AMP PHANTOM LOAD

**EXTERNAL LOAD (CATALOG NO. 2100-E):** UP TO 50 AMPS

**BUILT-IN LOAD (CATALOG NO. 2100-L):** 0, 5 AND 30 AMPS (CUSTOM LOADS AVAILABLE)

**DISCONNECT OPERATION (CATALOG NO. 2100-D)**

**LOAD RECEPTACLE (CATALOG NO. 2100-R):** 120 VAC RECEPTACLE

**SPECIAL REQUEST (CATALOG NO. 2100-S):** CONTACT TESCO TO SPEAK WITH A PRODUCT SPECIALIST

**CUSTOM FORMS (CATALOG NO. 2100-F):** CONTACT TESCO TO SPEAK WITH A PRODUCT SPECIALIST

**480 VAC METER TESTING (CATALOG NO. 2100-V)**





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# 2210 Desktop Test Interface Station



TESCO's new Desktop Test Interface Station (Catalog No. 2210) provides metering professionals with exceptional testing flexibility. The Test Interface Station is ergonomically designed for meter technicians working in a lab or a desktop, yet still rugged for field use. The Test Interface Station includes a zero insertion force (ZIF) meter socket, voltage selection, form selection, open/closed-link selection and bi-directional cabling to power a load box/test kit & connect test standard potentials. When combined with a test kit/test standard and powered via 120 VAC, the Test Interface Station creates a single position, stand-alone, meter accuracy testing device for various socket based meters (both mechanical & solid-state).

The Desktop Test Interface Station, with the proper load box, boasts a 50 amp max current input and operates on voltages up to 480V. An optional built-in load is also available, which will provide 5 or 30 amps, or you could choose the internal load which provides 0.5 amps. With the optional disconnect operation (only functional when powered via 120 VAC/inverter), you'll be able to conduct all required meter testing while at your desktop (or in the field).

**Meter Test Current:** 50 Amps max

**Meter Socket Rating:** 600 Volts

**Meter Forms:** 1, 2, 3, 4, 5/45, 6/36, 8, 9, 12, 14, 15 and 16

**Voltage:** 0, 120, 208, 240, 277, 480 (optional), custom voltages available

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# 2199 Desktop MQB

## 2199 Desktop Meter Qualification Board Catalog No. 2199

Providing complete capabilities for

- evaluating meters and communications performance

The 2199 provides every option possible on TESCO's 2100 Desktop Meter Station plus much more including:

- generate any voltage and load conditions the meter may encounter in the field
- Apply non-sinusoidal voltages with complex load waveforms
- Perform disconnect tests and reconnect tests without having to worry about being able to drive the meter's switches
- Voltages that are completely programmable from 30-350 volts phase to neutral.
- Loads that are completely programmable from 0-50 amps
- Standard disconnect/reconnect testing
- A zero insertion force socket (electrically operated)
- The most lightweight and portable desktop meter station available







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# 2990 Desktop Meter Test Station

## 2990 Desktop Meter Test Station Catalog No. 2990

TESCO introduces a state-of-the-art meter accuracy testing in an affordable desktop configuration!

The 2990 revolutionizes meter testing by providing full series parallel meter testing in a small, budget-friendly desktop package.

A fully ANSI compliant test board, the 2990 offers complete testing of all meters under the widest range of test conditions.

- The new waveform generator has all waveforms called out in ANSI C12.20-2015 (pub. 4/2017).
- All common electromechanical and solid state meters up to 50 amps can be tested with the 2990
- 0.04% TESCO Standard Traceable through NIST





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# Meter Qualification Board



## Next Generation Meter Qualification Board

- Three Flavors to fit a variety of budgets and functional needs:
  - Three Voltages and one current
  - True Series Parallel
  - True Three Phase
- Stock configurations of Master and slave modules to allow for faster delivery for those difficult to meet year end budgets
- These boards can be banked together to provide any number of sockets required. Disconnect testing is standard on all TESCO MQBs and each socket position is designed to accommodate any meter form requested.
- Power up and apply load to electric watt-hour meters for functionality testing with TESCO's multi-position Meter Qualification Boards (MQBs). These boards assist with AMI Meter Certification process and AMI meter qualification and communication testing.
- The new waveform generator has all waveforms called out in ANSI C12.20-2015 (pub. 4/2017).





