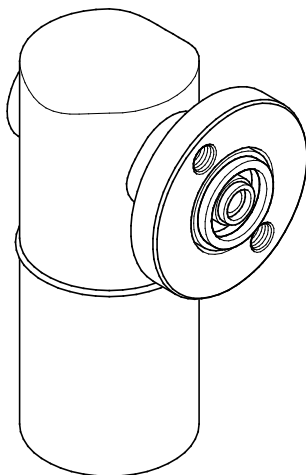


Inverted Bucket Steam Trap

# **IB 16A-7**



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## Preface

This installation & operating manual will help you use the inverted bucket steam trap IB 16A-7 safely and efficiently for its intended purpose.

This steam trap will be called equipment in this document.

This installation & operating manual is intended for anyone commissioning, using, operating, servicing, cleaning or disposing of this equipment and, in particular, for professional after-sales service technicians, qualified personnel and authorised and trained staff.

All of these persons must read and understand the content of this installation & operating manual.

Following the instructions given in this installation & operating manual helps avoiding danger and increases the reliability and service life of the equipment. Please note that in addition to the instructions given in this installation & operating manual you must also observe all locally applicable rules and regulations concerning the prevention of accidents as well as approved safety guidelines for good professional practice.

## Availability

Keep this installation & operating manual together with the plant documentation for future reference. Make sure that this installation & operating manual is available to the operator.

The installation & operating manual is part of the equipment. Please hand over this installation & operating manual when selling the equipment or passing it on.

## Text layout

Certain text elements of this installation & operating manual feature a specific typographic design. You can easily distinguish the following text elements:

Standard text

*Cross-reference*

- ▶ Listing
  - ▶ Sub-items in listings
- Steps for action.



Here you will find additional useful information and tips serving to assist you in using the equipment to its fullest potential.

## Safety

### Usage for the intended purpose

The inverted bucket steam trap is designed for use with a universal connector.

Its purpose is to discharge condensed steam.

The equipment must only be used within the allowable pressure and temperature limits and only if the chemical and corrosive influences on the equipment are taken into account.

Correct use includes compliance with the instructions given in this installation & operating manual, in particular obedience to all safety instructions.

Any other use of the equipment is considered to be improper.

Note that the equipment is also used incorrectly if the materials of the equipment are not suitable for the fluid.

## Basic safety notes

### Risk of severe injuries or death

- ▶ The equipment is under pressure and hot during operation. Before carrying out any work on the equipment make sure that the following requirements are met:
  - ▶ The pipes must be depressurized (0 bar).
  - ▶ The fluid must be completely removed from the pipes and the equipment.
  - ▶ During work on the equipment the installation must be switched off and protected against unauthorised or unintended activation.
  - ▶ The pipes and the equipment must have cooled down to room temperature (approx. 20 °C).
- ▶ If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment. Before working on the equipment make sure that it is completely decontaminated. Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- ▶ The equipment must only be used with fluids that do not attack the material and the gaskets and sealings of the equipment. Otherwise leaks may occur and hot or toxic fluid could escape.
- ▶ The equipment and its component parts must only be mounted or removed by qualified personnel. A qualified person must be acquainted with and experienced in the following:
  - ▶ Making pipe connections.
  - ▶ Working with dangerous (contaminated, hot or pressurized) fluids.
- ▶ If the admissible temperature and pressure limits are exceeded the equipment may be destroyed and hot or pressurized fluid may escape. This presents the risk of severe injuries or death. Make sure that the equipment is only operated within the admissible service range. For more information on limits and pressure & temperature ratings see name plate and the section "*Technical Data*".

### Risk of property damage or malfunctions

- ▶ Malfunctions occur if the equipment is installed with the body not vertically pointing downwards. This may result in damage to the equipment or the installation. Make sure that the equipment is installed upright with the body vertically pointing downwards.
- ▶ If the material is unsuitable for the fluid, increased wear may occur and fluid may escape. Make sure that the material is suitable for the fluid used in your installation.

### Environmental damage caused by incorrect disposal

- ▶ For the disposal of the equipment observe the pertinent on-site regulations concerning waste disposal.

## Qualification of personnel

A qualified person must be acquainted with and experienced in the following:

- ▶ the pertinent on-site rules and regulations for preventing fire and explosions
- ▶ working on pressure equipment
- ▶ making pipe connections
- ▶ working with dangerous (hot or pressurized) fluids
- ▶ observing all notes and instructions in this installation & operating manual and the applicable documents

## Typographic features of safety notes

### Danger note

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#### **DANGER**

Notes with the heading DANGER warn against imminent dangerous situations that can lead to death or serious injuries.

