



**FLOWSERVE**



**GESTRA**

## **GESTRA Steam Systems**

# **BK 27N**



## **Installation Instructions 818627-00**

Steam Trap

BK 27N, DN 40 - 50

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## Important Notes

### Usage for the intended purpose

Use steam trap BK 27N only for the discharge of condensed water in pipe lines or for air-venting within the admissible pressure/temperature ratings.

Check the corrosion resistance and chemical suitability of the steam trap for the application in question.

### Safety note

The equipment must only be installed and commissioned by qualified staff.

Maintenance and service work must only be performed by adequately trained persons who have a recognised level of competence.



#### Danger

The steam trap is under pressure during operation.

When loosening flanged connections, plugs or the regulator, hot water and/or steam may escape. This presents the risk of severe scalding.

Installation and maintenance work should only be carried out when the system is depressurized (0 bar): isolate the trap from both upstream and downstream pressure.

The trap becomes hot during operation. This presents the danger of severe burns to hands and arms. Installation and maintenance work should only be carried out when the system is cold (20 °C).

Sharp edges on internal parts present a danger of cuts to hands. Always wear industrial gloves when replacing the regulator or the strainer.



#### Attention

The name plate specifies the technical features of the equipment. Note that any piece of equipment without its specific name plate must neither be commissioned nor operated.

### PED (Pressure Equipment Directive)

The equipment fulfills the requirements of the PED 97/23/EC. The equipment can be used with fluids of group 2. With CE marking (except equipment according to section 3.3 of the PED).

### ATEX (Atmosphère Explosible)

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 can be used in potentially explosive areas 0, 1, 2, 20, 21, 22 (1999/92/EC).

The equipment is not Ex market.

## Explanatory Notes

### Scope of supply

**BK 27N:**

1 Steam trap BK 27N

1 Installation manual

### Description

Thermostatic steam trap with corrosion-resistant thermostatic element (Duo stainless steel bimetallic regulator, externally adjustable) unaffected by waterhammer. With internal Y-type strainer, integrated non-return valve and asbestos-free cover gasket (graphite). Installation in any position.

The default factory setting allows the steam trap to discharge condensate with virtually no banking-up. For more undercooling the settings of the installed, depressurized steam trap can be modified externally.

### Function

During start-up of the plant the Duo stainless steel plates are flat. The service pressure acts in the opening direction, the valve is completely open. As the condensate temperature rises, the plates deflect, drawing the stage nozzle towards the closed position. As the condensate temperature sinks, the deflection of the Duo stainless steel plates decreases and the steam trap opens at the adjusted opening temperature.

The thermostatic and spring characteristics of the stack of plates are balanced such that condensate is always discharged at a given undercooling temperature.

The trap provides automatic air-venting at start-up and during operation. BK 27N can also be used for thermal air-venting in steam systems.

### Design

**BK 27N:**

For installation in horizontal and vertical pipes.

## Technical Data

### Pressure / temperature ratings

#### BK 27N:

For the pressure and temperature ratings, see the designation on the body or the data given on the name plate: Pressure PN/Class, material number, max. temperature, max. pressure, max. differential pressure.

### Corrosion resistance

When used for its intended purpose, the safe functioning of the steam trap will not be impaired by corrosion.

### Sizing

The valve body must not be subjected to sharp increases in pressure. The sizing and dimensional allowances for corrosion reflect the latest state of technology.

### Name plate / marking

For the pressure and temperature ratings, see the designation on the trap body or the data given on the name plate. Further details are given in various GESTRA publications, such as datasheets and technical information.

In accordance with EN 19, the following type and design data are indicated on the name plate or body:

- Manufacturer
- Type designation
- Pressure class PN or Class
- Material number
- Maximum temperature
- Maximum pressure
- Direction of flow
- Stamp on the body / name plate, e. g.  $\frac{3}{05}$  specifies the manufacturing quarter and year (in this case the 3<sup>rd</sup> quarter of 2005).

