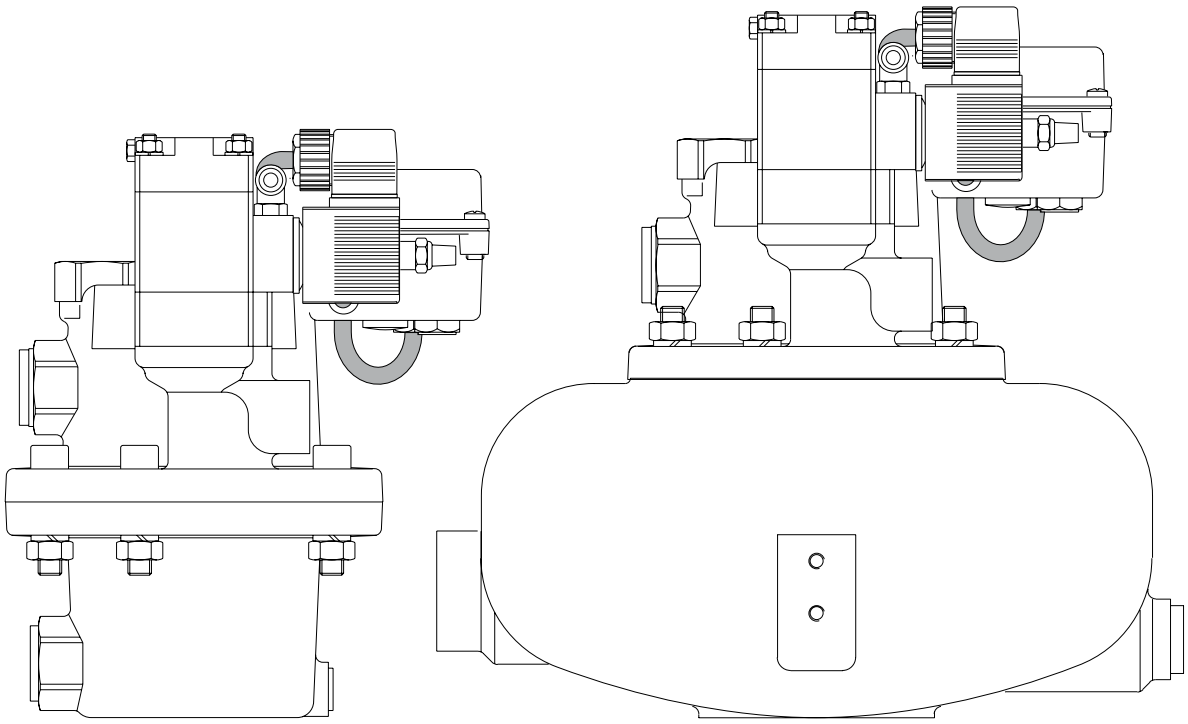
Instructions for installation and operation

english



BEKOMAT® 3 E Ex 63 (BM3EEXPN63)
BEKOMAT® 6 E Ex 25 (BM6EEXPN25)

II 2G EEx ib IIB T4
BVS 03 ATEX E214X

Dear Customer,

Thank you for deciding in favour of the BEKOMAT E Ex condensate drain. Please read the instructions carefully before installing your BEKOMAT E Ex unit and putting it into service. The perfect function of the condensate drain BEKOMAT E Ex - and thus reliable condensate discharge - can only be guaranteed if the recommendations and conditions stated here are adhered to.

Safety instructions

Please check whether or not these instructions correspond to the device type!
Please adhere to all advice given in these operating instructions. They include basic information which needs to be observed during installation, operation and maintenance. Therefore, it is vital for the technician and the responsible operator /skilled personnel to read these operating instructions prior to installation, start-up and maintenance.
The operating instructions must be accessible at all times at the place of application of the BEKOMAT 3 E Ex 63 / 6 E Ex 25.
In addition to these operating instructions, local and national regulations need to be observed, if required.
Make sure that the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is operated only within the permissible limit values indicated on the type plate. Any deviation involves a risk for persons and materials, and may result in malfunction and service failures.
If you have any queries regarding these installation and operating instructions, please contact BEKO TECHNOLOGIES.

Danger!
Compressed air!
Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components or plant components which are not secured.

Measures:

- Do not exceed the maximum operating pressure (see type plate)!
- **Only carry out service measures when the system is pressureless.**
- Use pressure-resistant installation material only.
- The feed pipe must be tubed firmly. Discharge pipe: short, fixed pressure hose onto pressure-resistant pipe.
- Make sure that persons or objects cannot be hit by condensate or escaping compressed air.

Danger!
Supply voltage!
There is the risk of an electric shock involving injury or death when coming into contact with non-insulated components carrying supply voltage.

Measures:

- During electric installations, all regulations in force need to be adhered to (e.g. VDE 0100 / IEC 60364).
- Service measures must only be undertaken when the system is deactivated!
- All types of electrical work must be carried out by authorised and qualified personnel only.

Further safety advice:

- For installation and operation, the national regulations and safety codes in force must also be adhered to.
- Regarding the inlet screw joints, excessive tightening forces must be avoided. This applies in particular to conical screw joints.
- Do not use the test button for permanent drainage!
- Only use genuine spare parts! This is imperative to ensure perfect functioning.

Danger!
Gas poisoning!

The escape of toxic gases or of gases which are hazardous to health involves the risk of toxification with possibly lethal consequences.

Maßnahmen:

When the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is in use, there is no guarantee against leakage. A small part of the gas/air mixture can always escape together with the discharged condensate. It must also be ensured that the control gas offtake cannot lead to the formation of potentially explosive atmospheres. For this reason, the relevant national explosion protection standards must be strictly followed during installation and operation of equipment in potentially explosive atmospheres.
In addition, the venting piston on the valve lid (2.9) and the venting of control air or control gas on the magnetic valve (2.12) can be fitted with a hose connection to draw off possibly combustible gas mixtures.

- **Only use pressure-proof installion material!**

  The feed line must be firmly fixed. Discharge line: short pressure hose on pressure resistant pipe. Please ensure that condensate cannot squirt onto persons or objects.
- Piping and screw couplings must be gas tight.
- Do not use conical connectors!

Danger!
Explosion!

Escaping of explosive gases may cause ignitable mixtures to ignite. This can involve serious injury or death.

Maßnahmen:

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- Piping and screw couplings must be gas tight.
- Do not use conical connectors!

Caution!
Malfunctions in the application!

Through incorrect installation and insufficient maintenance, the BEKOMAT can malfunction. Condensate which is not discharged can lead to damage to plants and in manufacturing processes.

Measures:

- Fail-safe condensate discharge directly optimises the compressed-air quality.
- To prevent damage and failures, it is imperative
  - To comply with the provisions regarding proper use and with the operating parameters of the BEKOMAT in connection with the case of application (see chapter "Proper use").
  - To strictly adhere to the installation and operating advice in these instructions.
  - To maintain and check the BEKOMAT 3 E Ex 63 / 6 E Ex 25 at regular intervals in accordance with the advice in these operating instructions.

Proper use

- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 is an electronically level-controlled condensate drain for compressed-air or compressed-gas plants.
- The device must only be used within the permissible operating parameters (see "Technical data").
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 is able to drain condensate under operating pressure from the plant components virtually without loss of compressed-air.
- For its function, the BEKOMAT 3 E Ex 63 / 6 E Ex 25 requires an operating voltage, an operating pressure and a control gas (see "Technical and electrical data").
- As far as the employment in plants with increased demands on the compressed-air quality is concerned (food industry, medical technology, laboratory equipment, special processes etc.), the operator must decide on measures for the monitoring of the compressed-air quality. These have an effect on the safety of the subsequent processes and may prevent damage to persons and plants.
- It is the task of the operator to ensure that the indicated conditions are met during the entire operating time.
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 and the condensate supply line must be protected against frost as, otherwise, the function is not assured.
- The electronics, the solenoid valve and the alarm output are accordingly intrinsically safe circuits (ib) in which neither sparks nor thermal effects which could cause the ignition >135 °C of an explosive atmosphere to occur.
- The no load voltage and possible short circuit current in the circuits for the electrical power supply, are limited to such an extent that neither opening nor closing functions nor excessive heating of the components and conductors in the circuits can cause an ignition.
- Temperature class T4 (ignition temperature of the media surrounding the BEKOMAT 3 E Ex 63 / 6 E Ex 25 must be above 135°C).
- Permissible components in the ambient air:

  benzine, ethane, methane, town gas (illuminating gas), butadiene -1,3, ethyl alcohol, methanol, diesel fuel, ethylene, propane, mineral oil, fuel oil, hydrogen sulphide
- Permissible media:

  BEKOMAT 3 E Ex 63: natural gas, methane, compressed air, CO_2
  BEKOMAT 6 E Ex 25: compressed air, CO_2
- In no case may an ignitable mixture entering the BEKOMAT 3 E Ex 63 / 6 E Ex 25.
- When using natural gas or methane during the operation, it must be ensured that these gases are not discharged into the environment. In order to accomplish this, the gas must be supplied to suitable degassing vessels and discharged via flame traps in accordance with the regulations.