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# MQB3



## Three Phase Meter Qualification Board

*Apply true three phase voltage and current to electric meters, enabling them to be tested under all possible conditions that may be encountered in the field with TESCO's MQB3.*

### The MQB3 facilitates the following meter shop functions in high volume:

- New AMI/AMR meters settings check-out
- Meter program updates
- Software revision checking for both the meter and the communications module
- Communications module troubleshooting
- Checking of problem meters for open/shorted elements

### With the MQB3, the user has the ability to check meter response to:

- Varying loads over long periods of time to simulate brown out and surge conditions
- Harmonic waveforms (can download custom harmonic waveforms through PC interface)
- Meter power on/off cycling
- Phasor distortion





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# MEB

## Meter Engineering Board (MEB)

*The Latest Generation of TESCO Demand and Time Run Boards with a lot more under the hood*

All of the functionality of the Meter Qualification Boards (MQB's) including the new automated meter socket design, disconnect testing, communication testing, and advanced functional tests with TESCO's Meter Engineer Board plus the ability to run Demand and Time Run tests. These boards have basic metrology of 0.1% accuracy traceable back through NIST. There is a Series Parallel version and a True Three Phase version.

### **TESCO's MEB can help with:**

- Meter evaluating testing and certification
- Communications performance
- Power Line Communications testing
- Software and firmware verification
- Meter setting verification
- Meter functional testing
- Demand testing for Utility Commission compliance and meter certification testing
- Time-run Testing
- Extended use testing
- Meter disconnect switch testing





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# MTS-3050

## Three Phase Meter Test Board (MTS-3050)

*An innovative meter ACCURACY test system offering unsurpassed functionality and ease of use. All of the features you will need to test meters today and tomorrow are standard.*

Run standard meter accuracy tests and complex meter accuracy tests under widely varying loading conditions with TESCO's MTS-3050.

### Features include:

- **THREE PHASE ACCURACY TEST BOARD**
- 0.04% accuracy
- Current Drive: Single range 0.01 to 50A(rms), 70A (peak)
  - with options to go up to 200 amps
- 30 to 350v phase to neutral and 50 to 600v phase to phase
- Ability to check meter response to:
  - Varying loads over long periods of time to simulate brownout and surge conditions
  - Harmonic waveforms (can download custom harmonic waveforms through PC interface)
  - Meter power on/off cycling
  - Phasor Distortion



### The MTS facilitates these meter shop functions:

- Full functional testing capability for all AMI/AMR meters
- Meter program updates
- Software revision checking for both the meter and the communications module
- Communications module troubleshooting
- Checking of problem meters for open/shorted elements





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# Multi-Position Meter Test Boards and MQB-MTS Hybrid Boards

## Three Phase Meter Test Board

*Of course we can take this three phase test board and can make a multi-position of up to three sockets per cabinet which allows us to stock these modules and provide these test boards in just a few weeks once again allowing us to meet difficult end of year budget cycles.*

But we can also mix and match our MTB's (Meter Test Boards) with our MQB's to better match testing time and better meet your budgeting requirements.

**We can provide better cost per test socket and provide more of the lower cost sockets for tests that take longer to run and provide only one or two of the Three Phase Accuracy test sockets (standard 0.04% accuracy) allowing a far greater bang for your buck.**





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# K-Base Test Board Adapters



The TESCO K-Base Test Board Adapters allow quick, convenient testing of self-contained K-Base meters on test boards designed for socket type meters. The K-Base Test Board Adapters are designed for single phase (Catalog No. 1180-2) and polyphase (Catalog No. 1180-4).



