**Australian Government**

**Civil Aviation Safety Authority**

Instrument number CASA 282/13

I, JOHN FRANCIS McCORMICK, Director of Aviation Safety, on behalf of the Civil Aviation Safety Authority, Australia (***CASA***), in its capacity as the Competent Authority for the air transport of radioactive material, make this instrument for the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air* applied by Part 92 of the *Civil Aviation Safety Regulations 1998*.

John F. McCormick
Director of Aviation Safety

20 December 2013

## Approval – Type B(U) package design – Analogue and Digital Measurements Pty Limited

### 1 Approval

For Part 6; 7.21.2 of the Technical Instructions, I approve the design mentioned in Schedule 1 as a Type B(U) package design.

### 2 Expiry

This instrument expires at the end of 30 September 2018, as if it had been repealed by another instrument.

*Note* This is the same date of expiry as the approval certificate mentioned in Schedule 1.

### Schedule 1 Approval certificate

The approval certificate contains the following information:

(Information as specified in paragraph 833 of IAEA TS-R-1 and paragraph 838 of IAEA SSR-6.)

(a) ***Type of certificate***

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

(b) ***Competent Authority identification mark***

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

(c) ***Issue date and expiry date***

Issue date: 4 October 2013

Expiry date: 30 September 2018.

(d) ***Transport restrictions***

This certificate only authorises air transport (CASA is the *Competent Authority* for air transport)

(e) ***National and international regulations***

*Civil Aviation Act 1988* (Australia);

*Civil Aviation Safety Regulations 1998* (Australia);

International Civil Aviation Organization: *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, 2013-2014 edition DOC-9284;

International Atomic Energy Agency: *Regulations for the Safe Transport of Radioactive Material*, 2005 edition TS-R-1, 2009 edition TS-R-1 and 2012 edition SSR-6;

Australian Radiation Protection and Nuclear Safety Agency (Australia): *Code of Practice – Safe Transport of Radioactive Material* — Radiation Protection Series Publication No. 2, 2008 Edition.

(f) ***Consignor obligations***

This approval 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.

(g) ***Reference to other certificates***

Approval for transport by road and rail is provided in Certificate of Approval of a Package Design AUS/2013-47/B(U)-96 issued by the Australian Radiation Protection and Nuclear Safety Agency and attached as Appendix 2.

(h) ***Approval of shipment – Type B(M) package***

Not applicable — package is not a Type B(M) package.

(i) ***Packaging identification***

Designer: Analogue and Digital Measurements Pty Limited

Model: 1860A

(j) ***Description of packaging***

The 1860A package consists of 6 (six) configurations, namely A to F. The package, composed of a cylindrical core with conic ends and an outer cylindrical crumple structure, both made of 316 grade stainless steel is presented in the illustration at Appendix 1. The package shielding material consists of lead, tungsten and stainless steel. The 1860A package, drawings and containment system are described in Appendix 2. The maximum dimensions are 910 mm x 870 mm x 870 mm with an unloaded mass of 980 to 1020 kg.

(k) ***Specification of design***

The design number is 1860A, the details for which are described in Appendix 2 to this approval.

(l) ***Authorised radioactive contents***

The 1860A package is not authorised to contain fissile material.

The 1860A package design is authorised to contain only solid special form radioactive material up to the following maximum quantities:

| Model | Configuration | Product Revision Number | Cesium-137 CS-137 | Iridium-192 Ir-192 | Cobalt-60 Co-60 |
|---|---|---|---|---|---|
| 1860A | A | A1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **35 TBq** (946 Ci) |
| 1860A | B | B1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **115 TBq** (3108 Ci) |
| 1860A | C | C1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **450 TBq** (12,162 Ci) |
| 1860A | D | D1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **560 TBq** (15,135 Ci) |
| 1860A | E | E1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **40 TBq** (1081 Ci) |
| 1860A | F | F1 | **1000 TBq** (27027 Ci) | **1850 TBq** (50,000 Ci) | **115 TBq** (3108 Ci) |

(m) ***Description of the containment system***

The cylindrical attenuating package inner core with conic ends and an internal drawer with end caps constitutes the "containment system" and has 12 stainless steel fins welded onto the outer surface. An outer cylindrical crumple is attached to each end cap of the package. Stainless steel mesh is welded onto the fins and crumple end shells.

(n) ***Additional details for packages containing fissile materials***

Not applicable — the package is not authorised to contain fissile material.

(o) ***Statement for Type B(M) packages***

Not applicable — package is not a Type B(M) package.

(p) ***Statement for packages containing uranium hexafluoride***

Not applicable — package is not authorised to contain uranium hexafluoride.

