

CURRENT Knowledge

Expert PAT & 17th Edition news and advice

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Issue 3 April 2010 www.current-knowledge.com



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from ELECTRICAL DANGER

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PAT technician
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PAT business
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17th Edition test professionals will love the improvements we made to the PowerPlus 1557 handheld multifunction tester and software. Like the new multi-worker feature that allows several people to simultaneously work on one certificate from separate testers. And the cloning feature that duplicates certificates from user templates.

The automatic format facility will bring a smile to their faces too. It ensures any entries are formatted to fit the allocated space available on preprinted certificates. Handy, don't you think? Especially when you consider just how much time and effort will be saved. And how much more profit can be made. Obviously, improvements go a long way.

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Welcome to this bumper PAT issue

Electricity is an integral, but invisible, part of all our lives. So it's easy to forget just how powerful and dangerous it can be.



Jim Wallace
Editor

In the UK, electrical incidents represent about 10% of all fatalities at work – and are the cause of many other injuries, fires and accidents. There is no doubt that the figures would be considerably higher if it were not for the vital role played by existing preventative maintenance programmes.

Nevertheless there remains widespread ignorance of the dangers posed by faulty electrical appliances, although the focus on maintaining health and safety at work is probably greater now than it ever has been.

As an example of the risks associated with getting it wrong, included in this issue is news of the recent agreement on financial penalties for those found guilty of corporate manslaughter. In addition there has been the recent widely publicised alerts and guidance from the Electrical Safety Council on the electrical safety responsibilities of landlords.

Within the workplace every single user of

electrical equipment has a duty to ensure the equipment is safe to use before doing so, yet it is rare to find an organisation that formally advises their staff what they need to look for before using electrical equipment and what to do should they find a problem.

It is against this background that we have decided to make this issue of Current Knowledge a bumper PAT edition.

In doing so we highlight some of the important PAT issues, focus on recent advances in test technology and demonstrate the range of practical test solutions available to help employers comply with their electrical safety responsibilities.

We hope you enjoy it.

Best regards

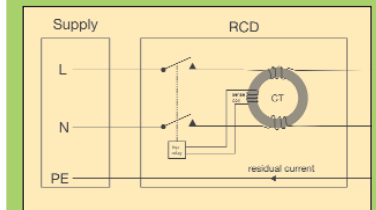
Jim Wallace, Editor, Current Knowledge

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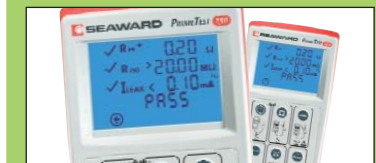
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Publisher: Seaward, Bracklen Hill, South West Industrial Est., Co. Durham, SR8 2SW
Editor: Jim Wallace
Assistant Editors: Siân Sweeney and Ian Watson
Distribution: www.current-knowledge.com
Email: info@current-knowledge.com
letters@current-knowledge.com
Tel: +44 (0)191 586 3511

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What's

**Elex shows**

Opening hours for all exhibitions are 10.00am to 4.00pm each day

16/17th September, Ricoh Arena, Coventry

30th November/1st December, Sandown Park, Surrey

NICEIC Northern Ireland Trade Show

26th and 27th May, Ramada Hotel, Belfast

ECA Electrical Industry Conference

14th to 18th May, Tenerife

NICEIC Golf Classic Tournament**Qualifying Rounds**

8th June – Delamere Golf Club, Cheshire

17th June - Bristol & Clifton Golf Club, Bristol

28th June - Sandwell Golf Club, Midlands

5th July - Malone Golf Club, Belfast

8th July - West Linton Golf Club, Edinburgh

14th July - Sand Martins Golf Club, Wokingham

20th July - Gog Magog Golf Club, Cambridge

23rd July - Garforth Golf Club, Leeds

Grand Final

24th & 25th September - Archerfield Links, Scotland

ECA South Wales Weekend Conference

25th - 27th June Cliff Hotel, Gwbert, Cardigan

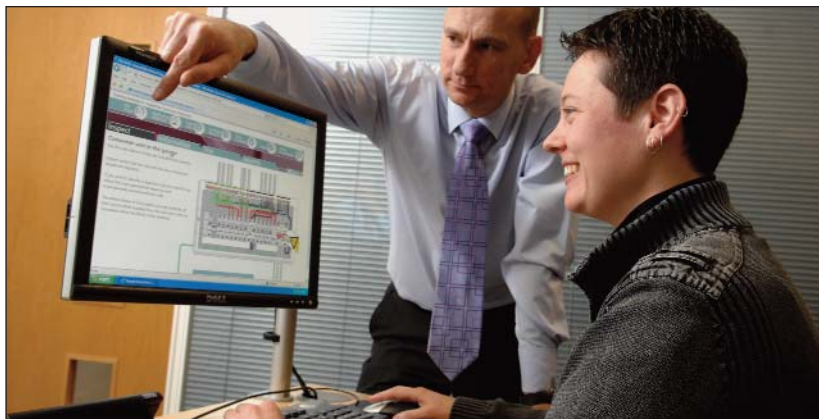
ECA National Golf Day

30th June, East Sussex National Golf Club

ECA West Midlands

3rd November, Moat House, Acton Trussell, Stafford

Online training from NICEIC



NICEIC has developed a new online training course for electricians involved in 17th Edition work.

