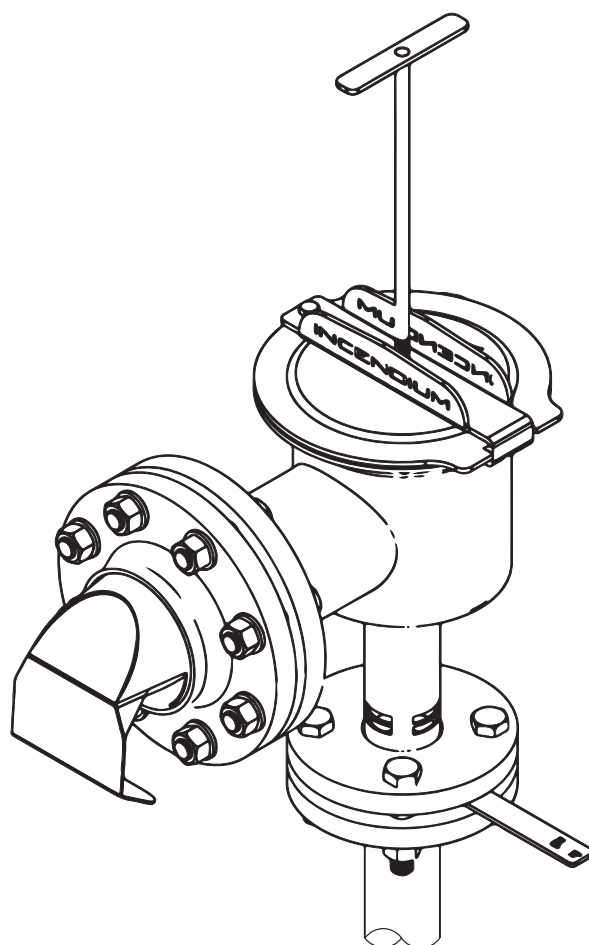




Tank Foam Generator

OPERATION AND MAINTENANCE





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1. General description

The Incendium Tank Top Foam Generator (TFG) and deflector (FD) are designed for extinguishing of storage tanks fires. The generator is designed with an integrated air foam generator to product low expanded foam and spread it over the flammable liquid surface. The top foam generator consists of a foam chamber and a built-in foam maker in stainless steel. A removable orifice plate is located at the inlet flange of the foam maker with the designated flow rate and pressure of the unit. A glass gas stop/vapour seal in the generator prevents the tank to be ventilated with the outside atmosphere. The gas stop bursts when expanded foam flow enters the foam chamber.

1.1 Function and handling

When the TFG is activated a premix flows through the TFG a vacuum is created. Air is aspirated through the air inlets. The air is mixed with the premix, thereby expanded to foam. The air and premix is mixed in the foam chamber and pushed through vapour seal into the tank. Inside the tank the foam is directed down and towards the tank side by the foam deflector (FD).

1.2 Liability Warning

The TFG must be operated and maintained in compliance with this document as well as with applicable standards, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the proper operation or integrity of this device. The owner is responsible for maintaining his fire protection unit or system and devices in proper operating conditions. The manufacturer or reseller should be contacted relative to any questions.

This manual must be read and understood by all personnel involved in operation, calibration and maintenance of this product and shall be kept in an accessible place for review.

The unit should not under any circumstance be operated outside the angle or pressure range as indicated in this manual. Operation of this device without understanding this manual can be dangerous.

1.3 Warranty

Incendium generally warrants for a period of one year from date of shipment (warranty period) that products furnished hereunder will be free from defects in material and workmanship.

This warranty is invalid if the device is, or has been:

- Misused or neglected
- If there have been accidents to the equipment
- Altered in any way
- Instructions in this manual has not been followed

1.2 Installation

For installation instructions, please see attached document no.: II-0001-TFG-EN

1.2.1 Inspection

- Inspect the TFG for damage that might have occurred during transport.
- Check that the gas stop/vapour seal is undamaged
- Check that signs on the equipment correspond to the material specification and order confirmation.
- Inspect that the TFG flanges have the same size and type as the water pipe and tank connection

1.2.2 Safety

- The installation is uncomplicated but must be carried out by qualified personnel. The directions given in this manual must be followed.
- Make sure that the TFG is safely secured when installing and running the system.
- Use only lifting gear and equipment that are well suited for the purpose.
- Do not lift the generator in the handle only.
- Before start up of the test make sure there is no personal in the affected area.

