



# Certificate

## for Radiation Device

<b>Certificate Number</b> R-476-0003-5-2028	<b>Date of Issue</b> August 04, 2022	<b>Date of Expiry</b> January 31, 2028
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The radiation device identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and section 12 of the *Nuclear Substances and Radiation Devices Regulations*.

**Manufacturer:** QSA Global Inc.

**Make and Model:** QSA Global Model Sentry 330

**Prev. Mfr. Name:**

**Device Type:** EXPOSURE DEVICE, CABLE

**Description:** The radiation device consists of a depleted uranium shield contained within a housing that surrounds a titanium 'S' tube. The housing is made from stainless steel and consists of a cylindrical shell and two welded end plates each about 9.5 mm thick. The internal void space of the welded housing is filled with polyurethane foam. Two port assemblies are welded to the shell body at the ends of the 'S' tube. These two, front and rear ports, provide access to the locking mechanism and source assembly. The radiation device uses an automatic securing mechanism to lock the source in the stored position. The radiation device is carried on a cart. The radiation device includes a handling rib assembly to increase the ease of lifting/movement.

The external dimensions of the radiation device are 495 mm x 495 mm x 495 mm and the overall weight of the radiation device is approximately 354 kg.

Either of the following sources may be used in the radiation device:

- 1- A cobalt 60 special form source model 60011 in a source assembly model A424-14 or 943 manufactured by QSA Global with maximum activity of 4.07 TBq.
- 2- A cobalt 60 special form source model 60011 in a source assembly model A424-13 manufactured by QSA Global with maximum activity of 8.14 TBq.
- 3- A cobalt 60 special form source model 60012 in a source assembly model A424-13 manufactured by QSA Global with maximum activity of 12.21 TBq.

Refer to the Summary Evaluation for additional information (CNSC Document Number 6837112). Reference CNSC Application Number 62523.

The radiation device may contain any of the following nuclear substances in a quantity not exceeding the corresponding quantity indicated:

Nuclear Substance	Maximum Quantity
Cobalt 60	4.07 TBq
Depleted Uranium (used as shielding)	12.21 TBq 220 kg

Designated Officer pursuant to paragraph 37(2)(a) of the  
*Nuclear Safety and Control Act*





# Summary Evaluation

For certificate number R-476-0003-5-2028

## 1. Identification of Radiation Device

<b>Type:</b> Exposure device
<b>Manufacturer:</b> QSA Global Inc.
<b>Model(s):</b> Sentry 330

## 2. Description

The radiation device incorporates an 'S' tube design which holds the source when it is not in the exposed position. A depleted uranium shield, contained within a housing, surrounds the titanium 'S' tube. The housing is made from stainless steel and consists of a cylindrical shell and two welded end plates each about 9.5 mm thick. The internal void space of the welded housing is filled with polyurethane foam. At two ends of the 'S' tube, two port assemblies are welded to the shell body. These two, front and rear ports, provide access to the locking mechanism and the source assembly. The radiation device uses an automatic securing mechanism to lock the source in the stored position. The radiation device is carried on a cart. The radiation device includes a handling rib assembly to increase the ease of lifting/movement.

The external dimensions of the radiation device are 495 mm x 495 mm x 495 mm. The overall weight of the radiation device is approximately 354 kg.

General assembly of the radiation device is shown in QSA Global Inc. drawing number R86000. An illustration of the radiation device is shown in attached Figures 1 and 2.

## 3. Intended Use

The radiation device is a portable exposure device used for industrial radiography.

## 4. Authorized Nuclear Substances

The radiation device is authorized to contain the source model with the activity up to the amount shown in the following table.

