GESTRA®

Steam-Powered

Condensate-Return Unit

KH

EN
English

Original Installation Instructions

850801-00

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Foreword

This installation & operating manual will help you use the steam-powered condensate-return unit KH safely and efficiently for its intended purpose. The steam-powered condensate-return unit KH will be called unit in this document.

This installation & operating manual is intended for anyone commissioning, using, operating, servicing, cleaning or disposing of this unit 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 unit. 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 unit. Please hand over this installation & operating manual when selling the unit or passing it on.

Other applicable documents

Further notes, instructions and information on the components of the system can be found in the documentation of the respective manufacturer.

These documents form an integral part of these instructions.

Keep these documents together with these operating instructions.

Provide these documents if you sell the system or pass 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 listing

➢ Steps for action.

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

Safety

Use for the intended purpose

The steam-powered condensate-return unit KH recieves the condensate either directly or via a condensate collector. In the condensate return unit, the condensate is conveyed by means of level control and motive steam to the deaerator or to a condensate collecting tank.

The unit must only be used within the allowable pressure and temperature limits and only if the chemical and corrosive influences on the unit 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 unit is considered to be improper.

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

Basic safety notes

Risk of severe injuries

- The unit may become hot during operation. Do not operate the unit unless thermal insulation or protection against accidental contact prevents you from touching hot surfaces.
- The unit is under pressure during operation and may be hot. Before carrying out any work on the unit make sure that the following requirements are met:
  - The pipes and the unit must be shut off depressurized (0 bar).
  - The higher-level system must be switched off.
  - The fluid must be completely removed from the unit.
  - The pipes and the unit must have cooled down to room temperature (approx. 20 °C)
- If the unit is used in contaminated areas there is a risk of severe injuries or death caused by harmful substances in or on the unit. Before working on the unit make sure that it is completely decontaminated. Always wear the protective clothing prescribed for contaminated areas when working on the unit.
- The unit must only be used with fluids that do not attack the material and the gaskets and sealings of the unit. Otherwise, leaks may occur and hot or toxic fluid could escape.
- The unit 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, vessel and tank connections.
  - Selecting suitable lifting gear and understanding the rules for its safe use.
  - Working with dangerous (contaminated, hot or pressurized) fluids.
  - The electrical personnel must also have knowledge and experience in electrical connection as well as of the current and mains voltage used.
- If the admissible pressure and temperature ratings are exceeded, the unit may be destroyed and hot or pressurised fluid may escape. Make sure that the unit 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 unit or parts of it could fall down.
- Make sure that only qualified personnel lifts the unit or parts of it.
- Make sure that nobody is standing or working below the hoisted unit.
- 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.
- Connections to the control cabinet as well as troubleshooting on the connected devices may only be made by trained GESTRA employees or specially trained electronics technicians. When working on electrical equipment, the operator must ensure a mains separation device.
- Make sure that all locally applicable regulations on safety and the prevention of accidents are strictly adhered to.

Risk of minor injuries

- Sharp edges on internals present the danger of cuts to hands. Always wear industrial gloves when servicing the unit.
- If the support of the unit during installation is insufficient the unit might fall down, thereby causing bruises or injuries. Make sure the unit 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 unit 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 unit 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.
- The operator must ensure that the integration into an assembly is reliable and suitable for the operating conditions. In doing so, the information in the operating instructions must be observed.
- The operator must check the compatibility of the fluid with the housing material before commissioning. The selection of suitable housing material and suitable coating is the responsibility of the operator.

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 unit
- 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
- the electrical personnel must also have knowledge and experience in electrical connection as well as of the current and mains voltage used.

Further information on the personnel qualifications required for individual activities can be found in the relevant 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 in compliance with EN 397
- Work boots in compliance with EN ISO 20345
- Industrial leather boots in compliance with EN 388
- Protective goggles in compliance with DIN EN 166

Typographic features of safety notes

Danger note

DANGER

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

WARNING

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

CAUTION

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

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 unit specification

Scope of supply

Our unit is delivered ready for assembly.

Task and function

Purpose

GESTRA's steam-powered condensate return units are designed for lifting condensate and process fluids. Steam, air or compressed gas is used to lift liquids in an electronically controlled way.

Function

The condensate flows into the upright cylindrical tank, displacing the air through a solenoid valve.

The tank is equipped with a multiple electrode type NRGS. As soon as the water level reaches the upper electrode tip (= max. water level), the solenoid valve in the vent line is closed by an amplifier and simultaneously the solenoid valve in the booster-steam line (introduced from above into the tank) is opened.

The flowing steam pushes the condensate via the condensate main into the condensate tank.

The condensate level sinks and when the lower electrode tip emerges, the solenoid valve in the booster-steam line is closed and the solenoid valve in the vent line opened. The cycle then repeats itself.

Before entering the condensate-return unit the condensate is collected in a condensate header to be provided on site. The condensate header must be equipped with a vent in order to ensure perfect air venting, especially if condensates of different pressure classes are fed together.

Note that condensate inlet and outlet lines have to be fitted with GESTRA non-return valves type RK, the condensate return unit must be equipped with a pressure gauge and a shut-off valve with regulating cone must be installed in the booster steam line. This arrangement ensures that the required booster steam pressure can be adjusted according to the length of the pressurised condensate line and the back pressure that must be overcome.

As the condensate return unit operates without a float it is unaffected by waterhammer.

Make sure that the booster steam line upstream of the solenoid valve is continuously drained by a GESTRA steam trap.

