PAT100 SERIES
Handheld portable appliance testers



- **Simple Tick/Cross, pass/fail indication plus measurement**
- **Battery powered with rechargeable options**
- **Includes 250 V Insulation and Leakage testing for safe IT testing and surge protected devices**
- **Testing portable and fixed electrical equipment**
- **10 mA and 30 mA Portable RCD lead testing (PAT150)**
- **Adjustable PASS test limits (PAT150)**
- **Substitute and Mains powered leakage testing (PAT150)**
- **Tough, rubber armoured with built-in front cover, hardened, scratch proof display window**

DESCRIPTION

The PAT100 series of hand help portable appliance testers enable simple, fast safety testing in all environments including offices, shops and business units. It is ideally suited to training organisations with a very short learning curve and tough, reliable functionality.

With rubber armoured cases and fitted with hardened, scratch proof glass, the PAT100s are exceptionally tough instruments.

Battery powered operation makes the PAT100s perfect for those locations where an electrical supply is not available, inconvenient or unsafe, especially building sites and warehouses. The PAT100 series conforms to all UK and European requirements for electrical safety testing.

Test groups

Test groups enable the correct sequence of tests to be performed automatically with minimum intervention by the user. This keeps testing simple, reduces test times to a minimum and helps to prevent testing errors.

PAT120:

- The PAT120 model has test groups available for Class I, Class II and Extension/Power leads.
- Fixed PASS limits.
- Insulation testing at 500 V (default) or 250 V can be selected at the start of the test.
- Leakage testing uses a "Substitute Leakage" also known as the "Alternative" method to remove the need for a mains supply during test.

The PAT150:

- The PAT150 has additional tests available for testing portable RCDs (PRCDs) of 10 mA and 30 mA.
- Separate tests for Continuity, Insulation, mains powered leakage testing and SELV measurements can be made using the Quick Test (QT) button.
- Test group pass limits and test duration can be configured by the user.
- Bond lead resistance can be nulled to reduce measurement errors.
- Live circuit measurement is available for testing the mains supply and socket polarity or electrical circuit voltage to 300 V ac.
- Can be used for testing fixed appliances.

Continuity test

Used for measuring the proper bonding of all metal parts of a class I device to the protective conductor.

Tests are performed at 200 mA dc in both polarities to be compliant with international and UK regulation or recommendations. This test is safe to perform on equipment where higher test currents could cause damage.

Insulation testing

Used for measuring the separation of conductive parts or conductors from earth. This test is usually performed at 500 V dc. The PAT100 series maintain the necessary test voltage down to 0.5 Mohms.

An additional 250 V dc insulation test is available on all models for use on IT equipment, on devices or extension leads that are fitted with surge protection, or simply where it may be considered undesirable to use a 500 V test.

Substitute leakage testing

Substitute leakage testing enables the measurements of AC leakage currents, which could differ significantly from the DC Insulation test results.

Substitute leakage testing is performed at less than 40 V ac. and does not require a mains supply.

Substitute leakage testing is used for measuring protective conductor current and touch current, in addition to an insulation test, or where it is considered an insulation test may damage equipment.

The Substitute leakage test will not operate equipment and so can be used where the operation of the equipment under test is undesirable.

Portable RCD testing (PRCD)

Portable RCDs can be tested using the PAT150. There is no need to find a non-RCD protected supply as the PAT150 will not trip external RCDs.

Both 10 mA and 30 mA RCDs can be tested both for disconnection times and the manual test button function.

Separated Extra Low Voltage (SELV) supplies

SELV supplies should be tested to ensure the output voltage does not exceed maximum limits as defined in the international regulations for Extra Low voltage systems. The PAT150 permits up to 50 V ac measurement, with a PASS or fail indication for SELV.

Differential Leakage (Protective Conductor Current), Touch Current & operational test

The PAT150 includes the facility for mains powered leakage test. This test has the benefit that equipment under test will function during the test sequence.

Battery life

The PAT120 & PAT150 operates from AA Alkaline or NiMH cells. Battery life is typically 4 days, based on 120 assets per day.

The PAT150R can be re-charged with NiMH batteries fitted.

