Nemko Ltd

TEST REPORT

No: 47584

Client	
Client contact	
Item/s tested	Multi Travel Conversion Adaptors with USB module With plug pins for use in: UK, Europe, Australia/New Zealand and USA and multiple aperture and Socket outlet accepting various UK, European, American and Australian/NZ plugs. Rated 250V 6A (fused) or 250V 2.5A(fused) Models: 270 & 271
Sample/s tested / Conditions	Four (two of each model) / condition good
Tested to	Limited Safety Evaluation based on IEC 60884-1: 2002 +A1: 2006 & A2: 2013 and national standard sheets/ requirements where relevant and deemed to comply (see Introduction).
Date sample received	30th September 2014
Test period	9th to 13th October 2014
Date of Issue	29th May 2015
Tests carried out at	20 ± 5 º C
Testing Officer	*Giuseppe Capanna*
Verified by	*Bunmi Phillips*

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1. Introduction

The samples were submitted for a limited assessment only. Full testing to IEC 60884-1 (Plugs and socket-outlets for household and similar purposes) and other relevant standard(s) mentioned has not been carried out as part of this assessment. This evaluation will consider primarily the UK users who have for example purchased the adaptor for use say on holiday outside the UK. This evaluation does not include plug insertion endurance tests and temperature tests, so compliance in these areas cannot be confirmed. The list of non-compliances or deviations detailed below should not be considered as exhaustive.

2. Overview

The 4 samples comprise of two travel conversion adaptors 270 & 271 with USB module. Each adaptor is barrel shaped and comes with the plug pins retracted. The ring on the body of the adaptor is twisted in order to engage the slider for the desired plug pins for the country required. Only the plug pins in use are connected to the socket outlet portion of the adaptor. The retracted pins are disconnected from the supply when not in use. The multiple socket outlet portion of the adaptors has multiple apertures and accepts BS 1363 plugs and also Europlugs, US plugs & AS/NZS plugs for class II appliances. The apertures for BS 1363 plugs and for European plugs are shuttered, whereas the apertures for the US and AS/NZS plugs are not.

Models 270 & 271


Model 270 with UK plug pins extended

3. Evaluation: Tests & Inspections

Dimensions

See tables below for measurements for the various plug pin types:

Plug type: CEE 7 Standard sheet XVI (Variant II flat plug)

Reference	REQUIRED mm	Sample1	**Verdict**
(a) Plug body end angle	45°	45°	**P**
(b) Plug body length point to point	34.6 – 36.0	36.16	**P**
(c) Plug body length across flats	25.6 – 26.6	26.40	**P**
(d) Plug body width	13.0 – 14.4	13.80	**P**
I Plug body height Note: (1) b-d maintained	18.0 (min)	18.15	**P**
(f) Plug Pin centres (A)	18.0 -19.2	18.50	**P**
(g) Plug Pin centres (B)	17.0 – 18.0	17.83	**P**
(h) Plug pin diameter (Brass)	3.94 – 4.06	3.963/3.965	**P**
(i) Plug pin diameter (insulation)	3.5(max)	3.363/3.362	**P**
(j) Plug pin length	18.5 – 19.5	18.62/18.62	**P**
(k) Plug pin insulation length	10.0 – 11.0	10.76/10.87*	**P**
(l) Plug pin collar diameter	4(max)	3.938	**P**
(m) Plug pin collar length	4 (max)	3.55	**P**

Plug type: BS 1363-1: 1995

Reference point	REQUIRED mm	Sample1	**Verdict**
FIG 5 Gauge	-	See note	—
Earth Pin centre to Line side edge	By Gauge	Pass	**P**
Earth Pin centre to Neutral side edge	By Gauge	Pass	**P**
Earth to Line pin centres	By Gauge	Pass	**P**
Earth to Neutral pin centres	By Gauge	Pass	**P**
Line & Neutral to Earth pin centres	By Gauge	Pass	**P**
Earth pin length	By Gauge	Pass	**P**
Earth pin chamfer length (major)	1.35-1.85	1.55	**P**