Nuclear Substance	Radiation Device Maximum Activity	Source Assembly Model	Source Model	Special Form Certificate	Source Assembly and Source Manufacturer
Co-60	4.07 TBq	A424-14	60011	USA/0377/S-96	QSA Global Inc.
Co-60	4.07 TBq	943	60011	USA/0377/S-96	QSA Global Inc.
Co-60	8.14 TBq	A424-13	60011	USA/0377/S-96	QSA Global Inc.
Co-60	12.21 TBq	A424-13	60012	USA/0377/S-96	QSA Global Inc.
Depleted Uranium	220 kg	Shielding	-	-	-

## 5. Maximum Expected Radiation Dose

Radiation Dose Rate with Maximum Activity of 12.21 TBq Co-60		
Distance from Surface (cm)	Source in Shielded Position ( $\mu\text{Sv/hr}$ )	Source Exposed (Sv/hr)
Surface	420	1716 (at 5 cm)
30	52	47.7
100	10	4.3

## 6. Conditions of Use and Storage

The radiation device is designed to operate or stored in the temperature range of  $-40\text{ }^{\circ}\text{C}$  to  $149\text{ }^{\circ}\text{C}$ . Humidity is not expected to affect the radiation device.

## 7. Leak Test

The leak test is to be conducted in accordance with QSA Global Inc.'s document *Sentry 110 and Sentry 330 Operating and Maintenance Manual MAN038* and in accordance with the *Nuclear Substances and Radiation Devices Regulations*.

## 8. Emergency and Accident Response

Emergency and accident responses are to be taken in accordance with QSA Global Inc.'s document *Sentry 110 and Sentry 330 Operating and Maintenance Manual MAN038* and the *Nuclear Substances and Radiation Devices Regulations*.

## 9. Quality Assurance

The design, testing and manufacture of the exposure device are made in accordance with *QSA Global Quality System Manual, QSM-1*, which complies with ISO 9001:2015 requirements. The exposure device has been demonstrated to meet ANSI N432-1980 and ISO 3999:2004 (E) standards.

## 10. Inspection, Maintenance and Servicing

The radiation device is to be inspected and maintained in accordance with the instructions provided by QSA Global, Inc. document *Sentry 110 and Sentry 330 Operating and Maintenance Manual MAN038* and in accordance with the *Nuclear Substances and Radiation Devices Regulations*. QSA Global, Inc. accepts the radiation device for disposal.

## 11. Transport Packaging

The radiation device is certified as a Type 'B' package. The package must be prepared for shipment and received in accordance with QSA Global Inc.'s document *Sentry 110 and Sentry 330 Operating and Maintenance Manual MAN038*.

The radiation device is to be transported in accordance with the *Packaging and Transport of Nuclear Substances Regulations, 2015*.

## 12. Authorized Accessories and Configurations

The following accessories are authorized for use with this radiation device:

Equipment	Model Nos	Manufacturer
Control assembly	664XX, 692XX, 693XX, SAN882XX, SAN882RXX, SAN883XX, SAN883RXX, SAN884XX, SAN884RXX, SAN885XX, SAN886XX, SAN886RXX, SAN887XX, SAN887RXX	QSA Global Inc.
Guide Tubes	48906-X, 48907-X, 48930-X, 48931-X, 48998-X, 48999-X, 67606-XX, 86066-X, 86067-X, 86068-X, 86069-X, 90203-XX, 95020-X, 95021, 95073-X, 95074-X, 95075-X and 95076-X. Model 489- and Model 950- style guide tubes may be used with Model TUB011-X shield assembly as an option. Models 69130-XX and 91500-XX. Models 48912G-X, 48912GTUB-XX, 48906G-X and 95020G-X swivel end guide tubes.	
Collimator*	TCN 527, TCN714, TCN 717, TCNL 719, TCNU 719, TCN782, TCN783, TCN784, TCN827, TCN828, TCN846	
Cart	Cart model 859	
End stops	TAN691, 8011003202	

\* All collimators listed in the table above are authorized for use with the model 60011 capsule.

The only collimators authorized for use for the A424-13 source assembly with the model 60012 capsule are the collimator models TCNL 719, TCNU 719.

X is the guide tube length and XX is control cable length in feet up to a maximum of 50 ft.

