



**CERTIFICATE OF APPROVAL
OF A PACKAGE DESIGN**

AUS/2013-47/B(U)-96

1. TYPE OF CERTIFICATE

This is a package design approval certificate for transport of radioactive material.

2. COMPETENT AUTHORITY IDENTIFICATION MARK

AUS/2013-47/B(U)-96

3. CERTIFICATE EXPIRY DATE

The expiry date of this certificate is 30 September 2018.

4. TRANSPORT RESTRICTIONS

- a. All users of this certificate shall comply with the limits and restrictions as described in the Analogue and Digital Measurements P/L Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.
- b. The Analogue and Digital Measurements P/L Model 1860A package design is authorized for transport by road and rail.

5. NATIONAL AND INTERNATIONAL REGULATIONS

The 1860A package design is authorised as a B(U) type package in accordance with the requirements of the:

- a. Australian Radiation Protection and Nuclear Safety Agency, *Code of Practice for Safe Transport of Radioactive Material* 2008, Radiation Protection Series No. 2.
- b. International Atomic Energy Agency, Regulations for the Safe Transport of Radioactive Material 2005 Edition (TS-R-1).

6. CONSIGNOR OBLIGATIONS

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

7. PACKAGE IDENTIFICATION

- a. Designer: Analogue and Digital Measurements P/L, Australia
- b. Model: 1860A

8. PACKAGE DESCRIPTION AND DESIGN

The 1860A package and drawings are described in Appendix 1, 3 and 4 respectively. The package containment system is described in Appendix 1.

9. AUTHORIZED RADIOACTIVE CONTENTS

The 1860A package is not authorised to contain fissile material. The authorized radioactive contents of the 1860A package are described in Appendix 2 and are only to be in solid special form.

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10. OPERATIONAL CONTROLS

All users of this certificate shall comply with the operational controls for preparation, loading, carriage, unloading and handling of the consignment, and stowage provisions for the safe dissipation of heat, as well as use of the packaging and specific actions to be taken prior to shipment as described in the Analogue and Digital Measurements P/L Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.

11. ACTIONS PRIOR TO SHIPMENT

All users of this certificate shall register their identity in writing with the relevant competent authorities prior to the use of this certificate and shall certify that they possess the instructions necessary for preparation of the package prior to shipment.

12. QUALITY ASSURANCE

All records of Quality Assurance activities required by paragraph 306 of the Australian Radiation Protection and Nuclear Safety Agency, Code of Practice for Safe Transport of Radioactive Material 2008, Radiation Protection Series No. 2 or paragraph 306 of the International Atomic Energy Agency, Regulations for the Safe Transport of Radioactive Material 2005 Edition (TS-R-1), shall be appropriately maintained and made available to relevant competent authorities.

13. NOTIFICATION AND REGISTRATION OF SERIAL NUMBERS

Package serial numbers shall be documented and maintained in an appropriate quality format by all users of this certificate. Should a package be disposed of or if there is a change of package ownership, this must be notified to the relevant competent authorities. Accordingly, the party relinquishing ownership of a package shall forward the name of the new owner to the relevant competent authorities.

14. EMERGENCY ARRANGEMENTS

All users of this certificate shall comply with emergency arrangements as described in the Analogue and Digital Measurements P/L Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.

ISSUED at SYDNEY, this *4th* day of *October* 2013.

Carl-Magnus Larsson
Chief Executive Officer

Australian Radiation Protection and Nuclear Safety Agency

Designated Competent Authority for the Commonwealth of
Australia for inland surface transport



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Australian Radiation Protection and Nuclear Safety Agency

SUMMARY OF THE CERTIFICATE ISSUES

Revision Number	Issue Date	Expiry Date	Certificate Identification	Reason for Revision
0	14 December 2007	14 December 2010	AUS/2007-13/B(U)-96	First publication
1	30 September 2013	30 September 2018	AUS/2013-47/B(U)-96	Modification to Design

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APPENDIX 1

1. DESCRIPTION OF THE PACKAGE

The 1860A package is designed, fabricated, inspected, tested, maintained and used in accordance with the report Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013 from Analogue and Digital Measurements P/L. The 1860A package consists of six configurations, namely, A to F.

The package, composed of a cylindrical core with conic ends and an outer cylindrical crumple shell, are both made of stainless steel grade 316 and presented in Appendix 3 and 4. The package shielding material consists of lead, tungsten and stainless steel.

1.1 CONTAINMENT SYSTEM

The cylindrical attenuating package inner core with conic ends and an internal drawer with end caps, which constitutes the “containment system”, has twelve stainless steel fins welded onto the outer surface. An outer cylindrical crumple shell is attached to each end cap of the package. Stainless steel mesh is welded onto the fins and crumple end shells.

1.2 DRAWER SYSTEM

The transported radioactive material is placed in a drawer in the centre of the package and it is accessible from both ends. The drawers are not pressurized.