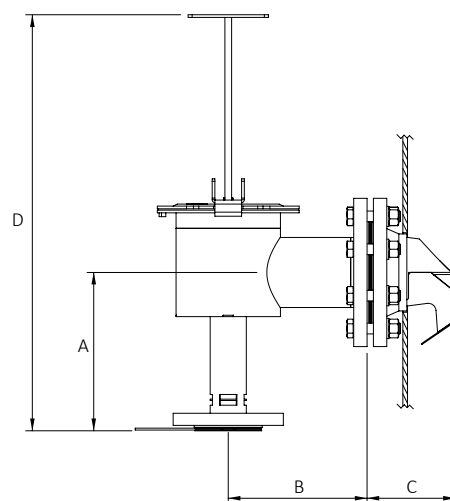


Figure 1.1: Dimensional view

DIMENSIONAL DATA

Model	A mm	B mm	C mm	D mm	Inlet mm	Outlet mm
TFG-50	235	210	122	615	50/2"	100/4"
TFG-100	265	210	227	680	100/4"	150/6"



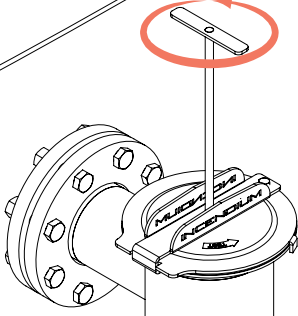
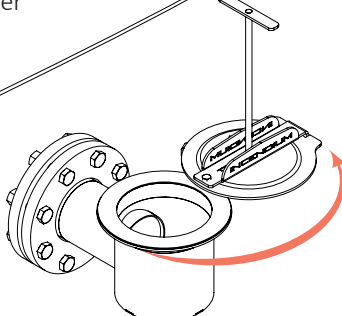
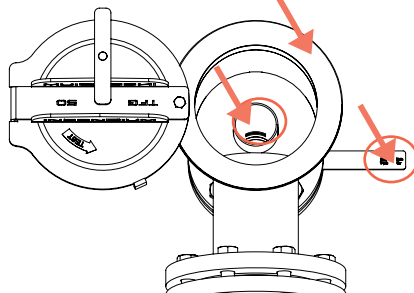
2. Test Procedure

The TFG does not require any regular maintenance. It is however recommended that the system is tested once every 6 months.

2.1 Safety

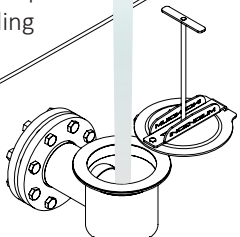
- Before start up of the test make sure there is no personal in the area affected of the test.
- The person performing the test should always wear appropriate safety equipment according to MSDS for the foam concentrate in question including harness for high altitude work.
- Follow every step in 2.2 - 2.4 for a complete and safe test of the TFG

2.2 Inspection and preparation before test

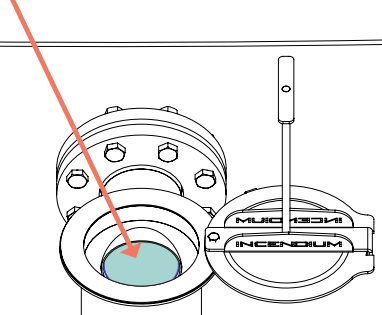
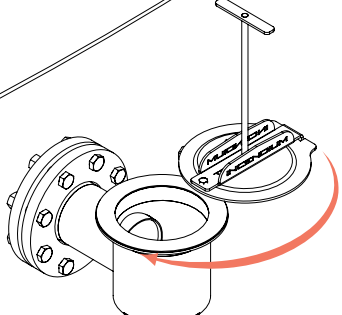
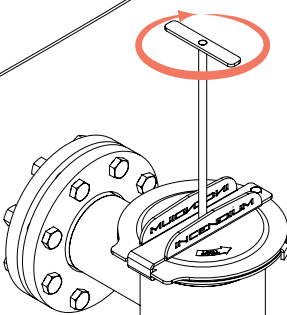
<p>1. Unlock the test cover by loosening the lock screw on top of the foam generator</p> 	<p>2. Open by swinging the test cover 180° according to the yellow sign on the test cover</p> 	<p>3. Check that data on the nozzle handle correspond to the flow and pressure specified for the specific tank. 4. Check that orifices are free of debris. 5. Check that the rubber seal of the test cover is in position and properly attached to the TFG</p> 
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2.3 Run test

1. Run the system test and check that the foam is properly generated. The expanded foam comes out at the top of the foam generator, thus avoiding foam flow into the tank.