(q) ***Operational controls***

All users of this certificate must 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 before shipment as described in the document Analogue and Digital Measurements Pty Limited Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.

(r) ***Use of packaging and actions before shipment***

Users of this certificate must comply with the use of the packaging and specific actions to be taken before shipment contained in the document Analogue and Digital Measurements Pty Limited Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.

(s) ***Statement regarding ambient conditions assumed for design***

Not applicable — ambient conditions assumed were as specified in paragraphs 654, 655 and 664 in TS-R-1:2009 (paragraphs 656, 657 and 666 in SSR-6).

(t) ***Quality assurance/management system***

The Quality Assurance/Management System applicable to the manufacture of the 1860A package is contained in the document Analogue and Digital Measurements Pty Limited Model 1860A Type B(U) Package Safety Analysis, Revision 1.13 of March 2013.

(u) ***Emergency arrangements***

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

(v) ***Identity of approval holder***

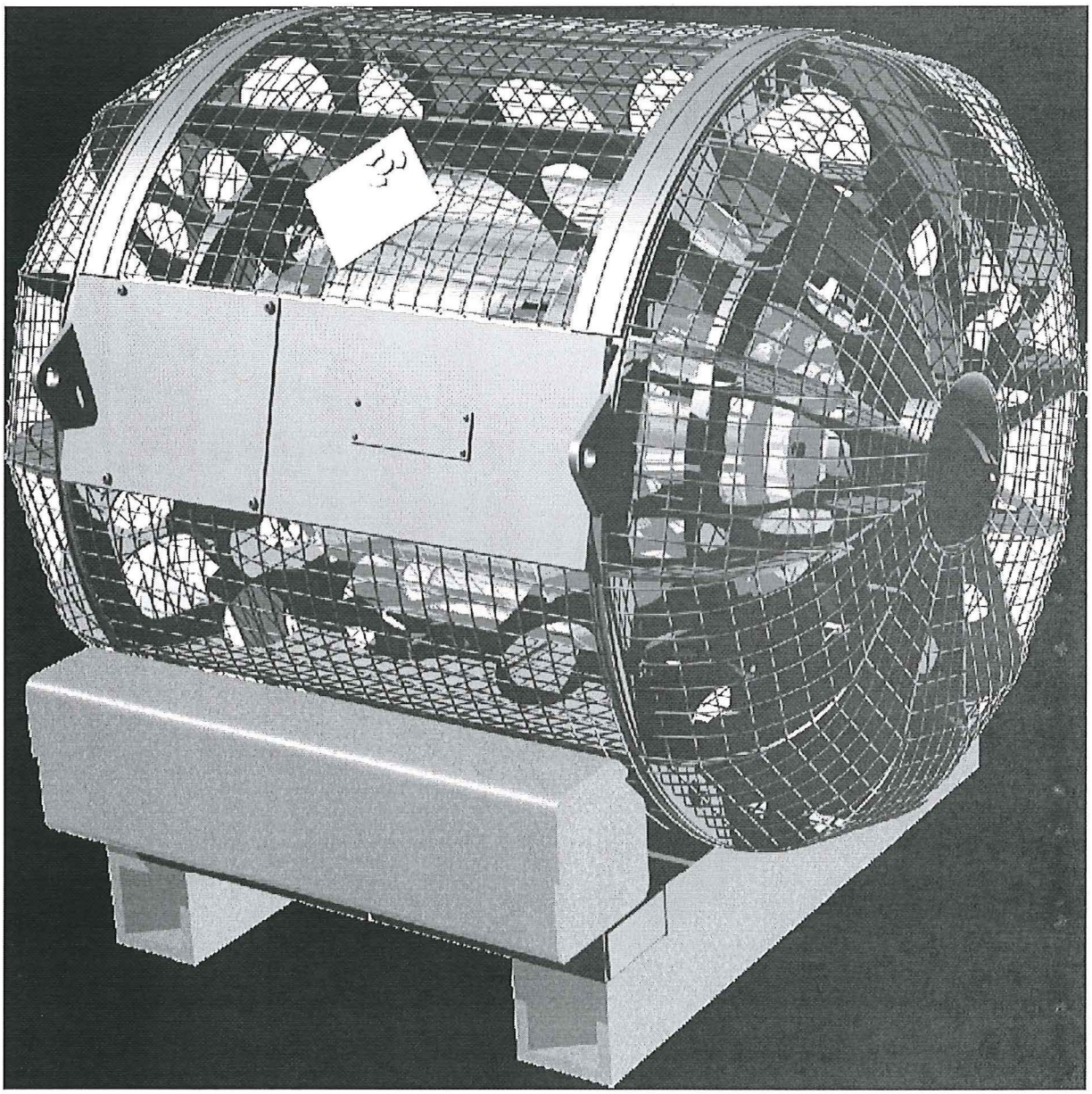
The approval holder is Analogue and Digital Measurements Pty Limited, Australian Business Number 57 005 531 484, 27 Cumberland Drive, Seaford, Victoria 3198, Australia.

