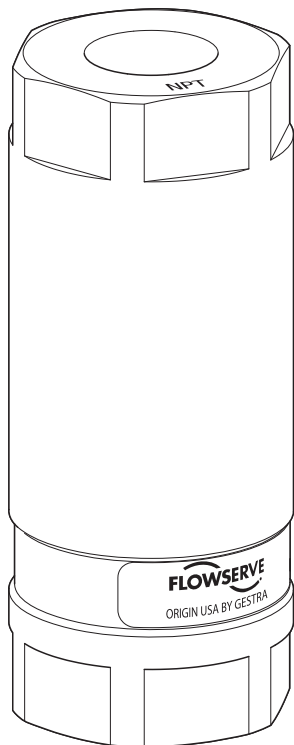


Steam Trap

**BK 37-5**



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## Foreword

This installation & operating manual will help you use the steam trap safely and efficiently for its intended purpose.

### ► BK 37-5

This device 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.

## Formatting features in the document

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

### Use for the intended purpose

Thermostatic/thermodynamic steam traps of the following type are installed in pipes:

### ► BK 37-5

This equipment is designed for discharging condensed water or air-venting steam lines.

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

- ▶ 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.

### Risk of minor injuries

- ▶ Sharp edges on internals present the danger of cuts to hands. Always wear industrial gloves when servicing the equipment.
- ▶ If the support of the equipment during installation is insufficient the equipment might fall down, thereby causing bruises or injuries. Make sure the equipment is safely held in place

during installation and cannot fall down. Wear protective safety footwear.

## Information on property damage or malfunctions

- ▶ Malfunctions will occur if the equipment is installed in a wrong position or with the flow arrow pointing in the opposite direction of the fluid flow. This may result in damage to the equipment or the installation. Make sure that the flow arrow on the equipment body matches the indicated direction of the fluid flow in the pipe.
- ▶ 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.

## 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 as well as industrial safety regulations
- ▶ working on pressure equipment
- ▶ making pipe connections
- ▶ working with dangerous (hot or pressurized) fluids
- ▶ lifting and transporting loads
- ▶ observing all notes and instructions in this installation & operating manual and the applicable documents

## Protective gear

The required protective gear depends on the types of fluid used and the regulations on site. For more information on suitable safety clothing and safety gear refer to the safety data sheet of the fluid in question.

Protective gear comprises the following items:

- ▶ protective helmet
- ▶ work boots
- ▶ industrial leather gloves

Depending on local rules and regulations and the noise level generated by the plant some form of ear protection to EN 352 must be worn.

Depending on local rules and regulations and the fluid used in the plant some form of eye protection to EN 166 must be worn.

## Typographic features of warning notes

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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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## Formatting features for warnings of property damage

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### ***Attention!***

This information warns of a situation leading to property damage.

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## Description

### Scope of supply and equipment specification

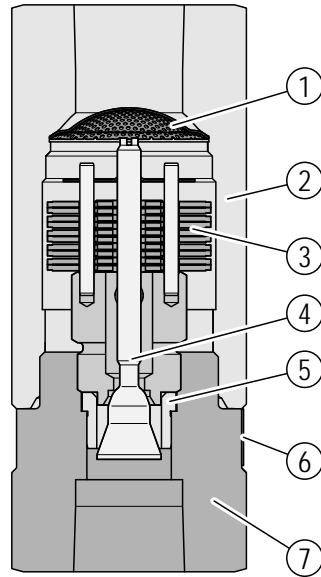
#### Scope of supply

Our equipment is delivered packed and ready for assembly.

