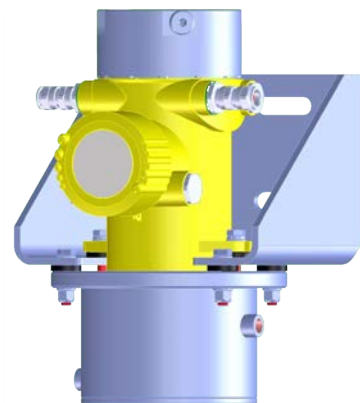


Supplementary instructions

Water cooling - MINITRAC 31

Active water cooling system for radiation-based sensors



Document ID: 48522



VEGA

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1 Product description

1.1 Configuration

The active water cooling system is suitable for radiation-based sensors of series MINITRAC 31.

The water cooling system consists of several modules.

Housing cooling lid (A)

The housing cooling lid can be screwed onto the instrument housing instead of the normal housing lid.

Housing cooling (B)

The cooling module for the sensor cools the active measuring part of the sensor.

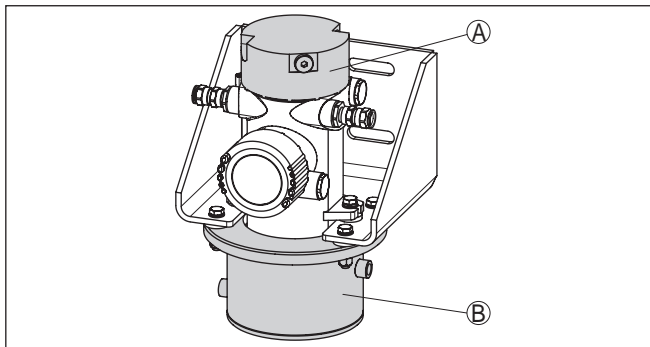


Fig. 1: Active water cooling system with fastening bracket (optional)

A Housing cooling lid

B Housing cooling

Scope of delivery

The following parts belong to the scope of delivery of the water cooling system:

- Housing cooling
- Fastening bracket
- Housing cooling lid
- Isolating sleeve (6 pieces)
- Fixing screw M8 x 50 (2 pieces)
- Fixing screw M8 x 40 (4 pieces)
- Washer for M8 (12 pieces)
- Hexagon nut M8 (6 pieces)
- Coolant hose ¼", length: 550 mm (21.65 in)
- NPT threaded adapter for cooling hoses ¼" (optional)



Information:

When the sensor is ordered with cooling, the sensor and the water cooling system are shipped already premounted.

If the cooling is ordered later, you have to mount the water cooling system on the sensor.

You can find further information in chapter "Mounting".

2 Mounting

Operating instructions

Mounting preparations

Take note of the operating instructions manuals of the corresponding radiation-based sensors and the source holder.



Warning:

During all mounting and dismounting work, the source container must be in switch position "OFF" and secured by a lock.

Carry out all work within the shortest possible time and at the largest possible distance. Provide suitable shielding.

Avoid risk to other persons by taking suitable measures (e.g. safety fence, etc.).

Mounting may only be carried out by authorized, qualified personnel who are monitored for radiation exposure according to local laws or the handling permit. Take note of the specifications in the handling permit. Also take the local conditions into account.



Caution:

The cooling system is used in areas with high temperatures. Therefore, use temperature-resistant cable and install it in such a way that contact with hot components is avoided.

General mounting instructions



Information:

When the sensor is ordered with cooling, the sensor and the water cooling system are shipped already premounted.

If the cooling is ordered later, you have to mount the water cooling system on the sensor.

Required tools:

- Fork wrench SW13 mm (2 pieces) - for the housing cooling
- Fork wrench SW19 mm (2 pieces) - for the mounting clips and the hose fittings of the cooling circuit

Take note of the following general mounting instructions:

- First of all, mount the fastening bracket and the housing cooling, and then the sensor
- The small lid of the instrument housing must point to the front after mounting the fastening bracket (x)
- The sensor together with the water cooling system is very heavy. Use a suitable lifting device for mounting, e.g. a sling

