Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Certificate

for

Radiation Device

Certificate Number	Date of Issue	Date of Expiry
R-094-0105-0-2041	June 17, 2026	January 31, 2041

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: Endress+Hauser SE+Co.KG

Make and Model: Endress+Hauser FQG74

Prev. Mfr. Name:

Device Type: FIXED GAUGE

Description: The radiation device consists of a source container housing, a process adapter (for the detachable option), a source magazine, sealed sources, a connection flange and a shutter assembly. The source container housing is made of stainless steel, is filled with lead and is fitted with a protective cover. A glass window on the protective cover provides an indication of the status of the source magazine or the source holder rods. A chain connects the protective cover to the source container housing.

The source magazine holds up to 12 or 20 source holder rods. Each rod contains a sealed source fitted with a protective cap at one end and is connected at the other end to an extension rope via a ball joint. The source holder rods may be rigid or flexible. In the “OFF” position, a retaining ring secures the source holder rods in place. For the detachable option, the source magazine is lowered into a process adapter connected to the protection pipe via a user-supplied process connection. A funnel aids insertion during the lowering of the source magazine. Once the source magazine is in place, a seal is fitted and the process adapter cover is held with a clamp and four screws.
The shutter assembly consists of a stainless-steel block actuated by a spindle connected to a manually operated crank. The shutter position “ON/OFF” is indicated through two viewing windows.

The radiation device includes three padlocks securing the shutter, the protective cover of the source container housing, and the locking plates that prevent the removal of the source holder rods from the source magazine. A transportation lock secures the shutter in the “OFF” position during transportation and serves as a flange-side seal.
The dimensions of the FQG74 are approximately 822 mm in height x 614 mm in width x 734 mm in length and it weighs up to 780 kg (with the extension ropes).

Refer to the Summary Evaluation for additional information. Reference CNSC application number 65430.

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

Nuclear Substance	Maximum Quantity
Cesium 137	814 GBq

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

Canada

Summary Evaluation

For certificate number R-094-0105-0-2041

1. Identification of Radiation Device

Manufacturer:	Endress+Hauser SE+Co.KG
Model(s):	FQG74
Type:	Fixed gauge

2. Description

The radiation device consists of a source container housing, a process adapter (for the detachable option), a source magazine, sealed sources, a connection flange and a shutter assembly.

The source container housing is made of stainless steel, is filled with lead and is fitted with a protective cover. A glass window on the protective cover provides an indication of the status of the source magazine (detachable option) or the source holder rods (non-detachable option). A chain connects the protective cover to the source container housing.

The source magazine holds up to 12 or 20 source holder rods. Each rod contains a sealed source fitted with a protective cap at one end and is connected at the other end to an extension rope via a ball joint. The source holder rods may be rigid (for straight protection pipes) or flexible (for curved protection pipes). In the “OFF” position, a retaining ring secures the source holder rods in place. For the detachable option, the source magazine is lowered into a process adapter connected to the protection pipe via a user-supplied process connection. A funnel aids insertion during the lowering of the source magazine. Once the source magazine is in place, a seal is fitted and the process adapter cover is held with a clamp and four screws.

The shutter assembly consists of a stainless-steel block actuated by a spindle connected to a manually operated crank. The shutter position “ON(AN)/OFF(AUS)” is indicated through two viewing windows.

The radiation device includes three padlocks securing the shutter, the protective cover of the source container housing, and the locking plates that prevent the removal of the source holder rods from the source magazine. A transportation lock secures the shutter in the “OFF” position during transportation and serves as a flange-side seal.

The dimensions of the FQG74 are approximately 822 mm in height x 614 mm in width x 734 mm in length and it weighs up to 780 kg (with the extension ropes).

The main components of the FQG74 are shown in Figure 1 and a picture of the FQG74 is shown in Figure 2.

3. Intended Use

The radiation device is used in systems for level limit detection and level, density, concentration and interface measurement.

4. Authorized Nuclear Substances

The radiation device is authorized to contain either up to 12 or up to 20 sealed sources, with the activity up to the amount shown in the following table:

Nuclear substance	Maximum activity*		Source model	Source manufacturer	Special form radioactive material certificate
	Radiation device	Sealed source			
Cs-137	814 GBq	81.4 GBq	VZ-357-001	Eckert & Ziegler	D/0100/S-96 or CZ/1051/S-96
		20.35 GBq	VZ-79-001		D/0085/S-96 or CZ/1048/S-96
		20.35 GBq	VZ-79-002		D/0099/S-96
		20.35 GBq	VZ-1508-001		D/0085/S-96 or CZ/1049/S-96
		81.4 GBq	VZ-3579-001		D/0102/S-96 or CZ/1052/S-96
		81.4 GBq	P04 / Cs7.P04		CZ/1012/S-96 or USA/0518/S

* The maximum activity corresponds to the nominal activity plus the manufacturing tolerance.

5. Maximum Expected Radiation Dose Rate

Maximum radiation dose rate with maximum activity of 814 GBq of Cs-137*		
Distance from surface (cm)	Closed shutter (µSv/h)**	Open shutter*** (mSv/h)
At the surface	33	1,210
30	12	250
100	5	48

* Derived from simulations of a unit loaded with 740 GBq of Cs-137 and validated by measurements from a unit loaded with 296 GBq of Cs-137.

** With transportation lock in place.

*** All sources secured in the “off” position.

6. Conditions of Use and Storage

The radiation device is designed to be operated and stored in an ambient temperature range of -52°C to 120°C. It should be lifted, carried and installed in an ambient temperature range of -40°C to 120°C. The radiation device is not susceptible to humidity.

The sealed sources are designed to be operated in a process temperature range of -52°C to 450°C.