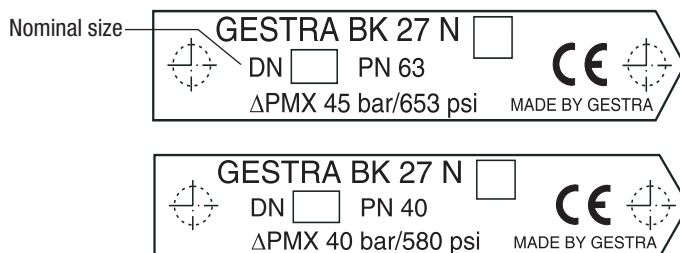


Fig. 1

# Design

## Component parts BK 27N

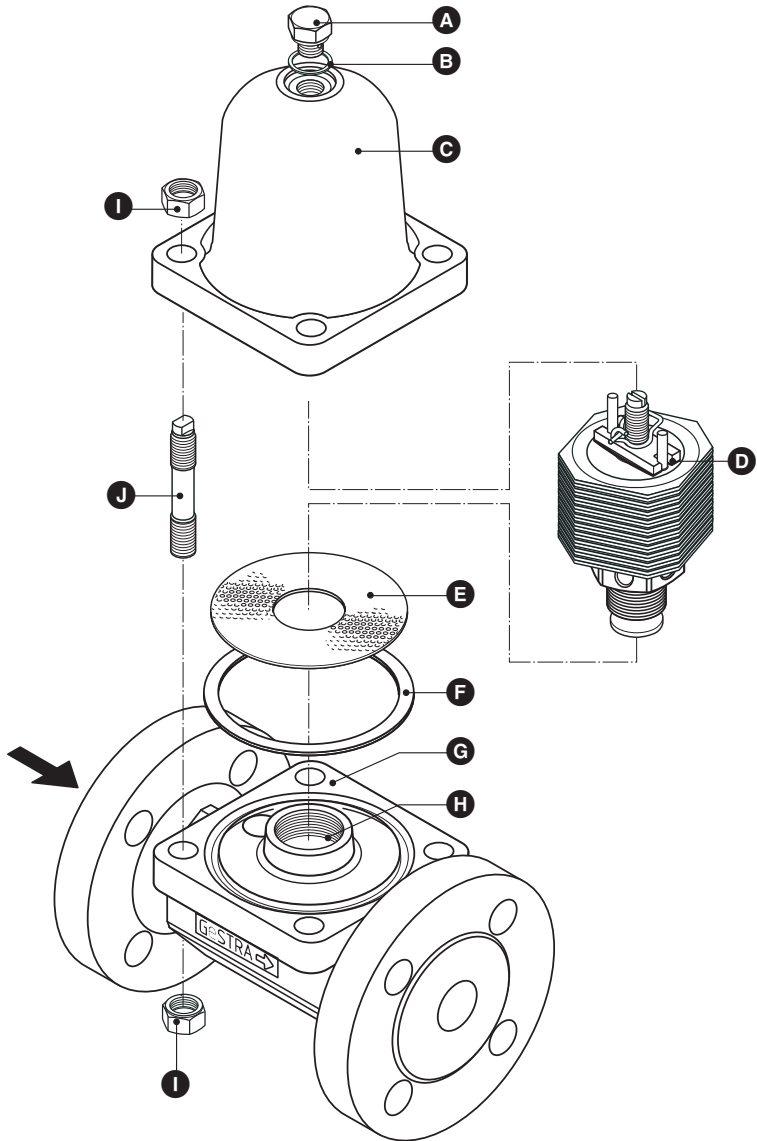


Fig. 2

### Key

- A** Sealing plug ¼" A
- B** Gasket A 14 x 18, 1.4301, DIN 7603
- C** Cover
- D** Bimetallic regulator
- E** Strainer
- F** Gasket 92.7 x 102 x 1
- G** Body
- H** Bush (interference fit, **not** a spare part!)
- I** Hexagon-head screw M 16, DIN 2510-5
- J** Bolt with waisted shank, form L, DIN 2510, M 16 x 80, A.F. 10



## Installation

### BK 27N

The steam trap BK 27N can be installed in horizontal or vertical position, but the flow direction arrow must be taken into account. In the case of a horizontal installation, the cover should be at the top.


### Flanged design

1. Take care of correct position of installation.
2. Take care of flow direction. The flow arrow is on the trap body.
3. Consider space required for opening trap. When the trap is installed a minimum space of **100 mm** is required for removing cover **C**.
4. Remove plastic plugs. They are only used as transit protection.
5. Clean seating surfaces of both flanges.
6. Install steam trap.

### Socket-weld design

1. Take care of correct position of installation.
2. Take care of flow direction. The flow arrow is on the trap body.
3. Consider space required for opening trap. When the trap is installed a minimum space of **100 mm** is required for removing the cover **C**.
4. Remove plastic plugs. They are only used as transit protection.
5. Remove regulator as described under **Maintenance**.
6. Clean socket-weld ends.
7. Arc-weld trap only manually (welding process 111 and 141 in accordance with DIN EN 24063).

### Butt-weld design

1. Take care of correct position of installation.
2. Take care of flow direction. The flow arrow is on the trap body.
3. Consider space required for opening trap. When the trap is installed a minimum space of **100 mm** is required for removing the cover .
4. Remove plastic plugs. They are only used as transit protection.
5. Clean butt-weld ends.
6. Arc-weld trap only manually (welding process 111 and 141 in accordance with DIN EN 24063) or use gas-welding process (welding process 3 in accordance with DIN EN 24063).



#### Attention

- Only qualified welders certified e. g. according to DIN EN 287 may weld the steam trap into pressurized lines.
- Do **not** insulate the steam trap.

### Heat treatment of welds

A subsequent heat treatment of the welds is not required provided that the pipe is made from a material similar to that used for the steam trap.

If, however, heat treatment is necessary, make sure that the treatment is limited to the area immediately around the weld. Should this not be possible remove the bimetallic regulator before carrying out the heat treatment.

## Commissioning

### BK 27N

Make sure that the flanged connections of the BK 27N are permanently bolted and tight.