The new resource, developed with e-learning experts Virtual College, means delegates can access training at a time, place and pace to suit them - and without taking time away from valuable on-site work.

Delegates can sit the course over a number of nights, weeks or months - it's totally flexible and NICEIC has structured the course into short interactive e-learning modules.

Once these are completed one can undertake a number of online revision tests that will check that the user is ready for entry to the final assessment.

Alan Wells, Head of Electrotechnical, NICEIC Group Limited said: "The fact that electricians can now access a 17th Edition course at a flexible time and place to suit them is an important step, especially in the current economic climate."

For more details visit www.niceic.com and click on Training or call 0870 013 0389.

Corporate killing fines tariff published

For all involved in maintaining the safety of electrical installations in the workplace, it should be of interest that the Sentencing Guidelines Council (SGC) has now published its final guideline for judges on penalties for corporate manslaughter and health and safety offences causing death.

The guideline will help courts set penalties for organisations convicted of corporate killing or causing death under health and safety legislation. It offers advice on the aggravating and mitigating factors affecting an organisation's level of guilt, the

size of the penalty and whether to impose other sanctions such as publicity and remedial orders.

The guidance says fines under the Corporate Manslaughter and Homicide Act 2007 should "seldom be less than £500,000 and may be measured in millions of pounds," and sets penalties for health and safety offences causing death at £100,000 upwards depending on the seriousness of the breach.

Courts will also have the option to use remedial orders, or to grant publicity orders forcing organisations to advertise their conviction.

Vital role of RCDs



The Electrical Safety Council has announced its ambition to dramatically increase ownership – and habitual use – of RCDs.

Comparing its aims to the successful work that has increased understanding of smoke detectors in recent years, the ESC says that while the fundamental message of the campaign is simple, achieving its objective

of increasing RCD protection in UK homes by 10% over the next 5 years will be a major challenge.

Since mid-2008, there has been a requirement in the UK Wiring Rules to provide RCD protection for virtually every socket-outlet and circuit in homes as part of a new installation, major rewire or replacement of a consumer unit. But even the most optimistic estimates suggest that, as yet, only 25% of consumer units in the UK include an adequate level of RCD protection.

The primary target audience for the ESC will be consumers who put themselves at greater risk of electrocution by using mains-powered equipment for improving their homes and maintaining their gardens – without RCD protection.

ESC technical guide updated

The Electrical Safety Council (ESC) has introduced an updated online version of its technical manual.

The Essential Guide to the Wiring Regulations is described by the ESC as a one-stop reference for everything you need to know to be 100% certain of doing the job right.

As well as the requirements of BS 7671 (IEE Wiring Regulations, Seventeenth Edition) the new guide provides guidance on the Building Regulations and British Standards, as well as a host of other topics that are relevant to electrical installations.

Further details from www.eschub.org.uk.

Take-Away a new NAPIT education pack



NAPIT is going back to school by providing support to students and training lecturers with a new 'NAPIT Take-Away Support Pack'.

The pack is designed to provide college lecturers and tutors with a range of information and materials to help students

with their electrical studies.

The NAPIT Take-Away Support Pack includes useful supporting material such as NAPIT and Seaward posters, Government leaflets and a Masterclass CD which has a number of lesson plans on all things electrical

for tutors to deliver as presentations to their classes.

For students the pack has helpful study material such as 17th Edition Route Maps, Z_s-Charts and Flowcharts explaining the Competent Person Scheme membership process once they are qualified including discount vouchers and other goodies.

Andy Sharp, NAPIT's Sales & Marketing Director says: "We have been visiting colleges across the country to understand how we can support tutors delivering their lessons and also help students on the path to an electrical career. We also have representatives who are available to talk to classes on their next steps once they are qualified to become a registered Competent Electrician."

To register your interest in the support pack please email info@current-knowledge.com with 'NAPIT Resource Pack' in the subject header and include your full contact details.

Got News?
Write to:
letters@current-knowledge.com
and it could feature in the next issue of
Current Knowledge



Getting technical

with Jim Wallace

A Test in Time Saves Lives

Jim Wallace looks at the critical role of RCDs and the importance of regular testing.

