Special Documentation
Source container FQG60, FQG61, FQG62, FQG63, FQG66

Instructions for loading and changing the source
Label set

Endress+Hauser
People for Process Automation

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1 Document information

1.1 Document function

This document describes the process for loading and changing the source for the source containers FQG60, FQG61, FQG62 FQG63 and FQG66.

1.2 Symbols used

1.2.1 Safety symbols

Symbol	Meaning
DANGER	**DANGER!** This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
WARNING	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
CAUTION	**CAUTION!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE	**NOTE!** This symbol contains information on procedures and other facts which do not result in personal injury.

1.2.2 Symbols for certain types of information

Symbol	Meaning
	Permitted Procedures, processes or actions that are permitted.
	Preferred Procedures, processes or actions that are preferred.
	Forbidden Procedures, processes or actions that are forbidden.
	Tip Indicates additional information.
	Reference to documentation
	Reference to page
	Reference to graphic
1., 2., 3. ...	Series of steps
	Result of a step
	Help in the event of a problem
	Visual inspection

1.2.3 Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
1. , 2. , 3. ...	Series of steps
A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections
	**Hazardous area** Indicates a hazardous area.
	**Safe area (non-hazardous area)** Indicates the non-hazardous area.

1.3 Documentation

Source container FQG60

Documentation	Comment
TI00445F/00	▪ The document is provided with the device. ▪ The documentation is available on the Internet: → www.de.endress.com

Source container FQG61, FQG62

Documentation	Comment
TI00435/00	▪ The document is provided with the device. ▪ The documentation is available on the Internet: → www.de.endress.com

Source container FQG61, FQG62

Documentation	Comment
TI00446/00	▪ The document is provided with the device. ▪ The documentation is available on the Internet: → www.de.endress.com

FQG66 source container

Documentation	Comment
TI01171F/00	The documentation is available on the Internet: → www.de.endress.com
BA01327F/00	▪ The document is provided with the device. ▪ The documentation is available on the Internet: → www.de.endress.com

Additional notes

Documentation	Comment
SD00292F/00	Supplementary Instruction Manual for Canada (FQG60, FQG61, FQG62, FQG63, FQG66)
SD00293F/00	Supplementary Instruction Manual for USA (FQG61, FQG62)
SD00313F/00	Supplementary Instruction Manual for USA (FQG63)

Documentation	Comment
SD01561F/00	Supplementary Instruction Manual for USA (FQG66)
SD01316F/00	Instructions for the transportation cask for the transportation of radioactive source capsules

2 Basic safety instructions

2.1 Requirements for personnel

The personnel for loading or changing the source must meet the following requirements:
- Trained, qualified specialists: must have a relevant qualification for this specific function and task
- Is familiar with the technical design of the source container and the source holder
- Before beginning work, the specialist staff must read and understood the instructions in the manuals (→ 4). All safety instructions contained in this documentation, especially the instructions on radiation protection, must be strictly observed.

⚠ CAUTION

Check compatibility of source with source container
- It must be ensured that the activity does not exceed the maximum permitted value and complies with national approvals.
- The source may only be exchanged if the same capsule type is used.
- All maintenance activities, such as removal or replacement of the radioactive source, may only be carried out by certified personnel whose radiation exposure is monitored in accordance with local regulations or the handling permit. In this context, ensure that this is permitted by the scope of the handling permit. All local conditions must be taken into consideration.

2.2 Preparation and implementation

⚠ WARNING

Preparation and implementation
- Detailed preparations are required to ensure that the process of replacing the radiation source is as fast as possible. Make sure that the tools and resources required (screened container for replaced source etc.) are at the ready before commencing the task.
- When changing the source, strictly observe all the instructions given in this manual.
- If the source container is mounted upside down, it is not permitted to replace the source. In this case, the source container must first be unbolted from its mounting position.
- All work must be carried out from a safe distance. There must be sufficient screening between the source holder and the body that only the exposure of the hands and forearms must be considered. Suitable measures (e.g. blocking of access) must be taken to protect other individuals from all possible risk.
- The planned procedure must guarantee that the distance between the hands and the source never falls below 10 cm (3.94 in).
- The source holder must be easily movable and may not show corrosion or damage.
- When exchanging the source, all seals must be checked and replaced if necessary.

2.3 Radiation protection

⚠ WARNING

Radiation protection
- The source container must be in the "OFF" position and secured in this position by a lock.
- We recommend loading or changing the source in a suitable room (e.g. workshop) and not in the plant on site.
- Never grip the source capsule directly by the hands; always use a tool (pliers or long pair of tweezers) to keep a distance of at least 10 cm (3.94 in).
- After loading or changing the source, check if the switching mechanism (ON-OFF switch) on the source container is working properly.

2.4 Estimating the dose

Under the conditions stated above, it is assumed that the changing procedure (removal and installation) will take 2 min. This results in the following dose (including safety margin):

15 mSv [1] with 18.5 GBq ^{137}Cs or 12.1 mSv with 1.85 GBq ^{60}Co

In order to keep the radiation exposure as low as possible when replacing the source, we generally recommend to have the source changed at Endress+Hauser. If the activity exceeds 18.5 GBq (^{137}Cs) or 1.85 GBq (^{60}Co) we urgently advise users to have the source changed at Endress+Hauser.

1) This is approximately one tenth of the limit for the organ absorbed dose according to Section 54.2 of the German Radiation Protection Ordinance (Strahlenschutzverordnung) for hands or forearms of occupationally exposed persons, category B, value 150 mSv.

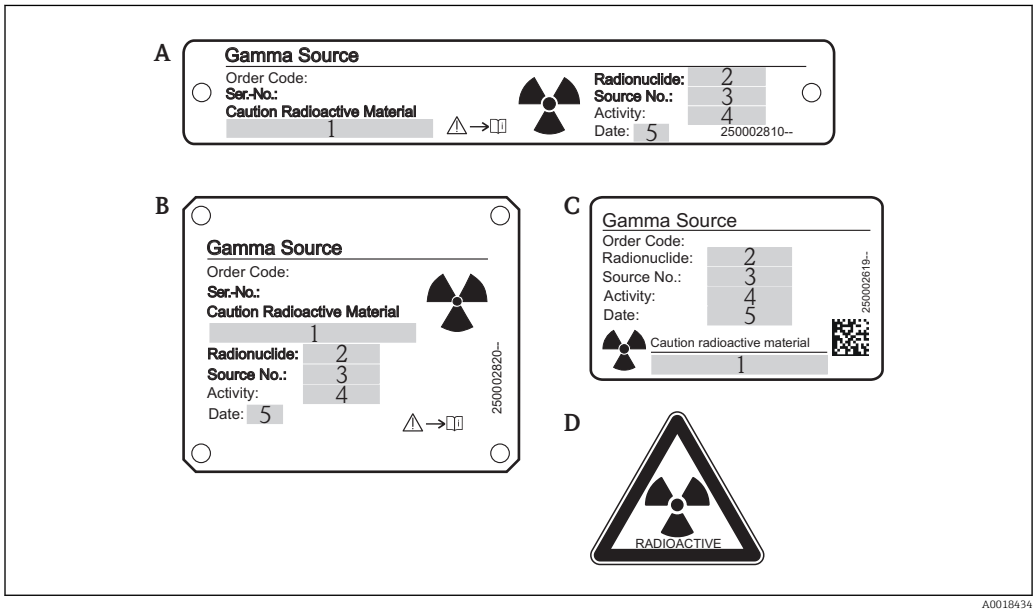
3 Label set for loading and changing the source

3.1 Scope of delivery

- A: Radiation source nameplate: 107 x 17 mm (4.21 x 0.67 in), stainless steel
- B: Radiation source nameplate 45 x 55 mm (1.77 x 2.17 in), stainless steel
- C: Adhesive nameplate 30 x 48 mm (1.18 x 1.89 in)
- D: 2 adhesive labels "RADIOACTIVE"
- 4 grooved pins
- Sealing wire and seals

3.2 Labeling

After loading a source container or changing a source, the appropriate nameplates for the radiation source must be marked with a durable inscription (e.g. by stamped letters) in the following way:



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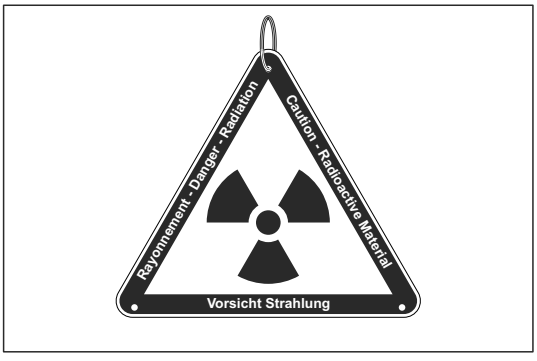
1 *Wording "Caution Radioactive Material", if required*
2 *"Co60" or "Cs137"*
3 *Serial number of the source capsule (according to supplier certificate)*
4 *Activity including unit (MBq or GBq)*
5 *Date of loading (month/year)*

3.3 Sign indicating radiation source is loaded

Depending on the version or the approval, a warning sign "Caution - Radioactive Material" is supplied with the source container.
Once the emitter source is loaded, the warning sign must be secured at the designated point or on the ring eyelet of the container.



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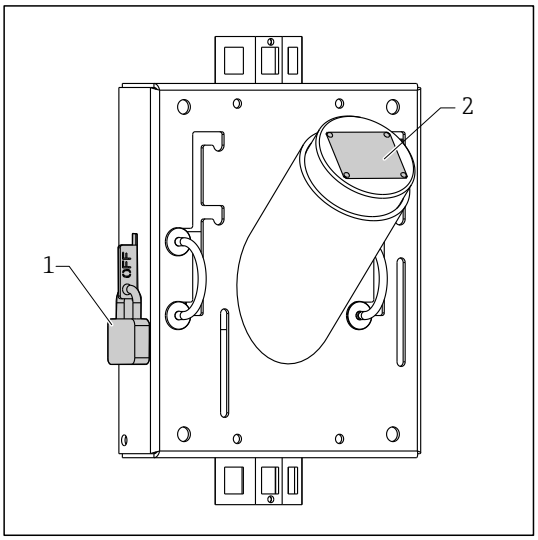
4 FQG60 Loading and changing the source

4.1 Order code 020, option B, C

Removing the source insert

- Set the shutter and padlock (1) to the OFF switch position.
- Remove the grooved pin and nameplate (2).



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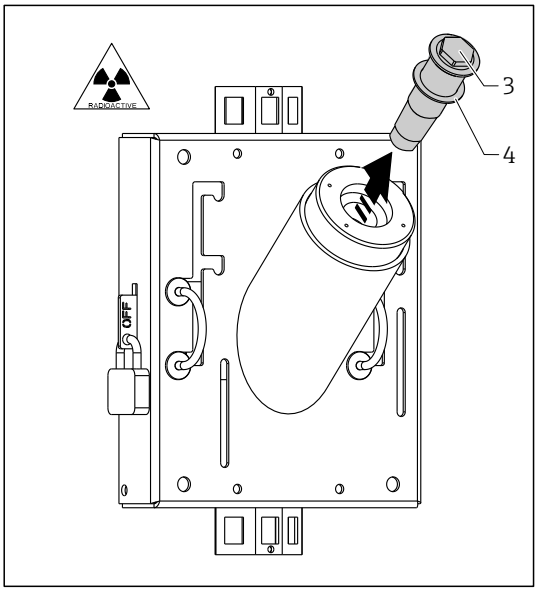
WARNING

Radiation is very high!

- ▶ Observe the radiation protection instructions (→ 🖹 6).