1.3 SPECIFICATIONS

The primary measurements and configurations specifications of the 1860A package are as follows:

Shape:	Cylindrical body containing cylindrical inner core with conic ends
Unloaded Mass:	980 to 1020 kg
Max. Dimensions (L x W x H):	910 mm x 870 mm x 870 mm
Max. diameter of outer crumple shell	770 mm
Max. diameter of inner cylindrical core with conic ends	460 mm
Configuration A	64 mm Round Drawer, Point Source, Lead filled, 980 kg
Configuration B	64 mm Round Drawer, Point Source, Ø150 mm and 100 mm long Tungsten Attenuator + Lead filled shell, 990 kg
Configuration C	64 mm Round Drawer, Point Source, Ø200 mm and 100 mm long Tungsten Attenuator + Lead filled shell, 1000 kg
Configuration D	64 mm Round Drawer, Pencil Source, Ø200 mm and 210 mm long Tungsten Attenuator + Lead filled shell, 1020 kg
Configuration E	75 mm Square Drawer, Point Source, 135 mm square and 100 mm long Tungsten Attenuator + Lead filled shell, 990 kg
Configuration F	75 mm Square Drawer, Point Source, 185 mm square and 100 mm long Tungsten Attenuator + Lead filled shell, 1000 kg

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APPENDIX 2

AUTHORIZED RADIOACTIVE CONTENTS

The 1860A package design is authorized to contain only solid SPECIAL FORM radioactive material up to the following maximum quantities:

Model	Configuration	Product revision number	Radioactive Material		
			Cesium-137	Iridium-192	Cobalt-60
1860A	A	A1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	35TBq (946 Ci)
1860A	B	B1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	115 TBq (3100 Ci)
1860A	C	C1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	450 TBq (12,160 Ci)
1860A	D	D1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	560 TBq (15,100 Ci)
1860A	E	E1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	40 TBq (1080 Ci)
1860A	F	F1	1000 TBq (27,000 Ci)	1850 TBq (50,000 Ci)	115 TBq (3100 Ci)

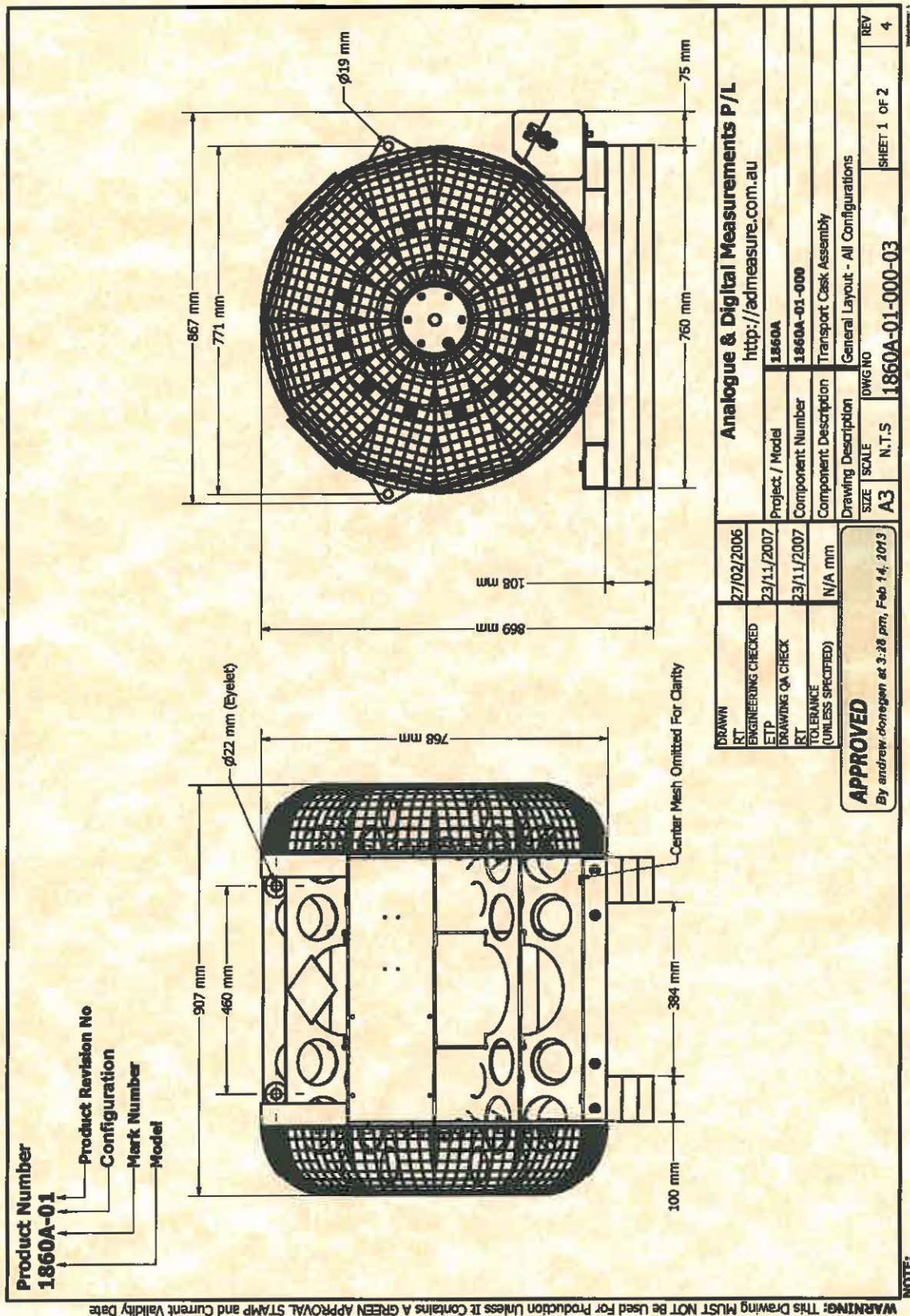
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APPENDIX 3
GENERAL DRAWING OF THE 1860A PACKAGE