What is an RCD?

RCD is the generic term for a Residual Current Device and refers to a device used to automatically disconnect the mains supply in the event of a fault. They are widely used as a means of protection against electrocution or fires caused by electrical faults. Whilst fuses and MCBs provide protection against short circuits and current surges, they do not protect against relatively small currents flowing through the human body. Currents as low as 100mA can prove fatal if the current flow is not interrupted.

How do they work?

An RCD is constructed such that the line and neutral conductors pass through a toroid core to create the primary winding and a sense coil wound around the toroid to create a secondary winding. This wiring arrangement forms a differential current transformer (CT) which drives the trip mechanism. Under normal conditions, the currents flowing in the line and neutral conductors are equal and opposite i.e. all of the current from the supply on the line conductor returns to the supply via the neutral conductor. When the line and neutral currents are equal and opposite no flux is produced in the toroid

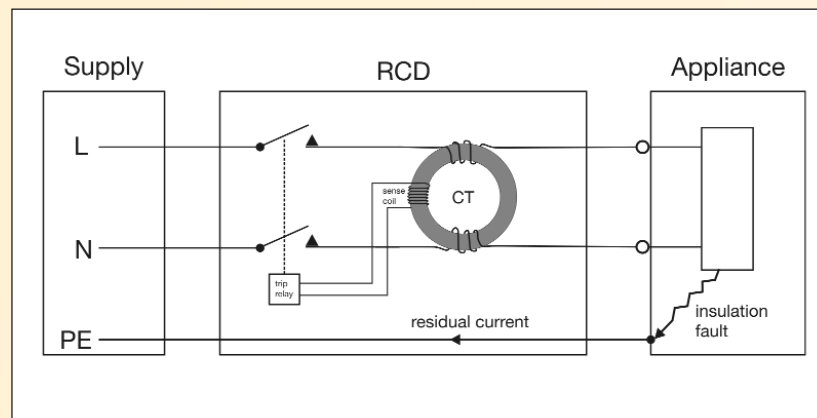


Figure 1: Typical RCD Configuration

and so no current is produced in the sense coil (see Figure 1).

In the event of an insulation fault, a portion of the line current (known as residual current – hence residual current device) flows to earth, and so the line and neutral currents will no longer be balanced. This imbalance caused by the residual current produces a flux in the toroid and a current will flow in the sense coil which will activate the trip mechanism. The incoming supply will be disconnected in around 20ms to 30ms and it is this rapid disconnection which greatly reduces the risk of electrocution or fire.

In a real situation, there will always be a

degree of residual current due to imperfect insulation or electronic components connected between the line and protective earth conductors. In order to avoid nuisance tripping, RCDs are designed to trip when the residual current is between 50% and 100% of the rated residual operating current.

Why test?

An RCD must rapidly disconnect the mains supply in order to provide protection against electric shock. Failure to operate quickly means that the level of protection is dramatically reduced. Left unchecked, an RCD may not



operate for very long periods of time and this inactivity can lead to an increase in the time taken to operate or total failure to operate.

A recent report commissioned by the Electrical Safety Council states that the primary mode of failure on electro-mechanical RCDs was ingress of fine particles of dust and moisture causing the moving components to stick or to operate slower than intended. Whilst manufacturers of electronic RCDs claimed that their products are more reliable than electro-mechanical RCDs, very little evidence to support this was found. Previous research in the USA suggests that the reliability of electronic RCDs may be similar to that of electro-mechanical RCDs.

Previous research published in Italy indicated that electromechanical RCDs had an average failure rate of 7.1%. However, if the RCDs were operated regularly, this figure fell to 2.8%, indicating that RCD reliability improved if they had been operated regularly.

Testing an RCD

A test instrument is used to apply a precise fault current equal to the rated residual operating current of the RCD and measure the time taken to disconnect the mains supply.

The IEE Code of Practice for In-Service Inspection and Testing of Electrical Equipment recommends that when an extension lead or multi-way adaptor is fitted with an RCD, the RCD must have a rated residual operating current not exceeding 30mA. The operation of the RCD should be checked by using the test button and in addition, the trip time should be measured using an RCD test instrument. The trip time should not exceed the values given in Figure 2.

A common problem when testing a portable RCD is that the mains supply may be protected by an RCD at the distribution board or consumer unit. In this case there is a risk that the main RCD may operate before the portable

RCD under test. This problem can be avoided by using a mains outlet which is not RCD protected or by using an RCD test adaptor which isolates the mains supply to the test circuit.

RCDs save lives. As with any protective device, we must take appropriate steps to ensure that they provide the required level of protection. Periodic inspection and testing helps to ensure that in the event of a potentially dangerous electrical fault, the RCD will do its job.

Is there a technical topic you would like to see covered?