The radiation device should be limited to mild to medium vibration; it has been tested from 5 to 200 Hz, with an amplitude of 0.01 $(m/s^2)^2/Hz$.

7. Leak Tests

Leak tests are to be conducted in accordance with Endress+Hauser procedures and the *Nuclear Substances and Radiation Devices Regulations*.

8. Emergency and Accident Response

Emergency and accident responses are to be taken in accordance with Endress+Hauser procedures and the *Nuclear Substances and Radiation Devices Regulations*.

9. Quality Assurance

The design, testing and manufacture of the radiation device are in accordance with the Endress+Hauser quality assurance program, which complies with ISO 9001.

10. Inspection, Maintenance and Servicing

The radiation device is to be inspected, maintained and serviced in accordance with Endress+Hauser procedures, and the *Nuclear Substances and Radiation Devices Regulations*.

11. Packaging and Transport

The sealed sources, when shipped in the source container housing assembly of the FQG74, can be transported as a Type A package, in accordance with the *Packaging and Transport of Nuclear Substances Regulations, 2015*.

12. Authorized Configurations and Accessories

There are four authorized configurations for the FQG74:

- Version A1: may contain up to 20 sealed sources, incorporated into rigid source holder rods, with a source magazine that is bolted to the source container housing and cannot be detached.
- Version B1: may contain up to 12 sources, incorporated into rigid source holder rods, with a source magazine that is bolted to the source container housing and cannot be detached.
- Version B2: may contain up to 12 sources, incorporated into rigid source holder rods, with a source magazine that can be detached and lowered into a process adapter.
- Version B3: may contain up to 12 sources, incorporated into flexible source holder rods, with a source magazine that is bolted to the source container housing and cannot be detached.

For version B2, the process adapter is authorized to contain the source magazine. In addition, a funnel can be temporarily fitted to the top of the process adapter to act as an insertion aid when lowering the source magazine into the process adapter.

13. Reference Documents

No.	Description	Date yyyy-mm-dd	CNSC Reference No.
1	Application	2025-11-06	UFAU4ACC6FJU-1569068575-303
2	Supplemental information	2026-04-16 2026-04-24 2026-05-05 2026-06-12	55DAD1PYT9B8-1569068575-599 55DAD1PYT9B8-1569068575-635 55DAD1PYT9B8-1569068575-797 55DAD1PYT9B8-1569068575-947

Figure 1: Main components of the FQG74

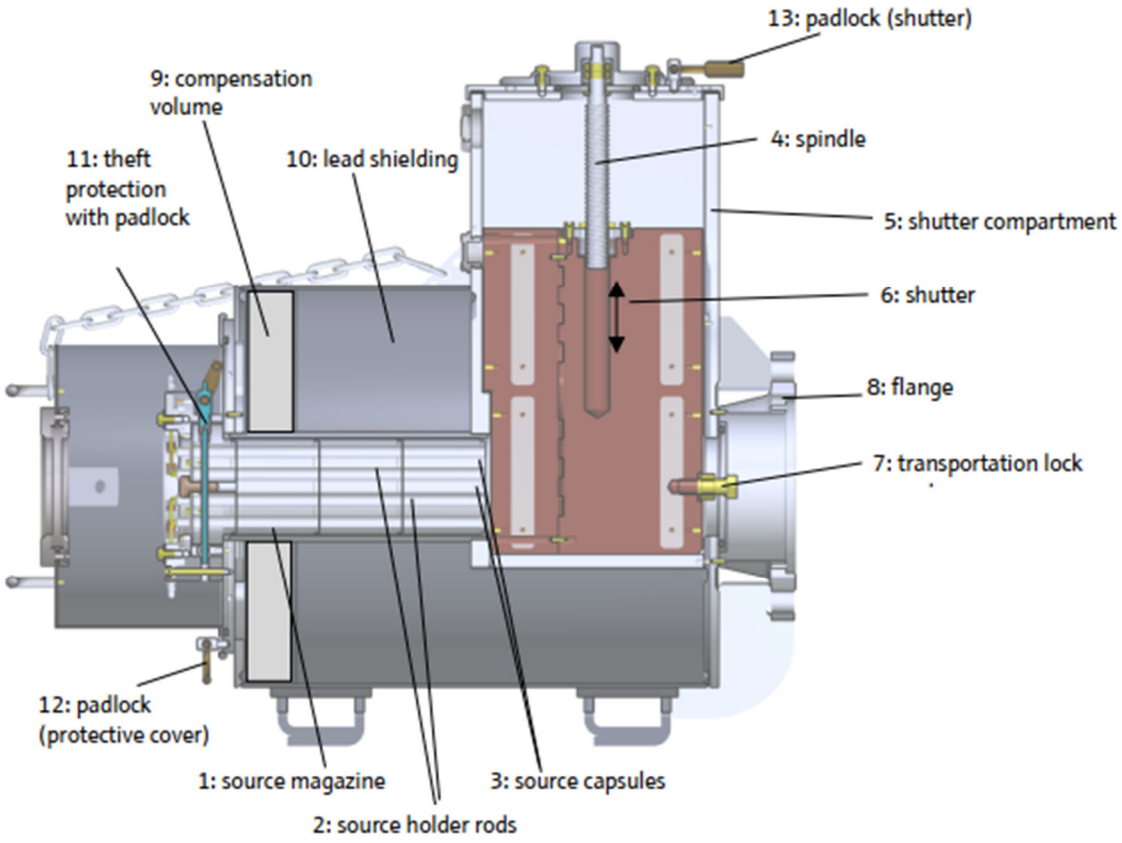

Figure 2: Picture of the FQG74 in its operating orientation