Exclusion from the field of application

- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 as a condensate drain alone cannot guarantee a defined compressed-air quality, for this purpose, other additional technical devices are required.
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 is not suitable for use in plants carrying vacuum or atmospheric ambient pressure.
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 must not be exposed to permanent direct solar or thermal radiation.
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 must not be installed and operated in areas with an aggressive atmosphere.
- The BEKOMAT 3 E Ex 63 / 6 E Ex 25 must not be installed in areas where frost is likely to occur.
- All substances or gas/vapour mixtures which are not listed under "Proper use" are not permissible.
- The BEKOMAT 6 E Ex 25 is not suitable for carrying natural gas.

CE **IP 65**  **II 2G EEx ib IIB T4**

BEKOMAT	**3 E Ex 63**	**6 E Ex 25**
min/max temperature	+1 ... +60 °C	
Condensate feed	3 x G¾	2 x G¾ 1 x G1
Condensate discharge	G ½	
Control air connector	Hose connector da = 6 mm	
Periodic maximum condensate quantity	700 l/h	1700 l/h
peak compressor performance	100 m³/min	1000 m³/min
peak refrigeration dryer performance (only with pre-separation)	200 m³/min	2000 m³/min
Operating pressure, min/max	1,2 ... 63 bar	1,2 ... 25 bar
Pressure control air or control gas	4 - 6 bar (recommended 5 bar)	
Weight (empty)	8,0 kg	16,0 kg
Condensate	oil-contaminated + oil-free + extremly aggressive	
Housing	Stainless steel	
Ignition protection type	"intrinsically safe" ib	
Explosion group	II B Category II 2 G, Zone 1	
Temperature class	T4 ignition temperature or ambient media >135 °C	

Electrical data

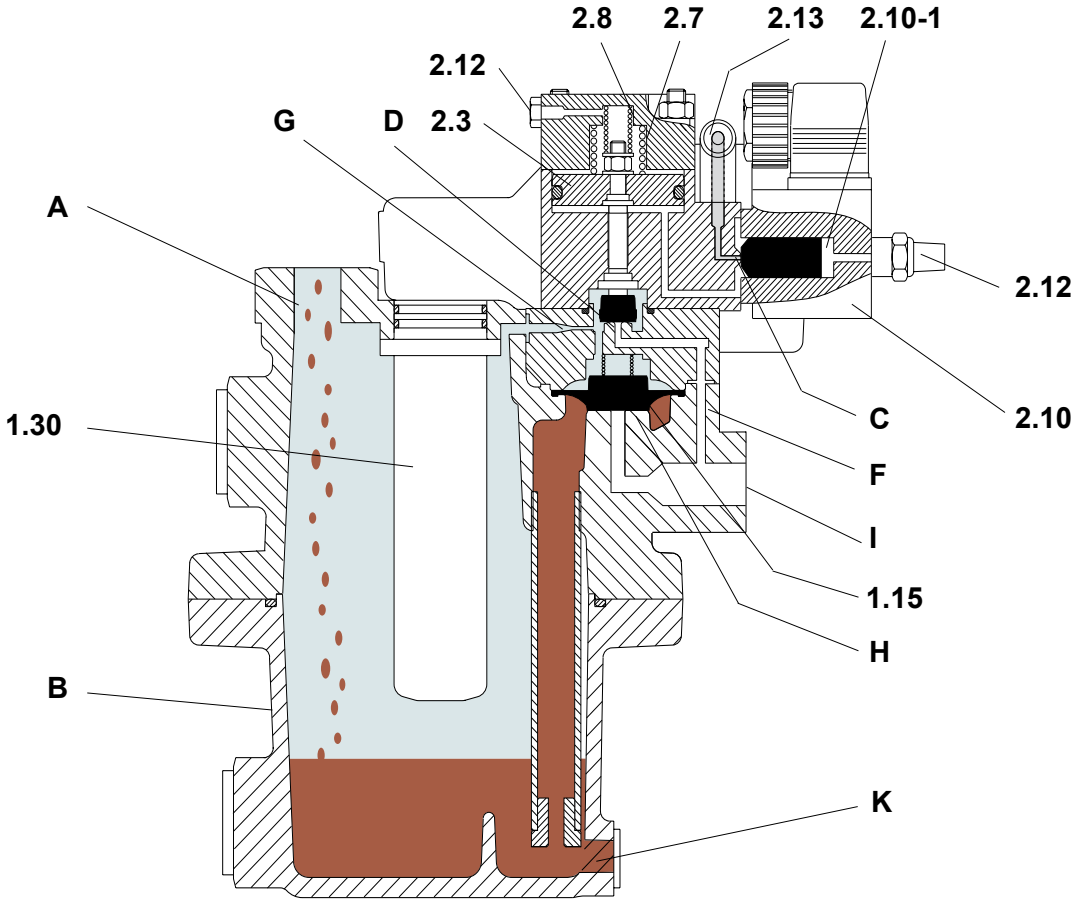
Voltage - Intrinsically safe power supply	U_{nenn} = 12,0 V nominal voltage $U_{0\ max}$ = 12,6 V $I_{u\ max}$ = 150 mA (max. fault current) P_{max} = 1,9 W
Recommended power supply	Power supply 85 - 230 VAC XZ KA03 001
Alarm output	Optocoupler output for operation of a NAMUR interface to DIN EN 60947-5-6. recommended buffer switching amplifier 230 VAC for BEKOMAT Ex XZ KA03 011
Solenoid valve	EN 50014 : 1997 + A1 + A2 EN 50020 : 1994 II2G EEx ia IIC T6 or EEX ia II T5 PTB 01 ATEX 2101

Explosions protection regulations

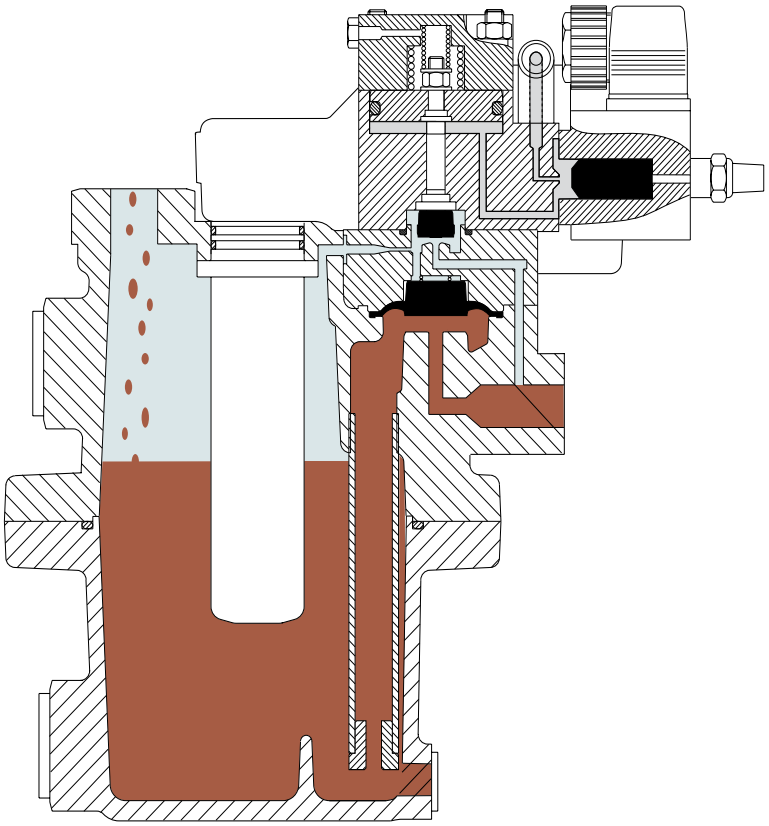
The BEKOMAT 3 E Ex 63 / 6 E Ex 25 fulfils the requirements of type of protection "intrinsically safe". This means that the energy created by its entire electronic system is at no time capable of igniting gases and vapours of explosion group II 2G EEx ib IIB T4.

Under certain circumstances, however, explosive gases or vapours can escape from the BEKOMAT 3 E Ex 63 / 6 E Ex 25 via the condensate. The operator of a system in a hazardous area is to ensure that the system is installed in such a way that ignition of a potentially explosive atmosphere cannot occur.