Email letters@current-knowledge.com

	Rated residual operating current	Satisfactory result
RCDs to BS 4293 and RCD-protected socket-outlets to BS 7288	30mA	Device should trip in not more than 200 ms
RCDs to BS EN 61008	30mA	Device should trip in not more than 300 ms

Figure 2: RCD Operating Times

All you need to know about PAT testers

The essential role of portable appliance testing (PAT) is to reduce the risk of electric shock by detecting potential safety problems with electrical appliances before they occur.

In this way, testers ensure the safety of electrical equipment used in all workplaces and enable employers to meet their legal obligations to provide a safe environment for staff and the public.

PATs start from basic pass/fail instruments capable of carrying out fundamental checks to more comprehensive testers used as part of formal preventative maintenance programmes.

There are also choices to be made between battery and mains powered testers, those capable of testing either or both 110V and 230V appliances and whether or not test data needs to be recorded for transfer to PC-based records systems.

The essential tests for most electrical products are earth continuity and insulation resistance, although a host of other tests such as touch and protective conductor current, IEC cord or lead tests and RCD trip time tests may also be required depending on the type of equipment in use and the associated risk factors.



Basic PAT Testers

At the basic level, PAT test instruments are available as relatively simple to operate devices that carry out basic electrical safety checks. Most are equipped with an earth continuity test, insulation resistance test and the ability to check the wiring of detachable mains cords but do not include tests which involve applying mains power to the appliance under test, for example protective conductor current or touch current. Results are displayed either as an immediate 'go/no go' indication – either in the form of a simple digital display and/or a pass/fail warning light, or measured values which can be recorded for traceability.

These basic instruments do not possess an internal memory for results storage and are designed for use by those who may be relatively unskilled in electrical work or for those who have a relatively small number of appliances to test. As a result they are ideal for those who may have an in-house responsibility for ensuring the safety of equipment used in such places as small business premises, care homes and nurseries - and by landlords for use in their rented properties.

Basic testers can be either battery or mains powered – although in recent years the portability and versatility provided by the former is increasingly making them the preferred choice of most safety personnel involved in testing.



Intermediate PAT testers

The next level of instruments offers a more comprehensive range of tests and often includes measurements such as protective conductor current, touch current and RCD trip time. The additional functions allow the user to test a wider range of appliance types in accordance with the IEE Code of Practice, for example, appliances with electronic power switches where insulation resistance testing is not appropriate. In the most modern, tests can also be undertaken to measure protective conductor current in 3-phase equipment using special in-line test adaptors.

In general, these instruments do not possess an internal memory for results storage but give measured values which can be recorded using a paper based system or suitable software package for improved traceability. They are suited to those who require a wide range of electrical tests but do not require automatic data storage.

They are ideal for those who may have an in-house responsibility for ensuring the safety of equipment used in organisations such as small businesses, schools and local authorities.

Manual testers are available as either mains or battery powered, although in the case of battery powered testers it is necessary to apply mains power when performing tests which need the appliance under test to be energised.



Advanced PAT testers

For more comprehensive test requirements, more sophisticated mains and battery powered testers are available that combine user-friendly operation with a whole range of other features for particular test demands or routines.

These include options for manual or automatic testing (with pre-set pass/fail thresholds) and the ability to reconfigure the automatic test sequences to cater for a wide range of electrical appliance types. In some instruments, the ability to create inspection and test sequences for non-electrical assets is also available, for example, when inspecting fire extinguishers or emergency lighting systems.

These more advanced testers record not only the test results but also details of the test program, site and location of the asset under test, details of the operator and the time and date that testing was carried out, all of which can be transferred to PC-held test

management programs for complete traceability.

More advanced testers are therefore suitable for use by PAT testing companies and specialist service companies with large asset databases under their responsibility.

For these types of application, lightweight PAT testers are now available that incorporate all Class I and Class II required electrical safety tests in a compact hand held enclosure. In most, long life battery power eliminates the reliance on mains outlets for testing, making the instrument totally portable and suitable for universal testing applications.

In most versions clear pass/fail messages are provided against digital electrical readings taken by the tester.

The more advanced and comprehensive PAT testers also incorporate a suite of other tests that can include protective conductor current, touch current and substitute leakage.

New test demands

In the most modern PAT testers, RCD testing is now included in the suite of test options available. This follows the inclusion of new advice in the third edition of the IEE Code of Practice that when an extension lead or multiway adaptor is fitted with an RCD, the operation of the RCD should be checked using an RCD test instrument to determine that the trip time is within specified limits.

In the same way, the IEE Code also now recommends a choice of insulation test voltage of 250V DC or 500V DC - or the use of substitute or alternative leakage measurement for some types of electrical equipment. Again not all testers are equipped with the capability to undertake this variety of tests.