- Unscrew and remove the source insert (3) using wrench AF24.



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NOTICE

Graphite seal

- ▶ Before initial loading, the source insert (3) is only screwed finger-tight.
- ▶ The graphite seal (4) is not press-fitted.
- ▶ For source change only: replace the graphite seal, clean the sealing surfaces of residue and place the sealing ring on the sealing surface.

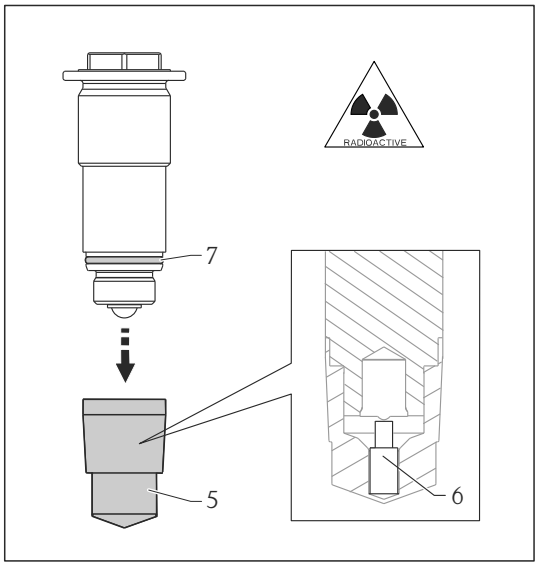
Changing/loading the source capsule

⚠ WARNING

Make sure the source capsule does not fall out

- ▶ Hold the source insert (3) including the protection cap (5) facing downwards.

- Unscrew the protection cap (5).
- For source change only: let the source capsule (6) drop into a screened container. Check O-rings (7) and replace if necessary.
- Insert the new source capsule, and screw protection cap (5) on tightly as far as it will go.



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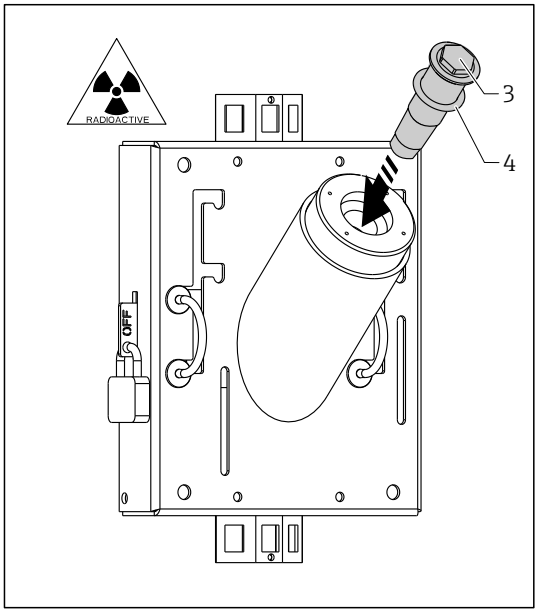
Inserting the source insert

- Insert the source insert (3) and screw it into place, torque 75 ±5 Nm (55.31 ±3.68 lbf ft).



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Attaching the nameplate

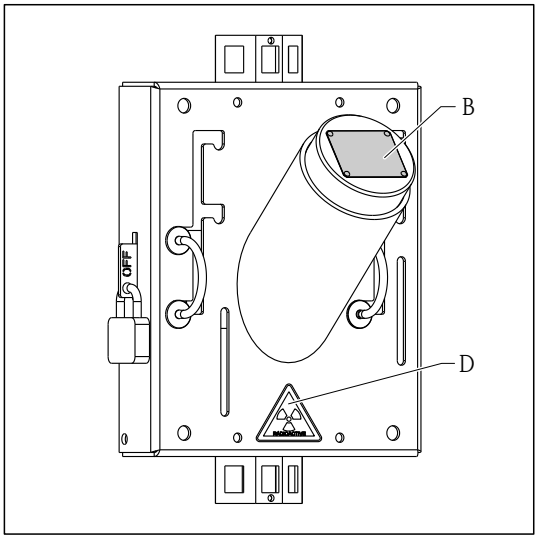
- Label the radiation source nameplate (B) ("labeling", → 🖹 8) and fix it to the source insert using four grooved pins.
- Stick the adhesive label (D) "RADIOACTIVE" on the indicated position (if not yet present).

ℹ The nameplates (A) and (C) are not needed for this version of the source container.

⚠ CAUTION

The radiation source nameplate (B) provides access protection to the source in conjunction with the four grooved pins.

- ▶ The four grooved pins must be securely fastened!



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4.1.1 Check after loading

Finally, the correct operation of the source container has to be checked:
- Is the padlock (1) fully operational and undamaged?
  If the padlock is damaged or not fully operational, do not use it again.
- Do the specifications on the nameplate (2) of the radiation source match the specifications on the certificate of the radiation source?
- Has the source container been damaged during the loading? (visual inspection)
- Are all necessary warning labels (B, D) attached?
  Observe the national regulations.

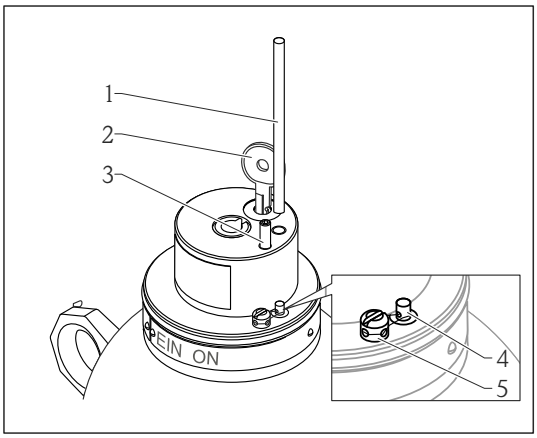
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

5 FQG61, FQG62 Loading and changing the source

5.1 Order code 020, option A

The source inserts of the following source containers are **not** compatible with one other:
- FQG61 or FQG62 with the previous models QG20 or QG100
- FQG61 with FQG62

Removing the source insert
- Remove the cover (see TI00435F/00).
- If necessary, screw extension rod (1) with M8 thread into the threaded bush of the insert to achieve as large a distance as possible from the radiation source.
- Unlock the lock (2).



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WARNING

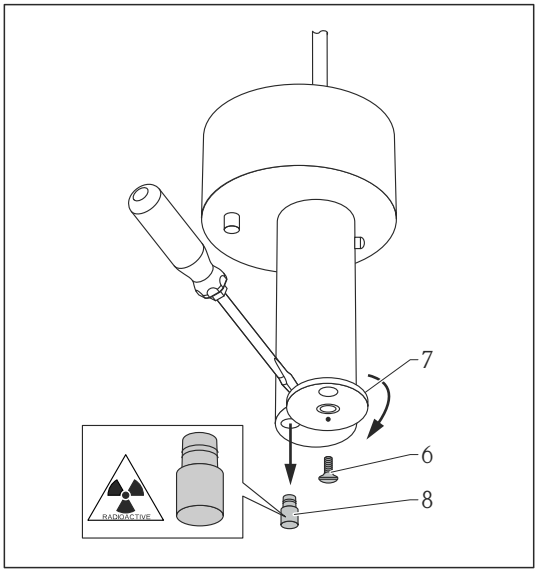
Radiation is very high!
- ▶ Observe the radiation protection instructions (→ 6).

CAUTION

Is the lock not functioning correctly or damaged?
- ▶ Do not use the lock again. Replace source insert!

- For the version with density modification: release setscrew (3) using AF5 Allen key.
- Remove seal connecting the locking pin (4) to the safety screw (5).
- Press in locking pin (4) and turn the insert until the marking arrow is pointing to the locking pin (4).
- Pull out insert.
- To protect against dirt, place the cover on the source container until the insert is reinstalled.

Inserting the source insert
- Push insert into the source container and turn it until the locking pin (4) pops out.
- Continue turning the insert until the OFF position is reached.
- Press in lock (2) with key and lock it. Remove key.
- If necessary, remove extension rod (1).
- For the version with density modification: screw in setscrew (3).
- Attach new seal connecting the locking pin (4) to the safety screw (5).



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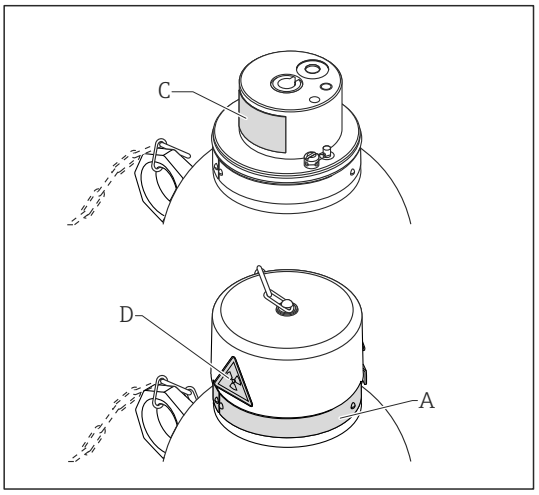
Changing/loading the source capsule

- If present, remove the safety screw (6) using an AF2.5 Allen key.
- Move the cover plate (7) to the side (to do so, use a screwdriver at the bore to lift the cover plate slightly from the cylinder, for example).
- For source change only: let the source capsule (8) drop into a screened container.
- Insert new source capsule, close cover plate (7).
- Screw in safety screw (6) (optional).

Attaching/changing the nameplate

- Label the radiation source nameplate (A) and fix it to the housing ring of the source container using two grooved pins.
- Label the adhesive nameplate (C) and stick it on the insert. Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Stick the adhesive label (D) "RADIOACTIVE" on the cover (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Put on the cover.

Nameplate (B) is not needed for this version of the source container.



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5.1.1 Check after loading

Finally, the correct operation of the source container has to be checked:

- Can the source insert easily be turned to the ON/OFF position?
- Does the lock (2) engage and is there a limit-stop?
- Are the locking pin (4) and the safety screw (5) sealed again?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

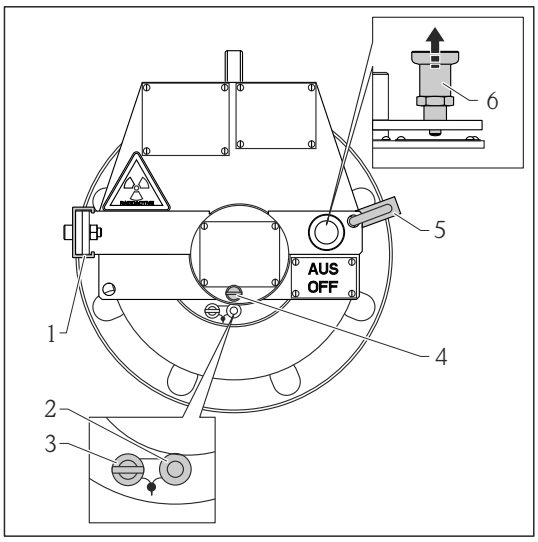
5.2 Order code 020, option B

The source inserts of the following source containers are **not** compatible with one other:
- FQG61 or FQG62 with the previous models QG20 or QG100
- FQG61 with FQG62

Removing the source insert
- Remove safety bracket (1).
- Release setscrew (4) if present.
- Remove padlock (5).
- Remove seal connecting the locking pin (2) to the safety screw (3).
- Press in locking pin. Pull out locking bolt (6) and move the rotary bracket over the locking pin.
- Pull out insert.

WARNING

Radiation is very high!
- ▶ Observe the radiation protection instructions (→ 6).