Valve closed



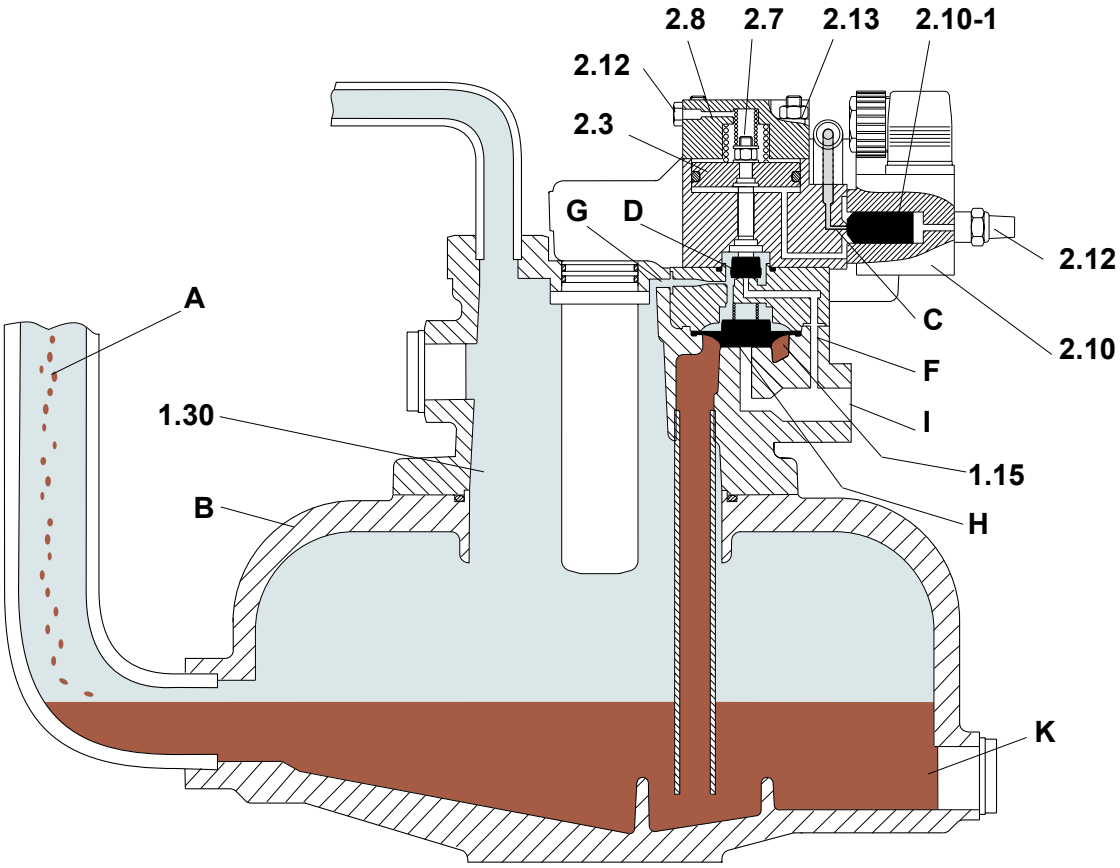
Valve open



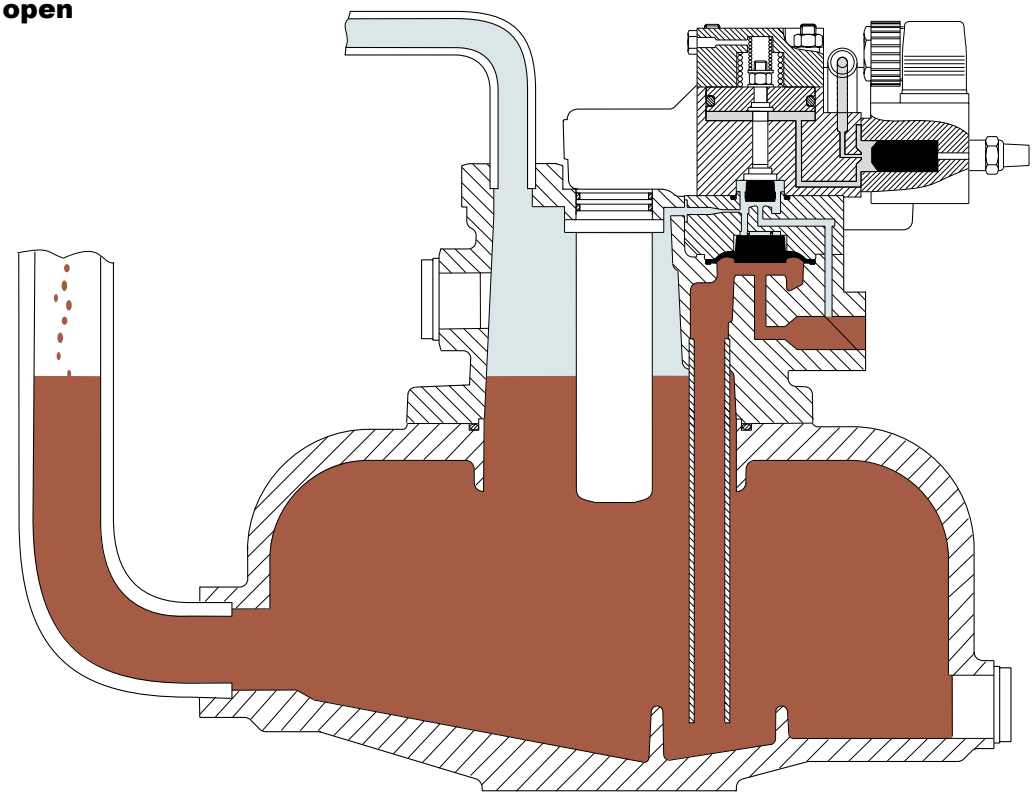
BEKOMAT 3 E Ex 63

1. Condensate drips through the inlet opening (**A**) and accumulates in the container (**B**).
2. The valve core (**2.10-1**) of the solenoid valve (**2.10**) closes the control air (gas) feed (**C**). The piston valve (**2.3**) is closed because the spring (**2.7**) and (**2.8**) presses it down on the valve seat (**D**) which in turn closes the venting line (**F**). The diaphragm (**1.15**) in turn is pressed down on the diaphragm seat (**H**) because of the bigger absorption above and the equal operating pressure below and above the diaphragm.
3. A signal switches the solenoid valve if the capacity sensor (**1.30**) registers condensate. As a result opens the control air feed (**C**, **2.13**) leading to the piston valve. The control air (gas) pressure lifts the piston valve (**2.3**). In turn the venting line (**F**) is opened, pressure above diaphragm diminished, because only throttled down air (gas) can enter. The diaphragm of the valve (**1.15**) is lifted from diaphragm seat (**H**) after letting of the air above the space of the diaphragm and the higher pressure inside the body pulls the condensate into the discharge line (**I**).
4. The electronic system of the condensate drain BEKOMAT 3 E Ex 63 is programmed in such a way that the valve will again be tightly closed before any compressed air or gas can escape.
5. The outlet dirt collector (**K**) serves to keep very coarse dirt particles at the bottom of the container.
6. In the event of condensate discharge (blocked discharge pipe, faulty diaphragm, dropping below the minimum system pressure of 1.2 bar, lack of compressed control air, insufficient working pressure of the control air), the device will switch to the alarm contro after a period of 60 seconds - the red LED flashes. In this state, the solonoid valve will open every 4 minutes for a period of 7.5 seconds, so that obstructions in the discharge line, for example, can automatically be removed.
7. A device filled in a pressureless state will automatically emptied as soon as the minimum pressure of 1.2 bar prevails in the BEKOMAT 3 E Ex 63 unit and the required control pressure is applied.
8. The alarm warning can be relayed via the opto-coupler output.
9. Losses of gas through dirt in the valve, worn out or other interferences cannot be excluded!