The incorporation of Bluetooth technology in some advanced PAT testers allows the wireless connection of barcode scanners, label printers and other accessories.

Advanced testers can also be linked directly to safety-labelling printers for the fast and automatic production of appliance test labels on-site. The labels not only provide confirmation that the equipment is safe to use but often include details of 'next test' due dates.

Test records

The HSE Memorandum of Guidance on the Electricity at Work Regulations 1989 and the IEE Code of Practice for In-service Inspection and Testing of Electrical Equipment both recommend that test results should be kept throughout the working life of electrical equipment to monitor the condition of the equipment and to demonstrate compliance with the Electricity at Work Regulations 1989.

The use of computerised portable appliance testers with an internal memory enables data to be transferred directly from the instrument to a PC-stored database allowing an automatic update of test records, the generation of test reports and advance testing schedules. The fact that test results are automatically recorded by the test instrument, transferred electronically and stored in locked fields in a database allows for a tamper free system ensuring full traceability.

The integration of test data collected by the PAT tester and computerised record systems also enables various improvements to be made in test scheduling, identifying next test due dates and the development of asset registers.

All of these factors can significantly improve operational efficiencies for both in-house testing and PAT companies and also improve the provision of added value services to customers.

Free
Guide to A PAT Testing

For your free 'A Guide to PAT Testing' call 0191 586 3511 or email sales@seaward.co.uk quoting CK03PAT.



PAT Selector Guide

	Battery Powered			Mains Powered
	Basic	Intermediate	Advanced	Advanced
	e.g. Seaward PrimeTest 50, PrimeTest 100	e.g. Seaward PrimeTest 250	e.g. Seaward PrimeTest 350	e.g. Seaward Supernova and Europa
Typical Users	<ul style="list-style-type: none"> Care homes Schools Landlords Hotel / Leisure industry 	<ul style="list-style-type: none"> In-house safety testing engineers Electrical Contractors Service & Maintenance Engineers 	<ul style="list-style-type: none"> PAT Companies Electrical Contractors Facilities Managers 	<ul style="list-style-type: none"> Facilities Managers Construction industry Hire Companies Manufacturers
Tests				
Mains supply Check	✓	✓		✓
Low current Earth Continuity (e.g. 200mA)	✓	✓	✓	✓
High current Earth Continuity (e.g. 25A)				✓
Insulation Resistance (250V)		✓	✓	✓
Insulation Resistance (500V)	✓	✓	✓	✓
PE Conductor Current (Earth Leakage)		✓	✓	✓
Touch Current		✓	✓	✓
Alternative Substitute Leakage	✓	✓	✓	✓
Flash Test				✓
IEC Lead Test	✓	✓	✓	✓
230V/110V INPUT/OUTPUT				✓
RCD Test		✓	✓	✓
3 phase leakage		✓		✓
Additional Features				
Results Display	PASS/FAIL	Actual test reading	Actual test reading	Actual test reading
Results storage			✓	✓
Bluetooth			✓	
Alpha-numeric keypad			✓	✓
Barcode scanner input			✓	✓
PE Resistance limit calculator			✓	✓
Automatic test sequences		✓	✓	✓
Recommended Software	Manual Data Entry	Manual Data Entry	Upload / Download	Upload / Download
Useful Accessories	<ul style="list-style-type: none"> Pass labels Fail labels Register of portable appliances and test record PAT checkbox 	<ul style="list-style-type: none"> Pass labels Fail labels 3 phase leakage adaptor RCD adaptor PAT checkbox Register of portable appliances and test record 	<ul style="list-style-type: none"> Test n Tag printer RCD adaptor Bluetooth barcode scanner PAT checkbox 	<ul style="list-style-type: none"> PAT checkbox Test n Tag Printer Barcode Scanner

This table indicates features typical to portable appliance testers within the basic, intermediate and advanced categories - For product-specific information please contact the manufacturer.

NO SHOCKS JUST PLENTY OF SURPRISES

INTRODUCING THE NEW PRIMETEST 250

Seaward's new portable appliance tester incorporates a unique range of electrical safety tests to ensure that all workplace electrical equipment does not pose a danger to users – including three-phase machinery.

The new hand held PrimeTest 250 is the first electrical tester in its class to provide all the electrical tests required for compliance with the IEE Code of Practice for the In-Service Inspection and Testing of Electrical Equipment – and also includes a host of other features.

These additional tests include an RCD trip time test, a 3-phase leakage test and a 250V DC insulation test suitable for testing sensitive electrical appliances and surge protected leads.

The unique range of tests incorporated in this lightweight and highly versatile instrument means that most workplace appliances can be tested using long life battery power. However the capability of the new tester also extends to protective conductor current and touch current measurement tests when required.