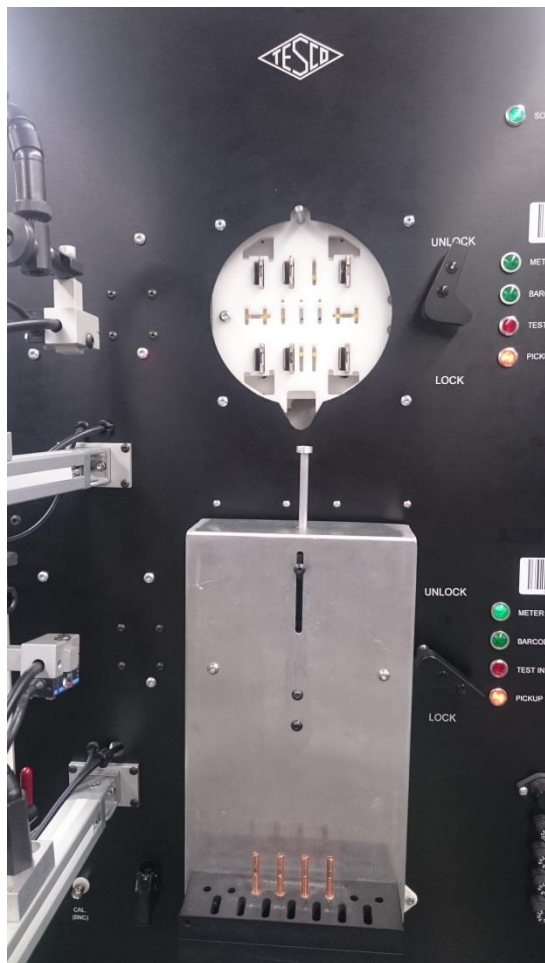
The K-Base Test Board Adapters are equipped with two clamps located on the front of the adapter, which will secure the meter to the base. The adapter also has an acrylic safety shield to protect the user from any arcing that may occur.





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# A-Base Test Board Adapters



- Easy-to-use
- 30 amp
- Cat# 1182 (single phase) accommodates forms 1A, 2A, 3A, and 12A
- Cat# 1183 (polyphase) accommodates forms 4A, 5A, 6A, 8A, 9A, 10A, 11A, 13A, 14A, 15A, 16A, 17A, 18A, 29A, 35A, 36A, 45A, 46A, and 48A
- Please contact us for other forms
- Can be used on ALL TESCO Meter Test Boards, RFL 5800s, and most WECO test boards
- Dimensions: approximately 7" x 4.5" x 12.5"
- Weighs less than 5 pounds







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# Meter Manager Software

- Over the past four years we have added over 25 million meters managed along with CT's, PT's, AMI hardware, rubber goods, tools as well as user defined materials
- Our team has been built out along with the product and over the past three years we have performed two 5 Million plus end point installations with both meeting every milestone and both going on time and on budget
- Meter Manager is considered a "Best of Breed" and is being used as a bolt on to SAP, Maximo, and Oracle CC&B
- Meter Manager is a Scalable Enterprise Ready system that has High Availability, Load Balancing, and seamless Fail Over
- Larger users have nearly a thousand active users
- One application replaced a deeply embedded system that had been installed for over 30 years and had over 70 interfaces. This utility paid an independent party over six figures to perform a sophisticated security penetration analysis. After completing the testing, hacking and analysis a single recommendation was made and implemented for what was defined as a "small vulnerability".





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# Meter Manager Software

New Ways in Which Meter Manager is being used;

- Meter Manager will be used on tablets to manage an AMI Field Deployment starting in the first quarter of 2019. This will be the largest utilization to date of the Site Verification module.
- Meter Manager is being used as the system of record for CT and VT site information for a multi-million meter utility. Their MDM queries Meter Manager for transformer information to check on billing. Unusual wiring parameters for specific sites are stored in meter manager along with all CT and PT ratios so billing multipliers can be calculated and periodically checked as a system against the billing system to ensure that clerical errors do not lead to billing errors.