Mount the fastening bracket

1. Place the isolating sleeves (4) between the housing cooling (5) and the fastening bracket (1).

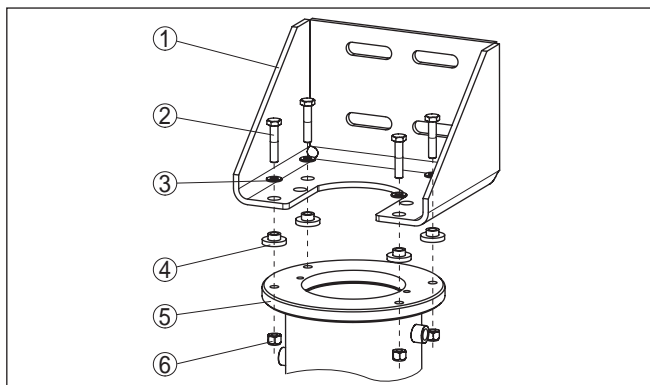


Fig. 2: Housing cooling

- 1 Fastening bracket
- 2 Hexagon screws M8 x 40 (4 pieces)
- 3 Washer for M8 (8 pieces)
- 4 Isolating sleeve (4 pieces)
- 5 Housing cooling
- 6 Hexagon nut M8 (4 pieces)

Housing cooling Mounting of the housing cooling

2. Place the fastening bracket (1) onto the housing cooling (5). Make sure that the coolant connections point in a suitable direction. Rotating the holding bracket later (1) is very difficult.
3. Connect the fastening bracket (1) with the scintillator cooling (5) according to the illustration and tighten the screws (2, 3, 6) with a torque of 15 Nm (11.06 lbf ft).
1. Mount the housing cooling with the fastening bracket in the required position.
2. The sensor marking is no longer visible when the housing cooling is mounted. You can find the position of the sensor marking according to the following illustration.

Add the sensor marking with a waterproof marker or a permanent, coloured adhesive tape to the outside of the housing cooling.

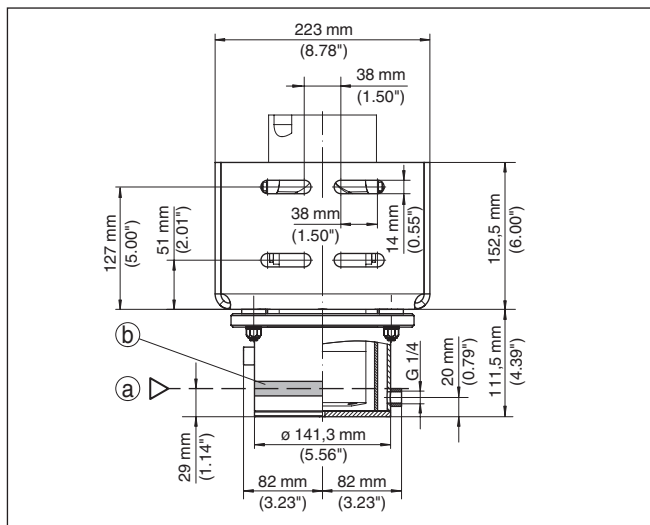


Fig. 3: Position of the sensor marking and drilling template of the fastening bracket - POINTRAC 31, short version (45 mm)

- a Position of the lower measuring range end
- b Sensor marking on the upper edge of the lateral connection nozzle

3. Insert the sensor into the housing cooling.

The small lid of the instrument housing must point to the front after mounting on the fastening bracket (x).

Mount the sensor with the two screws in the respective position.

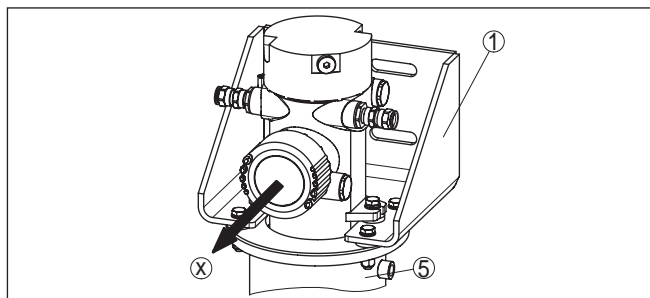


Fig. 4: Mounting direction of the sensor towards the fastening bracket

- 1 Fastening bracket
- 5 Housing cooling
- x Mounting direction of the housing

Mount the sensor according to the following illustration:

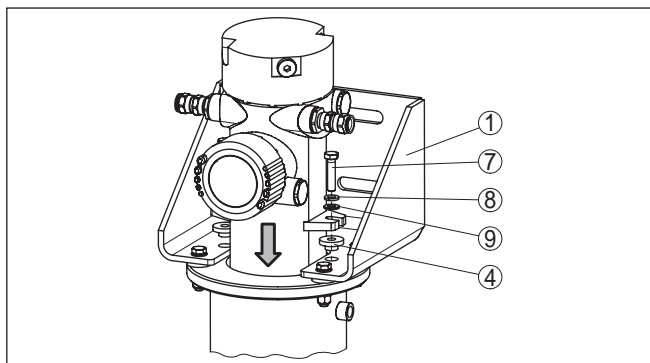


Fig. 5: Mounting the sensor

- 1 Fastening bracket
- 4 Isolating sleeve (2 pieces)
- 7 Hexagon screw M8 x 25 (2 pieces)
- 8 Retaining washer for M8 (2 pieces)
- 9 Washer for M8 (2 pieces)

Electrical connection

The housing cooling lid is screwed onto the existing sensor housing like a housing lid.

1. Unscrew the housing lid (18) from the sensor.
2. Connect the sensor to power supply. Keep the instructions of the operating instructions manual of the appropriate sensor in mind.

There is a connection diagram in the housing lid (18). This diagram is not in the housing cooling lid (19). So please note the details of the electrical connection in the operating instructions manual of the sensor.



Note:

The cooling system is used in areas with high temperatures. Therefore, use temperature-resistant cable and install it in such a way that contact with hot components is avoided.

Mounting of the housing cooling lid

1. Clean the thread of the housing cooling lid (19) and the thread on the housing.
2. Screw the housing cooling lid (19) onto the sensor instead of the housing lid (18) and turn the housing cooling lid (19) up to the stop.

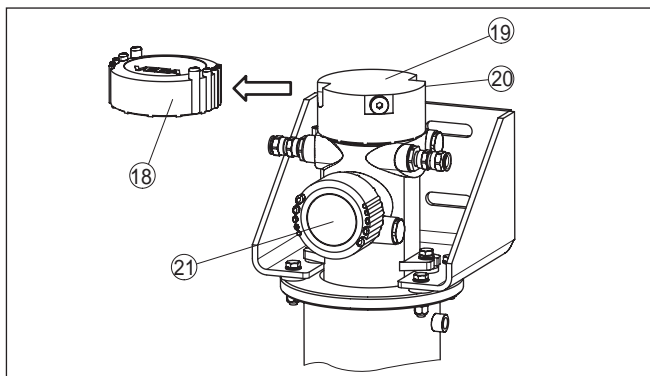


Fig. 6: Mounting of the housing cooling lid

18 Housing lid

19 Housing cooling lid

20 Connection opening for the coolant hose

21 Sensor

Mounting the sensor

As soon as the water cooling system is mounted, you can install the sensor with the water cooling system in your plant.

Connect cooling

The housing cooling and the housing cooling lid must be connected to the cooling circuit.

All threads for the cooling connection on the sensor are inner threads.

The required coolant hose is part of the scope of delivery.

Use clean tap water or distilled water for cooling. Oil or salt water are not suitable for the cooling system.

Make sure that the coolant cables do not freeze, e.g. in case of a shutdown.

You can find information on the throughput and the temperature of the cooling water in the technical data section.

Coolant pump

The water cooling may only be operated in an unpressurized state.

Use an open cooling circuit that circulates the coolant through the system by means of a pump.

Plan the coolant pump and a possible re-cooling system according to the required inlet temperature, pumping height and water throughput.

If you want to integrate a gate valve into the system, then install it only in the feed line to avoid pressurization in the cooling system.



Caution:

Make sure that the cooling water supply is reliable und interruption-free. Plan the necessary steps for a possible pump failure, missing coolant, etc.

We recommend installing a temperature sensor (in the return flow) that triggers an alarm when a critical temperature is reached.



If you want to use the water cooling in an application that is SIL qualified, you have to assess the SIL failure rates of the complete water cooling system and the cooling water supply yourself.

1. Install the coolant hose in such a way that it does not get kinked or come into contact with hot components.



Information:

Note the flow direction of the coolant. The direction of flow should be from bottom to top so that no voids can arise.