Valve closed

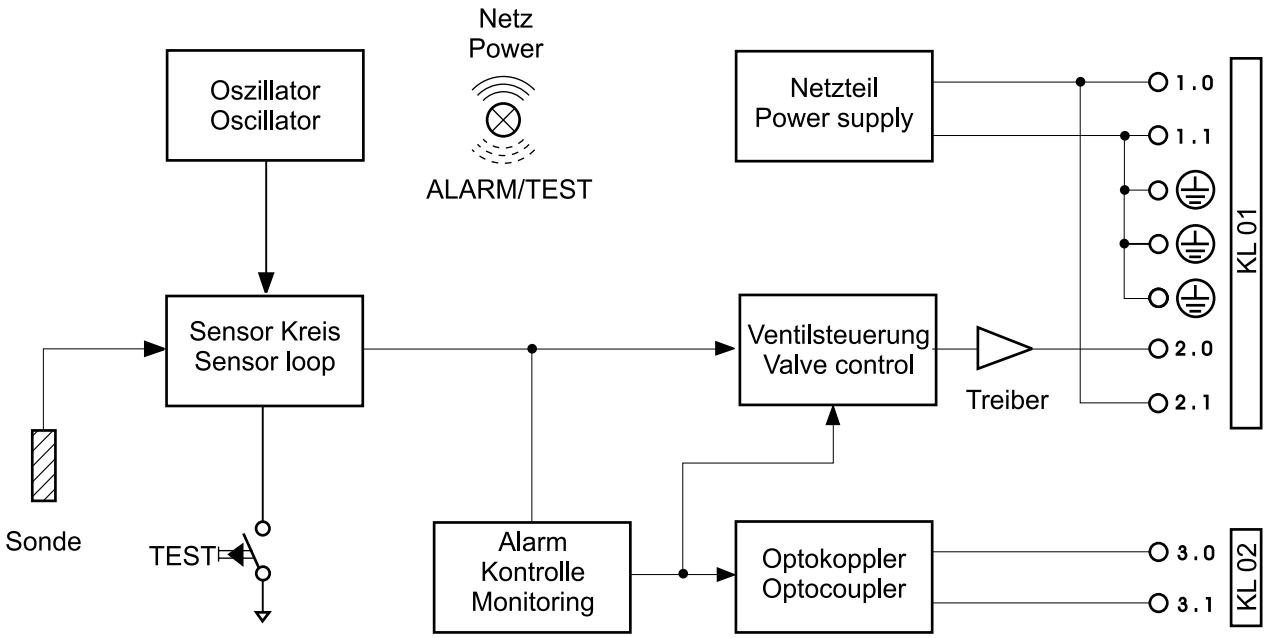


Valve open



BEKOMAT 6 E Ex 25

1. Condensate drips through the inlet opening (**A**) and accumulates in the container (**B**).
2. The valve core (**2.10-1**) of the solenoid valve (**2.10**) closes the control air (gas) feed (**C**). The piston valve (**2.3**) is closed because the spring (**2.7**) and (**2.8**) presses it down on the valve seat (**D**) which in turn closes the venting line (**F**). The diaphragm (**1.15**) in turn is pressed down on the diaphragm seat (**H**) because of the bigger absorption above and the equal operating pressure below and above the diaphragm.
3. A signal switches the solenoid valve if the capacity sensor (**1.30**) registers condensate. As a result opens the control air feed (**C**, **2.13**) leading to the piston valve. The control air (gas) pressure lifts the piston valve (**2.3**). In turn the venting line (**F**) is opened, pressure above diaphragm diminished, because only throttled down air (gas) can enter. The diaphragm of the valve (**1.15**) is lifted from diaphragm seat (**H**) after letting of the air above the space of the diaphragm and the higher pressure inside the body pulls the condensate into the discharge line (**I**).
4. The electronic system of the condensate drain BEKOMAT 6 E Ex 25 is programmed in such a way that the valve will again be tightly closed before any compressed air or gas can escape.
5. The outlet dirt collector (**K**) serves to keep very coarse dirt particles at the bottom of the container.
6. In the event of condensate discharge (blocked discharge pipe, faulty diaphragm, dropping below the minimum system pressure of 1.2 bar, lack of compressed control air, insufficient working pressure of the control air), the device will switch to the alarm contro after a period of 60 seconds - the red LED flashes. In this state, the solonoid valve will open every 4 minutes for a period of 7.5 seconds, so that obstructions in the discharge line, for example, can automatically be removed.
7. A device filled in a pressureless state will automatically emptied as soon as the minimum pressure of 1.2 bar prevails in the BEKOMAT 6 E Ex 25 unit and the required control pressure is applied.
8. The alarm warning can be relayed via the opto-coupler output.
9. Losses of gas through dirt in the valve, worn out or other interferences cannot be excluded!



Terminal assignment

1.0	Power supply	+12 Vdc
1.1	Power supply	0V
PE	External earthing connection	
PE	Internal earthing connection	
PE	Solenoid earthing connection	
2.0	-V solenoid	
2.1	+V solenoid	
3.0	NAMUR interface	
3.1	NAMUR interface	

Function

The BEKOMAT 3 E Ex 63 / 6 E Ex 25 is controlled by an electronic circuit which facilitates systematic, monitored condensate discharge in response to pressure.

A capacitive probe connected to an analysis circuit is located in a sensor tube to determine the condensate level. The condition of the probe is detected by phase comparison measurement. If the probe is immersed, the discharge process is initiated after a delay time of approx. 1 second, and a monitoring and alarm circuit is activated. The solenoid valve opens and thus initiates the discharge process for a defined period. At the end of this period the discharge process is terminated and the monitoring and alarm circuit deactivated.

The condensate drain cannot be emptied properly, if the operating pressure drops below 1.2 bar, the discharge pipe is blocked or the control pressure is insufficient or turned off. In such cases, the monitoring and alarm circuit takes over control of the further function sequence.

With the probe permanently flooded the discharge process is discontinued restarted after a delay of approx. 1.0 seconds. This process is repeated until an alarm signal is issued.

The alarm signal is issued after approx. 60 seconds, and the alarm circuit takes over the further control of the solenoid valve.

In fault conditions, the solenoid valve is first closed and the alarm condition signalled via an optocoupler. The alarm signal remains active and the solenoid valve is operated by the alarm circuit for approx. 7.5 seconds approx. every 4 minutes. While the alarm signal is active, the red operating display flashes. This switching function is repeated until the condensate drain has been restored to its normal functional condition.

The solenoid valve can be operated at any time with the test switch. It remains open as long as the button is pressed. In addition, the red LED flashes and an alarm signal is issued via the optocoupler when the test switch has been pressed for approx. 1 minute. When the test switch is restored to the off position, the condensate drain returns to normal operation.

The operating modes of the condensate drain are displayed by the red LED, the different display conditions being as follows:

Red LED permanently on:
Standby mode

Red LED flashing:
Alarm and test modes displayed by a flashing rhythm of 2 - 3 times per second

Danger!
Compressed air!
Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components or plant components which are not secured.

Measures:

- Do not exceed the maximum operating pressure (see type plate)!
- **Only carry out service measures when the system is pressureless.**
- Use pressure-resistant installation material only.
- The feed pipe must be tubed firmly. Discharge pipe: short, fixed pressure hose onto pressure-resistant pipe.
- Make sure that persons or objects cannot be hit by condensate or escaping compressed air.

Caution!
Malfunctions in the application!
Through incorrect installation and insufficient maintenance, the BEKOMAT can malfunction. Condensate which is not discharged can lead to damage to plants and in manufacturing processes.

Measures:

- Fail-safe condensate discharge directly optimises the compressed-air quality.
- To prevent damage and failures, it is imperative
  - To comply with the provisions regarding proper use and with the operating parameters of the BEKOMAT in connection with the case of application (see chapter "Proper use").
  - To strictly adhere to the installation and operating advice in these instructions.
  - To maintain and check the BEKOMAT 3 E Ex 63 / 6 E Ex 25 at regular intervals in accordance with the advice in these operating instructions.

Hinweis:

It is imperative to observe all hazard statements and warnings listed here.
Please also observe all regulations and notes regarding the industrial safety and fire prevention at the respective place of installation.
As a matter of principle, only use suitable and appropriate tools and materials in a proper condition.
Do not use aggressive cleaners and unsuitable devices such as high-pressure cleaners.
Please note that condensates may contain aggressive or harmful components. Therefore, skin contact should be avoided.
Condensate is subject to mandatory waste disposal and must be collected in suitable
containers, and disposed of or processed properly.

Wichtig!

It is essential to comply with the relevant explosion protec-tion regulations and standards and the Safety rules in installation and operation of the equipment.

Almost all malfunctions of the BEKOMAT 3 E Ex 63 / 6 E Ex 25 occurring in practice are attributable to improper installation.

Please therefore be sure to follow the notes on installation below and the installation examples listed, which are merely intended as a selection of the installation variants possible in practice, most strictly during installation of the BEKOMAT 3 E Ex 63 / 6 E Ex 25. Should you have any technical questions, please contact your supplier.

Please remember that incorrect installation can lead to serious damage and injury.