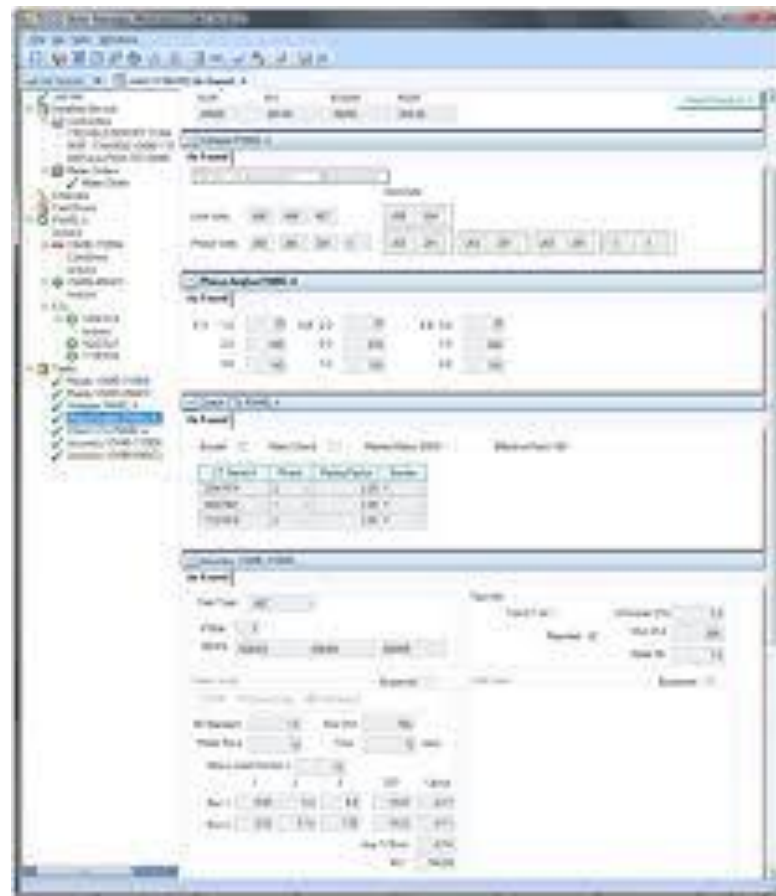


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# Meter Manager Software

## Basic Modules of Meter Manager

- Meter Shop
- Meter Inventory
- Meter Records
- Random Testing
- In-Service Testing
- PPE Inventory and testing
- Tool Inventory and Testing
- Field Verification Module
- Total life cycle asset management for everything metering





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# Training Rooms



TESCO is the leader in Meter Training Boards and Meter Training Rooms.

Instructors can set errors in a safe and consistent manner.

Equipment can be used for new training or refresher training.





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# Training Boards





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# Meter Farms

TESCO has been building Meter Farms since early in this first cycle of AMI deployments.

Over the years we have refined and improved the boards and in true TESCO fashion have been providing an increasing array of features to these meter farm panels so every installation is truly a custom design to the customer's specifications.



We have more meter farm sockets out than anyone in the industry although we recently toured a Meter Manufacturer's Meter Farm that is just slightly older than ours and has over 18,000 sockets. However, adding up all of our meter farm installations across North America – we eclipse even this number – in total, but not at any one location.





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# Streetlight Meter Farms and Boards

## Tests:

- Manufacturer product evaluation testing
- Accuracy testing
- Functional testing
- Qualification testing

## Products:

- Test Boards
- Mounting sockets
- Transformer Rated applications
- Field Test Equipment
- Meter Farms
- Meter Socket Adapters

## Applications

- Single streetlight meter
- Group of single streetlight meters
- Meter for a group of streetlights
- Meter for any pole mounted device





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# EVSE



PL100  
Load  
Emulator



T400 EVSE TESTER



T100 EVSE TESTER







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# EVSE





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# Hot Socket Repair Kit





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# Safety Disconnect Device



- Open the remote disconnect switch on any meter
- Close the remote disconnect switch on any meter
- Leave the meter in the socket during disconnect/reconnect
- Allow meter to be installed with switch open, for safety and arcing
- Save time and money sending techs out in the field
- LEDs show status of Safety Disconnect Device
- Read date and time of open/close along with meter serial number, or meter ID
- Read data out via USB interface for data logs, times, and voltage





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# Field Test Kits



**TESCO's Closed-Link Field Test Kit with Power Factor (Catalog No. 630)** has been designed to reduce the weight of field test equipment to the lowest possible limit when testing electric meters without potential links or with the links closed. The unit is protected within its ergonomic carrying case by a durable powder coated aluminum shell. The total weight of the meter test kit including leads, and digital reference standard is only 30 lbs! The test kit carrying case also incorporates ample storage space for the cable set and other tools.