The scope of supply comprises the following items:

- ▶ steam trap type Bk 37-5
- ▶ this installation & operating manual

## Equipment specification



Item no.	Designation
1	Strainer
2	Body (inlet)
3	Thermovit regulator
4	Nozzle stem
5	Bushing
6	Name plate with flow direction arrow
7	Body (outlet)

## End connections

The equipment is available with the following end connections:

- ▶ Screwed sockets
- ▶ Socket-weld ends

## Name plate

The following items are indicated on the name plate:

- ▶ Manufacturer
- ▶ Type designation
- ▶ Nominal size
- ▶ Pressure rating
- ▶ Design pressure
- ▶ Max. service temperature
- ▶ Max. admissible differential pressure
- ▶ Direction of flow

The following items are indicated on the equipment body:

- ▶ Material
- ▶ Manufacturing date (quarter/year)

## ATEX

The equipment does not have its own potential source of ignition and is therefore not subject to the ATEX Directive 94/9/EC.

The equipment is not Ex marked.

For more information refer to our ATEX Declaration of Conformity.

- Please observe the following notes if the equipment is to be used in explosion-risk areas:
  - ▶ The equipment can be used in zones (surrounding atmosphere acc. to Directive 1999/92/EC) 0, 1, 2, 20, 21 and 22 (ATEX Directive 94/9/EC).
  - ▶ Make sure that the operating fluid does not generate a surface temperature that exceeds the limit specified for the place of installation.
  - ▶ If the equipment is electrically insulated when installed between pipe connections appropriate

measures must be taken to discharge any static electricity.

## Pressure Equipment Directive

The equipment is excluded from the scope of the PED according to section 3.3 and must not bear a CE marking.

The equipment fulfills the requirements of the Pressure Equipment Directive PED 97/23/EC and can be used for the following fluids:

- ▶ Fluids of group 2

## Task and function

### Purpose

The equipment is designed for discharging condensed steam or air-venting pipelines.

The equipment features integral non-return valve action.

### Function

The equipment is fitted with a Thermovit regulator that regulates the flow of the fluid. The Thermovit regulator is screwed into the body.

The Thermovit regulator consists of a stack of several bimetallic plates. As the fluid temperature rises the plates deflect, thereby moving the stage nozzle. The orifice is being closed.

When the installation is cold the Thermovit regulator is open.

In the event of backflow, the pressure of the fluid forces the nozzle stem into the nozzle support. As a result the orifice is being closed.

## 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 protective 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.

## 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.
- Make sure that the flow arrow on the equipment body matches the direction of flow in the pipe.

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

### **Attention!**

Equipment will be damaged if the end connections are undersized.

- Make sure that the connections are strong and rigid enough to support the weight of the equipment and to withstand the forces that occur during operation.

The equipment can be installed in any position.

To install the equipment in or remove it from pipes use the following tool:

- ▶ Combination spanner 46 mm A. F. (corresponds to 1 13/16 inch), DIN 3113, form B
- Make sure that the pipe system of the plant is clean.
- Make sure that the equipment is free from foreign matter.
- Mount the equipment in the desired installation position.
- Connect the end connections of the equipment properly to the pipes.
- Make sure that the equipment is safely mounted and that all connections are made correctly.

## Operation

Do not work on the equipment while it is operating.

You can check the correct functioning of the equipment during operation using the GESTRA ultrasonic measuring unit VAPOPHONE® or TRAPTEST® (VKP 40 and VKP 40plus).

- 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.

### **Attention!**

Frost damage may occur when the installation is shut down.

- Drain the equipment if ambient temperatures below 0 °C (frost) are to be expected.

## 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.

## Maintaining the equipment

The equipment does not require any particular maintenance.

## Servicing the equipment and installing spare parts

- Replace a defective device with a new one.

## Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
The steam trap is cold or only hand-hot.	The shut-off valves for condensate inlet or outlet are closed.	Open the shut-off valves.
	The condensate inlet or outlet is dirt clogged.	Clean the pipes. Replace the equipment with a new one.
Insufficient condensate discharge. Insufficient thermal output of the user.	The shut-off valves for condensate inlet or outlet are closed.	Open the shut-off valves.
	The condensate inlet or outlet is dirt clogged.	Clean the pipes. Replace the equipment with a new one.
	Steam pressure and condensate flowrate fluctuate considerably. The pressure upstream of the steam trap is too low for the used trap type.	Use a different steam trap type. Contact the manufacturer to find out which trap type is the most suitable for your application.
	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. Lower the pressure in the condensate line. Check the size of the condensate line. Install a steam trap with a larger condensate discharge capacity or a condensate return unit.
	The distance between the drain point and the steam trap is too small.	Install the uninsulated steam trap approx. 1 - 2 m away from the drain point. Do not insulate the condensate line and lay it with a gradient so that the condensate is free to fall towards the steam trap.
	The condensate line does not have a slight fall from the drain point towards the steam trap. 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. Change the orientation of the condensate line.

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
	The condensate temperature is higher than the service temperature of the steam trap. The regulator does not open or only with a time delay.	If the steam trap or the condensate line is insulated remove the insulation. Use a different steam trap type.
Fluid escapes (equipment is leaking).	The end connections are not tight.	Seal off end connections (e. g. screwed or weld ends).
	The body has been damaged by corrosion or erosion.	Check the resistance of the body material for the fluid used. 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. 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. Take appropriate measures to protect the equipment against waterhammer, e. g. by installing suitable non-return valves.

- If faults occur that are not listed above or cannot be corrected, please contact our Technical Service or authorized agency in your country.

## Putting the equipment out of operation

### Removing harmful substances

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#### **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



#### **Caution**

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

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#### **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.

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

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#### **CAUTION**

Danger of bruising if the equipment falls down.

- When removing the equipment make sure the it is safely held in place and cannot fall down.
-

To install the equipment in or remove it from pipes use the following tool:

- ▶ Combination spanner 46 mm A. F. (corresponds to 1 13/16 inch), DIN 3113, form B
- Detach the end connections of the equipment from the pipes.
- Dispose of the equipment.

## Disposing of the equipment



### Caution

Environmental damage may be caused by poisonous fluid residues.

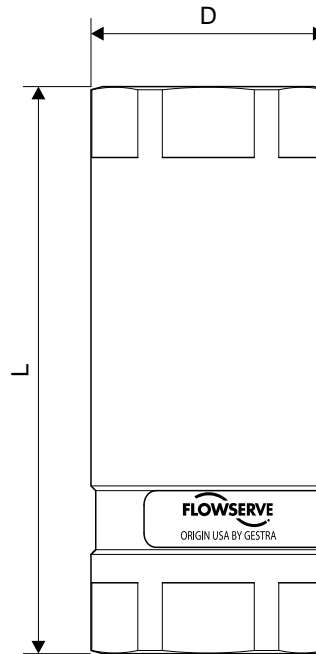
- Before disposing of the equipment make sure that it is clean and free of fluid residues.
- For the disposal of all materials observe the pertinent legal regulations concerning waste disposal.

The equipment is made from the following materials:

Component part	ASTM
Body	A105
Thermovit regulator	Stainless steel with bimetallic plates
Other internals	Stainless steel

## Technical data

### Dimensions and weights



Dimensions [mm]	
D	50
L	120

### Weights

Nominal size	[mm]	10	15	20	25
	[inch]	3/8	1/2	3/4	1
Weight	[kg]	1.4	1.38	1.32	1.23
	[lbs]	3.09	3.04	2.91	2.71

## Pressure & temperature ratings

<b>Limiting conditions for body to ASME B 16.34-2013, table 2-1.1</b>		
p (pressure) [bar]	102.1	57.5
T (temperature) [°C]	38	425
$\Delta$ PMX (max. admissible differential pressure) [bar]	45	

<b>Limiting conditions for body to ASME B 16.34-2013, table 2-1.1</b>		
p (pressure) [psig]	1,480	825
T (temperature) [°F]	100	800
$\Delta$ PMX (max. admissible differential pressure) [psi]	652	

## 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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