

Condensate Mixing Pipe

**KMS**

**EN**  
English

Original Installation Instructions

**850911-00**

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## Foreword

This Installation & Operating Manual will help you to use the KMS condensate mixing pipe correctly, safely and cost efficiently.

The KMS condensate mixing pipe is referred to below simply as equipment.

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

The KMS condensate mixing pipe is installed in steam and condensate systems.

The equipment introduces boiling condensate into a cold flow of condensate quietly and without water hammer.

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 may become hot during operation. Do not operate the equipment unless thermal insulation or protection against accidental contact prevents you from touching hot surfaces.
- ▶ The equipment is under pressure during operation and may be hot. 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.
  - ▶ Selecting suitable lifting gear and understanding the rules for its safe use.
  - ▶ Working with dangerous (contaminated, hot or pressurized) fluids.

- ▶ If the admissible pressure and temperature ratings are exceeded, the equipment may be destroyed and hot or pressurised fluid may escape. Make sure that the equipment is always used within the admissible pressure and temperature ratings.  
You can find information on the pressure and temperature ratings on the name plate.
- ▶ If unsuitable lifting gear is used or the gear is used improperly the equipment or parts of it could fall down.
  - ▶ Make sure that only qualified personnel lifts the equipment or parts of it.
  - ▶ Make sure that nobody is standing or working below the hoisted equipment.
  - ▶ Make sure that the lifting gear is of sufficient strength for the load to be hoisted and that the load is properly secured and attached to it. For more information on the nature and weight of the components and safe lifting points please contact the manufacturer.
  - ▶ Make sure that all locally applicable regulations on safety and the prevention of accidents are strictly adhered to.

## Risk of minor injuries

- ▶ There is a risk of cuts from sharp-edged parts of the equipment. Always wear protective gloves when working on the equipment.
- ▶ If the equipment is inadequately supported during installation, there is a risk of getting crushed if it falls. Use the eyebolt to secure lifting gear, if available. Secure the equipment during installation so it cannot fall. Use the eyebolt to do this, if available. Wear sturdy safety boots.

## Information on property damage or malfunctions

- ▶ Malfunctions will occur if the equipment is installed in a wrong position or with the flow pattern in the opposite direction of the fluid flow. This may result in damage to the equipment or the installation. Make sure that the flow pattern indicated in this installation and operating manual matches the 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
- ▶ 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 operator must ensure that anyone working on the equipment must wear the required protective clothing and safety gear stipulated for the site of installation. The protective clothing must be suitable for the used media and must protect the wearer against safety and health hazards associated with a particular job to be carried out at the site of installation. Protective clothing & equipment must provide protection from potential hazards, in particular from injuries to:

- ▶ Head
- ▶ Eyes
- ▶ Body
- ▶ Hand
- ▶ Feet
- ▶ Hearing

Note that this list is not exhaustive. The operator must establish personal protective equipment guidelines and specify any additional protective gear that is required if the worker is exposed to a specific risk at the site of installation.

## 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

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

This information warns of a situation leading to property damage.

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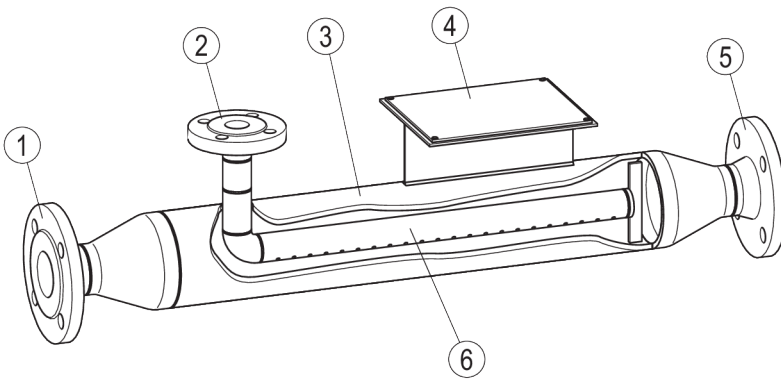
## Description

### Scope of supply and equipment specification

#### Scope of supply

Our equipment is delivered packed and ready for assembly.