**TESCO's new Field Test Interface Kit (Catalog No. 2200)** provides metering professionals with exceptional testing flexibility. The Field Test Interface includes a zero insertion force (ZIF) meter socket, voltage and form selection, and connection points to link it with a TESCO Field Test Kit (Catalog No. 621, 630 or GA Series). When combined with a Field Test Kit and powered via inverter (commonly used on service trucks), the Field Test Interface will then power the Field Test Kit to create a single position, stand-alone, meter accuracy testing device for various socket based meters (both mechanical & solid-state). Power for the Field Test Interface can also be supplied by customer potential via TESCO Field Test Kit (no need for the inverter).





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# Field Testing

TESCO's lightweight 50 Amp Field Meter Test Kit with Power Factor (Catalog No. 621), has been designed to reduce the weight of field test equipment to the lowest possible limit at approximately 25 pounds. A 120/240/277/480 voltage change switch is provided with an "OFF" position in order that the load can be de-energized without the necessity of breaking connections when it is desired to make adjustments to the meter under test. The various load values are changed by manipulation of a durable rotary switch. No connections need to be changed. The unit provides a 5, 15 and 50 Amp current source at full load and a 0.5, 1.5 and 5 amp current source on the light load setting. Power factor can be easily switched between 50% and 100% via a simple, durable toggle switch.



The TESCO Field Test Kit with Resistive Load (Catalog No. GA-50) has been designed to reduce the weight of field test equipment to the lowest possible limit at approximately 25 pounds. A 120/240/277/480 voltage change switch is provided with an "OFF" position in order that the load can be de-energized without the necessity of breaking connections when it is desired to make adjustments to the meter under test. The various load values are changed by manipulation of a durable rotary switch. The switching steps are so arranged that the full load value is adjacent to its corresponding light load value. Thus all that is necessary to change from full to light load, is to change the switch settings on the load. No connections need to be changed.



TESCO's Phase Angle Meter (Catalog No. 646) is a self contained portable device which requires no auxiliary equipment for its operation and furnishes a quick and direct method of checking relay and instrument connections. The TESCO Phase Angle Meter shows the angular relationship between one voltage and one current and is useful in switchgear (generator synchronizing) and metering (Power Factor) applications. The unit can also be used to measure the prevailing power factor in each phase of a polyphase watt-hour meter installation.





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# Artificial Loads

An industry staple for over 50 years, the TESCO's Artificial Resistive Load (Catalog No. 326) has been redesigned to meet 21st century standards, making it the most cost effective, portable and light weight artificial load box on the market today. Developed with the same strength and reliability that you have come to expect with all TESCO field test instruments, the 326 weighs only 13 lbs and is designed for input voltages of 69v, 120v, 240v, 277v and 480v (69v is optional). The unit is built for selectable full load current taps at 2.5A, 5A, 15A, 30A, 50A and light load taps at 0.25A, 0.5A, 1.5A, 3A and 5A.

TESCO's RC-50 Artificial Phantom Load has been redesigned to meet the most exacting requirements. It operates from a single phase source and will deliver current at either unity or 50% power factor at all full load ranges.





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# Test Switches & Accessories

TESCO introduced the original **Meter Test Switch** in the early 1920's. Today, TESCO's line of Test Switches has been redesigned with the intention to combine the best features of tried and proven switching methods with improvements in materials and construction. TESCO's Test Switches are open knife blade and can custom manufacture each order to your specifications.



TESCO **Transformer-Rated Pre-Wired Meter Enclosures** are designed for use in commercial and industrial metering installations where voltage ratings of 480 and above are required. The enclosures are available with either ring or ringless, single piece or two piece covers, and can be pre-wired between the test switch and socket to meet your exact specifications. TESCO Pre-Wired Meter Enclosures are UL Listed.



TESCO Single & Three-Phase **Transockets** offer the flexibility of a single enclosure for current transformer metering and allow mounting of current transformers and a test switch. By combining the meter socket and transformer cabinet, TESCO provides a cost-effective metering solution. TESCO Transockets are available with 4, 5, 6, 8, 10, 11, 13 or 15 terminal meter sockets, with services up to 600 amps. TESCO Transockets are suitable for overhead and underground service and are prewired to your specifications, with your choice of current transformers and voltage transformers (if applicable).