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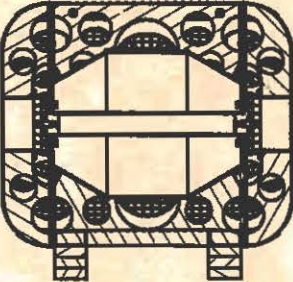
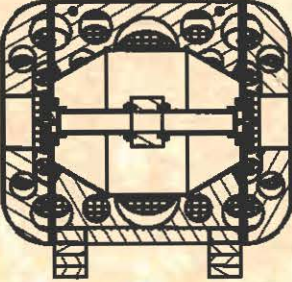
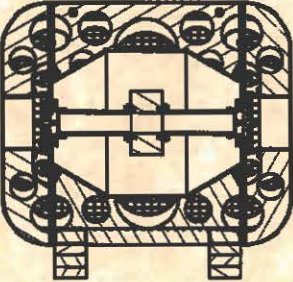
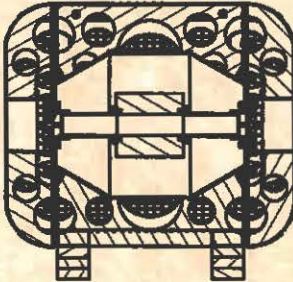
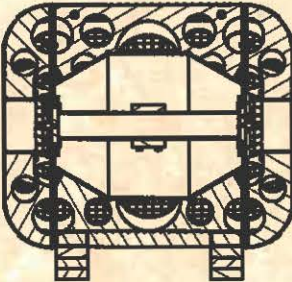
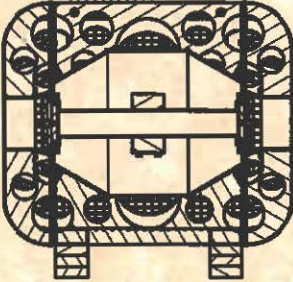


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APPENDIX 4

CONFIGURATIONS 'A' TO 'F' DRAWINGS OF THE 1860A PACKAGE

CONFIGURATION - A 1860A-A1		CONFIGURATION - B 1860A-B1		CONFIGURATION - C 1860A-C1	
					
Note: Unloaded Mass: 980 Kg, Draw: ϕ 64 mm (dia), Attenuator Material: Lead (Pb)		Note: Unloaded Mass: 990 Kg, Draw: ϕ 64 mm (dia), Attenuator Material: Lead (Pb) & Tungsten (W)		Note: Unloaded Mass: 1000 Kg, Draw: ϕ 64 mm (dia), Attenuator Material: Lead (Pb) & Tungsten (W)	
CONFIGURATION - D 1860A-D1		CONFIGURATION - E 1860A-E1		CONFIGURATION - F 1860A-F1	
					
Note: Unloaded Mass: 1020 Kg, Draw: ϕ 64 mm (dia), Attenuator Material: Lead (Pb) & Tungsten (W)		Note: Unloaded Mass: 990 Kg, Draw: \square 75 mm (squ), Attenuator Material: Lead (Pb) & Tungsten (W)		Note: Unloaded Mass: 1000 Kg, Draw: \square 75 mm (squ), Attenuator Material: Lead (Pb) & Tungsten (W)	
DRAWN RT 27/02/2006		ENGINEERING CHECKED ETP 23/11/2007		DRAWING QA CHECK RT 23/11/2007	
TOLERANCE (UNLESS SPECIFIED) N/A mm		APPROVED By <i>andrew.donagan</i> at 3:28 pm, Feb 14, 2013		Analogue & Digital Measurements P/L http://admeasure.com.au	
SIZE A3		SCALE N.T.S		DWG NO 1860A-01-000-03	
SHEET 2 OF 2		REV 4			

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