2.4 Reset after test

<p>1. Check that gas stop/vapour seal is undamaged.</p> 	<p>2. Return the test cover to its original position</p> 	<p>3. Secure the test cover by tightening the lock screw</p> 
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2.5 Test conclusion

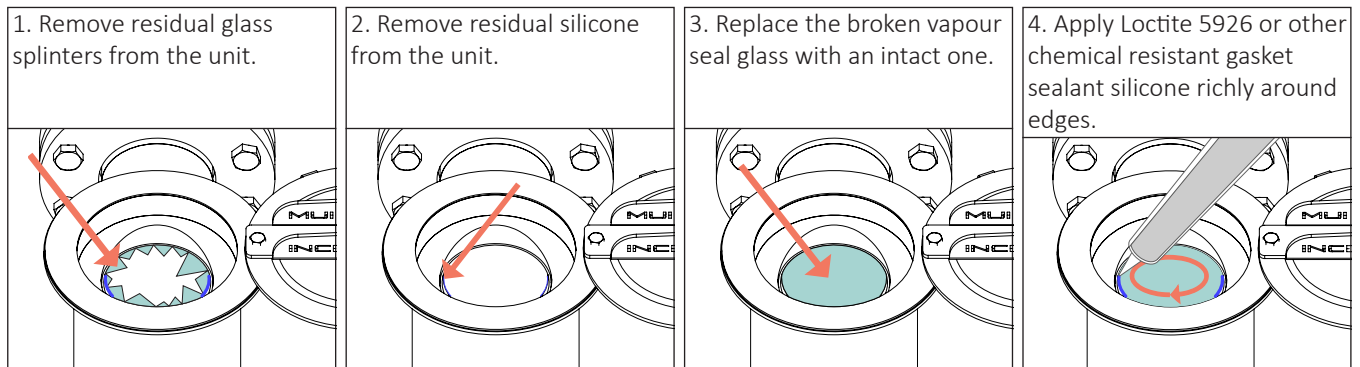
Test is now concluded. Report any deviations from normal behavior to management and call Incendium if any problems occur