SPECIFICATIONS

ENVIRONMENTAL CONDITION:

Operating ambient	20°C
Humidity	Nominal humidity

CONTINUITY TEST

Test voltage	Compliance Voltage: +4V dc –0 % /+10 % (open circuit)
Test current	Bi-directional +200mA -0% + 50mA (into 2Ω load)
Continuity accuracy	Resistance: ± 5% ± 3 digits (0 to 19.99 Ω)
Resistance resolution	10 mΩ
Display range	0.01 to 19.99Ω
Continuity test nulling	up to 9.99 Ω
Test time	User selectable from 2 sec to 20 sec or selected during test to 180sec

INSULATION TEST

Insulation test	250V dc –0 % /+25 % open circuit 500V dc –0 % /+25 % open circuit ≥ 500V 0% dc across 0.5 MΩ load
Short circuit/charge current	< 2mA dc
Insulation accuracy	±3% ±10 digits (0 to 19.99 MΩ)
Resolution	0.01 MΩ
Display range	0.10 MΩ to 99.99 MΩ
Test duration	User selectable from 2 sec to 20 sec or selected during test to 180sec

SUBSTITUTE LEAKAGE TEST

Leakage current	Accuracy ± 5% ± 3 digits
Test frequency	Nominal mains frequency 50Hz
Test voltage	< 50V ac
Resolution	0.01mA
Display range	0.10 to 19.99mA
Test duration	User selectable from 2 sec to 5 seconds

Reading corrected to 230V ac.

DIFFERENTIAL LEAKAGE CURRENT

Test voltage	Nominal supply voltage 230 V ac
Test frequency	Nominal mains frequency 50 Hz
Test accuracy	±5% ± 3 digits
Resolution	0.01 mA
Display range	0.10 to 19.99 mA
Test duration	User selectable from 2 sec to 5 seconds

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TOUCH CURRENT TEST

Test voltage	Nominal mains 230 V ac
Test frequency	Nominal mains 50 Hz
Test accuracy	± 5% ± 3 digits
Resolution	0.01 mA
Display range	0.10 to 3.99 mA
Test duration	User selectable from 2 sec to 5 sec

SELV DEVICE TEST

Test voltage	0 to 300 V ac
Measurement accuracy	± 3% ± 3 digits
Resolution	0.1 V ac
Display range	0.1 to 300 V ac

EXTENSION LEAD TEST

Test includes Insulation and Bond tests.

Test voltage	5V
Polarity	Lead OK Live/neutral shorted Live/neutral reversed Live/neutral open circuit

PORTABLE RCD TEST

Test voltage	Nominal mains 230 V
Test frequency	50Hz
Test current accuracy	+2% to +8% (1 x I, 5 x I)
Trip time accuracy	±1% ± 1ms
Trip time resolution	0.01ms
Display range	0 to 200ms (1 x I) 0 to 40ms (5 x I)

MAINS SUPPLY TEST

Frequency measurement range	50 Hz
Test voltage	40 to 300V ac
Accuracy	± 3% ± 3 digits
Resolution	0.1Vac
Display range	40 to 300V ac

CIRCUIT TEST
(Carried out automatically, not available to user)

Test voltage	5V
Test frequency	Nominal Mains 50 Hz
Test current	< 100mA short circuit

Safety

Instrument designed to IEC 61010-1: 2012
Test leads designed to IEC 61010-031: 2005
300 volts to Earth Category II
Mains fuse protection to 250 volts rms ac

EMC

Design to meet IEC 61326-1: 2006 and IEC 61326-2-2: 2005.

Fuse

(user replaceable)
UK variants has mains plug fuse
One F 100 mA 250 V 5 x 20 mm HBC fuse.

ENVIRONMENTAL

Operating temperature range	0°C to +40°C
Storage temperature range	-20°C to +60°C
Humidity	90%RH @ +10°C +30°C 75%RH @ +30°C to +40°C
Maximum altitude	2,000m to full safety spec.
IP rating	IP40 (with front cover closed)

MECHANICAL

BATTERIES

Battery life	3 days based on 120 tests/ day using 2000 mAh Alkaline batteries
Battery type	Supply voltage 12 Vdc (Alkaline AA LR6) 9.6 Vdc (NiMH AA LR6)

WEIGHT

PAT120 (instrument only): 1150 g (40.4 oz)
Shipping weight: 2370g (83.6 oz)

PAT150 (instrument only): 1300 g (45.8 oz)
Shipping weight: 2795g (98.6 oz)

PAT150R (instrument only): 1300 g (45.8 oz)
Shipping weight: 2975g (104.9 oz)

DIMENSIONS

Dimensions (instrument and case)	203mm (L) x 148mm (W) x 78mm (H) (8 x 5.7 x 3.2 inches)
Dimensions (instrument and packaging)	456mm(L) x 178mm (W) x 89mm (H) (18 x 7.1 x 3.5 inches)

