

Supplementary instructions

Emitter loading and exchange

VEGASOURCE series 80



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VEGA

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1 Safety instructions

Radiation protection

These supplementary instructions describe the loading and exchanging of the source for source holders VEGASOURCE series 80.

Carefully read this supplementary instructions and the corresponding operating instructions of the source container and carry out the work only after you have completely understood all instructions.

It is absolutely necessary that you take note of all safety instruments, particularly of the instructions concerning radiation safety.

Check if the source capsule fits the existing loading pipe of the source container. Compare the data in the shipping papers of the source capsule with the data of the source container.

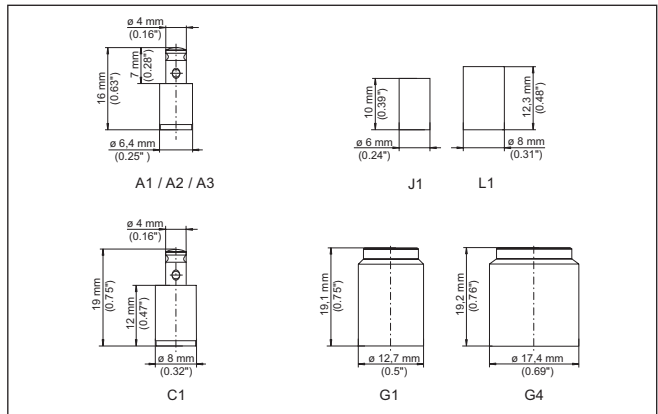


Fig. 1: Different versions of source capsules

A1 Capsule VZ-79-001 (Cs-137), nipple $d = 6.4 \times 16$ mm

A2 Capsule VZ-64-001 (Co-60), nipple $d = 6.4 \times 16$ mm

A3 Capsule VZ-79-002 (Cs-137), nipple $d = 6.4 \times 16$ mm/1350 °C

J1 Capsule IGI-Z-3, cylinder $d = 6 \times 10$ mm

L1 Capsule IGI-Z-4, cylinder $d = 8 \times 12$ mm

C1 Capsule VZ-357-001 (Cs-137), nipple $d = 8 \times 19$ mm

G1 Capsule X38, capsule 9084, capsule P17

G4 Capsule P20

	VEGASOURCE					
	81	82	83	84	85	86
A1 - VZ-79-001	●	●	●	●	●	●
A2 - VZ-64-001	-	-	-	●	●	●
A3 - VZ-79-002	●	●	●	●	●	●
J1 - IGI-Z-3	●	●	●	-	-	-
L1 - IGI-Z-4	●	●	●	-	-	-
C1 - VZ-357-001	-	-	●	●	●	●
G1 - X38	●	●	●	●	●	●
G1 - 9084	●	●	●	●	●	●

	VEGASOURCE					
	81	82	83	84	85	86
G1 - P17	●	●	●	●	●	●
G4 - P20	-	-	-	●	●	●

Tab. 1: Possible applications of the source capsules

Safety instructions

- All maintenance work such as dismantling or exchanging the radioactive source must only be carried out by authorized, qualified personnel monitored for radiation exposure according to the local legislation or the handling permit. Take note of the specifications of the present handling permit. All conditions on site must be taken into account.
- All work must only be carried out from a protected location (shielding). Avoid risk to other persons through suitable measures (e.g. safety fence, etc.).
- Make all necessary preparations for exchanging the source to ensure that the work is carried out as fast as possible. Get all required tools and accessories ready before you start work.
- Before starting the work, get a suitable, shielded vessel ready for holding the exchanged source capsule.
- Observe all the instructions of this supplementary instructions manual for source exchange
- Never touch the source capsule directly, but use a suitable gripping device. Keep a distance of at least 10 cm (4 in).
- Check all O-rings and seals when exchanging the source and replace them, if necessary.
- Check the function of the switching facility of the source container before installing or exchanging a source capsule (ON/OFF-switching).
- When system inspections are carried out, always set the source container to position OFF and secure this position with a lock against inadvertent switching on.
- If possible, practise the procedure beforehand, especially the handling of the gripping tool.

Scope of delivery

- Unmarked type label "Source", stainless steel
- 4 grooved pins

Labelling

When loading a source container or exchanging a source, the corresponding type labels of the source must be permanently lettered, e.g. with punch-type letters.

With sources exceeding a certain level of activity, the warning "Highly radioactive source" must be stated on the type label.

This is the case with Cs-137 with an activity ≥ 20 GBq (540 mCi).