Name plate

The following items are indicated on the name plate:

- Manufacturer
- Type designation
- Min. service temperature
- Max. service temperature
- Max. service pressure
- Mark e.g. CE, UKCA (if required)
- Year of construction
- Serial number
- Type of vessel
- Weight
- Body of regulations
- Test pressure
- Test date
- Volume

Application of European Directives

Pressure Equipment Directive

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

- Fluids of group 2

ATEX

The system must not be used in potentially explosive atmospheres.

Storing and transporting the unit

Attention!

Unit can be damaged if stored or transported improperly.

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

Storing the unit

- ➢ Please observe the following items when storing the unit:
- Do not store the unit for more than 12 months.
- Use the supplied sealing plugs or other suitable seal caps in order to seal off all openings of the unit.
- Protect the sealing surfaces and contact areas against mechanical damage.
- Protect the unit and all components against hard shocks and impacts.
- Store the unit 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 unit.
- Please contact the manufacturer if you cannot comply with the recommended storage conditions.

Transporting the unit

DANGER

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

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

- For devices weighing about 25 kg or more, you need support from a second person or a suitable hoist.

  The exact weight of unit from which support is required depends on your physical abilities and local regulations and conditions.
- Meet the requirements for storage also when transporting the unit.
- Prior to transport seal off connections with sealing plugs.

  If you do not have the sealing plugs supplied with the unit, use appropriate seal caps to seal off the connections.
- For short distances (only a few metres) you can transport the unit unpacked.
- When transporting the unit over larger distances use the original packaging.

  If you do not have the original packaging use a box that protects the unit adequately against corrosion and physical damage.

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

Mounting and connecting the unit

Preparing installation

DANGER

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

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

- Take the unit out of the transport packaging.
- Check the unit 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 unit.
- Keep the sealing plugs and the packing for further use.

DANGER

Personnel working on pipes, vessels and tanks 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 unit or the vessels / tanks.
- Make sure that the connections are depressurised.
- Make sure that the unit 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.

Connecting the unit

DANGER

Incorrectly connected equipment can cause fatal accidents or severe injuries.

- Make sure that only qualified skilled personnel connect the system.
- Make sure that the system is only connected to the mains by qualified electrical personnel.

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

- Connect the system only as described in this operating manual.

CAUTION

Environmental damage caused by leaking medium in case of damaged seal!

- Make sure that the sealing surfaces are undamaged.
- Clean the sealing surfaces before installing a new seal.
- Replace each seal after removal.

Attention!

The unit can be damaged if connections are too weak.

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

- Make sure that the unit is free from foreign matter.
- Position the system.

The operator has to ensure that the unit and the sealing material is suitable for the fluid used in his system.

- Inspect all seals before installation to ensure they are in perfect condition.
- Provide connections for condensate inlet and outlet.
- Provide connections for air-venting and booster steam
- Drain the booster steam line at its lowest point.
- Supply switchbox with a voltage of 220-230V, 50Hz.

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

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

Commissioning

Attention!

The unit can be damages by corrosion or other chemical influences.

- Check the compatibility of the fluid with the housing material before commissioning.

The selection of a suitable housing material and suitable coating is the responsibility of the operator.

- Observe the installation and operating instructions for the individual components.
- Check all piping connections before commissioning.
- Check all valves and fittings attached to the system.
- Provide power supply.
- Open the shut-off valve for the pressure gauge.
- Slowly open the shut-off valve for the booster steam.
- After the first lifting process check all flanged connections. Retighten the flange connections if required.

Operation

The condensate return unit operates automatically.

Do not work on the unit while it is operating.

After Operation

DANGER

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

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

The operator must ensure on site that the system can be drained safely.

Attention!

Frost damage may occur when the installation is shut down.

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

- Empty the system via the drain valve.

Removing external dirt deposits

- To remove dirt deposits, rinse the unit 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 unit with a clean, lint-free cloth.

Maintaining the unit

The unit does not require any particular maintenance.

- Examine the unit at regular intervals and check it for correct operation.
- Establish maintenance intervals as a function of the quality of the steam and condensate.
- If necessary, clean the unit.

Spare parts

Various components of the system can be replaced in the event of damage.

Information on the components can be found in the specifications of the respective manufacturers as well as the relevant documents.

Putting the unit out of operation

Removing harmful substances

DANGER

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

- Only qualified personnel are allowed to perform work on contaminated unit.
- Always wear the protective clothing prescribed for contaminated areas when working on the unit.
- Make sure that the unit 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 unit 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 unit.
- For the disposal of all residues observe the pertinent legal regulations concerning waste disposal.

Removing the unit

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 unit or the pipes.
- Make sure that the pipes upstream and downstream of the unit are depressurised.
- Make sure that the installation is switched off and protected against unauthorised or unintended activation.
- Make sure that the unit 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.

DANGER

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

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

- Store the unit as described in section “Storing the unit“.

Re-using unit after storage

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

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

Disposing of the unit

CAUTION

Environmental damage may be caused by poisonous fluid residues.

- Before disposing of the unit 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 unit is made of welded sheet steel.

Returning the unit

You can return the unit to your contractual partner.

- Make sure that all harmful substances are removed from the unit.
- Pay attention to the instructions in section „Transporting the unit“.
- Pack the unit in its original packaging or in suitable transport packaging.

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

- Send the completed and signed decontamination declaration with the unit. 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 unit.

Technical data

Pressure & temperature ratings

You can find the values for your unit on the name plate.

Weights

You can find the values for your unit on the name plate.

Manufacturer's declaration

You can find details on the conformity of the unit in our Declaration of Conformity or Manufacturer's Declaration.

You can download the latest Declaration of Conformity or Manufacturer's Declaration at www.gestra.com or request it from the address below:

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

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