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#### **WARNING**

Notes with the heading WARNING warn against possibly dangerous situations that could lead to death or serious injuries.

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#### **CAUTION**

Notes with the heading CAUTION warn against dangerous situations that could lead to minor or moderate injuries.

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### Information on environmental and property damage

---

#### ***Attention!***

This note warns against situations that may lead to environmental and/or property damage.

---

## Description

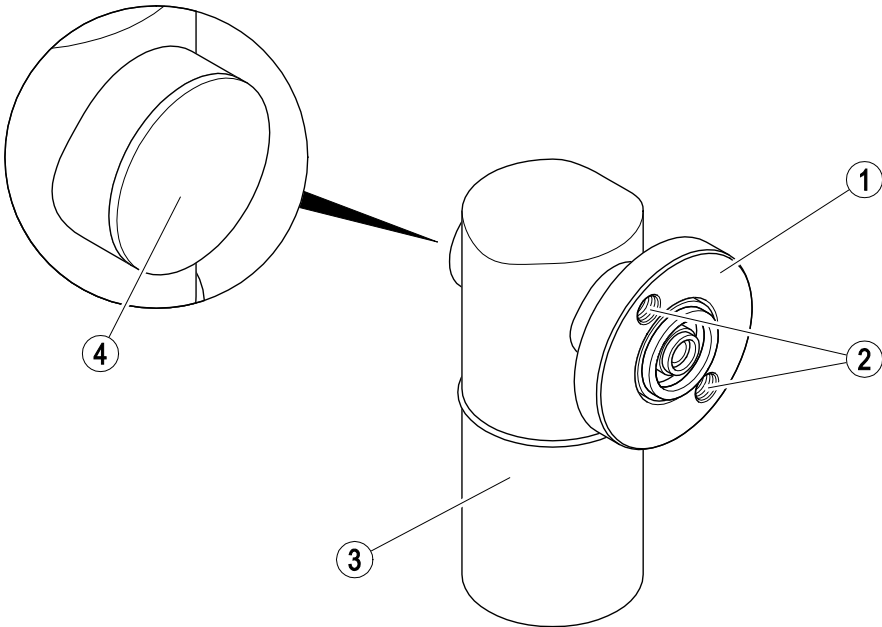
### Scope of supply and equipment specification

The equipment is available for various differential pressures  $\Delta PMX$ . For more information see section "*Pressure & temperature ratings*" from page 16 onwards and the name plate.

### Scope of supply

Our equipment is delivered packed and ready for assembly.

### Equipment specification



| No. | Designation                             |
|-----|---|
| 1   | Revolvable universal connector (Swivel) |
| 2   | Threaded bores                          |

| No. | Designation |
|-----|-------------|
| 3   | Body        |
| 4   | Name plate  |

The equipment is designed for use with a universal connector e. g. UC 36 or UCY 36. The equipment can also be connected to the TrapStation TS 36.

## Name plate

The following items are indicated on the name plate:

- ▶ Manufacturer
- ▶ Type designation
- ▶ Design
- ▶ Design temperature
- ▶ Design pressure
- ▶ Max. service temperature
- ▶ Max. service pressure
- ▶ Max. admissible differential pressure

The following items are indicated on the equipment body:

- ▶ Material
- ▶ Identification marking of material testing
- ▶ Batch code

The manufacturing date is located at different positions depending on the equipment type.

- ▶ on the name plate
- ▶ on the body next to the name plate
- ▶ on the body next to the connection

The manufacturing date is stated as quarter and year of the production.

**Example:** "3/10" reads: manufactured in the third quarter of 2010.

## Application of European Directives

### Pressure Equipment Directive

The equipment conforms to this directive (see "Manufacturer's Declaration" section) and can be used for the following media:

- ▶ Fluids of group 2

## ATEX Directive

The equipment does not have its own potential ignition source and is not subject to this directive (see "Manufacturer's Declaration" section).

When installed, static electricity may arise between the equipment and the connected system.

When used in potentially explosive atmospheres, the plant manufacturer or plant operator is responsible for discharging or preventing possible static charge.

If it is possible for medium to escape, e.g. through actuating mechanisms or leaks in threaded joints, the plant manufacturer or plant operator must take this into consideration when dividing the area into zones.

## Purpose and function

### Purpose

The equipment is designed to discharge condensed steam.