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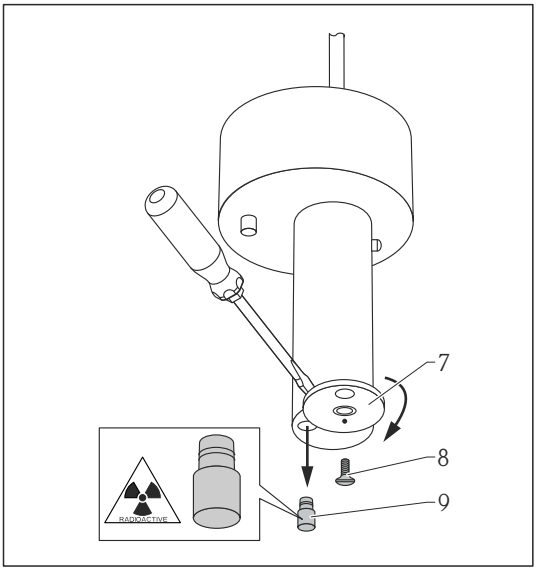
Changing/loading the source capsule
- If present, remove the safety screw (8) using an AF2.5 Allen key.
- Move the cover plate (7) to the side (to do so, use a screwdriver at the bore to lift the cover plate slightly from the cylinder, for example).
- For source change only: let the source capsule (9) drop into a screened container.
- Insert new source capsule, close cover plate (7).
- Screw in safety screw (8) (optional).



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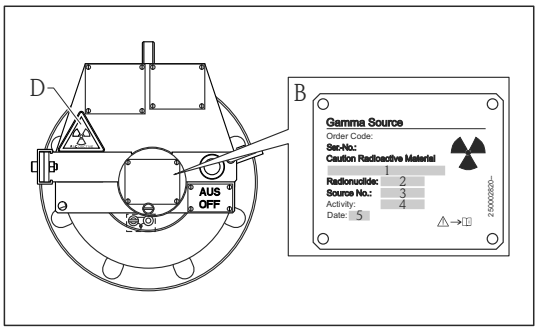
Inserting the source insert

- Push insert into the source container and turn until the locking pin (2) pops out.
- Continue turning the insert until the OFF position is reached.
- Insert padlock (5) into the hole provided and lock it.
- Let the locking bolt (6) snap into place.
- Tighten setscrew (4).
- Secure the locking pin (2) and safety screw (3) together with a new seal.
- Fit the safety bracket (1).

Attaching/changing the nameplate

- Label the radiation source nameplate (B) and fix it to the source insert using four grooved pins.
- Stick the adhesive label (D) "RADIOACTIVE" on the indicated position (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Put on the cover.

The nameplates (A) and (C) are not needed for this version of the source container.



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1 *Wording "Caution Radioactive Material", if required*
2 *"Co60" or "Cs137"*
3 *Serial number of the source capsule (according to supplier certificate)*
4 *Activity including unit (MBq or GBq)*
5 *Date of loading (month/year)*

5.2.1 Check after loading

Finally, the correct operation of the source container has to be checked:

- Is the safety bracket (1) mounted correctly?
- Can the source insert easily be turned to the ON/OFF position?
- Does the locking bolt (6) engage and is there a limit-stop?
- Is it impossible to pull out the source insert in any position?
- Is the padlock (5) fully operational and undamaged?
  If the padlock is damaged or not fully operational, do not use it again.
- Are the locking pin (2) and the safety screw (3) sealed again?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

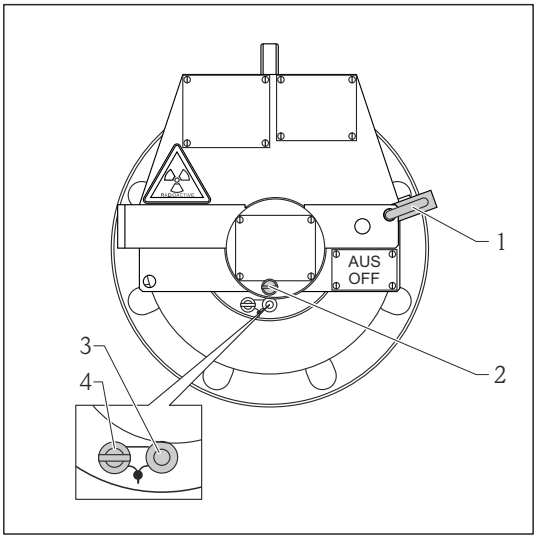
5.3 Order code 020, option C

The source inserts of the following source containers are **not** compatible with one other:
- FQG61 or FQG62 with the previous models QG20 or QG100
- FQG61 with FQG62

Removing the source insert
- Release setscrew (2) if present.
- Remove seal connecting the locking pin (3) to the safety screw (4).
- Remove padlock (1).
- Press in locking pin (3). Move the rotary bracket over it.
- Pull out insert.

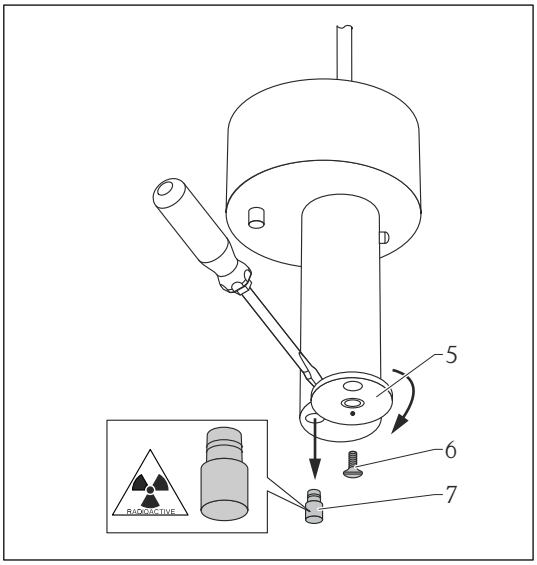
WARNING

Radiation is very high!
- ▶ Observe the radiation protection instructions (→ 6).



A0018448

Changing/loading the source capsule
- If present, remove the safety screw (6) using an AF2.5 Allen key.
- Move the cover plate (5) to the side (to do so, use a screwdriver at the bore to lift the cover plate slightly from the cylinder, for example).
- For source change only: let the source capsule (7) drop into a screened container.
- Insert new source capsule, close cover plate (5).
- Screw in safety screw (6) (optional).



A0018449

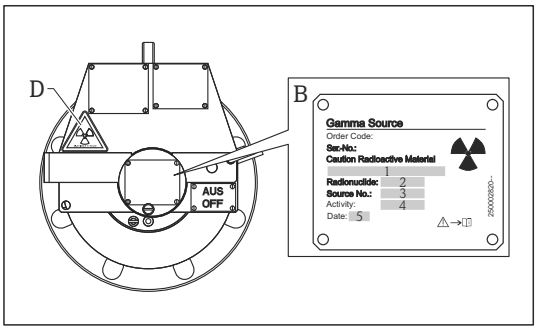
Inserting the source insert

- Push insert into the source container and turn until the locking pin (3) pops out.
- Continue turning the insert until the OFF position is reached.
- Insert padlock (1) into the hole provided and lock it.
- Tighten setscrew (2).
- Secure the locking pin (3) and safety screw (4) together with a new seal.

Attaching/changing the nameplate

- Label the radiation source nameplate (B) and fix it to the source insert using four grooved pins.
- Stick the adhesive label (D) "RADIOACTIVE" on the indicated position (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.

The nameplates (A) and (C) are not needed for this version of the source container.



A0022931

1 *Wording "Caution Radioactive Material", if required*
2 *"Co60" or "Cs137"*
3 *Serial number of the source capsule (according to supplier certificate)*
4 *Activity including unit (MBq or GBq)*
5 *Date of loading (month/year)*

5.3.1 Check after loading

Finally, the correct operation of the source container has to be checked:

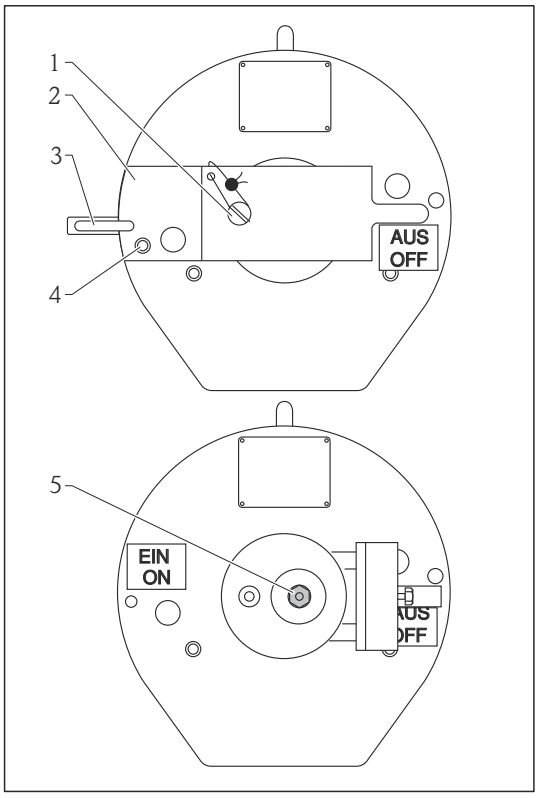
- Can the source insert easily be turned to the ON/OFF position?
- Is it impossible to pull out the source insert in any position?
- Is the padlock (1) fully operational and undamaged?
  If the padlock is damaged or not fully operational, do not use it again.
- Are the locking pin (3) and the safety screw (4) sealed again?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

5.4 Order code 020, option D

Removing the source insert

- Release setscrew (4) if present.
- Remove the seal from the screw (1) and unscrew the screw until it can be pulled up.
- Remove padlock (3).
- Fold up fastening bracket (2).
- If necessary, screw extension rod with M6 thread into the thread of the source holder (5) to achieve as large a distance as possible from the radiation source during transportation.
- Unscrew source holder (5) using wrench AF13 and remove.



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WARNING

Radiation is very high!

▶ Observe the radiation protection instructions (→ 🖹 6).

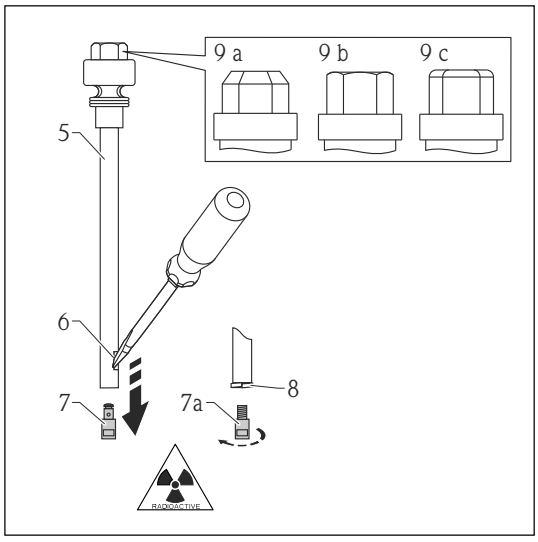
NOTICE

Identifying feature: source holder to capsule type

▶ 9a: Source holder with chamfer, intended for sources with nipple.
▶ 9b: Source holder without chamfer for sources with M4 thread.
▶ 9c: Source holder with curve, intended for sources with M4 thread (VZ-3579).

Inserting the source insert

- For source change only: check O-rings and replace if necessary.
- Screw source holder (5) into the source container and tighten source holder with wrench AF13. Remove extension rod if necessary.
- Fold down fastening bracket (4).
- Insert padlock (1) into the hole provided and lock it.
- Fasten setscrew (2).
- Tighten screw (3).
- Secure the screw (3) with a new seal.