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# Field Testing Equipment



Cat. 1047: TESCO's new CT Ratio/Burden Tester is a lightweight, portable and highly accurate in-service test set to assist in finding lost revenue by testing the accuracy of your meter circuits.



Cat. 500: TESCO's Phase Sequence Indicator is lighter and more compact than any other indicator available. Phase sequence is simple indicated by two neon lights – one for phase sequence 1-2-3, and the other for 3-2-1.



Cat. 995A: TESCO's Click Switch simplifies your testing needs by connecting directly to the input BNC of any TESCO or RD/RM standard. The switch housing is stainless steel and built with the TESCO tradition of durability and ruggedness for the field.



Cat. 1077: TESCO's Test Plug has been redesigned for use with all test switch current test jacks, making testing quicker, safer, and more accurate. The Test Plug eliminates the possibility of opening current transformer secondaries.



Cat. 1076: TESCO's Test Switch Isolator is perfect for isolation of an open test jack. Available in an ergonomic design, this isolator is a perfect compliment to Cat. 1077 Test Plugs and Cat. 6441 Test Switch Protectors.







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# Additional Accessories



Cat. 301: TESCO's Socket Safety Clip improves the holding force of a meter socket jaw to close to 20 lbs., and can withstand temperatures beyond 400 degrees. This temporary solution simply clips around the jaws of a meter socket until the socket can be replaced.



Cat. 300: The new TESCO Hot Socket Gap Indicator is used to determine if a meter socket jaw has become worn-out and unsafe for continued use. The Gap Indicator determines unsafe holding force on meter socket jaws based on laboratory testing.



Meter Socket Blank-Out Covers: Available with (Cat. 275) or without blades (Cat. 276), TESCO's Meter Socket Blank-Out Covers are the perfect solution for meter boxes that require a meter to be removed from service while still maintaining a safe environment.



Cat. 1037-STND: TESCO is introducing a new optical pickup (Catalog No. 1037-STND) for one way meter communication through the calibration LED found on most solid state meters. The pickup senses infrared pulses from ANSI compliant meters for complete, automatic testing.





THE EASTERN SPECIALTY COMPANY

# Meter Seals & Accessories



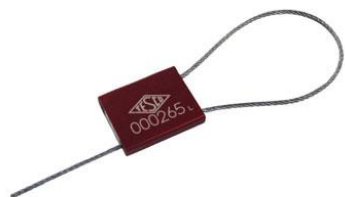
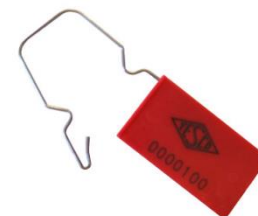
Cat. 220: TESCO's Demand Seals are self-locking, tamper-indicating and designed for easy application and removal from electrical meters.

Cat. 221 above;  
Cat. 222 below

Cat. 221 Acrylic Meter Seals and Cat. 222 Polypropylene Padlock Meter Seals are a low-cost solution that provides a tamper-evident meter seal. Combined with a stainless steel hasp, TESCO meter seals are ideal for outdoor use and are customizable. Also available with a square base.

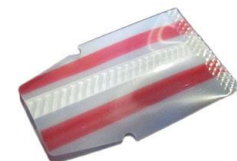


Cat. 221 above;  
Cat. 222 below



Cat. 223: Cable Seals are used primarily for securing CT and PT cabinets in addition to metering enclosures. TESCO's Cable Seals are flexible, tamper-proof, user-friendly, and customizable.

Cat. 250: TESCO's Mylar® Meter Disconnect Sleeves provide a fast and safe solution to leave a watt-hour meter in place, but electrically disconnected from the socket.





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# Jumpers & Accessories



Cat. 200: TESCO's Load-to-Line Jumpers allows the utility to perform meter maintenance without interruption of service to the downstream occupant.

Cat. 201: The TESCO "H" Jumper allows utilities to perform meter maintenance while one leg of the service is inoperable. TESCO jumpers are rated for 100 amps continuous duty and are made from a durable 1/16" thick tin-plated copper with a durable insulating material covering everything except the blades.



Cat. 202: TESCO A-Base Jumpers allow meter technicians to jump either customer-load or test-load on A-Base meter installations.