#### Equipment specification



No.	Designation
1	Condensate inlet N1
2	Boiling condensate connection N2
3	Main pipe
4	Name plate
5	Condensate outlet N3
6	Nozzle lance

The equipment features the following connections:

- ▶ Condensate inlet connection N1
- ▶ Boiling condensate connection N2
- ▶ Condensate outlet connection N3

### **End connections**

The equipment is available with the following end connections:

- ▶ Flanges

### **Name plate/identification**

The following items are indicated on the name plate:

- ▶ Manufacturer
- ▶ Type designation
- ▶ Min. service temperature
- ▶ Max. service temperature
- ▶ Maximum service pressure
- ▶ Max. service pressure
- ▶ CE marking
- ▶ Year of construction
- ▶ Serial number
- ▶ Type of vessel
- ▶ Weight
- ▶ Body of regulations
- ▶ Test pressure
- ▶ Volume

## **Task and function**

### **Purpose**

The KMS condensate mixing pipe is installed in steam and condensate systems.

The equipment introduces boiling condensate into a cold flow of condensate quietly and without water hammer.

The manufacturer recommends installing the condensate mixing pipe horizontally in the condensate collecting line.

Mixing the flows of condensate as they merge reduces wear and expensive maintenance on the condensate system.

### **Function**

The cold condensate flows through the condensate inlet N1 (1) into the condensate mixing pipe and then into the main pipe. The boiling condensate is fed into the main pipe through the connection N2 (2) and a nozzle lance (6). This ensures that the flows of condensate are mixed quietly without water hammer.

The condensate enters the condensate collecting line via the condensate outlet N3 (5).

# Application of European Directives

## Fluids

The equipment is designed for the following fluids (in accordance with the EU Pressure Equipment Directive or Pressure Equipment (Safety) Regulations in the UK):

- Fluids of group 2

The units have the following Fluid Group classification:

<b>Type</b>	DN 25 (80) DN 15	DN 25 (80) DN 20	DN 40 (80) DN 20	DN 40 (80) DN 25	DN 50 (100) DN 25	DN 50 (100) DN 32	DN 80 (125) DN 25	DN 80 (125) DN 40	DN 80 (125) DN 50
<b>Fluid Group</b>	Art. 4, Section 3				Category I, Module A				

Due consideration must be given to chemical and corrosive influences.

## Potentially explosive atmospheres

The equipment does not have its own potential source of ignition (as per ATEX Directive). Please pay attention to the following information:

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.

The high temperature of the fluid can cause the system to heat up to the point of ignition.

If using in potentially explosive atmospheres, the plant manufacturer or plant operator is responsible for preventing temperatures on the surfaces of the equipment that could lead to ignition.



## 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



### **DANGER**

Risk of bruises if the equipment or component parts fall down.

- Use suitable lifting gear when moving or lifting the equipment and/or component parts.
  - Make sure that the equipment cannot topple over.
  - Make sure that nobody is standing below the lifted 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



#### **DANGER**

Risk of bruises if the equipment or component parts fall down.

- Use suitable lifting gear when moving or lifting the equipment and/or component parts.
- Make sure that the equipment cannot topple over.
- Make sure that nobody is standing below the lifted equipment.

- 
- 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.

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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.

- 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.

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

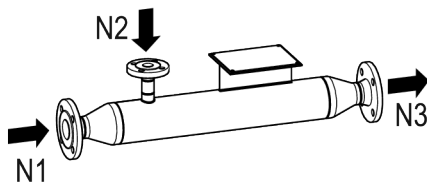
### Attention!

The equipment can be damaged if connections are too weak.

- Make sure that the connected equipment is not subjected to any forces or torques.

The plant operator is responsible for ensuring that the equipment and sealing material are suitable for the fluid used.

- Make sure that the materials of all equipment components are suitable for the fluid used.
- Please contact the manufacturer for further information.
- Inspect all seals before installation to ensure they are in perfect condition.
- Make sure that the pipe system of the plant is clean.
- Make sure that the equipment is free from foreign matter.
- Install the equipment (3) parallel to the floor.
- Connect the cold condensate supply to the condensate inlet N1 (1).
- Connect the condensate drain to the condensate outlet N3 (5).
- Make sure that the connection between the condensate inlet N1 (1) and the condensate outlet N3 (5) is horizontal.
- Connect the condensate line for boiling condensate to connection N2 (2) from above.



- Make sure that the equipment is safely mounted and that all connections are made correctly.
- At operating temperature, check that flange connections are tight.