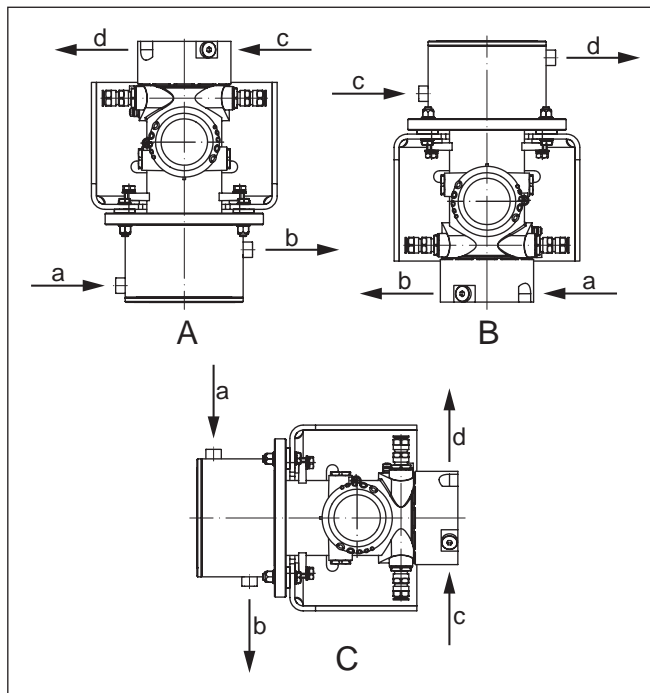


Fig. 7: Mounting position of the cooling system - note flow direction of the coolant (a, b, c ...)

- A Vertical mounting - housing head on top
- B Vertical mounting - housing head on bottom
- C Horizontal mounting

2. Connect the lines for the cooling water.

All threads for the cooling connection on the sensor are inner threads.

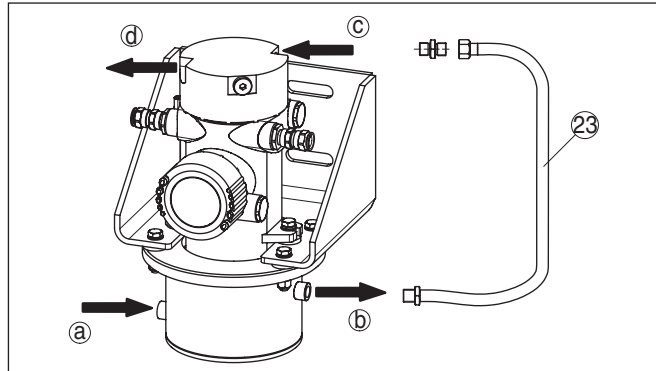


Fig. 8: Flow direction of the coolant

- a Coolant inlet - housing cooling
- b Coolant outlet - housing cooling
- c Coolant inlet - housing cooling lid
- d Coolant outlet - housing cooling lid
- 23 Coolant hose



Note:

The enclosed coolant hose (23) is pre-fabricated in its length. One end of the hose has a fixed connection thread, the other has a rotatable connection.

This ensures that the coolant hose remains straight.

All connection threads have seals already in place. Make sure that the seals are there when mounting.



Fig. 9: Pre-assembled coolant hose

- 23 Coolant hose
- 24 Rotatable connection thread
- 25 Fixed connection thread
- 26 Double nipple 1/4" (DIN ISO 228)

3. First screw in the fixed connection thread (25) of the coolant hose (23) and tighten the fitting with a torque of 25 Nm (18.43 lbf ft).
4. Unscrew the double nipple (26) from the rotatable connection thread (24) of the coolant hose and mount it in the connection hole of the sensor cooling.

Tighten the double nipple (26) with a torque of 25 Nm (18.43 lbf ft).

5. Screw the rotatable thread (24) into the double nipple (26). Apply counterforce on the rear nut with a fork wrench (SW 19) and tighten the connection thread with a second fork wrench with a torque of 25 Nm (18.43 lbf ft).

6. Fill the water cooling system.

Check the tightness of the system and the hose fittings.

The cooling system may only be operated in an unpressurized state.



Caution:

Do not loosen any screws or hose connections during operation and make sure that the coolant supply is reliable and interruption-free.

Install a protective grid

Take note of the operating instructions manuals of the corresponding radiation-based sensors and the source holder.

When handling radioactive substances, unnecessary radiation exposure must be avoided.

If there are gaps or intervening spaces after mounting, provide protective fences or grids to keep hands away from the dangerous area. Such areas must be marked accordingly.

Install a safety barrier on both sides of the cooling system. A sheet metal cover or an appropriately shaped plastic sheet can also be used.

3 Replacement parts

3.1 Available spare parts - water cooling

Selected components of the cooling are available as replacement parts. The following parts are available:

The stated quantity is the quantity delivered.