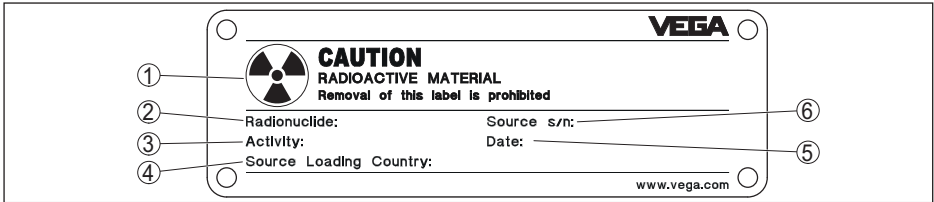


Fig. 2: Type label source - Example (version X, C)

- 1 Warning - Radioactivity
- 2 Source: Cs-137
- 3 Activity of the source in MBq or GBq
- 4 Country of origin of the source
- 5 Loading date of the sources (MM/YYYY)
- 6 Serial number of the source capsule (for traceability of the source)

Preparation

Make sure that the necessary accessories and tools are available and in technically perfect condition.

Keep the source capsule (on site) well shielded in the transport packaging.

Ensure that the number combination for the padlock on the source holder is available.

Load the source container or exchange the source capsule with utmost care.

Use a suitable gripping device e.g. a long pair of pliers when inserting or exchanging the source capsule.



Note:

When replacing, you will need a suitable, shielded container to store the old source capsule.

Contact our specialists before carrying out such work.

2 Loading or source exchange

2.1 Version X, C

Required tools

You need the following tools when exchanging the source capsule on version X:

- Number combination for padlock
- Allen spanner (Torx TR30) with inner hole
- Flat-headed screwdriver, size 1.5 x 10
- Gripping tool for source capsule

Remove protective cap

Remove optional protective cap.

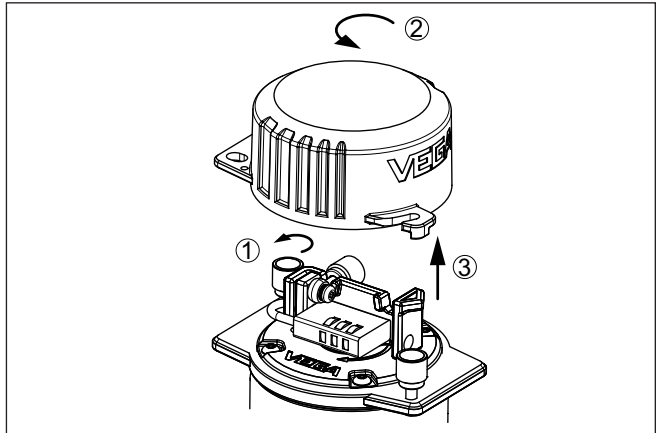


Fig. 3: Removing the protective cap (optional)

- 1 Loosen fixing screws
- 2 Turn the protective cap anti-clockwise
- 3 Remove cover

Remove loading pipe

VEGASOURCE 81, 82, 83

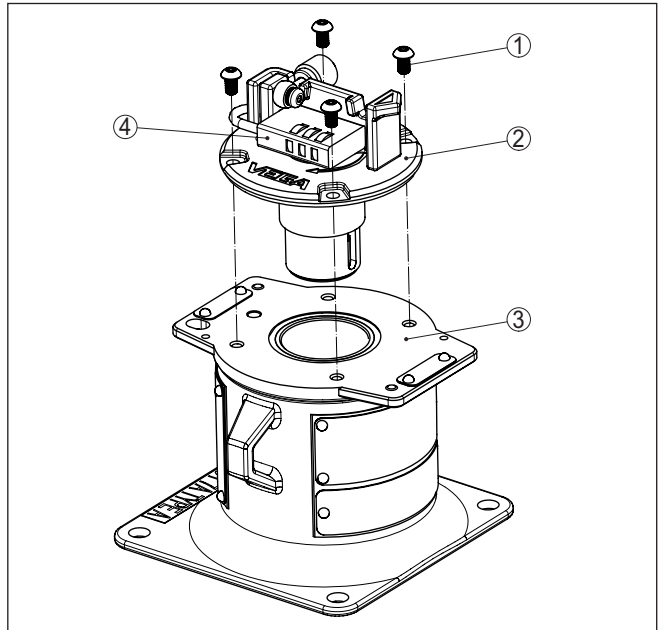


Fig. 4: Pull out the loading pipe upwards - VEGASOURCE Version X, C (manual switchover)