### Function

The inverted bucket inside the equipment body is attached by a lever to the sealing element of the valve seat. When the equipment is filled with condensate the bucket remains at the bottom. The valve is open and condensate is being discharged. As soon as steam or gas enters the equipment the bucket becomes buoyant and the lever pushes the sealing element into the valve seat. The valve is closed. Any gas or air is allowed to escape through the small air vent hole in the top of the bucket.

## Storing and transporting the equipment

### **Attention!**

Equipment can be damaged if stored or transported improperly.

- Close all openings with the sealing plugs or covers supplied with the equipment or use similar sealing covers.
- Protect the equipment against moisture and corrosive atmospheres.
- Please contact the manufacturer if the specified transport and/or storage requirements cannot be met.

## Storing the equipment

Please observe the following items when storing the equipment:

- ▶ Do not store the equipment for more than 12 months.
- ▶ Use the supplied sealing plugs or other suitable seal caps in order to seal off all openings of the equipment.
- ▶ Protect the sealing surfaces and contact areas against mechanical damage.
- ▶ Protect the equipment and all components against hard shocks and impacts.
- ▶ Store the equipment only in closed rooms that meet the following environmental conditions:
  - ▶ Air humidity below 50 %, not condensing
  - ▶ Indoor air: clean, salt-free and non-corrosive
  - ▶ Temperature 5–40 °C.
- Make sure that all these requirements are always met when storing the equipment.
- Please contact the manufacturer if you cannot comply with the recommended storage conditions.

## Transporting the equipment

- Meet the requirements for storage also when transporting the equipment.
- Prior to transport seal off connections with sealing plugs.



If you do not have the sealing plugs supplied with the equipment use appropriate seal caps to seal off the connections.

- For short distances (only a few metres) you can transport the equipment unpacked.
- When transporting the equipment over larger distances use the original packaging.
- If you do not have the original packaging use a box that protects the equipment adequately against corrosion and physical damage.



For a short period of time the equipment may be transported even if the temperature is below 0 °C, provided that the equipment is completely empty and dry.

## Mounting and connecting the equipment

### Preparing installation

- Take the equipment out of the transport packaging.
- Check the equipment for transport damage.
- Contact the manufacturer if you detect any kind of shipping damage.

When supplied by the factory, the connections may be sealed off with sealing plugs.

- Remove sealing plugs before mounting the equipment.
- Keep the sealing plugs and the packing for further use.





## DANGER

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable safety clothing and safety gear refer to the safety data sheet of the fluid in question.

- Drain pipes until they are empty.
- Switch the installation off and protect it against unauthorised or unintended re-activation.
- Make sure that a suitable universal connector is installed in the pipe. A suitable universal connector is, for instance, the UC 36 or the UCY 36. The equipment can also be connected to the TrapStation TS 36.

## Connecting the equipment



## DANGER

Incorrectly connected equipment can cause fatal accidents or severe injuries.

- Make sure that only qualified skilled personnel connect the equipment to pipes.

Specialist personnel must be highly qualified and fully experienced in making pipe connections for the respective type of end connection.

To allow easy access for routine servicing and exchanging components observe the indicated withdrawal distances and allow for clearances to adjacent installation parts.

For more information see chapter "*Dimensions and weights*" on page 16.

- Make sure that the pipe system of the plant is clean.

## Attention!

Malfunctions due to incorrect position of installation of the equipment.

- Make sure that the equipment is upright with the body vertically pointing downwards when you install and operate it.
- Make sure that the equipment is free from foreign matter.

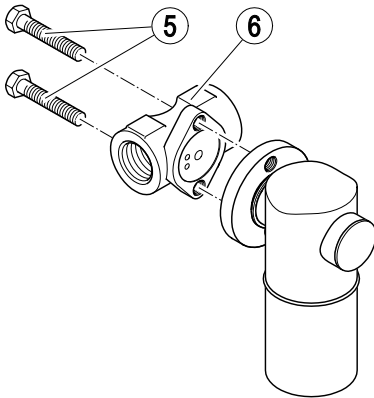


At initial start-up the equipment must first be primed with condensate in order to create the necessary water seal.

If the fluid is harmless you can prime the equipment before connecting it. If the fluid is dangerous the equipment must first be connected before it can be primed.

- For this purpose proceed as described in section "*Commissioning the equipment*" on page 10.

- Use screws that are suitable for a 3/8" –16 UNC thread.
- Install the equipment upright with the body pointing downwards to the mounted universal connector (6).
- Fasten the screws (5) using a torque spanner (US: wrench) to a torque of 20 Nm (15 lbs. ft.).



- Make sure that the equipment is safely mounted and that all connections are made correctly.

## Commissioning the equipment

After installation commission the equipment.