Water cooling

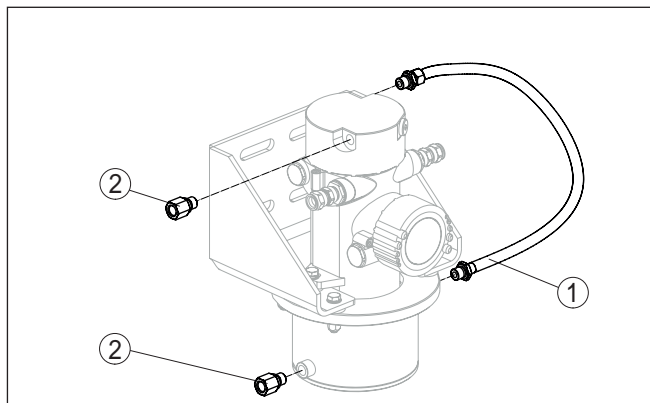


Fig. 10: Scintillator cooling - hoses and adapters

- 1 Coolant hose - housing cooling/housing cooling lid
- 2 Threaded adapter - water cooling 1/4 NPT (1 pce.)

4 Supplement

4.1 Technical data

General data

Take note of the information in the operating instructions manual of the installed MINITRAC level sensor and the source holder

Material 316L corresponds to 1.4404 or 1.4435

Materials

- Housing cooling 316L
- Housing cooling lid 316L

Application temperature See following tables (throughput - coolant)

Weight

- Housing cooling (basic weight) 2.3 kg (5.1 lbs)
- Fastening bracket 4.3 kg (9.5 lbs)
- Housing cooling lid 2.4 kg (5.3 lbs)

Torques

- Screws - Sensor mounting (M8) 15 Nm (11.1 lbf ft)
- Nuts - housing cooling (M8) 15 Nm (11.1 lbf ft)
- Coolant hoses, threaded fittings 25 Nm (18.5 lbf ft)

Connection thread of coolant hoses ¼" DIN ISO 228 outer thread
(adapters for NPT fittings are enclosed with respective version)

Throughput - coolant water

Cooling water pressure The cooling system may only be operated in an unpresurized state

Coolant temperature	Ambient temperature		
	+70 °C (+158 °F)	+80 °C (+176 °F)	+100 °C (+212 °F)
< +20 °C (+68 °F)	0.5 l/min (0.14 US gal/min)	0.5 l/min (0.14 US gal/min)	2 l/min (0.53 US gal/min)
< +30 °C (+86 °F)	0.5 l/min (0.14 US gal/min)	0.5 l/min (0.14 US gal/min)	7 l/min (1.85 US gal/min)

Tab. 1: Required water throughput to reach the max. permissible sensor temperature of +60 °C (+140 °F)

4.2 Dimensions

Active water cooling system

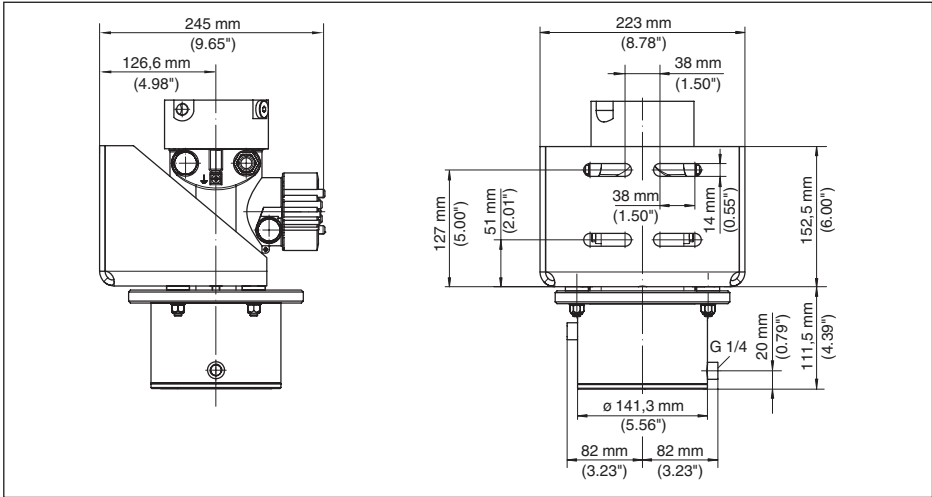


Fig. 11: Active water cooling system with housing cooling and housing cooling lid

Printing date:

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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice

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