The illustration above uses the example of a methane gas plant to show how it can be ensured that no gas enters the hazardous zone. This is simply an example, and the relevant explosion protection regulations must in all cases be examined and observed. The condensate is to be fed from the BEKOMAT 3 E Ex 63 / 6 E Ex 25 into a degassing tank through a gas extraction line. The condensate flows through the gas extraction line into the water in the degassing tank, while the gas escapes upwards through the gas extraction line into the open air.

A residual gas extraction line is also to be provided, entering the degassing tank above the water level and the gas extraction line above the condensate discharge line, in order to facilitate the channelling off of further small quantities of gas which may enter the degassing tank together with the condensate into the open air.

Caution!

1. As degassing tanks cannot usually be manufactured as gas tight units, they must always be located in the explosion protected area.
2. A **flame barrier** must be integrated in the gas extraction line outside the building and the hazardous zone.
3. **Explosive atmospheres** must not be created in the discharge process.
4. It should be ensured that the entire **pipework system is gas tight**.

Condensate inlet:

The condensate is fed to the BEKOMAT 3 E Ex 63 / 6 E Ex 25 through one of the 3 hexagonal connectors with G ¾" and the marking "IN", depending on the particular application (see page 18-21). The pipework and shutoff valve should have a diameter G of at least ¾". Only use ball valves as shutoff valves. Any dirt traps are to be removed (see page 20-21).

The condensate must always be fed to the unit in a downward gradient.

Caution! Do not use conical screw couplings, as the threads may be forced apart.

Condensate outlet: "OUT" connector = G ½

Min. diameters for pipework: BEKOMAT 3 E Ex 63 / 6 E Ex 25 = G½

The discharge line may be laid as a riser for a maximum of 5 m. It should be noted that the minimum necessary operating pressure for the BEKOMAT 3 E Ex 63 / 6 E Ex 25 increases by approx. 0.1 bar per metre water column.

The following rules are always to be observed on installation and operation of the BEKOMAT E Ex 63 :

1. The condensate must be fed to the BEKOMAT 3 E Ex 63 / 6 E Ex 25 down a continuous gradient through a condensate feed line which is as short as possible and whose diameter corresponds to at least G ¾ for the BEKOMAT 3 E Ex 63 / 6 E Ex 25.

2. The continuous gradient allows the condensate to flow unimpeded into the BEKOMAT 3 E Ex 63 / 6 E Ex 25 with a simultaneous return flow of the gas mixture in the casing. The unit can only fill with condensate when a gas flow volume equivalent to the incoming condensate flow volume can flow out.

3. If only the lower "IN" connector on the BEKOMAT 3 E Ex 63 / 6 E Ex 25 can be connected to the condensate feed line for technical reasons, the exchange of gas mentioned above is only ensured when an air/gas venting line is fitted to one of the upper "IN" connectors. The pressure at the inlet and outlet ends of this air/gas venting line must be the same. The recommended minimum pipe diameter is ¼". The connection of the gas venting line to the vessel to be drained (outlet) must be above the maximum possible condensate level.

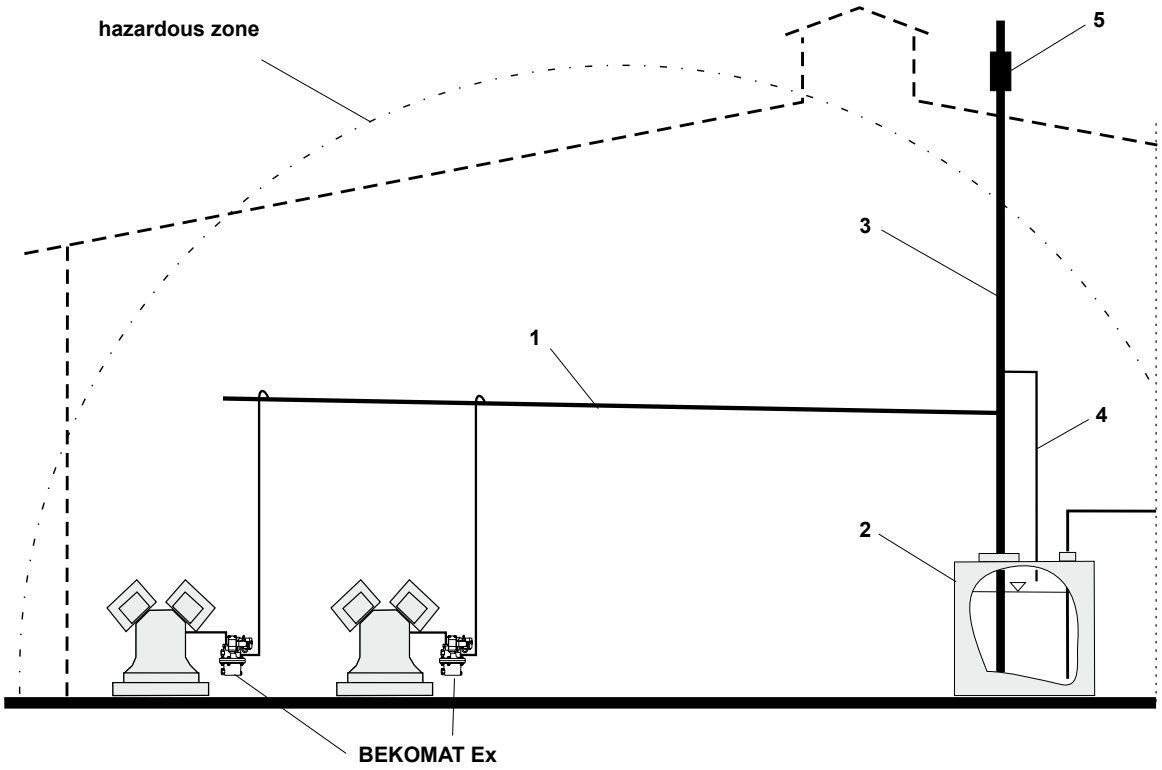
Installation of such an air/gas venting line is also necessary whenever the condensate flow volume exceeds 120 l/h, which is generally the case in Summer with compressor outputs of more than 40 m^3/min.

This type of installation is illustrated by the depictions in the following installation examples.

4. The condensate discharge line may be mounted on a wall as a riser for a maximum of 5 m. The minimum necessary operating pressure 0.5 bar then rises by approx. 0.1 bar per metre of level difference.

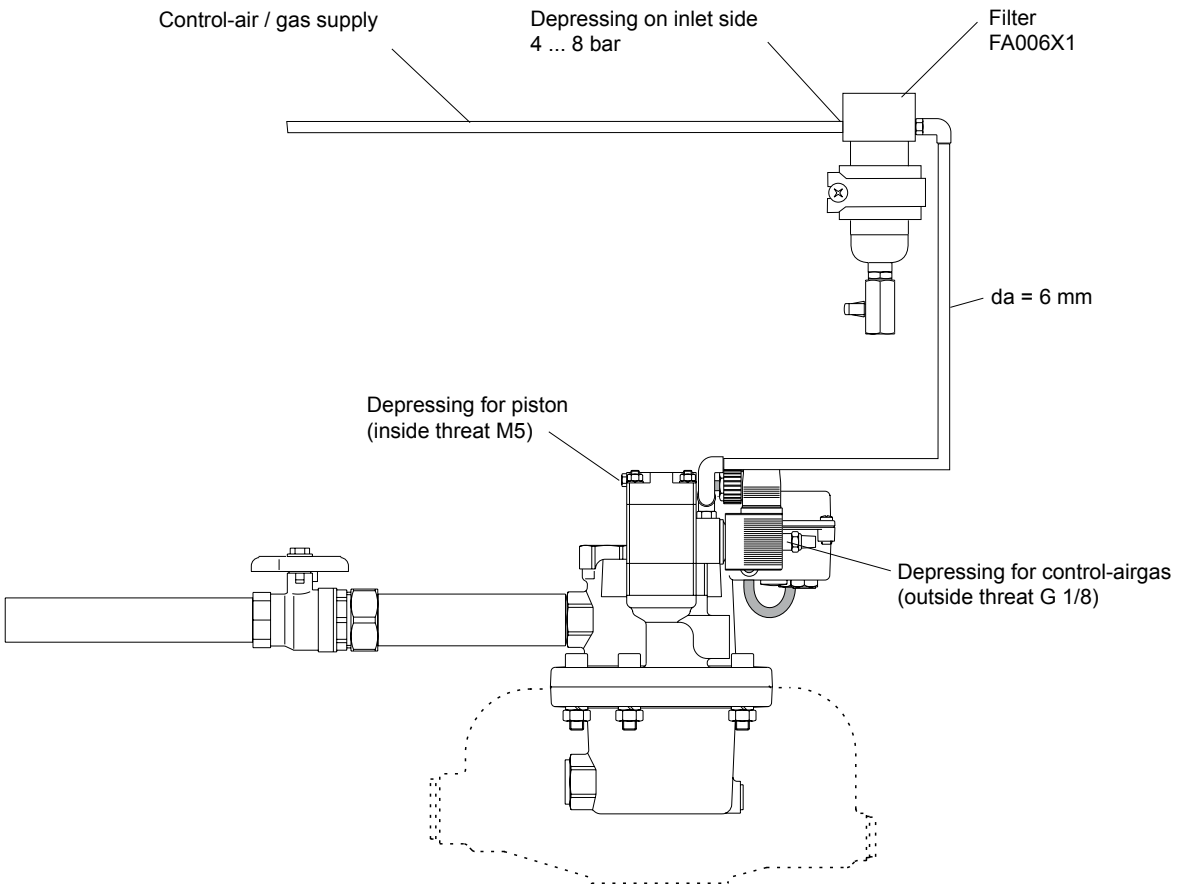
Several condensate discharge lines should only be connected to a single collecting line when the pressure in all the discharge lines is equal. With different pressure, e.g. on multiple stage compressors, one collecting line should be laid for each pressure. The collecting line is to have a diameter G of at least 1", and the outlet from the line must be at atmospheric pressure (0 bar gauge). The collecting line must on no account be shut off by a valve or similar.