(w) ***Signature and identification of certifying official***

The signature and identification of the certifying official is on page 1 of this Approval.

## Appendix 1

Illustration of Package: **MODEL 1860 TYPE B(U) PACKAGE**



## Appendix 2

## Certificate of Approval of a Package Design issued by the Australian Radiation Protection and Nuclear Safety Agency: AUS/2013-47/B(U)-96

Australian Government

Australian Radiation Protection and Nuclear Safety Agency

### 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

Certificate Number: **AUS/2013-47/B(U)-96**

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, ∅150 mm and 100 mm long Tungsten Attenuator + Lead filled shell, 990 kg |
| Configuration C | 64 mm Round Drawer, Point Source, ∅200 mm and 100 mm long Tungsten Attenuator + Lead filled shell, 1000 kg |
| Configuration D | 64 mm Round Drawer, Pencil Source. ∅200 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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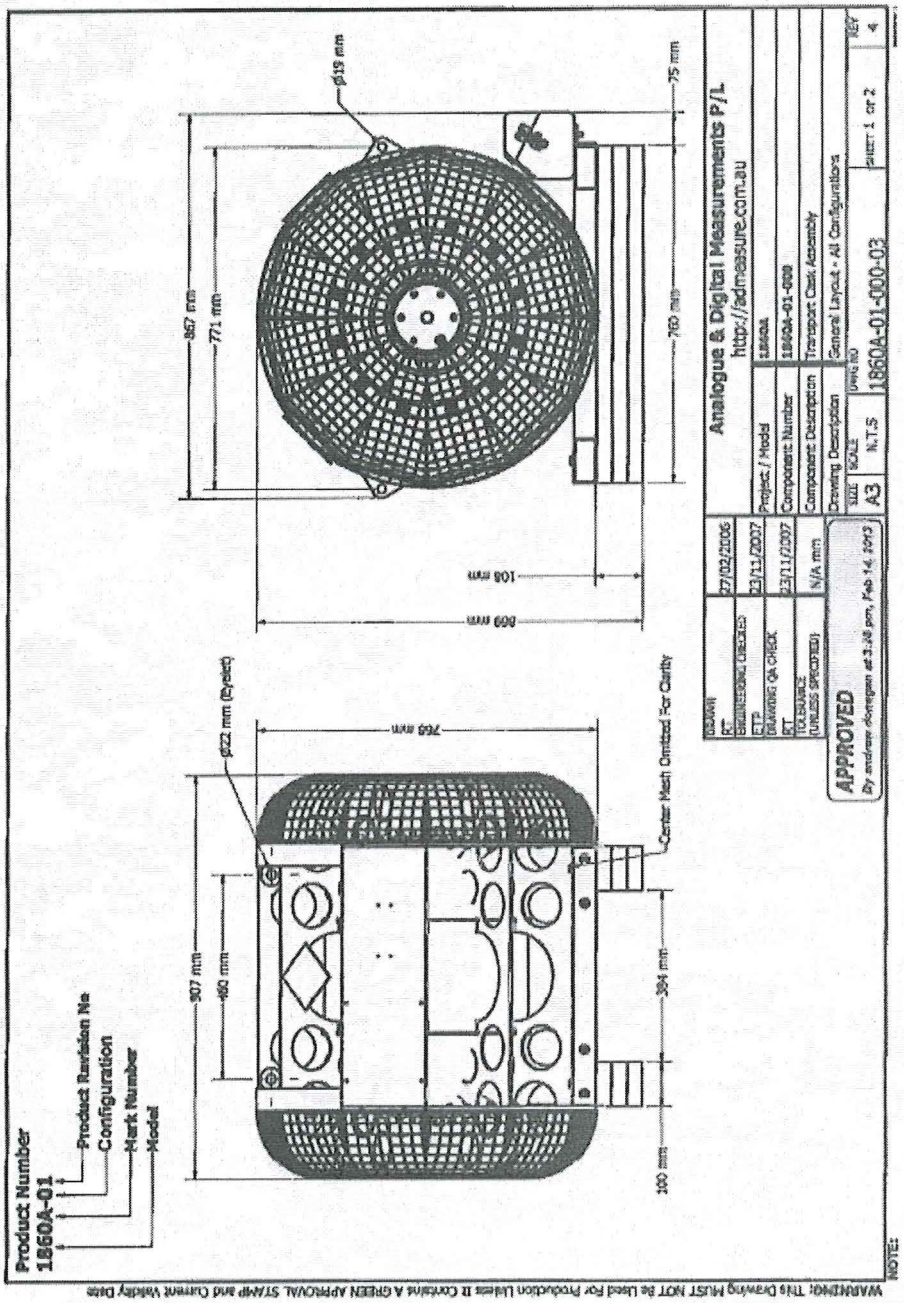
## APPENDIX 3
## GENERAL DRAWING OF THE 1860A PACKAGE