#### Attention

The equipment is under pressure during commissioning and operation. When loosening the sealing plug **A** in order to change the settings of the regulator, hot water or steam will escape. The force of the flowing steam will throw the sealing plug out.

This presents the risk of severe burns and scalds to the whole body. The equipment is hot during operation. This presents the risk of severe burns to hands and arms.

Always wear industrial gloves when changing the regulator settings. Installation and maintenance work should only be carried out when the system is depressurised (zero bar). Isolate the equipment from both upstream and downstream pressure.

### Setting the regulator (undercooling, controlled steam flow)

The default factory of the bimetallic regulator of the BK 27N ensures steam-tight shut-off and the discharge of condensate with virtually no banking up.

#### Settings for a larger amount of undercooling (banking-up of condensate):

1. Depressurise the steam trap and wait until it has cooled down to room temperature (20 °C).
2. Unscrew sealing plug **A**.
3. Use a screwdriver to turn the nozzle stem of the bimetallic regulator **D** to the right.  
¼ turn corresponds to approx. 8K change in temperature. Max. 1½ turns to the right starting from factory setting are possible.
4. Tighten sealing plug **A** with a torque of 40 Nm.

#### Settings for controlled steam flow

1. Depressurise the steam trap and wait until it has cooled down to room temperature (20 °C).
2. Unscrew sealing plug **A**.
3. Use a screwdriver to turn the nozzle stem of the bimetallic regulator **D** to the left.  
¼ turn corresponds to approx. 8K change in temperature. Max. 1½ turns to the left starting from factory setting are possible.
4. Tighten sealing plug **A** with a torque of 40 Nm.

### Restoring factory settings

1. Depressurise the steam trap and wait until it has cooled down to room temperature (20 °C).
2. Unscrew sealing plug **A**.
3. Use a screwdriver to turn the nozzle stem of the bimetallic regulator **D** to the right until it hits the stop. Then turn it 3 ¼ to the left.
4. Tighten sealing plug **A** with a torque of 40 Nm.

## Operation

### BK 27N

Certain operating conditions make servicing of the BK 27N necessary (see section **Maintenance**).

## Maintenance

GESTRA steam traps type BK 27N do not require any special maintenance. However, if used in new installations which have not been rinsed it may be necessary to check and clean the trap.

### Check steam trap

You can check the steam trap BK 27N for steam loss during operation using the ultrasonic measuring unit VAOPHONE® or the test unit TRAPtest®.

Should you detect any loss of live steam clean the trap and/or replace the regulator.

### Clean / replace bimetallic regulator and strainer

1. Take heed of the note “Danger” on page 4.
2. Undo bolts **J**. Remove cover **C** from the body **G**.
3. Remove and clean regulator **D**.
4. Remove and clean strainer **E**.
5. Clean body **G**, internals and all seating surfaces.
6. Replace regulator **D** in case of visible signs of wear or damage.
7. Apply heat-resistant lubricant to all threads and seating surfaces (use for instance WINIX® 2150).
8. Insert new gasket **F**.
9. Insert strainer **E**.
10. Screw in regulator **D** and tighten with a torque of **350 Nm**.
11. Put cover **C** onto the body **G**. Tighten bolts **J** and nuts **I** alternately and in several steps to a torque of **90 Nm**.

### Tools

- Combination spanner 32 A.F., DIN 3113, form B
- Combination spanner 18 A.F., DIN 3113, form B
- Combination spanner 19 A.F., DIN 3113, form B
- Open-end spanner 10 A.F., DIN 3110, ISO 3318
- Torque spanner 20 – 120 Nm, DIN ISO 6789

## Torques

Item	Designation	Torques [Nm]
<b>D</b>	Regulator	350
<b>J I</b>	Bolts, nuts	90
<b>A</b>	Sealing plug	40

All torques given in the table are based at an ambient temperature of 20 °C.

WINIX® 2150 is a registered trademark of WINIX GmbH, Norderstedt

## Spare Parts

### Spare parts list

Item	Designation	Stock code
<b>D</b>	Regulator BK 27N <sup>3)</sup> , compl., incl. gasket <b>F</b>	376607
<b>A</b>	Sealing plug ¼" A	096178
<b>B</b>	Gasket for sealing plug (A 14 x 8)	000992
<b>F</b>	Gasket <sup>4)</sup> 92.7 x 102 x 1	376677
<b>E</b>	Strainer	097018

<sup>3)</sup> Note: The regulator of the BK 27N does **not** fit into the body of the BK 27!

<sup>4)</sup> 20 pcs. Contact your local dealer for smaller quantities.

## Annex

### Declaration of Conformity CE

We hereby declare that the equipment **BK 27N** conforms to the following European Directives:

- EC Pressure Equipment Directive (PED) 97/23/EC dated 29 May 1997, apart from the equipment according to section 3.3.
- Applied conformity assessment procedure according to: Annex III, Module H, verified by the Notified Body 0525.

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

Bremen, den 30<sup>th</sup> November 2004  
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