5. The BEKOMAT 3 E Ex 63 / 6 E Ex 25 requires an additional control air or control gas connection. The pressure should amount to 5 (±1) bar. The control air or the control gas must be treated via the supplied filter and connected appropriately. Please ensure that the filter is installed in such a manner that the depression on the filter head is located on the inlet side, this means the media flow is from the exterior to the interior through the filter element.



Compressor, condensate discharge and treatment in hazardous zones

1 Condensate collection line
2 Degassing duct
3 Gas extraction line
4 Residual gas extraction line
5 Flame barrier



Installation BEKOMAT 3 E Ex 63 / 6 E Ex 25 at the control-air / gas depressing and depressing of piston

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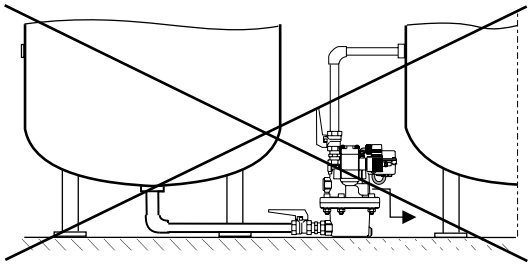
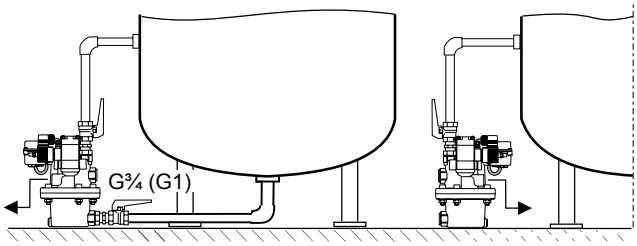
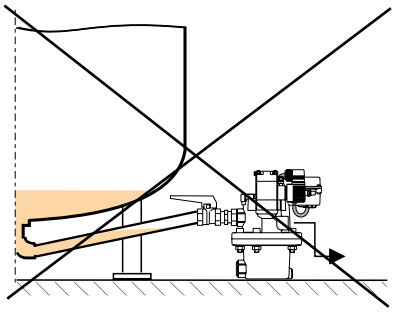
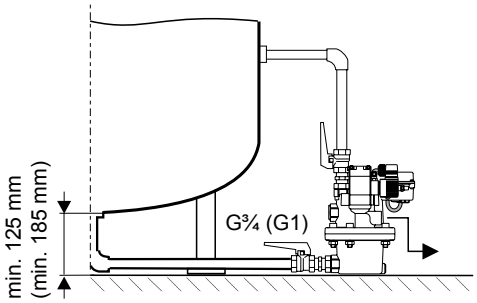
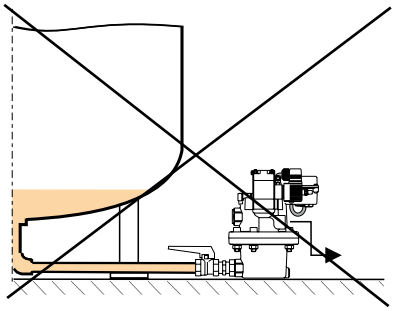
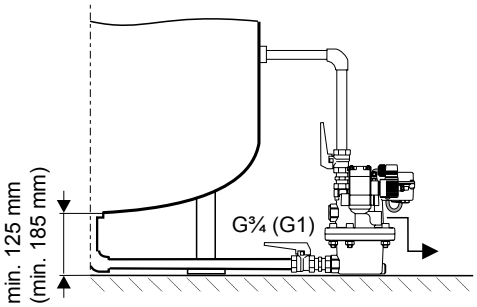
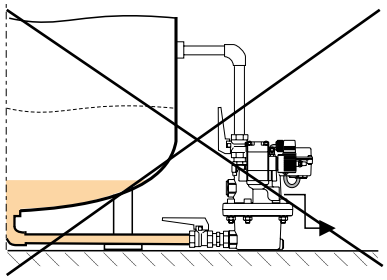
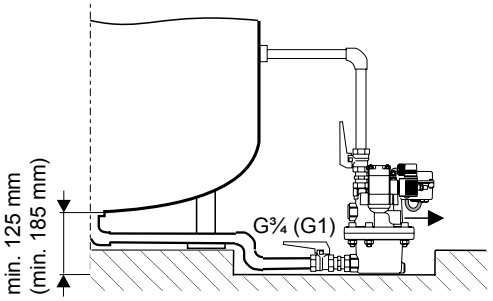
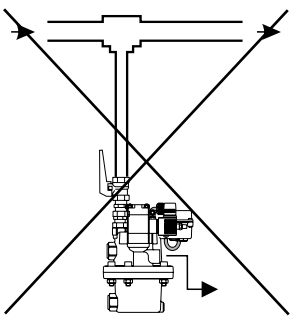
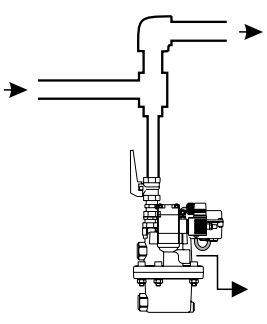
	
	
	
	
	Dimensions in brackets (...) = BEKOMAT 6 E Ex 25
	

Never use a single BEKOMAT 3 E Ex 63 / 6 E Ex 25 for draining several condensate sources.
The different pressures potentials in the individual source units would lead to by-pass flows in the feed lines.

The condensate must always be fed to the BEKOMAT 3 E Ex 63 / 6 E Ex 25 down a gradient to one of the two upper connectors marked "IN". If connection of the condensate drain line can only be made to the lower "IN" connector on the BEKOMAT 3 E Ex 63 / 6 E Ex 25 due to constricted space (e.g. too little floor clearance under a boiler), a separate air/gas venting line must always be laid back to the vessel to be drained at a point above the condensate level so as to ensure the flow of air to and from the BEKOMAT 3 E Ex 63 / 6 E Ex 25.