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Product selection table:	UK		Germany		Dutch Spain Belgium		Belgium Poland		Switzerland		Australia New-Zealand	
	PAT120-UK	PAT150-UK	PAT120-DE	PAT150-DE	PAT120-EU	PAT150-EU	PAT120-FR	PAT150-FR	PAT120-CH	PAT150-CH	PAT120-AU	PAT150-AU
Connector Interfaces												
Mains Test Socket	BS1363		CEE 7/4 Schuko				CEE 7/5 French		Swiss SEV 1011		AS/NZS 3112 (15A)	
Power Supply												
AA alkaline/NiMH	■	■	■	■	■	■	■	■	■	■		■
Rechargeable (PAT150R)*		■		■		■		■		■		■
Testing												
Protective Earth Resistance	■	■	■	■	■	■	■	■	■	■		■
250 V insulation	■	■	■	■	■	■	■	■	■	■		■
500 V insulation		■		■		■		■		■		■
Cable test	■	■	■	■	■	■	■	■	■	■		■
Live protective conductor current		■		■		■		■		■		■
Live touch current		■		■		■		■		■		■
Substitute leakage	■	■	■	■	■	■	■	■	■	■		■
Functional test (part of Live leakage test)		■		■		■		■		■		■
10 mA PRCD		■		■		■		■		■		■
30 mA PRCD		■		■		■		■		■		■
SELV voltage		■		■		■		■		■		■
Lead resistance nulling		■		■		■		■		■		■
Fuse test												
Function Keys												
Class 1	■	■	■	■	■	■	■	■	■	■		■
Class 2	■	■	■	■	■	■	■	■	■	■		■
Lead/cord	■	■	■	■	■	■	■	■	■	■		■
PRCD		■		■		■		■		■		■
Single test		■		■		■		■		■		■
LCD Backlight	■	■	■	■	■	■	■	■	■	■		■
Setup		■		■		■		■		■		■
On/Off	■	■	■	■	■	■	■	■	■	■		■
Standard Accessories												
4mm plug lead probe + croc clip	1	2	1	2	1	2	1	2	1	2		2
Extension lead adaptor	BS1363		IEC 83:1975 Std C 1b						SN SEV 1011		AS/NZS 3112:2000	
AC Charger Adaptor		■		■		■		■		■		■
Mains Supply Cord		■		■		■		■		■		■
Carry case	■	■	■	■	■	■	■	■	■	■		■

Note: The rechargeable version of the PAT150 has the identifier (R).

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ORDERING INFORMATION

Description	Order Code
PAT120-CH PORTABLE APPLIANCE TESTER	1003-074
PAT120-DE PORTABLE APPLIANCE TESTER	1003-066
PAT120-DE-RS PORTABLE APPLIANCE TESTER	1003-067
PAT120-EU PORTABLE APPLIANCE TESTER	1003-070
PAT120-FR PORTABLE APPLIANCE TESTER	1003-072
PAT120-UK PORTABLE APPLIANCE TESTER	1003-062
PAT120-UK-RS PORTABLE APPLIANCE TESTER	1003-063
PAT150-AU PORTABLE APPLIANCE TESTER	1003-077
PAT150-CH PORTABLE APPLIANCE TESTER	1003-075
PAT150-DE PORTABLE APPLIANCE TESTER	1003-068
PAT150-DE-RS PORTABLE APPLIANCE TESTER	1003-069
PAT150-EU PORTABLE APPLIANCE TESTER	1003-071
PAT150-FR PORTABLE APPLIANCE TESTER	1003-073
PAT150-UK PORTABLE APPLIANCE TESTER	1003-064
PAT150-UK-RS PORTABLE APPLIANCE TESTER	1003-065
PAT150R-AU PORTABLE APPLIANCE TESTER	1003-435
PAT150R-CH PORTABLE APPLIANCE TESTER	1003-434
PAT150R-DE PORTABLE APPLIANCE TESTER	1003-430
PAT150R-DE-RS PORTABLE APPLIANCE TESTER	1003-431
PAT150R-EU PORTABLE APPLIANCE TESTER	1003-432
PAT150R-FR PORTABLE APPLIANCE TESTER	1003-433
PAT150R-UK PORTABLE APPLIANCE TESTER	1003-428
PAT150R-UK-RS PORTABLE APPLIANCE TESTER	1003-429

Description	Order Code
Included accessories for PAT120	
Extension lead adaptor BS1363	1001-234
Continuity/earth bond lead	1001-233
Carry case	1005-075
PAT100 range ~ Included accessories for PAT150	
Continuity/earth bond lead	1001-233
SELV/mains voltage test lead Red x1	1005-077
Extension lead adaptor BS1363	1001-234
Extension lead adaptor Schuko	1001-235
Extension lead adaptor Australia	1001-236
Extension lead adaptor Switzerland	1005-081
Mains plug test lead	6231-601
Mains plug test lead (CEE 7/7)	1005-078
Mains plug test lead (AS/NZS 3112)	1005-080
Carry case	1005-075
Included accessories for PAT150R	
AC Mains charger – multi-country	1003-436
Optional accessories	
Plug adaptor IEC C6 - C13	1001-232
110 V Extension lead adaptor	6220-639
415 V adaptor lead (4-pin) to BS1363 (16 A)	1000-767
415 V adaptor lead (5 pin) to BS1363 (16 A)	1000-770

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