For this purpose proceed as follows:

- Make sure that the pipes are free from foreign matter and dirt particles.

### **Attention!**

Equipment may be damaged due to insufficient or too rapid priming.

- Slowly prime the equipment until there is enough condensate to create the necessary water seal.
- 
- Slowly prime the equipment with the fluid.
  - Wait until the equipment is completely filled with condensate and service pressure is reached.
  - Visually check the equipment and its connections for any leaks.
  - Check the function of the equipment.



To check the performance of the equipment you can use for instance the GESTRA ultrasonic detector.

- Follow the instructions given in the operating manual of the GESTRA ultrasonic detector.

## Operation

You can use the GESTRA ultrasonic measuring unit VAPOPHONE® to check the performance of the equipment during operation.

- For more details refer to the installation & operating manual of the ultrasonic measuring unit.

## After operation



### DANGER

If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment.

- Only qualified personnel are allowed to perform work on contaminated equipment.
- Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- Make sure that the equipment is completely decontaminated before carrying out any service work.
- Follow the pertinent instructions for handling the hazardous substances in question.

## Maintaining the equipment



Note that the maintenance intervals indicated in the following section are the absolute minimum.

- Carry out any maintenance or additional service work whenever required.
- Visually check the equipment and its connections for any leaks at least once a year.
- Eliminate any leak that you encounter.
- Check the performance of the equipment at least once a year.
- Replace a defective device with a new one.



To check the performance of the equipment you can use for instance the GESTRA ultrasonic detector.

- Follow the instructions given in the operating manual of the GESTRA ultrasonic detector.

## Removing external dirt deposits

- To remove dirt deposits rinse the equipment with fresh water and wipe it with a clean, lint-free cloth.
- To remove any persistent residues use a cleaning agent that is suitable for the material and carefully wipe the equipment with a clean, lint-free cloth.

## Troubleshooting

| <b>Problem</b>   | <b>Cause</b>   | <b>Remedy</b>  |
|--|--|--|
| The steam trap is cold or only hand-hot.                                       | The isolating valves for condensate inlet or outlet are closed.  | Open the isolating valves.   |
|  | The condensate inlet or outlet is dirt clogged.  | Clean the pipes.<br>Clean the equipment.   |
| The steam trap is blowing off live steam.                                      | There are dirt deposits in the equipment.  | Replace the equipment with a new one.  |
|  | The seat is leaking.   | Replace the equipment with a new one.  |
|  | The bypass is open.  | Close the bypass.  |
| Insufficient condensate discharge.<br>Insufficient thermal output of the user. | The isolating valves for condensate inlet or outlet are closed.  | Open the isolating valves.   |
|  | The condensate inlet or outlet is dirt clogged.  | Clean the pipes.<br>Replace the equipment with a new one.  |
|  | The steam trap is undersized.  | Use a steam trap with a larger condensate discharge capacity.  |
|  | The differential pressure is too small.  | Increase the steam pressure.<br>Lower the pressure in the condensate line.<br>Check the size of the condensate line.<br>Install a steam trap with a larger condensate discharge capacity, a pump steam trap or a condensate return unit. |
|  | The condensate line does not have a slight fall from the the drain point towards the steam trap.<br>The condensate is lifted upstream of the steam trap. | Lay the condensate line with a gradient so that the condensate is free to fall towards the steam trap.<br>Change the orientation of the condensate line.   |
|  | Insufficient deaeration.   | Provide additional deaeration.<br>Use a different steam trap type.<br>Contact the manufacturer to find out which trap type is the most suitable for your application.  |

| <b>Problem</b>                        | <b>Cause</b>                                       | <b>Remedy</b>  |
|---------------------------------------|--|--|
| Fluid escapes (equipment is leaking). | The end connections are not tight.                 | Seal off the end connections (e. g. flanged or screwed ends).  |
|                                       | A gasket for the universal connector is untight.   | Check the gasket for dirt deposits.<br>Clean the gasket and the gasket surfaces.<br>Replace the equipment with a new one.  |
|                                       | The body has been damaged by corrosion or erosion. | Check the resistance of the body material for the fluid used.<br>Use a steam trap made from a material that is suitable for the fluid used.                      |
|                                       | The equipment has been damaged by frost.           | Replace the equipment with a new one.<br>When shutting down the installation make sure that the condensate lines and the steam trap are completely drained.      |
|                                       | The equipment has been damaged by waterhammer.     | Replace the equipment with a new one.<br>Take appropriate measures to protect the equipment against waterhammer, e. g. by installing suitable non-return valves. |

## Putting the equipment out of operation

### Removing harmful substances



#### **DANGER**

If the equipment is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the equipment.