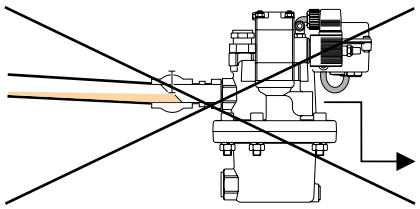
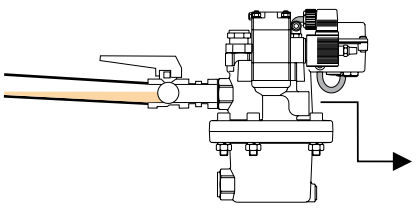
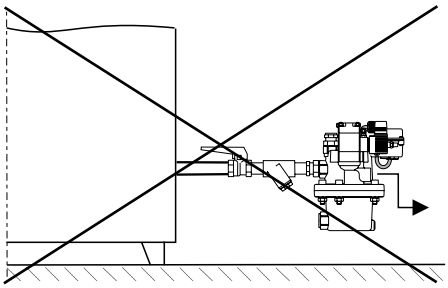
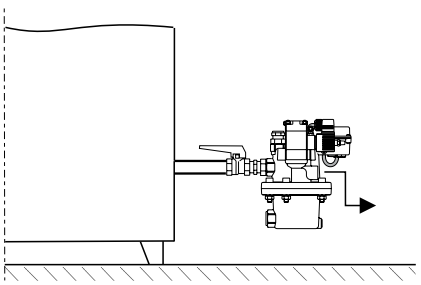
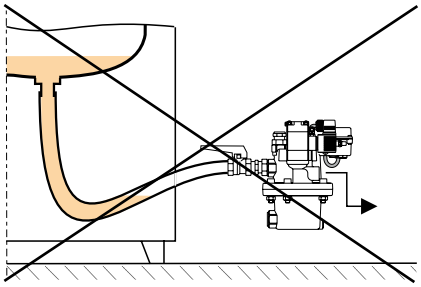
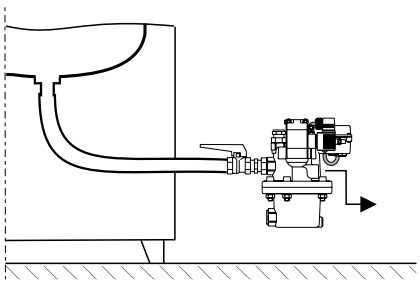
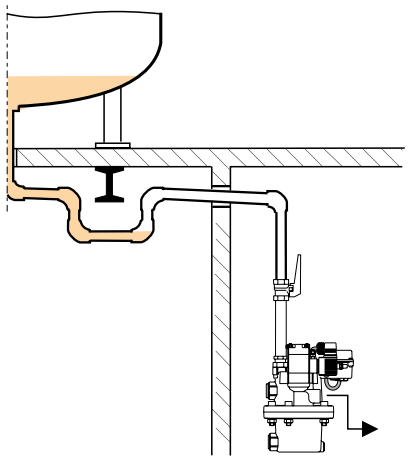
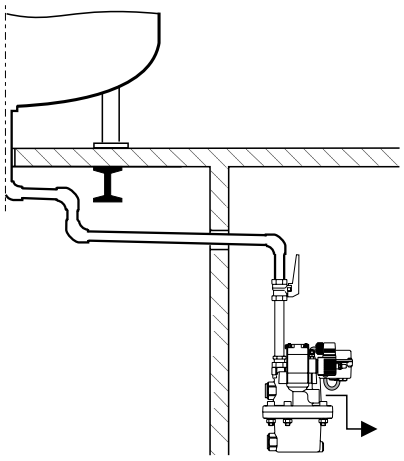
With compressor outputs > 40 m^3/min, the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is always to be fitted with a condensate feed line and a separate air/gas venting line as shown in the figure at the top right.

Caution!
The pressure at the connectors on the vessel to be drained for the condensate feed line to the BEKOMAT 3 E Ex 63 / 6 E Ex 25 and for the air/gas venting line must be the same. In addition, it must be ensured as mentioned above that the air/gas venting line joins the vessel to be drained at a point above the condensate level.

The floor clearance below the vessel to be drained must be at least 125 mm for BEKOMAT 3 E Ex 63 / 6 E Ex 25 so that the vessel can be completely emptied.

When draining from a piping system, the BEKOMAT 3 E Ex 63 / 6 E Ex 25 unit must always be positioned at the lowest point and the piping must be laid in such a way that the condensate flows to this lowest point. If this is not observed, the condensate can be trapped in water pockets or entrained by the flow of compressed air.

Installation

wrong	correct
	
	
	
	

Only use ball valves as shut off fittings. The feed lines should have a diameter of at least G ¾" for BEKOMAT 3 E Ex 63 / 6 E Ex 25 throughout. If smaller cross sections are used, the condensate feed and the venting of the BEKOMAT 3 E Ex 63 / 6 E Ex 25 will not function properly.

Do not install any filters or dirt traps in the feed line to the BEKOMAT 3 E Ex 63 / 6 E Ex 25.
If filters are fitted, remove the complete filter housings.

If a hose is used as the feed line to the BEKOMAT 3 E Ex 63 / 6 E Ex 25, it must have a continuous gradient as otherwise the venting of the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is not ensured.

The feed line must have a continuous gradient to the BEKOMAT 3 E Ex 63 / 6 E Ex 25.
The flow of air to and from the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is otherwise not ensured.

Danger!
Supply voltage!

There is the risk of an electric shock involving injury and death when coming into contact with non-insulated components of the external power supply unit or the switch amplifier carrying supply voltage.

Measures:

- During electric installations, all regulations in force need to be adhered to (e.g. VDE 0100 / IEC 60364).
- Service measures must only be undertaken when the system is deactivated!
- All types of electrical work must be carried out by authorised and qualified personnel only.

1.80

	Alarm NAMUR interface	
3.1	+C	
3.0	-E	

	Ventil / Valve		Gehäuse/Housing	Spannungs-Versorgung Power supply		
2.1	+V				-L	
2.0	-V					+L
		PE	PE	PE		

Electrical installation

The electrical installation may only be carried out by specialists who are qualified for such work in Ex-areas.

Always use an intrinsically safe power supply in accordance with the data on page 3.

1. Dismantle the hood upper-piece (**1.3**) (see page 28) after loosening the 4 screws (**1.35**)
2. Loosen the free cable fastenings in the hood lower piece (**1.80**) and pass the cable though.
3. Pay attention to terminal assignment and cable selection on page 12 and page 22 and connect the prepared cords.
4. Adjust cable and tighten the cable screw connection
5. Replace the hood upper piece (**1.3**), check for correct seating, and tighten the 4 screws (**1.35**).

Danger!
Compressed air!
Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components or plant components which are not secured.

Measures:

- Do not exceed the maximum operating pressure (see type plate)!
- **Only carry out service measures when the system is pressureless.**
- Use pressure-resistant installation material only.
- The feed pipe must be tubed firmly. Discharge pipe: short, fixed pressure hose onto pressure-resistant pipe.
- Make sure that persons or objects cannot be hit by condensate or escaping compressed air.

Danger!
Supply voltage!
There is the risk of an electric shock involving injury or death when coming into contact with non-insulated components carrying supply voltage.

Measures:

- During electric installations, all regulations in force need to be adhered to (e.g. VDE 0100 / IEC 60364).
- Service measures must only be undertaken when the system is deactivated!
- All types of electrical work must be carried out by authorised and qualified personnel only.

Caution!
Malfunctions in the application!
Through incorrect installation and insufficient maintenance, the BEKOMAT can malfunction. Condensate which is not discharged can lead to damage to plants and in manufacturing processes.

Measures:

- Fail-safe condensate discharge directly optimises the compressed-air quality.
- To prevent damage and failures, it is imperative
  - To comply with the provisions regarding proper use and with the operating parameters of the BEKOMAT in connection with the case of application (see chapter "Proper use").
  - To strictly adhere to the installation and operating advice in these instructions.
  - To maintain and check the BEKOMAT 3 E Ex 63 / 6 E Ex 25 at regular intervals in accordance with the advice in these operating instructions.

Hinweis:

Beachten Sie unbedingt alle aufgeführten Gefahren- und Warnhinweise.

Beachten Sie auch alle Vorschriften und Hinweise des Arbeits- und Brandschutzes am jeweiligen Installationsort.

Verwenden Sie grundsätzlich nur geeignetes und passendes Werkzeug und Material in ordnungsgemäßem Zustand.

Verwenden Sie keine aggressiven Reinigungsmittel und ungeeignete Geräte, wie Hochdruckreiniger.

Beachten Sie, dass Kondensate aggressive und gesundheitsschädigende Bestandteile enthalten können. Deshalb sollte ein Hautkontakt vermieden werden.

Kondensat ist ein entsorgungspflichtiger Abfall, welcher in geeigneten Behältern aufgefangen, entsorgt oder aufbereitet werden muss.

Please note:

The manufacturer's warranty is invalidated in the case of improper assembly or intervention in the device by non-authorised persons, also in these cases a hazard exists for personnel and operating fixtures!

For security reasons we recommend checking the BEKOMAT 3 E Ex 63 / 6 E Ex 25 and servicing once a year. Please contact BEKO, a BEKO subsidiary or authorised partner.

We recommend processing the alarm message via a switch amplifier on the NAMUR interface so that malfunctions on the device are optimally recognised

The filter element of the control air /gas filter should be replaced once a year. Possible accumulated condensate does not need to be blown off in the meantime.

The product key (beginning with XE KA03…) and the Ex no. (see page 32) must be specified for replacement part orders if required

Function test:

You should include the BEKOMAT 3 E Ex 63 / 6 E Ex 25 in the routine inspection cycles of your Ex areas.

Watch for noticeable indications such as blinking alarm LED or leaks.

The function can be checked by activating the test switch.

Please note that in the process, large quantities of gas can also flow into the discharge line.

To check the opto-coupler alarm output, shut off the condensate supply and activate the test switch for 1 minute.