If flange connections are leaking, proceed as follows:

- Power down the system and wait until the tank and pipes are cool enough to touch.
- Re-tighten threaded joints.
- Power the system up again.
- Again check that flange connections are tight at operating temperature.

During operation the surface of the equipment gets hot. This presents the risk of burns.

- Lag the surface of the equipment with suitable insulating material.

## Operation

Do not work on the equipment while it is operating.

## After operation

### ***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.

- Examine the equipment at regular intervals and check it for correct operation.
- If necessary, clean the equipment.

No spare parts are available for the equipment.

- Replace a defective device with a new one.

## Putting the equipment out of operation

## 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 protective clothing and safety gear refer to the safety data sheet of the fluid in question.



### **DANGER**

Risk of bruises if the equipment or component parts fall down.

- Use suitable lifting gear when moving or lifting the equipment and/or component parts.
  - Make sure that the equipment cannot topple over.
  - Make sure that nobody is standing below the lifted equipment.
- 
- Detach the end connections of the equipment from the pipes.
  - Put the equipment onto a suitable base.
  - Store the equipment as described on page 9.

## 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.

## Returning the equipment

You can return the equipment to your contractual partner.

- Make sure that all harmful substances are removed from the equipment.
- Pay attention to the instructions in section "Transporting the equipment" from page 9.
- Pack the equipment in its original packaging or in suitable transport packaging.

The transport packaging must protect the equipment from damage in the same way as the original packaging.

- Send the completed and signed decontamination declaration with the equipment. The decontamination declaration must be attached to the packaging so that it is accessible from outside.
- Register the return delivery with your contractual partner before returning the equipment.

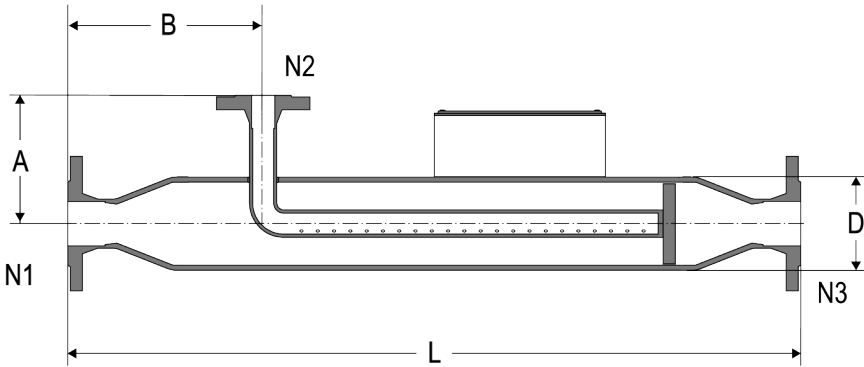
## Disposing of the equipment

The equipment is made from the following materials:

Component	Material
Pipes	1.0345/P 235 GH
Flanges	1.0460/P 250 GH

## Technical data

### Dimensions and weights



Type		DN 25 (80) DN 15	DN 25 (80) DN 20	DN 40 (80) DN 20	DN 40 (80) DN 25	DN 50 (100) DN 25	DN 50 (100) DN 32	DN 80 (125) DN 25	DN 80 (125) DN 40	DN 80 (125) DN 50
<b>Volume</b>	[l]	3.5		3.6		5.9		9.4		
<b>N1, N3 (DN)</b>	[mm]	25		40		50		80		
<b>N2 (DN)</b>	[mm]	15	20	25		32	25	40	50	
<b>D</b>	[mm]	90				120		140		
<b>L</b>	[mm]	900								
<b>A</b>	[mm]	145				160		170		
<b>B</b>	[mm]	240								
<b>Weight</b>	[kg]	14.3	15.5	16.8	17.5	23.3	24.4	29.1	30.8	32.7

### Pressure & temperature ratings

Pressure [bar]	-1 ... +12
Service temperature [°C]	-10 ... +200

You can find the values for your equipment on the rating plate.

## Declaration of Conformity – Standards and Directives

You can find details on the conformity of the equipment and the applicable standards and directives in the Declaration of Conformity and the relevant certificates.

You can download the latest Declaration of Conformity at [www.gestra.com](http://www.gestra.com). You can request the relevant certificates by writing to the following address:

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Modifications to the equipment not approved by us will invalidate the Declaration of Conformity and the certificates.



You can find our authorized agents around the world at: [www.gestra.com](http://www.gestra.com)

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