- Only qualified personnel are allowed to perform work on contaminated equipment.
- Always wear the protective clothing prescribed for contaminated areas when working on the equipment.
- Make sure that the equipment is completely decontaminated before carrying out any service work.
- Follow the pertinent instructions for handling the hazardous substances in question.

Qualified personnel must have extensive experience with and a working knowledge of:

- ◆ pertinent rules and regulations concerning handling hazardous substances
- ◆ special regulations for handling the hazardous substances encountered on site
- ◆ using the required personal protective equipment (PPE) and clothing

#### ***Attention!***

Environmental damage may be caused by poisonous fluid residues.

- Before disposing of the equipment make sure that it is clean and free of fluid residues.
  - For the disposal of all materials observe the pertinent legal regulations concerning waste disposal.
- 
- Remove all residues from the equipment.
  - For the disposal of all residues observe the pertinent legal regulations concerning waste disposal.

### Removing the equipment



#### **DANGER**

Personnel working on pipes are exposed to safety risks and may suffer severe injuries, poisoning or even loss of life.

- Make sure that no hot or hazardous fluid is in the equipment or the pipes.
- Make sure that the pipes upstream and downstream of the equipment are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the equipment and the pipes have cooled down to room temperatures.
- Wear protective clothing that is suitable for the fluid and, if necessary, wear protective gear.

For more information on suitable safety clothing and safety gear refer to the safety data sheet of the fluid in question.

- Detach the equipment from the universal connector.
- Put the equipment onto a suitable base.
- Store the equipment as described in section "Storing the equipment" on page 8.

## Re-using equipment after storage

Observe the following instructions if you want to remove the equipment and use it again somewhere else:

- ◆ Make sure that the equipment is free of any fluid residues.
- ◆ Make sure that all connections are in good condition and leak-free.
- Use the equipment only for its intended purpose and the service conditions for which it was specified.

## Disposing of the equipment

---

### ***Attention!***

Environmental damage may be caused by poisonous fluid residues.

- Before disposing of the equipment make sure that it is clean and free of fluid residues.
  - For the disposal of all materials observe the pertinent legal regulations concerning waste disposal.
- 

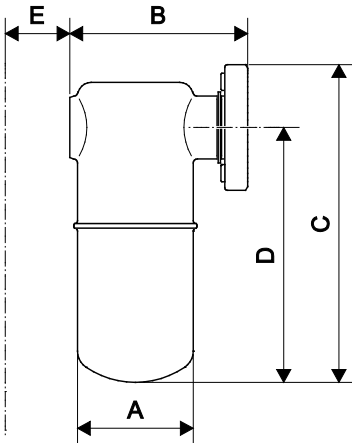
The equipment is made from the following materials:

### **IB 16A-7**

| <b>Component</b> | <b>EN</b>       | <b>ASTM</b>     |
|------------------|-----------------|-----------------|
| Body             | 1.4306          | A240-304L       |
| Internals        | Stainless steel | Stainless steel |

## Technical data

### Dimensions and weights



| Dimensions                     | [mm] | [inch] |
|--------------------------------|------|--------|
| <b>A</b>                       | 66   | 2.6    |
| <b>B</b>                       | 104  | 4.1    |
| <b>C</b>                       | 178  | 7.0    |
| <b>D</b>                       | 142  | 5.6    |
| <b>E (withdrawal distance)</b> | 64   | 2.5    |

|               |        |        |
|---------------|--------|--------|
| <b>Weight</b> | 1.5 kg | 3.3 lb |
|---------------|--------|--------|

### Pressure & temperature ratings

| $\Delta$ PMX [bar] | PMO                 | $\Delta$ PMX [psi] | PMO                   |
|--------------------|---------------------|--------------------|-----------------------|
| 4.8                | 28 bar<br>at 425 °C | 70                 | 400 psig<br>at 800 °F |
| 8.6                |                     | 125                |                       |
| 17.2               |                     | 250                |                       |
| 27.6               |                     | 400                |                       |



## **Manufacturer's Declaration**

For more information on the Conformity Assessment according to European rules refer to our Declaration of Conformity or our Declaration by Manufacturer.

To download the current Declaration of Conformity or Declaration by Manufacturer go to [www.gestra.com/documents](http://www.gestra.com/documents) or contact:

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This declaration is no longer valid if modifications are made to the equipment without consultation with us.







Agencies all over the world: [www.gestra.de](http://www.gestra.de)

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