Suitable for in-house safety testing engineers or specialist PAT service personnel, the inclusion of the RCD test is in keeping with the latest IEE Code that, when extension leads or multiway adaptors are fitted with an RCD, the operation of the RCD should be checked using

a test instrument to determine that the trip time is within specified limits.

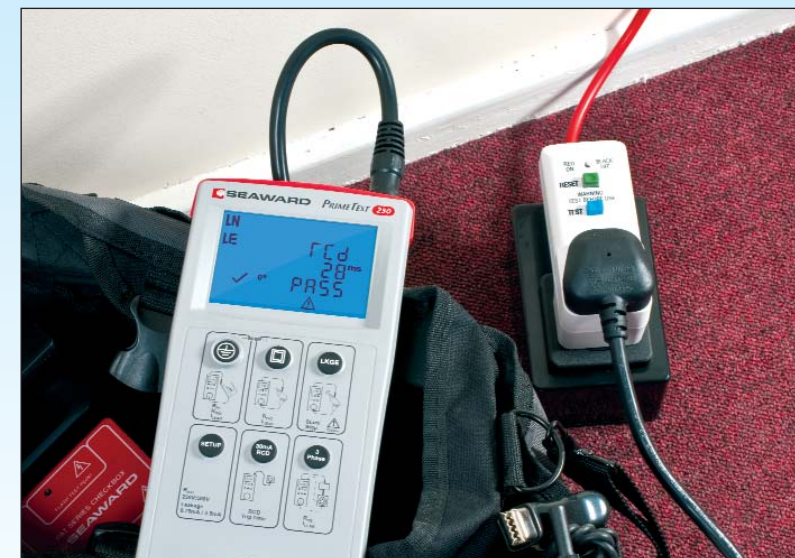
The new PrimeTest 250 meets this requirement and a special accessory is available to allow the RCD test function to operate without tripping any RCDs in the mains supply.

In addition, earth continuity and earth leakage on 3-phase equipment can be tested using a special in-line adaptor. As a result, 3-phase industrial plant and equipment used in factories, workshops, schools and colleges can all be tested safely and effectively.

Universal graphics on the case of the PrimeTest 250 guide the user through the test modes available and a single push button operation enables the appropriate sequence of electrical tests to be activated.

All electrical safety tests are carried out against pre-set limits and a large display area gives a clear pass or fail indication, as well as digital test result values for those that require them.

The Primetest 250 forms part of a comprehensive range of portable appliance testers from Seaward that comprises of different models and test specifications to meet all workplace electrical safety testing needs.



PrimeTest 250 Key Features

- Easy to use manual PAT Tester
- Comprehensive range of tests
- Clear PASS / FAIL indication
- RCD trip time, 250V / 500V insulation test, protective conductor current, touch current, 3 phase earth leakage
- Lightweight
- Automatic test sequences



PAT TECHNOLOGY HELPS CLM SUCCEED

CLM Case Study

Investment in new instrumentation technology has helped one of the UK's leading providers of electrical safety testing services continue to grow, with nearly five million workplace portable appliance tests being carried out last year.

Set up in 1989, CLM Ltd was originally established as a lighting maintenance business serving public sector organisations and blue chip retailers. Over the last 2 decades, however, the business has been radically transformed, establishing itself as one of the UK's leading dedicated electrical safety testing specialists.

As part of this transformation CLM has equipped its engineers with Seaward PrimeTest 300 and PrimeTest 350 hand held portable appliance testers. These lightweight testers are battery powered for maximum portability and speed of testing. In addition Bluetooth technology makes connection with accessories and the downloading of test data fast and simple.

CLM Ltd, based in Warrington, has around 150 test engineers working from a network of regional offices carrying out in-service inspection and electrical compliance testing at customers' premises.

By using the Seaward testers to increase operating efficiencies and improve productivity, CLM has been able to remain highly competitive at a time when the PAT market has experienced pressures on test price rates.

Paul McDermott, National Operations Manager of CLM Compliance, explains: "Many customers have sought price reductions during the recession to ensure sustainability within their own businesses and all portable appliance test service companies have had to examine their own cost bases as a result.

"Being able to work smarter has become more important than ever. Investment in the Seaward PrimeTest PAT technology has helped us to considerably improve the efficiency of

testing services.

"This in turn has enabled the company to largely withstand the effects of the recession by helping us to offer our clients a test cost structure that represents excellent value for money and at the same time still provides CLM with a profitable return."

As part of its service CLM continues to educate and guide its customers on their health and safety obligations.

Paul McDermott said: "Many of those who attended our recent roadshows were shocked to discover exactly what legislation covers electrical testing and what their own responsibilities were to comply with those requirements."