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Earth pin width (major)	7.80-8.05	7.876	**P**
Earth pin chamfer angle	58º-62º/60º-80º	61°/63°	**P**
Neutral pin length	By Gauge	Pass	**P**
Line pin length	By Gauge	Pass	**P**
Line pin sleeve width (minor)	3.90-4.05	3.980	**P**
Neutral pin sleeve width (minor)	3.90-4.05	3.968	**P**
Line pin brass width (minor)	3.90-4.05	3.965	**P**
Neutral pin brass width (minor)	3.90-4.05	3.964	**P**
Line pin chamfer length (major)	1.35–1.85	1.52	**P**
Neutral pin chamfer length (major)	1.35-1.85	1.60	**P**
Earth pin chamfer length (minor)	1.35-1.85	1.55	**P**
Line pin tip chamfer angles	58º-62º/60º-80º	65°	**P**
Neutral pin tip chamfer angles	58º-62º/60°-80°	65°	**P**
Line pin sleeve width (major)	6.22-6.48	6.312	**P**
Neutral pin sleeve width (major)	6.22-6.48	6.314	**P**
Line pin brass width (major)	6.22-6.48	6.265	**P**
Neutral pin width (major)	6.22-6.48	6.263	**P**
Earth pin width (minor)	3.90-4.05	3.984	**P**
Line pin sleeve length	9.5 max	9.14	**P**
Line pin (Brass) length	9.2 max	8.94	**P**
Neutral pin sleeve length	9.5 max	9.12	**P**
Neutral pin (Brass) length	9.2 max	8.85	**P**
Line tip end width	1.2-2.0	1.68	**P**
Neutral tip end width	1.2-2.0	1.70	**P**
Vertical side face length	-	See note	**—**
Line pin edge to periphery	9.5min	>10	**P**
Neutral pin edge to periphery	9.5min	>10	**P**
Low edge of L/ N pin to top edge of plug	-	See note	**—**

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Plug type: AS/NZS 3112 10A Flat pins without earth (fig 2.1c)

Plug type	10A Flat pins without earth (fig 2.1c)		
Pin type	Flat pin with radius on end and side bevels (fig 2.1h)		
Dimensions	**REQUIRED mm**	**Sample1**	**Verdict**
Body size/shape	By Gauge	See note	—
(A)Active pin width metal	6.2-6.5	6.271	P
(A) Active pin width insulation	6.2-6.5	6.304	P
(A) Neutral pin width metal	6.2-6.5	6.281	P
(A) Neutral pin width insulation	6.2-6.5	6.315	P
(B) Earth pin width	6.2-6.5	N/A	N
(C) Active pin thickness metal	1.58-1.78	1.590	P
(C) Active pin thickness insulation	1.58-1.78	1.603	P
(C) Neutral pin thickness metal	1.58-1.78	1.585	P
(C) Neutral pin thickness insulation	1.58-1.78	1.605	P
(D) Active, Neutral pin spacing	By Gauge	Pass	P
(E) Earth pin spacing	By Gauge	Pass	P
(F) Active pin length	16.66-17.46	17.25	P
(F) Neutral Pin length	16.66-17.46	16.95	P
(G) Earth pin length	19.14-20.74	—	N
(R) pin side bevel, or	0.30-0.40	0.33	P
(R) pin side radius	0.30-0.40	—	N
(S) pin corner bevel height, or	0.80-1.00	—	N
(S) pin end radius height	0.80-1.00	0.95	P
(T) pin corner bevel depth	≤0.60		N
(V) pin end radius	6	6	P
(i) Body Radius (option 1)	21.9 (max)	—	N
(ii) Body Radius (option 2)	27.0 (min)	30.97	P
Body size/shape	By Gauge	See note	—

Plug type: ANSI/NEMA WD 6-2002 standard sheet 1-15

Reference	REQUIRED (inches)	Sample1	**Verdict**
Line & neutral plug pin centres	0.495 – 0.505	0.5025	**P**
Line plug pin width	0.240 – 0.260	0.24950	**P**
Line plug pin thickness	0.055 – 0.065	0.05720	**P**
Neutral plug pin width	0.240 – 0.260	0.24895	**P**