Cat. 203: TESCO also offers Potential Jumpers, which are equipped with crocodile-clip connectors, and are available in 18 gauge wire and rated for 5 amps/600 volts.



Cat. 204: TESCO offers Fused Jumper Sets in various combinations based on your preferences. Customization includes color, test clip style and cable length.

Cat. 205: TESCO's Horn Bypass Jumpers are used on self-contained meter services to temporarily supply a customer's power while the meter is removed from service.



Cat. 277: TESCO's Meter Socket Jumper Covers offer a safe and easy method of bypassing a meter socket. Can be used with either ringless or ring-style meters and designed to take the place of the meter.





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# Services

- ✓ Accuracy Testing
- ✓ Acceptance Testing
- ✓ Disconnect Testing
- ✓ Retirement Testing
- ✓ Certification Testing
- ✓ Re-Flashing/Re-Programming
- ✓ AMI Support
- ✓ Meter Engineering Support





THE EASTERN SPECIALTY COMPANY

# Voltage Tester: K-60

**FOR AC AND DC 120 TO 600 VOLTS**

**CAT III RATED UL 61010-1**

**K-60 KNOPP VOLTAGE TESTER** for AC and DC with polarity indicator. Double safety indication is by solenoid and by neon lamp.

Knopp Voltage Testers offer portability and ease of use with full protection. These exceptionally versatile and useful tools are backed by a reputation for quality in the design and manufacture of electrical test equipment

Knopp Voltage Testers are designed and built with safety, the **key** criteria! Dual voltage indication is provided by solenoid and neon lamp, operating **independently**. The lamp gives a bright warning signal. Voltages are shown by a positive, easy-to-read, moving indicator. There is a signal by hum and vibration; and the user is protected by high-grade, properly applied insulation, and by separation of incoming leads (the do not cross over each other within the housing). Interior separation of the circuit is a basic design feature of the case.

Nylon insulation covers prod tips to within 9/16" of end to prevent shorts across tips. The K-60 has no exposed metal parts. The scale and plate are both of insulating material.

Each K-60 order includes the K-60 voltage tester, Cordura carrying case, and leads.





THE EASTERN SPECIALTY COMPANY

# Phase Sequence Indicator

**ROTARY TYPE • NO LAMPS •  
RELIABLE • RUGGED • VERSATILE •  
TIME SAVING**

**POSITIVE, STRAIGHTFORWARD  
SEQUENCE INDICATION IS  
PROVIDED** over a wide variety of voltage  
and frequency by direction of rotor rotation.  
No need for range switching or terminal  
changing. Also indicates an open phase.

**MODEL K-3: 60-600 volts, 25-60 Hz**

**MODEL K-6: 24-480 volts, 400 Hz**

Use of the Knopp Phase Sequence  
Indicator saves man-hours and protects  
valuable equipment against damage. It  
pays for itself in a short time.





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# Third Rail Tester: 4E2-1

The Knopp 4E2-1 Voltage Tester is designed to detect electrical potential (voltage) between the third rail and ground on high voltage electrified transit systems. Two, redundant neon bulbs are used to indicate the presence of voltage.

Features of the 4E2-1 include:

- Can be used on AC or DC
- Can be used up to 1,500 volts
- Can span a distance of up to four (4) feet
- Uses a dual neon lamp principle for double safety protection





THE EASTERN SPECIALTY COMPANY

# Working Together

MERALCO's Mission is to provide your customers the best value in energy, products and services.



TESCO's Mission is to become the primary outside metering resource for all of our electric utility customers.



THE EASTERN SPECIALTY COMPANY

With this visit here by our Installation Team as well as myself, the President and Owner of the Company, we hope that we are demonstrating our willingness to work far more closely together and to become your resource for everything related to marking MERALCO's meter service department one of the most progressive in our industry.



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# TESCO's Users Group

**June 9-12, 2019**

*Philadelphia, PA*

- Learn and discuss new TESCO technology and products through interactive sessions and hands-on training with TESCO engineers.
- NEW training sessions for the new Meter Shop and Lab Equipment
- Current AMI Topics and Practices for First Deployments
- Meter Manager Software sessions including asset management tracking, in-service testing, and kiosks.
- Tour of TESCO's facility
- Dinner with the founding fathers and tour of historic district





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# Questions and Comments



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