3. Service

3.1 Vapour Seal

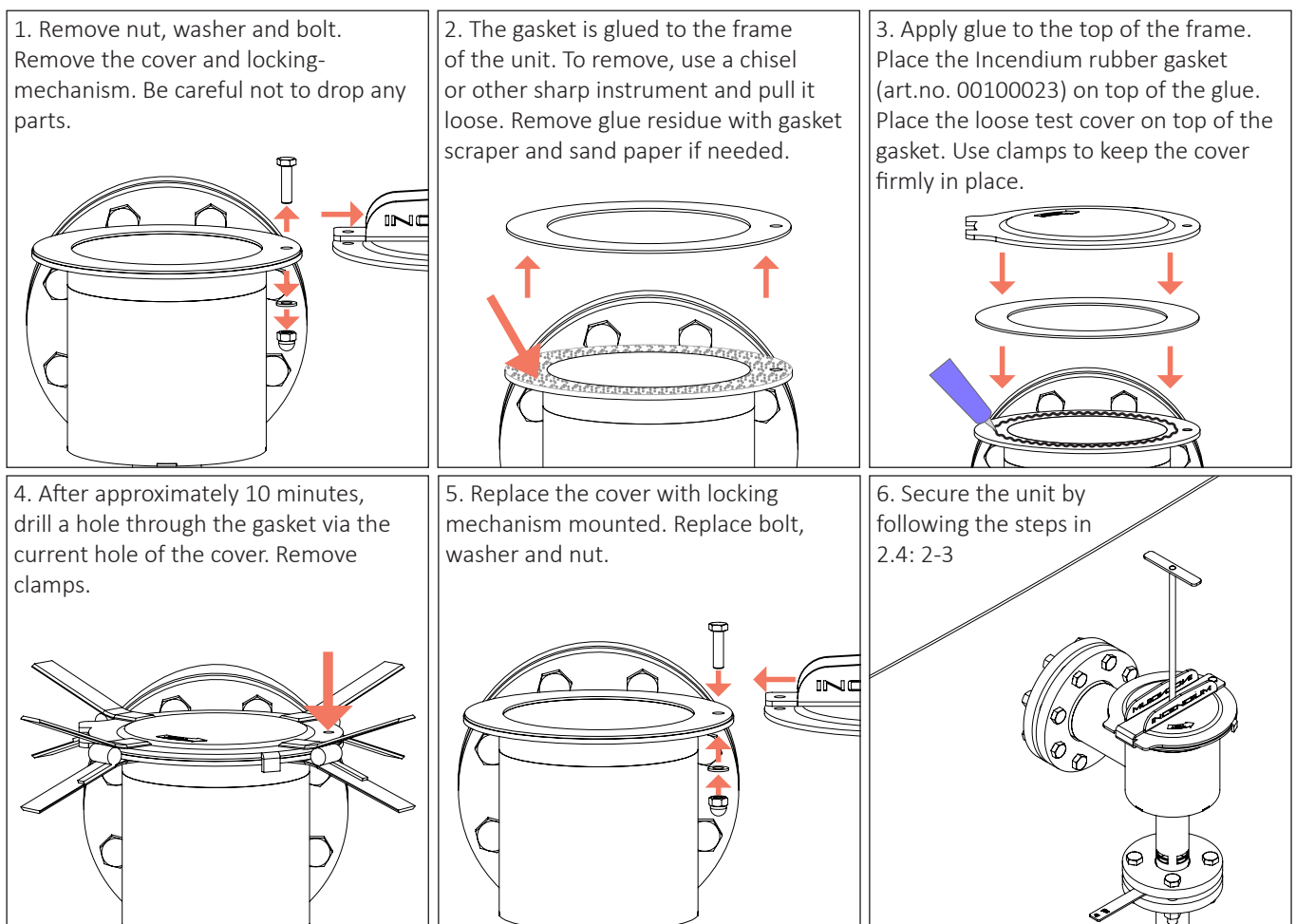
The TFG contains a vapour seal that is broken when the fire fighting system is initiated. If when checked the vapour seal is broken, it must be replaced so that no gases or fluids leak through the unit. Follow the steps below to replace the vapour seal.



When sealant has been applied, make sure to press the silicone and smooth it out around the edges. This is done to make sure that a proper seal is achieved. If this is not done the vapor seal might not function as intended. The TFG can now be mounted but should not be used for 24 hrs since this could cause the glass to break.

3.2 Gaskets

The TFG as a unit contains several gaskets to ensure the function as well as prevent leakage. In case of heavy wear or leakage these needs to be replaced. Gaskets pressed between flanges is uncomplicated to replace and can be done easily by someone experienced. Replacing the gasket sealing the test cover is however a different matter should be done according to the following steps. Start with unlocking and opening the test cover as shown in 2.2 steps: 1-2.





4. Spare parts

4.1 Spare parts TFG-50 DIN/ANSI

Complete unit article number, DIN: 81002003

Complete unit article number, ANSI: 81002108

Item	Part	Article no.
1	TFG-50 House DIN	00100001-DIN
1	TFG-50 House ANSI	00100001-ANSI
2	Locking unit	00100026
3	Test cover	00100008
4	Test cover gasket	00100023
5	Vapour seal	00100024
6	Nozzle DN50 DIN	00100022
6	Nozzle DN50 ANSI	00100258
7	FD-100 Deflector	81004502
8	Gasket DN100	50408091
9	Gasket DN50	50408079
10	Bolt M8x30	ISO 4017
11	Washer M8	ISO 7089
12	Nut CAP M8	DIN 1587

4.2 Spare parts TFG-100 DIN/ANSI

Complete unit article number, DIN: 81004002

Complete unit article number, ANSI: 81004105

Item	Part	Article no.
1	TFG-100 House DIN	00100027-DIN
1	TFG-100 House ANSI	00100027-ANSI
2	Locking unit	00100037
3	Test cover	00100033
4	Test cover gasket	00100038
5	Vapour seal	00100039
6	Nozzle DN100 DIN	00100249
6	Nozzle DN100 ANSI	00100036
7	FD-150 Deflector	81006522
8	Gasket DN150	50408099
9	Gasket DN100	50408091
10	Bolt M8x30	ISO 4017
11	Washer M8	ISO 7089
12	Nut CAP M8	DIN 1587