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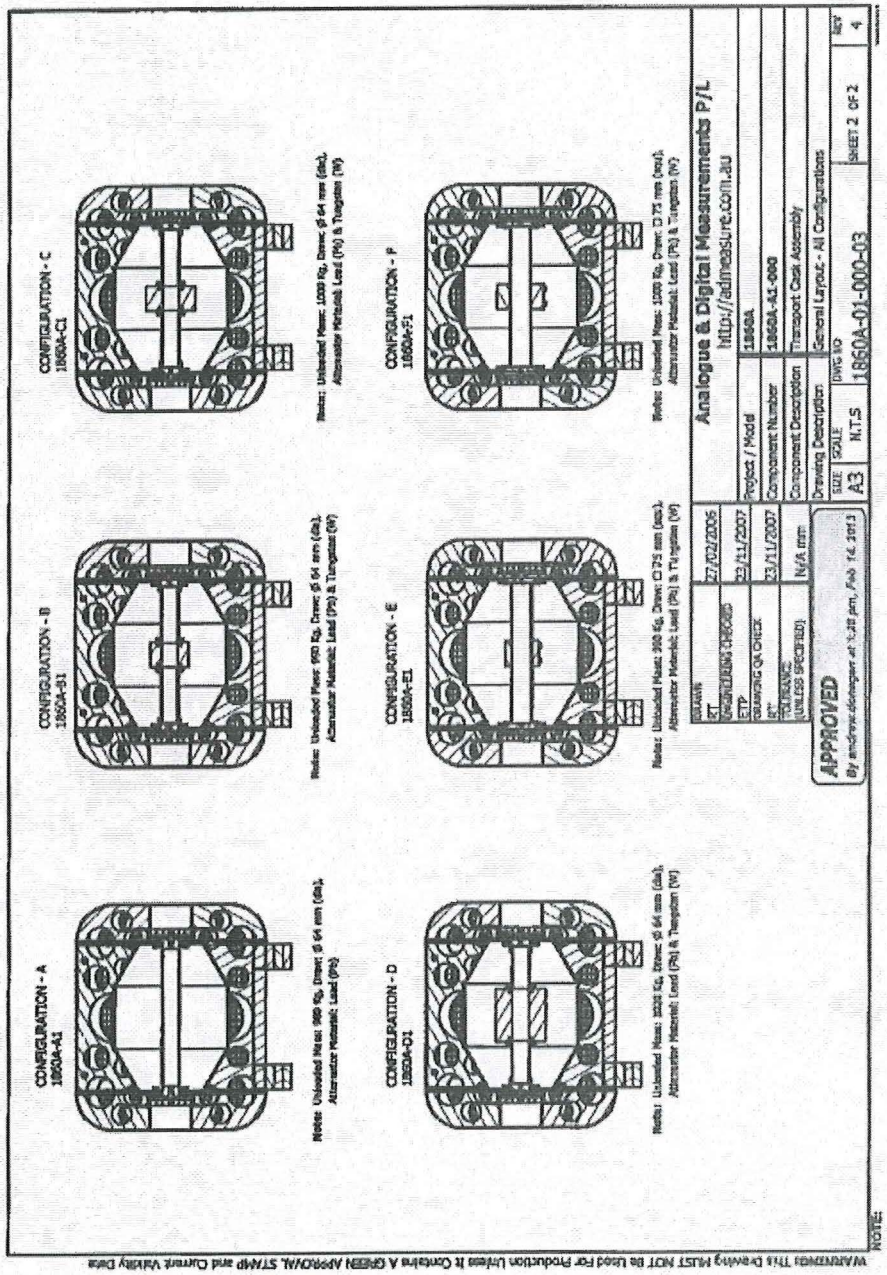
## APPENDIX 4

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




Certificate Number: **AUS/2013-47/B(U)-96**

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