## 13. Reference Documents

No.	Description	Date yyyy-mm-dd	CNSC Reference No.
1	Application, for Rev. 4 certificate	2022-02-15 2022-03-31	6748035 6770094
2	Application, for Rev. 5 certificate	2022-07-14	6835034

Figure 1: QSA Sentry 330 Exposure Device

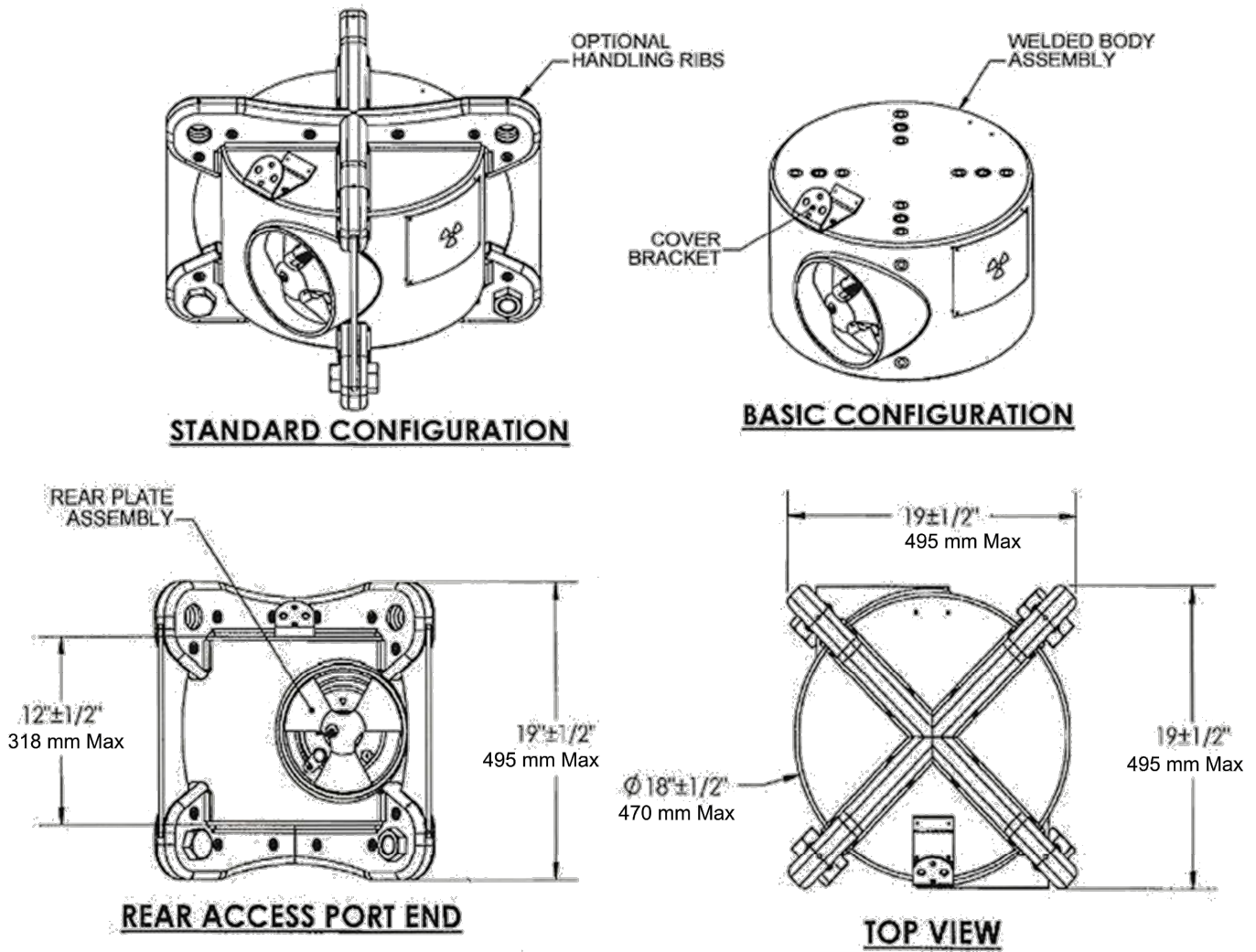


Figure 2: Optional Model 859 cart