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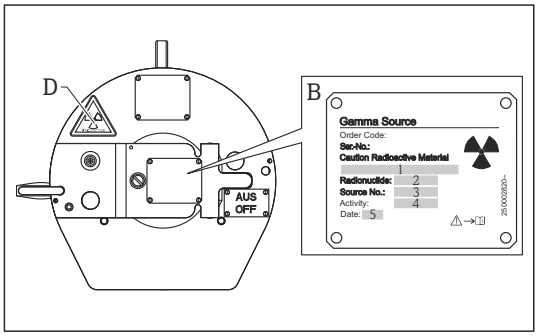
Changing/loading the source capsule

- For source change only:
  Insert the blade of a screwdriver (width 4 mm) into the slit (6) in the source holder and press out the source capsule with nipple (7) or unscrew source capsule (7 a) with thread M4 using a tool. Let source capsule drop into a screened container.
- Insert new source capsule:
  Press capsule (7) into the source holder until it engages. For M4 threaded versions: insert a spring washer (8) and screw in the source capsule (7 a); torque 2±0.5 Nm(1.47±0.36 lbf ft).

Attaching/changing the nameplate

- Label the radiation source nameplate (B) and fix it to the source insert using four grooved pins.
- Stick the adhesive label (D) "RADIOACTIVE" on the indicated position (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.

The nameplates (A) and (C) are not needed for this version of the source container.



1 *Wording "Caution Radioactive Material", if required*
2 *"Co60" or "Cs137"*
3 *Serial number of the source capsule (according to supplier certificate)*
4 *Activity including unit (MBq or GBq)*
5 *Date of loading (month/year)*

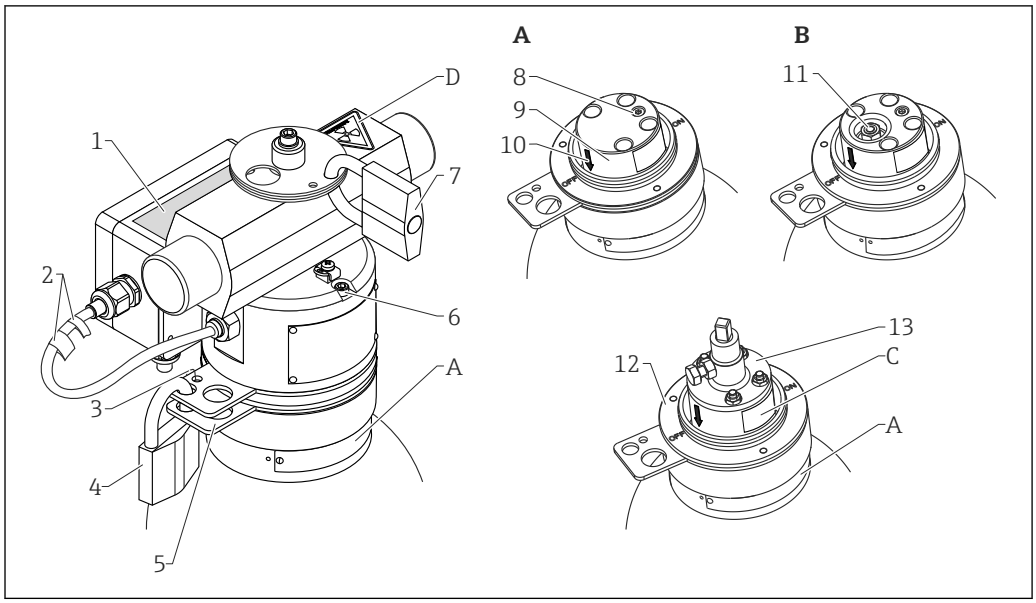
5.4.1 Check after loading

Finally, the correct operation of the source container has to be checked:

- Can the source insert easily be turned to the ON/OFF position?
- Is the padlock (3) fully operational and undamaged?
  If the padlock is damaged or not fully operational, do not use it again.
- Is the screw (1) sealed again?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

5.5 Order code 020, option K, L, M, N



A FQG61/FQG62; Order code 020, option K, L
B FQG61/FQG62; Order code 020, option M, N

Disassembling the drive unit and square adapter

- The source container must be in the "OFF" position. Disconnect compressed air and remove supply lines.
- Open padlock (4) and remove seal (3).
- Loosen screws (6).
- Remove complete drive unit.
- Remove the square adapter (13).

⚠ WARNING

Radiation is very high!

▶ Observe the radiation protection instructions (→ 🖹 6).

Radiation source removal and installation for option K, L

- Release the safety screw (8).
- Turn the source insert (9) 1/4 turn anticlockwise and remove.
- Remove and insert the radiation source → 🖹 12
- For source change only: check O-rings and replace if necessary.
- Push source insert (9) into source container.
- Turn the source insert (9) until the marking arrow (10) is above the "AUS-OFF" marking on the adapter disc (12).
- Screw safety screw (8) back in.

Radiation source removal and installation for option K, L

- If necessary, screw extension rod with M6 thread into the thread of the source holder (11) to achieve as large a distance as possible from the radiation source during transportation.
- Observe information concerning source holder → 🖹 18
- Unscrew source holder (11) using wrench AF13 and remove.
- Remove/insert radiation source → 🖹 18
- For source change only: check O-rings and replace if necessary.
- Screw source holder (11) into the source container and tighten source holder with wrench AF13. Remove extension rod if necessary.

Attaching/changing the nameplate

- Label the radiation source nameplate (A) and fix it to the housing ring of the source container using two grooved pins.
- Label the adhesive nameplate (C) and stick it on the insert.
  Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Stick the adhesive label (D) "RADIOACTIVE" on the cylinder of the pneumatic actuator (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.

Mounting square adapter and drive unit

- Insert the square adapter (13). Check:
  The marking arrow (10) on the source insert is located above the "AUS-OFF" marking on the adapter disc (12).
- Fit the complete drive unit and fasten it with three screws (6).
- Attach the padlock (4) and new seal (3) to secure the source against unauthorized access.
- Connect the compressed air and supply cables.

5.5.1 Check after loading

Finally, the mounting of the source container has to be checked:

- Is the seal on the brackets (5) new?
- Are the cables of the proximity switches undamaged?
- Is the terminal box undamaged and unchanged internally?
- Are the two padlocks (4) fully operational and undamaged?
  If one lock is (or both locks are) damaged or not fully operational, do not use it (or them) again.
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?
- Only for option model L and N (ATEX variant):
  Is the nameplate (1) fixed to the terminal box and is it legible?
- Is the nameplate (2) fixed to the Namur proximity switches and is it legible?

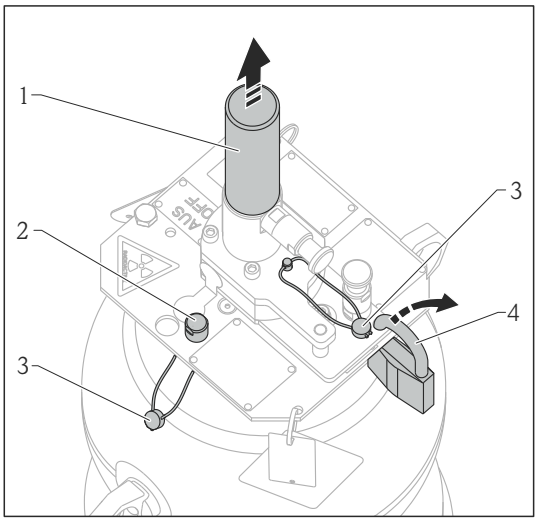
- After the completion of the check the operational reliability has to be checked. To do so, switch the compressed air on/off and check the movement of the swivel insert and the functioning of the Namur proximity switches.
- Observe the operating data and the safety instructions in TI00435F/00/EN.
- In addition to this, the following must be checked for containers with ATEX certification:
  - Is the documentation available? (XA available?);
    Compare the XA number with the specifications on the nameplate.
  - Do not mix up Ex with Non-Ex versions (correct allocation to the order)
- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

6 FQG63 Loading and changing the source

6.1 Order code 020, option B

Removing the source insert

- Remove the protection cap (1).
- For source change only: remove the two seals (3).
- Release the stop pin (2). (AF13).
- Remove the padlock (4) and keep it in a safe place.



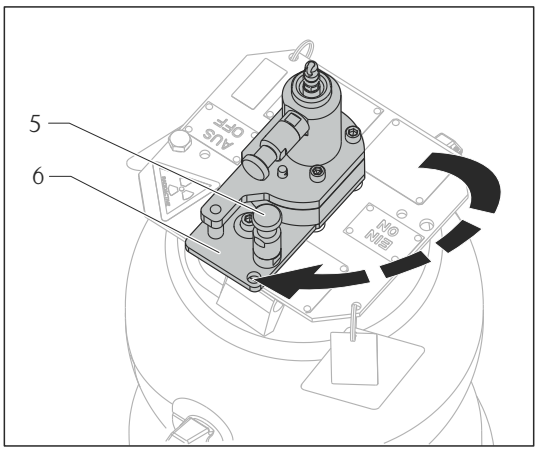
A0018453

- Pull the locking bolt (5) upwards, rotate the swivel insert (6) by **90° clockwise**.

⚠ CAUTION

Keep exposure to radiation low!

▶ Do not remove the swivel insert in this position! The swivel insert remains in this position for the next work steps!

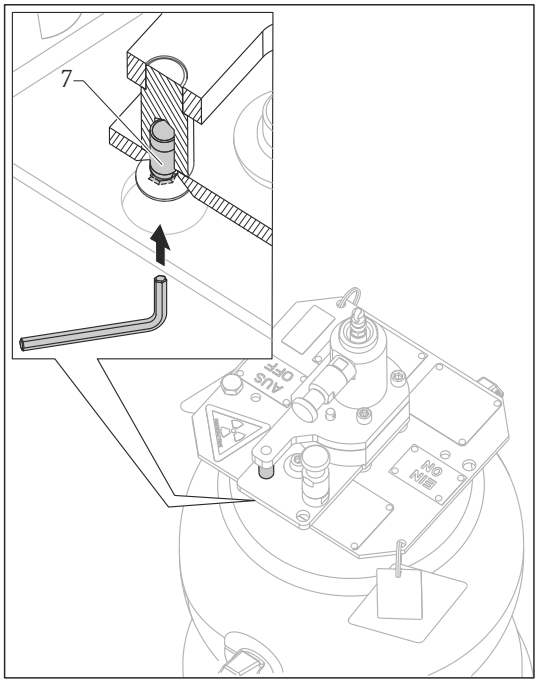


A0018454

NOTICE

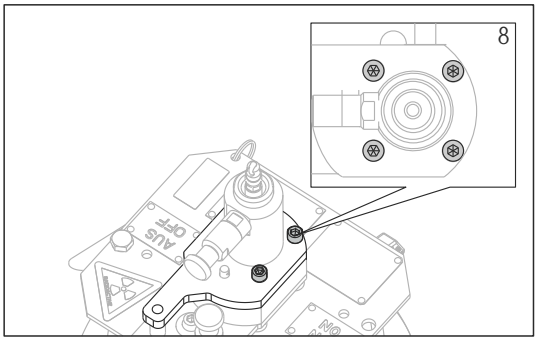
Remove safety screw (7)

- ▶ Using an Allen key AF3, the screw is unscrewed from below through the bore, see figure.



A0018455

Remove the four screws (8) from the upper part of the swivel insert (AF5).