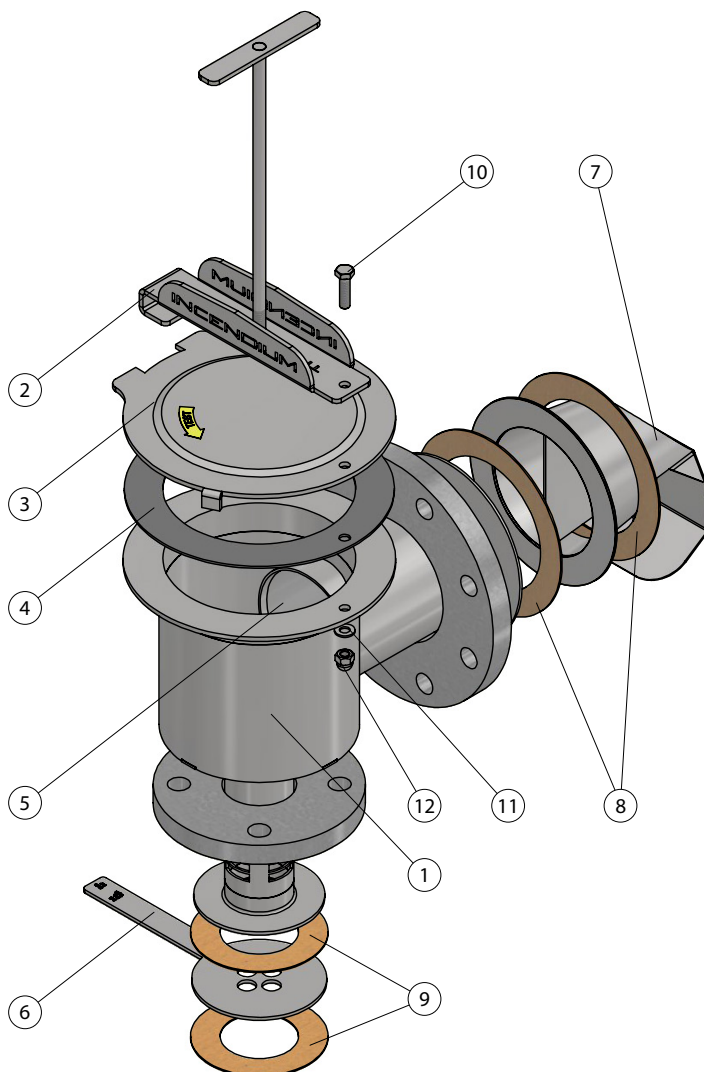


Figure 3: Spare parts, exploded view

Attention

Spare parts should always be installed by credited professionals or by Incendium installation to ensure a safe and correct installation.



5. Troubleshooting

- Vapour from the tank is leaking out through the generator:
 - o Check that the gas stop is intact.
 - o Check the flange to the tank is properly tighten and the gaskets are in place
- The generator operates at too low flow or too high pressure when tested:
 - o Check that all valves in the system are positioned at the correct settings.
 - o Check that the orifice of the generator correspond to the settings of the system specification
 - o Check that the openings of the orifice are free and not blocked by stones or debris.
 - o Check that any filters in the system not are blocked.
- The generator operates at too high flow or too low pressure when tested:
 - o Check that all valves in the system are positioned at the correct settings.
 - o Check that an orifice is installed at the generator.
 - o Check that the orifice of the generator correspond to the settings of the system specification
- The stream of water from the generator test outlet is turbulent when testing the generator with water or foam:
 - o Check that the openings of the orifice are free and not blocked by debris or stones.
 - o Check that the test cover is fully open and not partly blocking the water flow.

Note: Testing the generator with the cover closed or partly closed may cause the gas stop to burst and allow water to enter the tank.
- The foam produced during test has bad quality or bad expansion ratio:
 - o Check that an orifice is installed at the generator.
 - o Check that the openings of the orifice are free and not blocked by stones or debris.
 - o Check the foam mixing equipment in the system is operating normally
- Foam is leaking inside the tank during testing:
 - o Check that the vapour seal is intact.

Other documentation

Datasheet for TFG

Assembly drawing: 100025 and 100031