Given the lack of knowledge around electrical safety it should come as no surprise that CLM estimates that up to 6% of the electrical appliances and equipment it regularly tests have some form of damage or fault.

Product Spotlight

Accessories and software



New Adaptor Avoids Unwanted Tripping of RCDs

Seaward has added a new adaptor to its wide range of PAT accessories. The latest addition allows users to test a portable RCD or RCD protected extension lead without risk of tripping the main RCD in the installation.

Most Seaward portable appliance testers are already equipped with an integral RCD trip time test, however, when testing a portable RCD using a mains outlet on an installation which is RCD protected, the test may cause the main RCD to operate. The new compact RCD test adaptor provides an isolated mains supply which prevents unwanted tripping of any RCD at the main distribution board or consumer unit. The Seaward RCD adaptor can be used easily and effectively with any make of PAT tester or RCD test instrument.

RCD testing has taken on greater significance since the introduction of the 3rd edition of the IEE Code of Practice which recommends that when an extension lead or multiway adaptor is fitted with an RCD, the operation of the RCD should be checked using an RCD test instrument to determine that the trip time is within the limits set out in BS 4293, BS 7288 or BS EN 61008.

For those responsible for carrying out portable appliance testing this may require some changes to be made to the type of test instruments used. However, Seaward has anticipated these changes and many of the company's testers are now equipped with an RCD trip time test.



New 3 Phase Adaptor

A new adaptor designed for use with Seaward's new PrimeTest 250 PAT tester enables earth leakage testing to be carried out on 3-phase machinery, plant and equipment used in factory environments.

3-phase plant and equipment are in common use around many factories and workshops and should be subjected to in-service inspection and testing according to the IEE Code of Practice. In many cases the equipment will be fitted with electronic control circuitry which makes insulation testing inappropriate. In such cases the insulation should be assessed by measurement of the protective conductor current.

The specially designed adaptor from Seaward is fitted with a BS 4343 plug and socket allowing it to be connected in-line with the 3-phase supply to measure the current flowing in the protective conductor. The test adaptor is connected to the PrimeTest 250 allowing the earth leakage current to be shown on the instrument's display when the 3-phase appliance is operating. Adaptors are available with 16A or 32A BS 4343 plugs and sockets.



New PAT Record Keeping Software

Seaward has introduced a new manual entry software program for keeping PAT records.

The new PATGuard Elements program is designed for use in conjunction with manual PAT instruments that do not incorporate an internal memory for the storage of test results.

The HSE Memorandum of Guidance on the Electricity at Work Regulations advises that records of maintenance, including test results should be kept throughout the life of the equipment as this will enable the condition of equipment and the effectiveness of maintenance policies to be monitored as well as demonstrating that an effective maintenance system is in place.

The entry level program enables the measurements made using manual PAT instruments to be entered into a PC-based record keeping system. Data can be presented using a number of built-in report templates and the software also allows test history to be compared for trend analysis

As a result PATGuard Elements enables a formal log of all PAT test results to be maintained for all electrical equipment even when the most basic of testers are used to carry out the electrical safety testing.

**For more information on the featured products please email:
info@current-knowledge.com**

Q&A

Need to know something? Then Bob's the man to ask.

Q We have equipment which is powered by figure of eight mains leads. How do we PAT test these leads, considering that the lead settings on the some testers are only for mains leads with an IEC connector? At present we do a test of equipment with the lead connected and print a label twice.

Nigel, Middlesex

A The IEE Code of Practice recommends that a 2-core cord set should be tested as a Class II appliance. The recommendation is for visual inspection and polarity and insulation checks to be carried out. Insulation resistance can be measured without a connection between the figure of eight connector and the tester as the test voltage is applied to the mains plug. The earth bond/insulation test clip is required to provide a return path for the insulation measurement. Again referring to the IEE Code, when testing insulation on a class II appliance the test probe should be connected to any metal parts or suspect joints in the enclosure where conductive material may have accumulated.

With regards to a polarity check, figure of eight connectors are not polarised and so this test is not appropriate. If some form of adaptor or converter were used to allow the figure of eight plug to be connected to the IEC test socket there is no way to determine which way round the figure of eight plug should be put in. If we plug it in, do the polarity check and it fails, simply reversing the figure of eight connector would "correct" the polarity as seen by the tester.

Q My PAT tester is 18 months old and I use it mainly to test my own equipment as a Training Consultant, and to offer a simple Pass/Fail service to customers as an offshoot to my main business. I've used the kit less than 100 times since purchase.

I know calibration is normally advised annually but with such a low usage isn't that factor to be taken into account? If so how often would you suggest I have my tester calibrated?