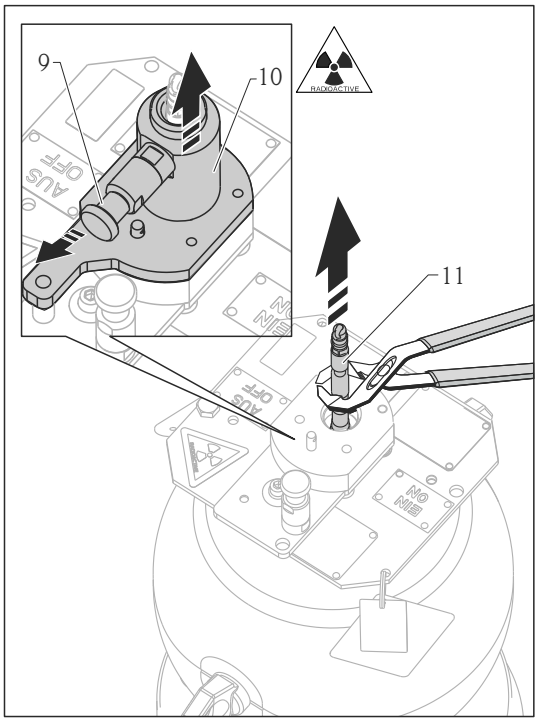
A0018456

WARNING

Radiation is very high!

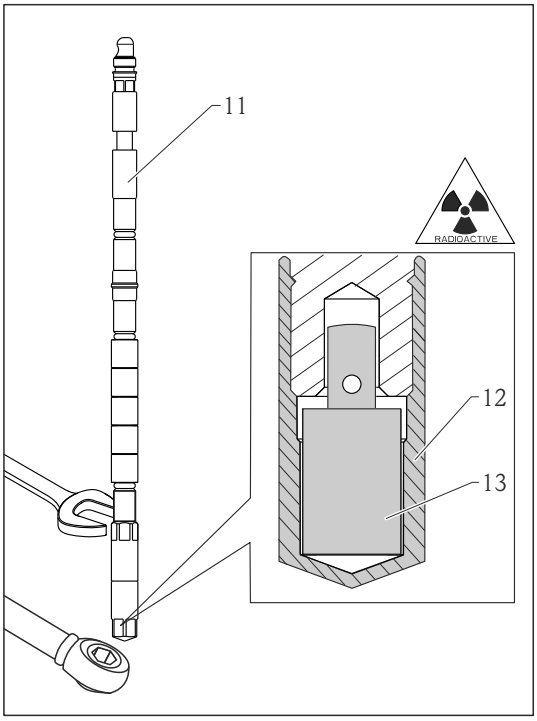
- ▶ After the upper part (10) of the swivel insert has been removed, exposure to radiation is very high. Observe the safety instructions, (→ 🖹 6).

- Pull out locking bolt (9) and hold it in that position.
- Carefully remove the upper part (10) of the swivel insert so that the source holder is not damaged or pulled out at the same time.
- Carefully remove the source holder (11), e.g. using a pipe wrench.



A0018457

When mounting and removing, ensure that the source holder (11) is in a vertical position with protection cap downwards, see figure.



Changing/loading the source capsule

- Unscrew the protection cap (12), e.g. using a torque wrench and an open-end wrench (AF11).
- For source change only: let the source capsule (13) drop into a screened container.
- Insert new source capsule.
- Attach and tighten the protection cap.

⚠ CAUTION

Avoid the protection cap becoming loose

▶ When tightening the protection cap, a torque of 20 ±1 Nm (14.75 ±0.73 lbf ft) must be observed!

Inserting the source insert

- Carefully insert the source holder (11), e.g. using a pipe wrench.
- Attach the upper part (10) of the swivel insert. While doing so, hold the locking bolt (9) in pulled-out position. Note the position of the swivel insert.

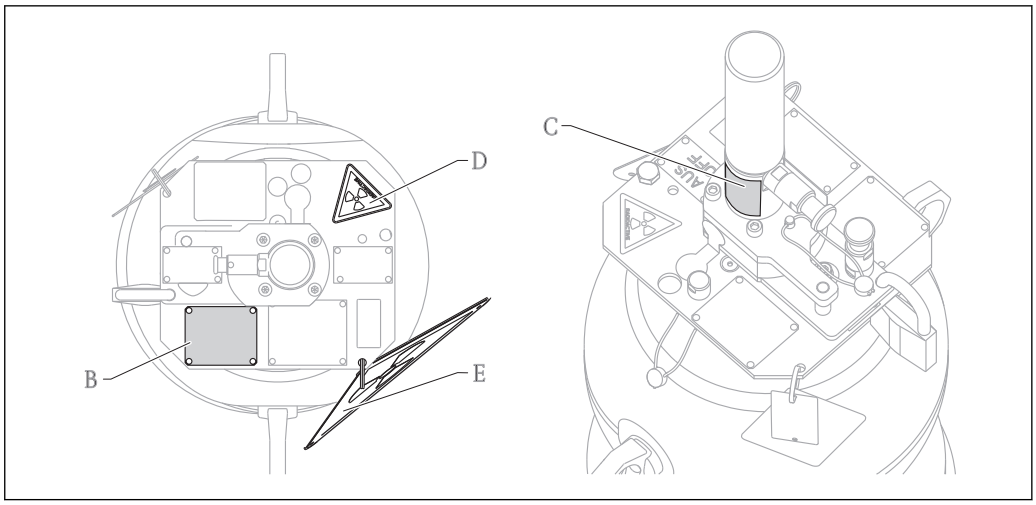
The locking bolt (9) must snap into the flute of the source holder.

- Using the four screws (8), fasten the swivel insert, torque 8 ±0.5 Nm (5.9 ±0.36 lbf ft).
- Insert the safety screw (7) and tighten it (AF 3), torque 5 ±0.5 Nm (3.68 ±0.36 lbf ft).
- Turn the swivel insert (6) 90° counterclockwise (OFF position) and allow the locking bolt (5) to click into place audibly.
- Insert padlock (4).
- Tighten the stop pin (3), torque 12 ±1 Nm (8.85 ±0.73 lbf ft).
- Secure by attaching two seals (2).
- Fit the protection cap (1) and tighten it as far as possible.

Attaching/changing the nameplate

- Label the radiation source nameplate (B) and fix it to the mounting plate using four grooved pins.
- Label the adhesive nameplate (C) and stick it on the swivel insert. Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Stick the adhesive label (D) "RADIOACTIVE" on the mounting plate (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Attach the warning sign (E) "Caution - Radioactive Material" to the mounting plate (if not yet present).

The nameplate (A) is not needed for this version of the source container.



A0018459

6.1.1 Check after loading

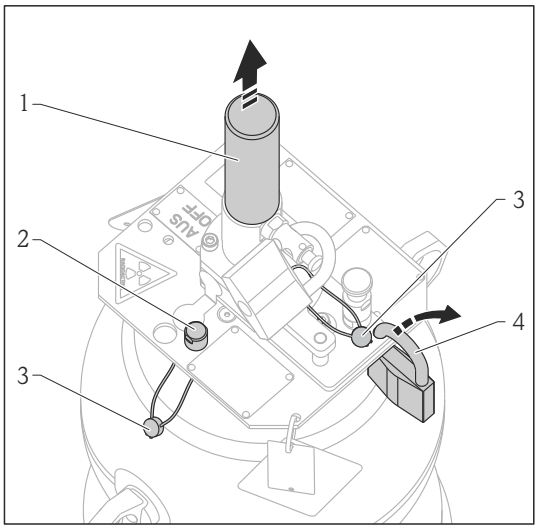
Finally, the correct operation of the source container has to be checked:
- Can the swivel insert (6) be easily turned to the ON/OFF position?
- Is the safety screw (7) fitted?
- Do the locking bolts (5, 9) engage and is there a limit-stop?
- Is the padlock (4) fully operational and undamaged?
  If the padlock is inoperable or damaged, do not use it again.
- Have both seals (3) been renewed?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

6.2 Order code 020, option C

Removing the source insert

- Remove the protection cap (1).
- For source change only: remove the two seals (3).
- Release the stop pin (2). (AF13).
- Remove the padlock (4) and keep it in a safe place.



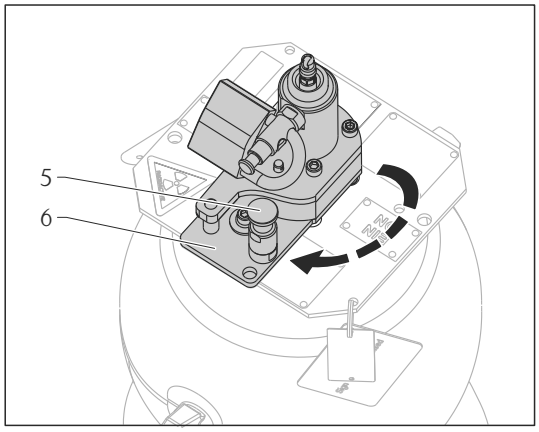
A0018460

Pull the locking bolt (5) upwards, rotate the swivel insert (6) by **90° clockwise.**.

⚠ CAUTION

Keep exposure to radiation low!

- ▶ Do not remove the swivel insert in this position! The swivel insert remains in this position for the next work steps!

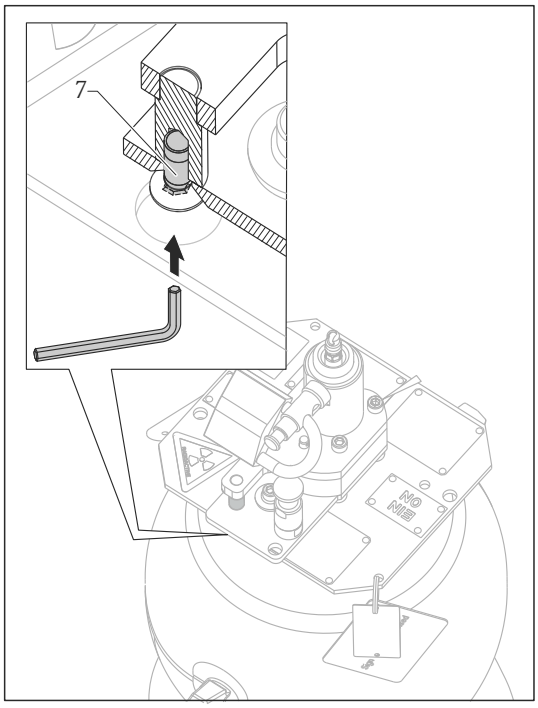


A0018461

NOTICE

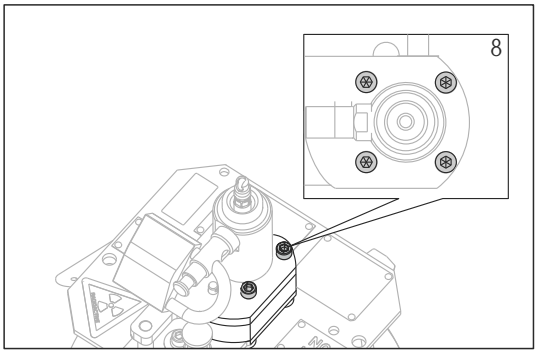
Remove safety screw (7).

- ▶ Using an Allen key AF3, the screw is unscrewed from below through the bore, see figure.