- 1 Internal hexagon head round screw (Torx TR30) with internal pin
- 2 Loading pipe
- 3 Source holder
- 4 Padlock

VEGASOURCE 84, 85, 86

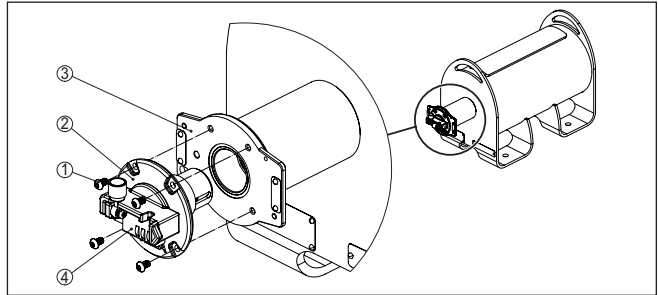


Fig. 5: Pull the loading pipe out to the front - VEGASOURCE Version X, C (manual switchover)

- 1 Internal hexagon head round screw (Torx TR30) with internal pin
- 2 Loading pipe
- 3 Source holder
- 4 Padlock

- Remove padlock (4)
- Make sure that the source holder is in position "OFF".
- Mark with a felt-tip pen so that the correct position of the loading pipe can be quickly and clearly seen when it is reinserted.
- Unscrew the internal hexagon head round screws (Torx TR) with the internal pin (1) using a suitable screwdriver, size TR30.
- Pull the loading pipe (2) out to the front

Insert or exchange source

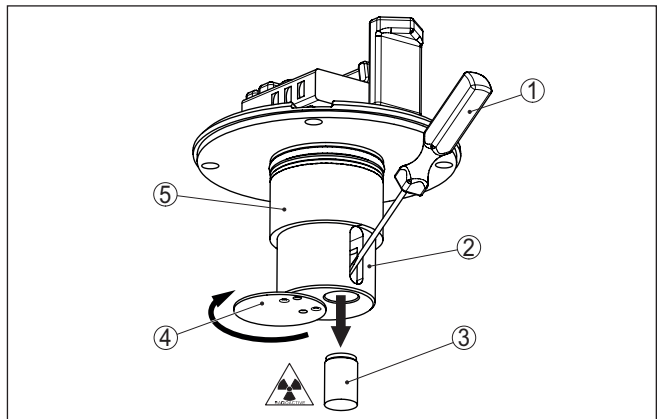


Fig. 6: Exchange of the source - VEGASOURCE Version X, C (manual switchover)

- 1 Slot screwdriver
- 2 Access groove
- 3 Source capsule
- 4 Cover plate (swivelling)
- 5 Loading pipe

- Swivel the cover (4) in front on the cylinder of the loading pipe (5) to the side. To do this, lift the cover (8) slightly with a small slotted screwdriver
- Insert a small slotted screwdriver (1) into the side of the access groove (2) and push the source capsule (3) out to the front and drop it into a shielded container. Make sure that the capsule does not fall out in an uncontrolled manner.
- Insert the new source capsule (3) from the front side and press it in completely. Use a suitable gripping tool for insertion. Press the source capsule into the loading pipe (5) on a firm surface.
- Swivel the cover plate (4) back in front of the loading pipe (5) using a screwdriver.

Insert loading pipe

- Push the loading pipe (5) all the way into the source holder. Pay attention to the correct position (marking).
- Screw in and tighten the internal hexagon head round screws (Torx TR) with the internal pin (5) using a suitable screwdriver, size 30.
- Fit the padlock and lock
- Secure the source holder with a new seal

Attach or replace the type labels

- Remove existing type labels (when exchanging the source)
- Unpack the type label (55 x 45 mm) and label it according to your preparation capsule. For more information, see chapter "Safety instructions - Labelling"

Position of the type labels - VEGASOURCE 81, 82, 83

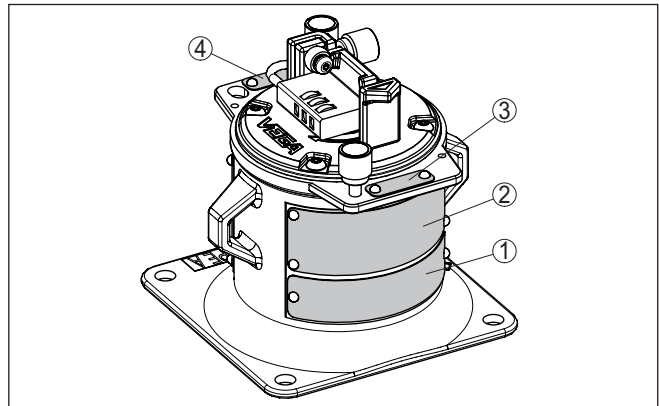


Fig. 7: Position of the type labels VEGASOURCE 81, 82, 83 - e.g. version X, C (manual switchover)