George, Vale of Glamorgan

A It is possible to extend the period between calibrations by using some form of verification device or checkbox to perform regular checks of your instrument. A risk assessment is commonly used to

determine whether the interval between calibrations can be extended – what is the likelihood or probability of the instrument performance changing, based on the amount of usage, and what are the consequences of the device not performing correctly.

The IEE Code of Practice recommends that the on-going accuracy of test equipment is assessed using a reference circuit or checkbox and that records are kept. This is particularly useful as it allows the user to detect any change in performance over time. If you perform regular checks and find that there is no deviation in performance then this could be used as a justification for extending the calibration interval.

Q What advice is provided for the testing of newly purchased electrical appliances for offices and other low risk areas (including desk lamps and PCs for example)?

I have a PAT testing schedule but often new items of equipment are purchased before a test is due in that particular area. It is not always possible for an electrician to get to that area to test the new item for a week or two.

Additionally I then have items which are out of sync with the scheduled test visit.

Is it acceptable to work by a procedure where office managers (or other senior staff) can carry out a visual inspection and proceed to use an item of equipment and for it to be formally inspected and tested at the next scheduled visit?

(I recognise that this would only apply to new items purchased through the company purchasing department from reputable suppliers and other equipment would continue to be tested prior to use.)

Neville, Cumbria

A The requirement to test newly purchased items depends specifically on corporate policy and risk assessment. Some companies test new equipment before use whilst others put the equipment into service and don't test until the first in-service test is due.

I am not aware of any particular requirements to test new equipment before it is placed in service. The Electricity at Work Regulations require that reasonably practicable steps are taken to prevent danger. If equipment has been CE marked then the manufacturer is stating that it complies with all relevant EU Directives, including those relating to electrical safety. If the equipment is CE marked, has been tested at the end of manufacture and has not suffered any damage during transit then it should be electrically safe

when you receive it.

Your office managers could check for the CE mark during their initial inspection and check for signs of damage, for example, during shipping. It would be prudent to keep a record of these visual inspections.

Some organisations carry out tests on all new equipment as a matter of course. This typically includes recording and numbering the item, test it and then retest with the next scheduled test. The other advantage to testing a newly acquired item is it can then be issued with an asset number and becomes logged onto your testing database.

From a PAT point of view, testing schedules can become difficult to manage if new items are brought into an organisation without being registered and/or recorded in the correct manner. However, the IEE Code talks about 'in-service testing' and doesn't address new equipment; some official guidance on this matter would be welcome.

Q During PAT testing in a local hotel, I came across an insect zapper with fluorescent tubes. What is the recommended practice for testing these without risk of damage to the tubes?

Anon

A Fluorescent tubes are unlikely to be damaged by an insulation test, but may affect the reading (which is why they are often removed first). Reducing the insulation test voltage to 250V may eliminate the effect of the tube and give a correct reading for the equipment.

Thanks for some great questions – Keep them coming and look out for future TechTalk articles covering these topics.

Got a question? Send it to: letters@current-knowledge.com



A hole lot of fun!

Readers of Current Knowledge have the opportunity to take part in this year's NICEIC Golf Classic.

This exclusive event comprises eight regional qualifying rounds in June and July with the Grand Final to be played in September at the prestigious Archerfield Links on the East Lothian coast of Scotland.

Seaward is a key sponsor of the

Competition winners

Last month we gave 5 readers the chance to win a Seaward VT800D Digital Voltage Tester.

Last month winners:

Simon Gamble from Coalville
Kevin Saddington from Garforth
David Wynd from Birtley
Graham Harper from Derby
David Jones from Isle of Man

competition and is offering one lucky golfing reader the chance to take part in the tournament as a member of the Seaward team.

The NICEIC Classic is a Stableford pairs event and to participate players need to have a valid handicap certificate.

The winner can choose to play at one of the qualifying rounds to be played at Gog Magog, Cambridgeshire on 20th July or Garforth, near Leeds on 23rd July.

Join in the fun

To enter simply send in your name and contact details to competition@current-knowledge.com, along with which course you would prefer to play at, and the lucky winner will be selected at random from all those who express an interest.

Closing date for entries:

Wednesday 30th June 2010.

NICEIC Golf Classic Tournament dates

Qualifying Rounds

8th June – Delamere Golf Club, Cheshire

17th June – Bristol & Clifton Golf Club, Bristol

28th June – Sandwell Golf Club, Midlands

5th July – Malone Golf Club, Belfast

8th July – West Linton Golf Club, Edinburgh

14th July – Sand Martins Golf Club, Wokingham

20th July – Gog Magog Golf Club, Cambridge

23rd July – Garforth Golf Club, Leeds

Grand Final

24th & 25th September – Archerfield Links, Scotland

Terms & Conditions

Entrants must be available to play on one of the dates specified, should the winner not be available on either date, a new winner will be selected at random from the remaining entrants.