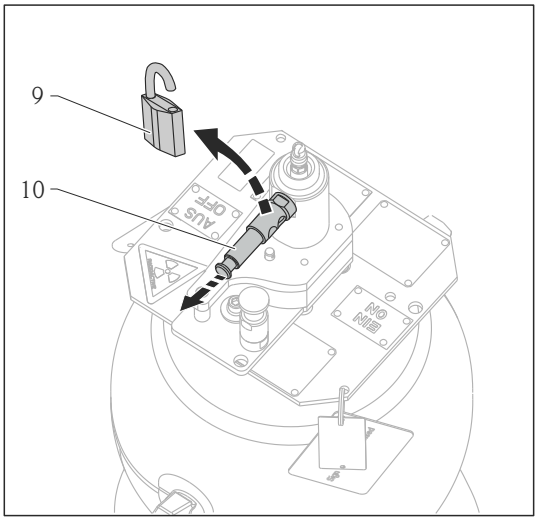
A0018462

Remove the four screws (8) from the upper part of the swivel insert (AF5).



A0018463

- Remove padlock (9) from the locking mechanism.
- Pull out the locking bolt (10) and hook the padlock (9) into the outer bore for safekeeping. Do not lock it!



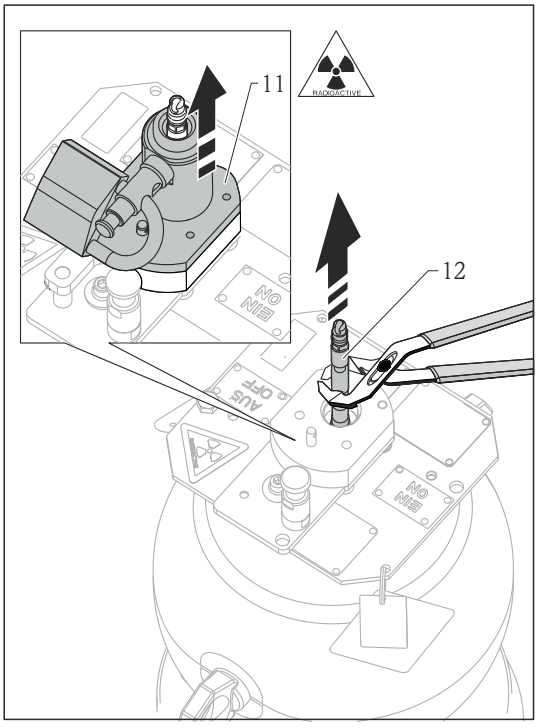
A0018464

⚠ WARNING

Radiation is very high!

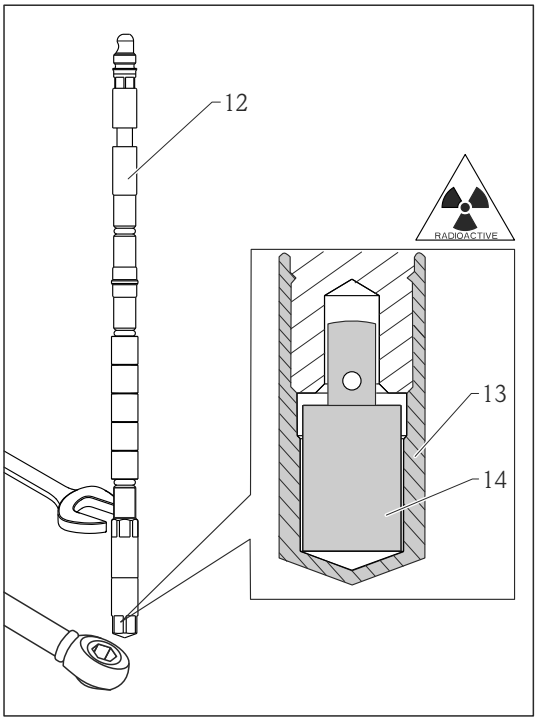
► After the upper part (11) of the swivel insert has been removed, exposure to radiation is very high. Observe the safety instructions, (→ 🖹 6).

- Carefully remove the upper part (11) of the swivel insert so that the source holder is not damaged or pulled out at the same time.
- Carefully remove the source holder (12), e.g. using a pipe wrench.



A0018465

When mounting and removing, ensure that the source holder (12) is in a vertical position with protection cap downwards, see figure.



Changing/loading the source capsule

- Unscrew the protection cap (13), e.g. using a torque wrench and an open-end wrench (AF11).
- For source change only: let the source capsule (14) drop into a screened container.
- Insert new source capsule.
- Attach and tighten the protection cap.

⚠ CAUTION

Prevent the protection cap from becoming loose

- ▶ When tightening the protection cap, a torque of 20 ±1 Nm (14.75 ±0.73 lbf ft) must be observed!

Inserting the source insert

- Carefully insert the source holder (12), e.g. using a pipe wrench.
- Attach the upper part (11) of the swivel insert. Note the position of the swivel insert.
- Remove the padlock (9) from the outer bore.

⚠ CAUTION

Observe the following steps:

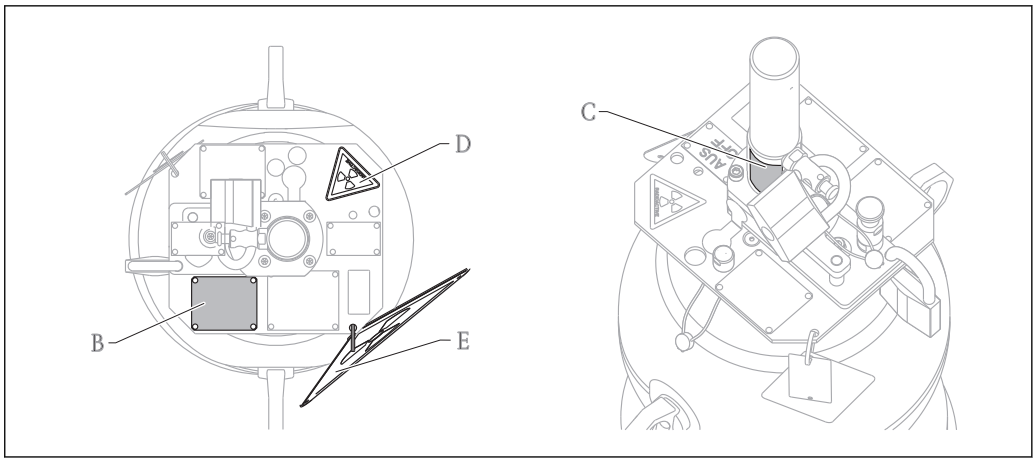
- ▶ The locking bolt (10) must snap into the flute of the source holder.
- ▶ Hook padlock into the inner bore.

- Using the four screws (8), fasten the swivel insert, torque 8 ±0.5 Nm (5.9 ±0.36 lbf ft).
- Insert the safety screw (7) and tighten it (AF3), torque 5 ±0.5 Nm (3.68 ±0.36 lbf ft).
- Turn the swivel insert (6) 90° counterclockwise (OFF position) and allow the locking bolt (5) to click into place audibly.
- Insert padlock (4).
- Tighten the stop pin (3), torque 12 ±1 Nm (8.85 ±0.73 lbf ft).
- Secure by attaching two seals (2).
- Fit the protection cap (1) and tighten it as far as possible.

Attaching/changing the nameplate

- Label the radiation source nameplate (B) and fix it to the mounting plate using four grooved pins.
- Label the adhesive nameplate (C) and stick it on the swivel insert. Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Stick the adhesive label (D) "RADIOACTIVE" on the mounting plate (if not yet present). Prior to this, clean the adhesive surface with a suitable cleaning agent.
- Attach the warning sign (E) "Caution - Radioactive Material" to the mounting plate (if not yet present).

The nameplate (A) is not needed for this version of the source container.



A0018467

6.2.1 Check after loading

Finally, the correct operation of the source container has to be checked:
- Can the swivel insert (6) be easily turned to the ON/OFF position?
- Is the safety screw (7) fitted?
- Does the locking bolt (5) engage and is there a limit-stop?
- Is the padlock (4) fully operational and undamaged?
  If the padlock is inoperable or damaged, do not use it again.
- Have both seals (3) been renewed?
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?

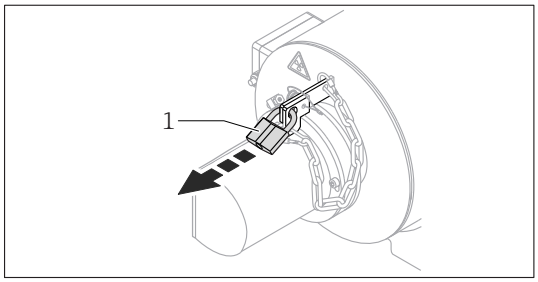
- After completion of the check the source insert must be set to the OFF position and secured with a padlock so it cannot be switched on.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

7 FQG66 Loading and changing the source

7.1 Order code 020, option A (manual operation) and option B (manual operation with proximity switch)

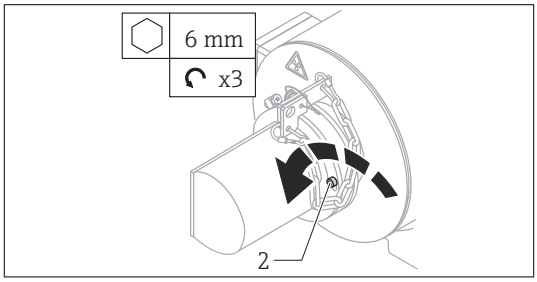
The switch of the source container is in the "AUS/OFF" position, see the indicator in the inspection glass.

1. Remove padlock (1)



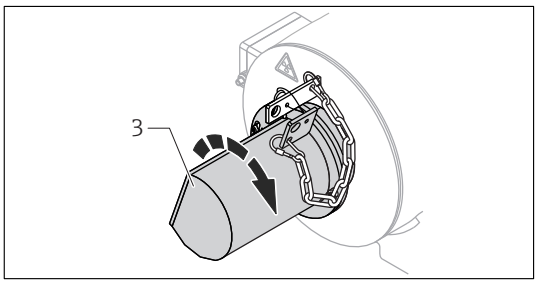
A0031403

2. Turn the screws (2) (AF6) on the cover three to four times to release them

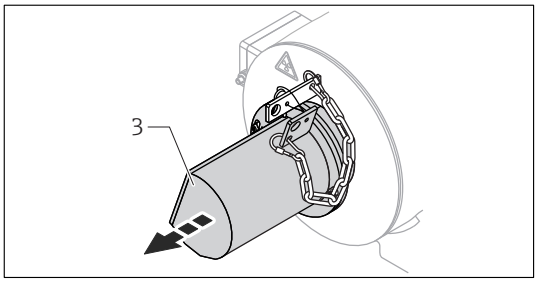


A0031405

3. Turn the cover (3) clockwise and remove it

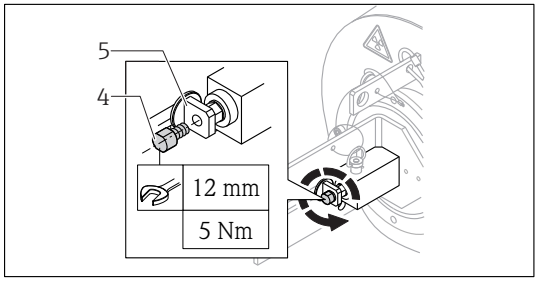


A0031406



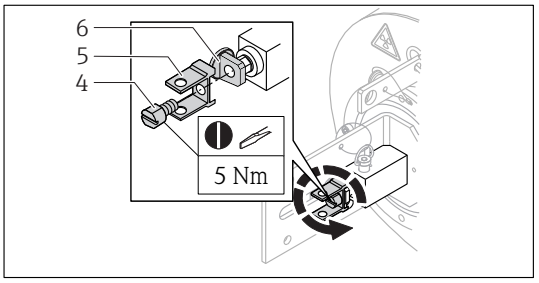
A0031407

4. Release the thrust rod (4) (AF12) from the source holder rod. Remove the spacer (5) with the thrust washer



A0031408

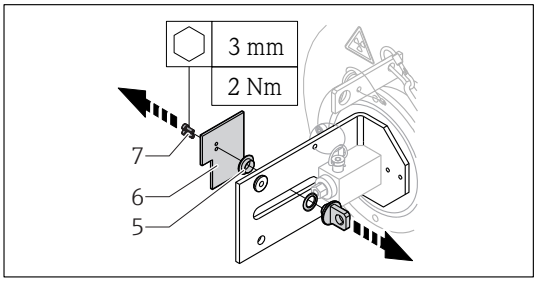
NRC Device Registration, USA: Release the thrust rod (4) (AF12) from the source holder rod. Remove the safety bracket (5), spacer and thrust washer (6)