Neutral plug pin thickness	0.055 – 0.065	0.05730	**P**
Line plug pin length	0.625 – 0.718	0.6545-0.6905	**P**
Neutral plug pin length	0.625 – 0.718	0.6675-0.6725	**P**
Line pin hole position	0.449 – 0.479	0.4665	**P**
Neutral pin hole position	0.449 – 0.479	0.4665	**P**
Line pin hole diameter	0.120 – 0.130	0.1260	**P**
Neutral pin hole diameter	0.120 – 0.130	0.1260	**P**
Line pin hole countersink diameter	0.151 – 0.161	0.1595	**P**
Neutral pin hole countersink diameter	0.151 – 0.161	0.1515	**P**
Line pin hole countersink angle	44° - 46°	45°	**P**
Neutral pin hole countersink angle	44° - 46°	45°	**P**

Multi Socket-outlet section

General observations

The socket-outlet section of the adaptor does not follow the dimensions of any particular standard sheet, but is of a multi aperture type designed to accept BS 1363 plugs, and also Europlugs, US plugs & AS/NZS plugs for class II appliances . The adaptor is marked stating: "Non-earthed appliances only".
The socket-outlet has apertures to accept BS 1363 plugs. The socket section fully accepted the min gauge and the max gauge of BS 1363 fig. 11. The 1363 fig. 12 contact gauge and the fig.14 non-contact were both applied. The contact gauge made good contact (both lamps lit) and the non-contact did not make contact (no lamps lit) when no force was applied.

Although the required distance varies for different standard sheets, (e.g. 8.1mm for most of Europe, 9.6mm for UK) an attempt to comply the gauging requirements of some of the standard sheets has been sought. Deviations from the dimensions specified in the standard sheets may be made, particularly where the adaptor is attempting to comply with multiple standard sheets, some of which having conflicting requirements. However any deviations should not adversely affect the purpose and safety of travel adaptors complying with the standard sheet, especially with regard to interchange ability and non-interchange ability.

Complies

Clearances and Creepage distances

The creepage distance (& clearance) between the live parts of the fuse contacts and the engagement surface of a socket-outlet that the adaptor may be connected to is 6.17mm. This is considered adequate for the worst case scenario. i.e. for situations where the adaptor is used in a socket-outlet with an unearthed front plate.

Complies

Accessibility of live parts

The contacts protected by shutters were no longer accessible with the test pin detailed in figure 9 with a force of 20N and the test pin detailed in figure 10 with a force of 1N(see clause 10.5).

Complies

Construction

Pin(s) and contacts of portable accessories shall be locked against rotation (see clause 14.3),The UK plug pins did not rotate when a torque of 0.4Nm was applied (60884-1) and also withstood a torque of 1Nm as required by BS 1363-1 12.9.6. The UK plug pins also met the requirements of the pin mechanical strength test of BS 1363-1 clause 12.9.4. 1100N was applied with no bending of the plug pins.

Complies

The USB circuit fitted to models 261 & 271 would require approval to EN 60950-1or an equivalent standard. Approval of the USB was not provided for this evaluation.

If a plug is an integral part of plug-in equipment, that equipment shall not cause over heating of the pins or impose undue strain on fixed socket-outlets. The maximum torque allowed by 60884-1 in order not to impose undue strain is 0.25Nm.
Models 270 & 271 exerted a torque of 0.27Nm on the socket-outlet when a plug with 1m of 1.5mm^2 flexible cord was connected to the adaptor which is above the limit for 60884-1. However it should be noted that for BS 1363-3 (clause 13.10) a torque of 0.7Nm is acceptable.

Screws Current Carrying Parts and Connections

Electrical connections shall be so designed that contact pressure is not transmitted through insulating material other than ceramic or pure mica unless there is sufficient resiliency in the metallic parts to compensate for any possible shrinkage or yielding of the insulating material.

The sockets contacts for the various plug types now make contact on two sides each plug type and do not rely on the plastic enclosure for contact pressure. The minimum force gauge of BS 1363-3 fig 16b was applied and retained for 30 seconds on the sample checked.

Complies

Note on Gauges:
The samples supplied did not fit the BS 1363-3 figure 5 gauge or the appendix A gauge of AS/NZS 3112. However, with the absence of a dedicated standard for travel adaptors in the UK at present it appears that this is common practice for this type of product to have an engagement surface larger than that of a standard plug. The dimensions of the engagment surface on this product may interfere with the switches of some switched socket-outlets.

********** **END OF REPORT** **********