- 1 Type label - Source holder
- 2 Type label - Source (replace)
- 3 Position indication OFF
- 4 Position indication ON

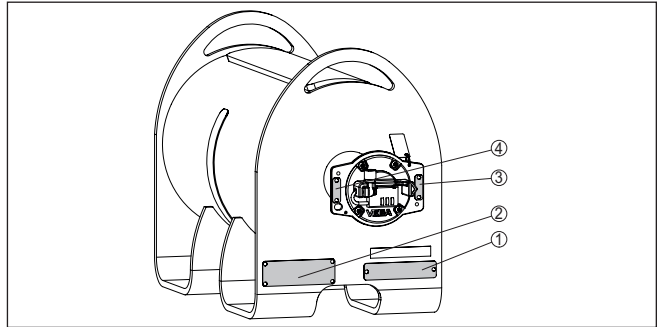
Position of the type labels - VEGASOURCE 84, 85, 86

Fig. 8: Position of the type labels VEGASOURCE 84, 85, 86 - e.g. version X, C - Manual On/OFF switching

- 1 Type label - Source holder
- 2 Type label - Source (replace)
- 3 Position indication OFF
- 4 Position indication ON

- Press the type label onto the intended surface of the source holder and bend it slightly into shape.
- Attach the type label to the source holder with four notched nails.
- Attach the adhesive label "Radioactive" to the source container (if not already present)
- Insertion or exchange of the source is finished

Put on protective cap

1. Put on the protective cap (optional).
Turn the protective cap 180° if it does not fit correctly.
2. Turn the protective cap clockwise until the straps are below the fastening screws.
3. Tighten the fixing screws manually

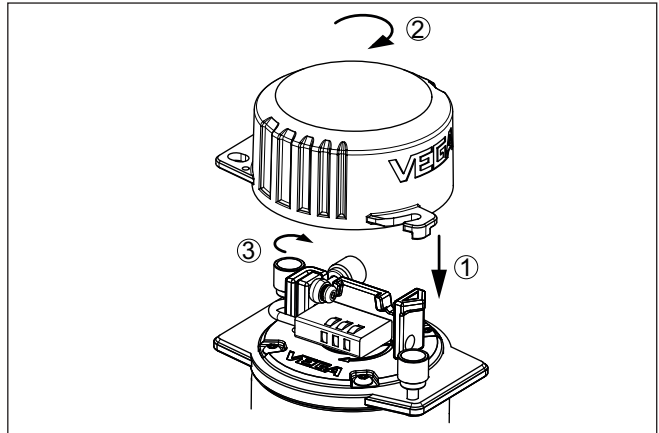


Fig. 9: Putting on the protective cap

- 1 Put on protective cap
- 2 Turn the straps of the protective cap under the fastening screws
- 3 Tighten fixing screws

3 Supplement

3.1 Technical data

Source

Take note of the specifications in the operating instructions of the source container VEGASOURCE.

Half-value layers

	VEGASOURCE 81	VEGASOURCE 82	VEGASOURCE 83
Source	Cs-137	Cs-137	Cs-137
Number of the half-value layers	4.9	8.6	11.5

	VEGASOURCE 84	VEGASOURCE 85	VEGASOURCE 86
Source	Cs-137	Co-60	Co-60
Number of the half-value layers	15.78	11.5	13.8

Activity of the source

	VEGASOURCE 81	VEGASOURCE 82	VEGASOURCE 83
Cs-137	max. 0.74 GBq (20 mCi)	max. 7.4 GBq (300 mCi)	max. 185 GBq (5000 mCi)

	VEGASOURCE 84	VEGASOURCE 85	VEGASOURCE 86
Cs-137	max. 370 GBq (10000 mCi)	max. 370 GBq (10000 mCi)	max. 370 GBq (10000 mCi)
Co-60	max. 3.7 GBq (100 mCi)	max. 37 GBq (1000 mCi)	max. 185 GBq (5000 mCi)

Product-related fluctuations of the source activity and tolerances of the measuring instruments are not taken into account for the above data.

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