A0031410

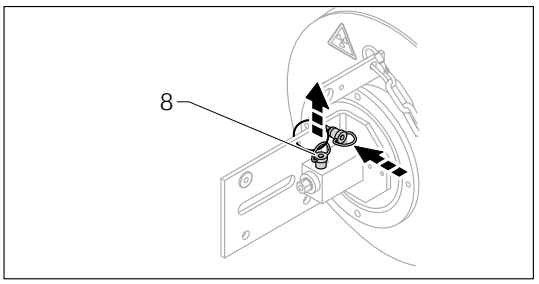
5. Release 2 x Allen screws (7) (AF3) to remove the cover plate (6) and the plain bearing bushing (5)

The switch of the source holder rod is in the "AUS/OFF" position and is secured by the lock pin



A0031409

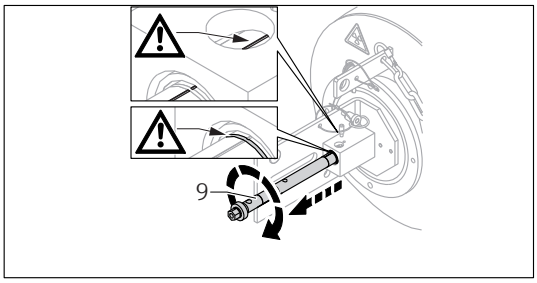
6. Remove the lock pin (8) from the source holder rod and place it into the parking position



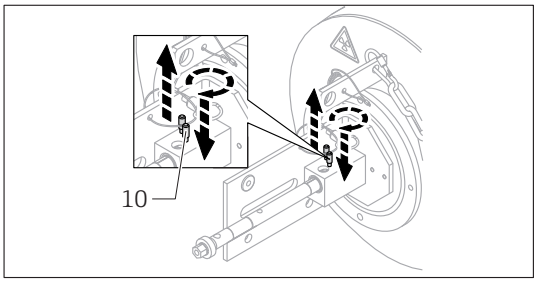
A0031411

7. **Disassembling the source holder rod with the M4 threaded radiation source**

Pull out the entire source holder rod (9) until the annular marking groove is visible. Turn the source holder rod until you can see the axial marking line in the bore, then move the locking bolt (10) out of the parking position, screw it into the threaded bore and tighten it in order to fix the protective tube which is screwed to the source holder rod. The protective tube remains in the container. Turn the source holder rod to release it from the protective tube.



A0031614



A0031615

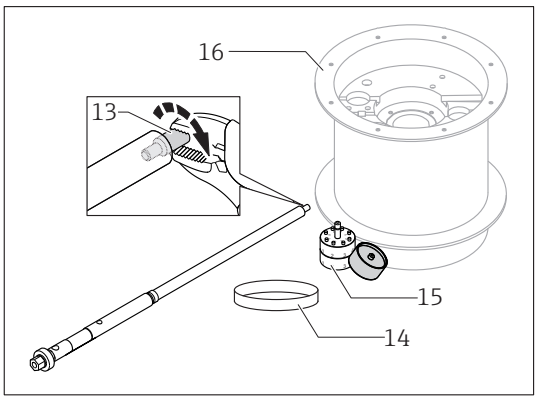
⚠ WARNING

Radiation is very high!

- Observe the radiation protection instructions (→ 🖹 6).

Disassembling the M4 threaded radiation source and depositing it in the transportation cask

Hold the source holder rod with the radiation source (13) over the collection tray (14) provided. Using a pliers screw the radiation source with the M4 thread (13) out of the source holder rod and place it in the collection tray. Then insert the radiation source into the transportation container (15) provided for this purpose and then insert it into the transportation cask (16).



A0031617

8. **Disassembling the source holder rod with a cylindrical radiation source**

⚠ WARNING

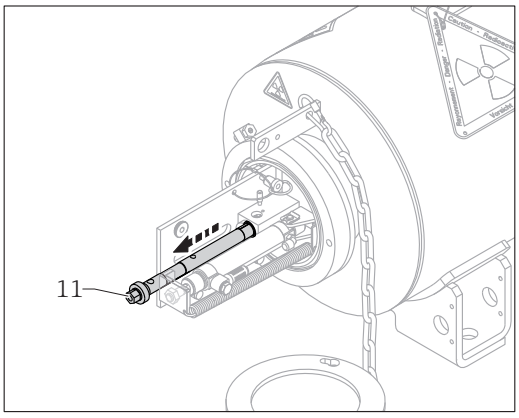
Radiation is very high!

- Observe the radiation protection instructions (→ 🖹 6).

⚠ WARNING

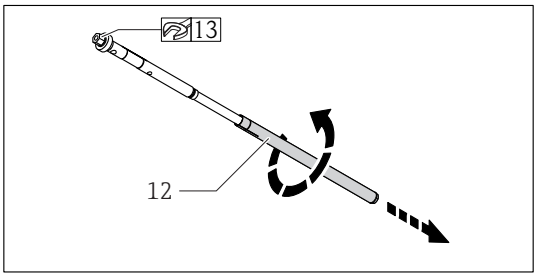
Do not release the protective tube from the source holder rod. The cylindrical radiation source is loosely installed in the protective tube

- Pull out the entire source holder rod (11) along with the protective tube so that the protective tube with the radiation source does not remain in the source container



A0031866

Disassembling the cylindrical radiation source
Turn the source holder rod to unscrew it from the protective tube (12)



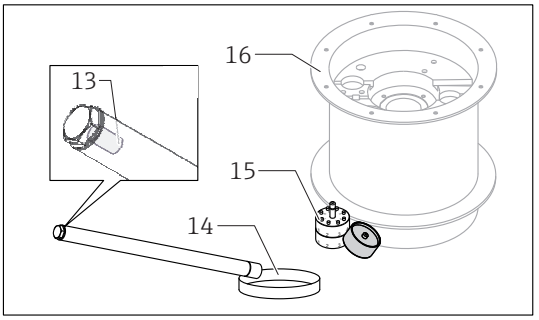
A0031620

⚠ WARNING

Make sure the source capsule does not fall out

- ▶ Hold the protective tube (12) so that it is pointing downwards to ensure the radiation source does not fall out

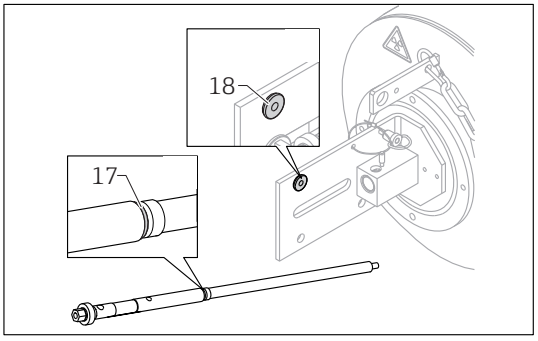
Depositing the cylindrical radiation source in the transportation cask
Hold the protective tube with the radiation source (13) over the collection tray (14) provided and allow the cylindrical radiation source (13) to drop out of the protective tube and into the collection tray. Then insert the radiation source into the transportation container (15) provided for this purpose and then insert it into the transportation cask (16).



A0031621

Additional information is provided in Special Documentation SD01316F

9. Replace the O-ring (17) on the source holder rod and the reference O-ring (18)



A0031618

10. Insert the new radiation source. Install the source holder rod into the source container in the reverse order and secure in the "AUS/OFF" switch position with the lock pin. Then perform the check as described in Section 7.1.1

7.1.1 Check after loading

Finally, the correct operation of the source container has to be checked:
- Do the specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source?
- Is the ON/OFF indicator correctly installed?
- Are the locking bolt and the lock pin in the parking position?
- Can the source holder rod be easily inserted into the ON/OFF position
- Are the padlock and lock pin fully operational and undamaged. Replace the padlock and lock pin if they are damaged or not working correctly

- On completion of the checks, set the source holder rod to the OFF position, move the lock pin out of the parking position and engage it in the OFF position and mount the cover. The lock pin in the OFF position protects the source holder rod from being switched on. This should only be done before transporting the source container. The padlock then secures the container against tampering and manipulation.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

7.2 Order code 020, option L (pneumatic drive)

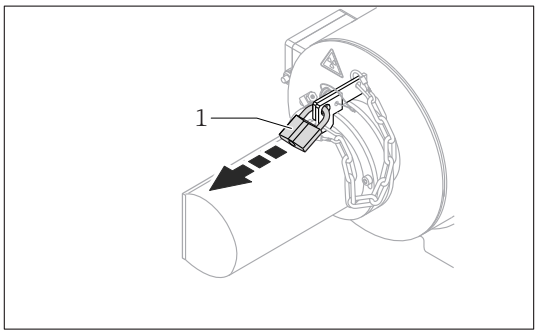
The switch of the source container is in the "AUS/OFF" position.

⚠ CAUTION

Risk of injury when cover is open!

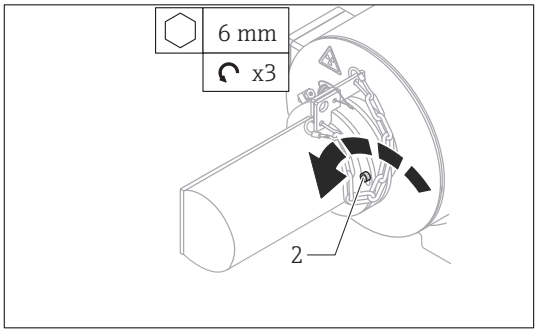
- Make sure that the pneumatic drive is unpressurized for the entire time the cover is removed!

1. Remove padlock (1)



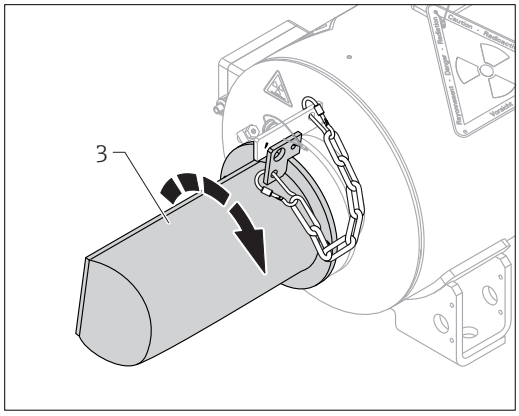
A0031848

2. Turn the screws (2) (AF6) on the cover three to four times to release them

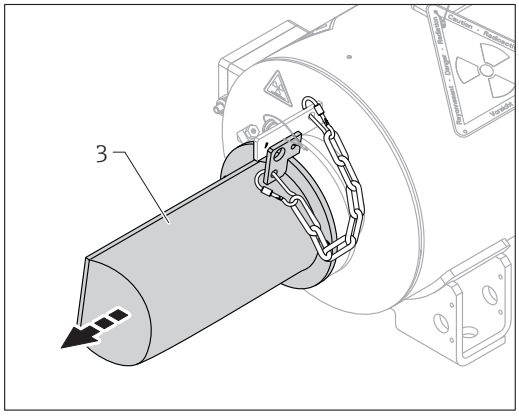


A0031849

3. Turn the cover (3) clockwise and remove it



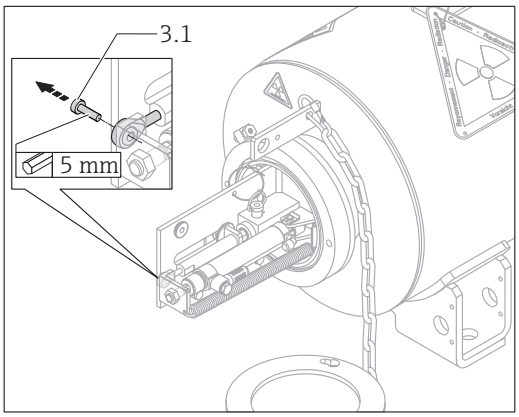
A0031850



A0031851

4. Release the Allen screw (3.1) (AF5). The drive is released from the source holder rod

The switch of the source holder rod is in the "AUS/OFF" position and is secured by the lock pin



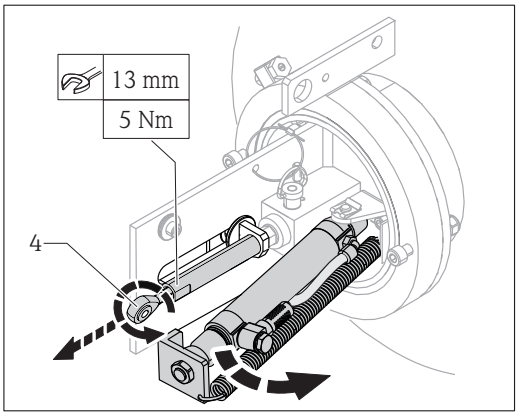
A0028624

5. **NOTICE**

The clearance dimensions may never be changed!

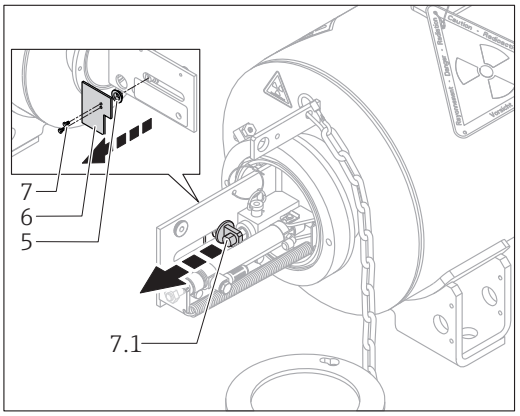
- Do not release the thrust rod, hexagonal nut and swivel head screw

Unscrew the entire thrust rod (4) (AF13)



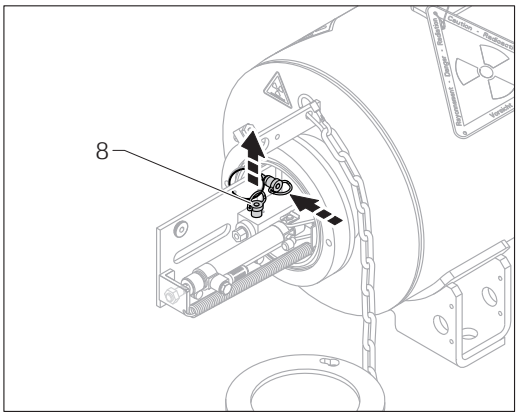
A0031873

6. Release 2 x Allen screws (7) (AF3) to remove the cover plate (6) and the plain bearing bushing (5). Remove the spacer and thrust washer (7.1)



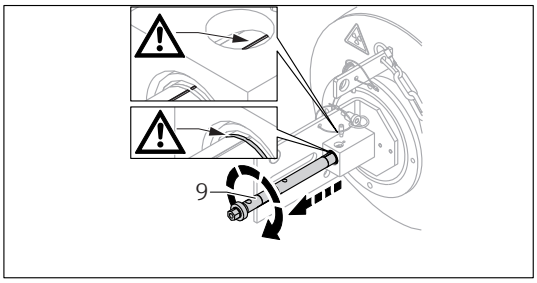
A0029304

7. Move the lock pin (8) out of the "OFF" position and into the parking position

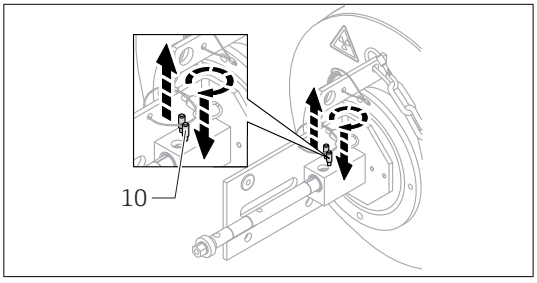


A0029305

8. **Disassembling the source holder rod with the M4 threaded radiation source**
Pull out the entire source holder rod (9) until the annular marking groove is visible. Turn the source holder rod until you can see the axial marking line in the bore, then move the locking bolt (10) out of the parking position, screw it into the threaded bore and tighten it in order to fix the protective tube which is screwed to the source holder rod. The protective tube remains in the container. Turn the source holder rod to release it from the protective tube.



A0031614



A0031615

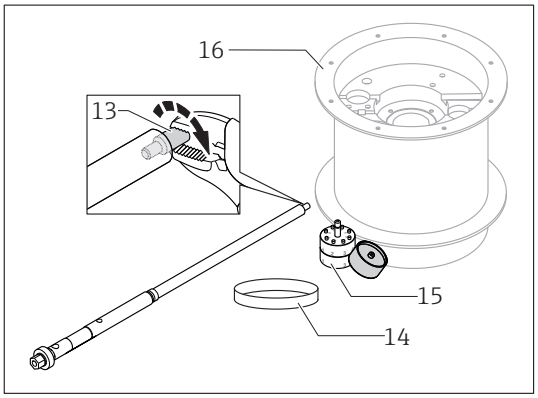
⚠ WARNING

Radiation is very high!

- Observe the radiation protection instructions (→ 🖹 6).

Disassembling the M4 threaded radiation source and depositing it in the transportation cask

Hold the source holder rod with the radiation source (13) over the collection tray (14) provided. Using a pliers screw the radiation source with the M4 thread (13) out of the source holder rod and place it in the collection tray. Then insert the radiation source into the transportation container (15) provided for this purpose and then insert it into the transportation cask (16).



A0031617

9. **Disassembling the source holder rod with a cylindrical radiation source**

⚠ WARNING

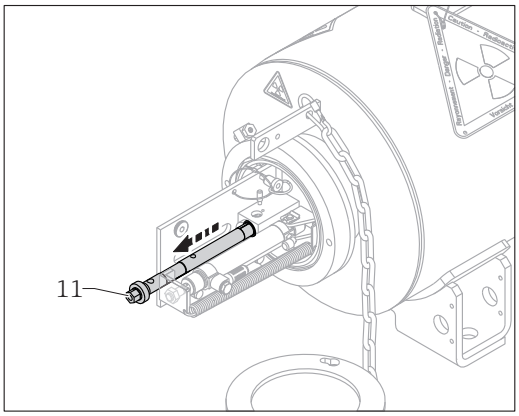
Radiation is very high!

- Observe the radiation protection instructions (→ 🖹 6).

⚠ WARNING

Do not release the protective tube from the source holder rod. The cylindrical radiation source is loosely installed in the protective tube

- Pull out the entire source holder rod (11) along with the protective tube so that the protective tube with the radiation source does not remain in the source container



A0031866

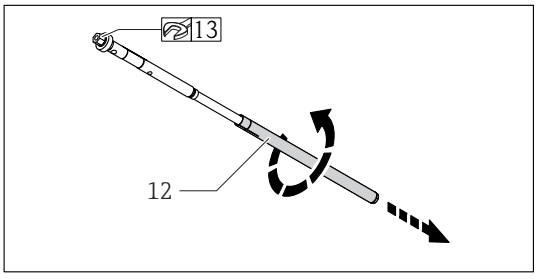
Disassembling the cylindrical radiation source

Turn the source holder rod to unscrew it from the protective tube (12)

⚠ WARNING

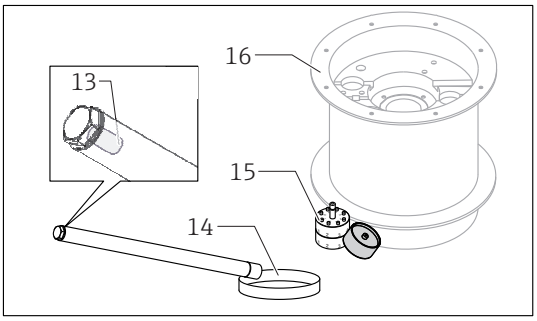
Make sure the source capsule does not fall out

- Hold the protective tube (12) so that it is pointing downwards to ensure the radiation source does not fall out



A0031620

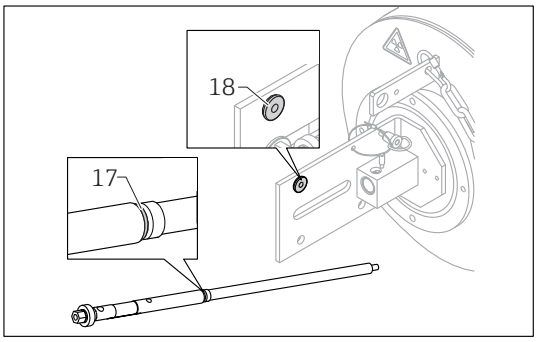
Depositing the cylindrical radiation source in the transportation cask
Hold the protective tube with the radiation source (13) over the collection tray (14) provided and allow the cylindrical radiation source (13) to drop out of the protective tube and into the collection tray. Then insert the radiation source into the transportation container (15) provided for this purpose and then insert it into the transportation cask (16).



A0031621

Additional information is provided in Special Documentation SD01316F

10. Replace the O-ring (17) on the source holder rod and the reference O-ring (18)



A0031618

11. Insert the new radiation source. Install the source holder rod into the source container in the reverse order and secure in the "AUS/OFF" switch position. Then perform the check as described in Section 7.2.1

7.2.1 Check after loading

Finally, the correct operation of the source container has to be checked:
- The cables and proximity switches are undamaged
- The terminal box is undamaged and unchanged internally
- Drive secured correctly
- The padlock and lock pin are fully operational and undamaged. Replace the padlock and lock pin if they are damaged or not working correctly
- The specifications on the nameplate of the radiation source match the specifications on the certificate of the radiation source
- The nameplate of the Namur proximity switches is provided and legible

On completion of the checks, the operational reliability has to be checked:

⚠ CAUTION
Risk of injury!
▶ Observe operating data and safety instructions

To do so, switch the compressed air on/off and check the movement of the source holder rod and the functioning of the Namur proximity switches

- On completion of the checks, set the source holder rod to the OFF position, move the lock pin out of the parking position and engage it in the OFF position and mount the cover. The lock pin in the OFF position protects the source holder rod from being switched on. This should only be done before transporting the source container. The padlock then secures the container against tampering and manipulation.
- The limit values that apply in your country must be checked and observed.
- If one or more criteria are not met, do not continue to use the source container. For more information contact the Service Department at Endress+Hauser.

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