The alarm message is executed via the opto-coupler and a separating switch amplifier.

Exchange set of wearing of the BEKOMAT 3 E Ex 63 / 6 E Ex 25
(see components on page 28)

After installation make in any case a careful functional and leak test of the unit. Replace the control valve on the BEKOMAT 3 E Ex 63 / 6 E Ex 25 only for authorised specialists !

For the purpose, the XE KA03 302 wearing part set is intended, which may be ordered from the supplier under the serial number of the unit.

With BEKOMAT 3 E Ex 63 / 6 E Ex 25 in installed position:

1. Depressurise the BEKOMAT 3 E Ex 63 / 6 E Ex 25. Let off the air by the test bottom.
2. Switch off operating current and disconnect (only by authorised staff)
3. Taking apart of the BEKOMAT 3 E Ex 63 / 6 E Ex 25

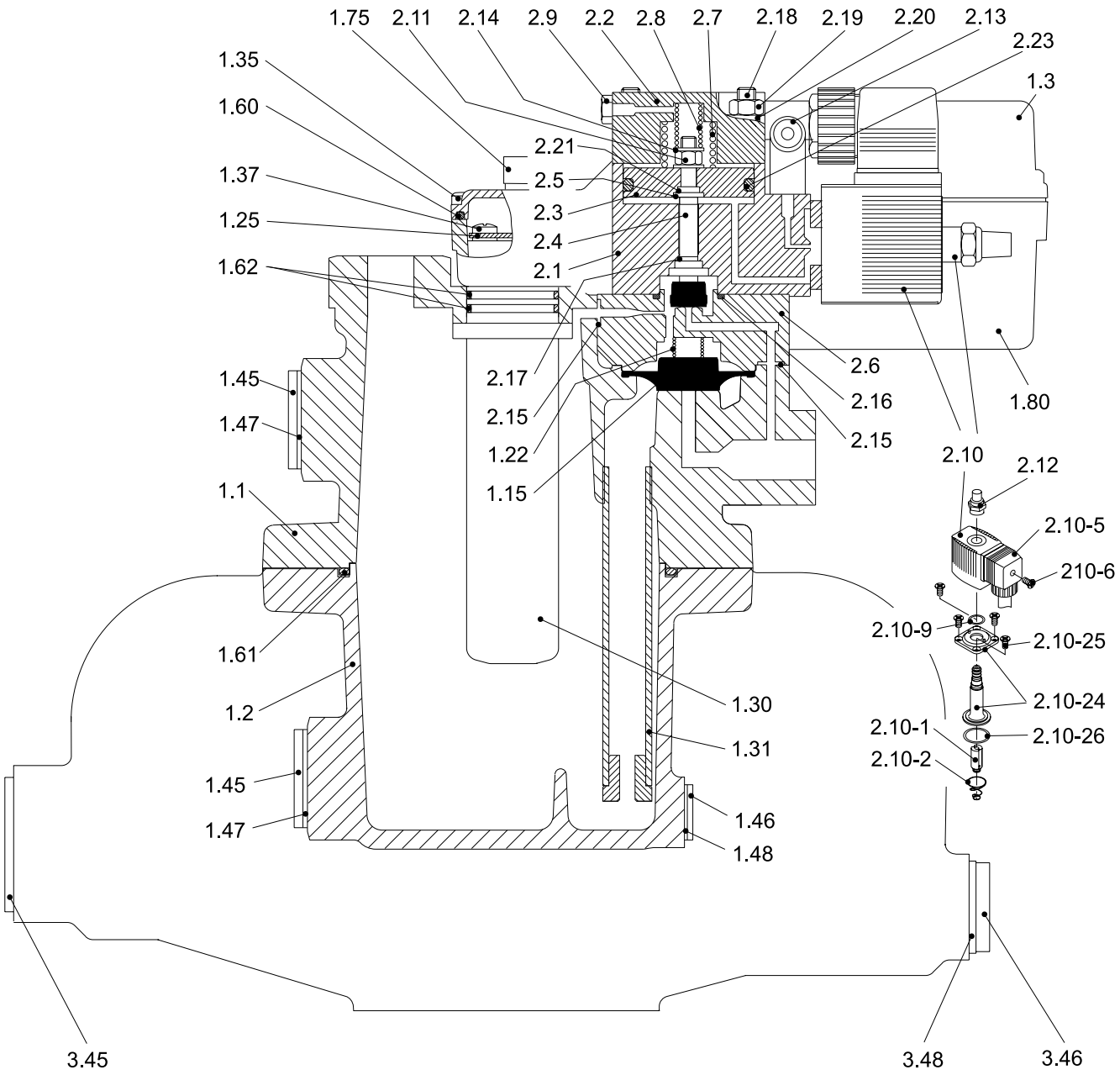
With BEKOMAT 3 E Ex 63 / 6 E Ex 25 in de-installed position:

1. Loosen the screw (**2.10-6**) and remove the valve plug.
2. Remove 4 nuts (**2.19**) and take off the valve unit completely.
3. Remove the valve cover (**2.2**) and the diaphragm cover(**2.6**).
4. Should the condensate be oleaginous and/or strongly contaminated, we recommend opening of the housing and removal of the bottom of the housing (**1.2**). Please remove any contamination residues from the inside of the bottom of the housing (**1.2**) and from the sensor (**1.30**) Please do not use solvents!
5. Insert the diaphragm cover (**2.6**) with the related new O-rings (**2.16, 2.17**).
6. Cleaning and blowing out of the control channels G and F, of the diaphragm seat H and of the silencer (**2.12**) (see page 10).
7. Exchange of the O-rings (**1.61, 2.16, 2x 2.15**), springs (**2.7, 2.8**) and diaphragms (**1.15**) against new ones form the XE KA03 302 wearing part set.
8. Exchange of the non-disassembled valve block unit with valve block (**2.1**), piston (**2.3**), o-ring (**2.21, 2.23**), piston rod (**2.4**), washer (**2.5**), solenoid valve (**2.10**) with silencer (**2.12**), core guide pipe (**2.10-24**), valve core (**2.19-1**) with spring (**2.10-2**), o-ring (**2.10-9**), oval ring (**2.10-26**), countersunk screws (**2.10-25**) against the new valve unit from the XE KA03 302 wearing part set. Please do not disassemble this unit!
9. The removed valve unit may be sent in a non-disassembled manner, and stating the BEKOMAT serial number. After having checked the reusability of individual components, a credit note will be issued.
10. Prior to the assembly of the unit, a leak and functional test should be carried out under "uninstalled" conditions, if possible.
11. Exchange the filter element of the filter for the control air (gas). Where the FA006X1 filter is applied, please use the filter element FE111X1.

Subsequent to the installation of the BEKOMAT 3 E Ex 63 / 6 E Ex 25, carefully carry out a leak test and a performance test including the control-air (-gas) filter and the hoses.

Trouble shooting

FAULT AND SYMPTOM	TEST	REMEDY
Red LED is off	Check the power supply to the unit (terminals 1.0 and 1.1).	**no:** Locate and remove fault in power supply. **yes:** have circuit board changed by BEKO
Condensate discharge does not function although all parameters indicate faultless performance.	In this case there is a fault in the condensate feed to the BEKOMAT 3 E Ex 63 / 6 E Ex 25. The usual causes are a lack of gradient in the feed line to the BEKOMAT 3 E Ex 63 / 6 E Ex 25 and/or inadequate venting of the unit.	
Occurrence of other faults with no clear symptoms	Check whether the power supply to the unit is in accordance with the specification and within the permissible tolerances.	**no:** Rectify the cause and then observe the BEKOMAT 3 E Ex 63 / 6 E Ex 25 to ascertain whether the fault might be due to overvoltage. **yes:** Contact us by telephone. Our telephone service will assist you in clarifying the cause and then arrange for its rectification.
Alarm LED flashes	1. Press the test switch	
	1.1 Condensate is not discharged. Check the power supply to the solenoid. Check cable terminals 2.0 and 2.1.	**no:** have circuit board changed by BEKO
	1.2 Check whether the pressure has fallen below the minimum operating pressure	**no:** Depressurise and deenergise the BEKOMAT 3 E Ex 63 / 6 E Ex 25. Dismantle the solenoid diaphragm valve and remove any blockages. Inspect the diaphragm and replace it if defective. It is advisable to replace all the seals and the solenoid core at the same time. We supply a practical set of parts subject to wear. Thoroughly clean the casing and sensors. **no:** Check whether the discharge line from the BEKOMAT 3 E Ex 63 / 6 E Ex 25 is blocked.
	1.3 Condensate and air are discharged, but the alarm signal continues.	Open the unit and thoroughly clean the sensors.

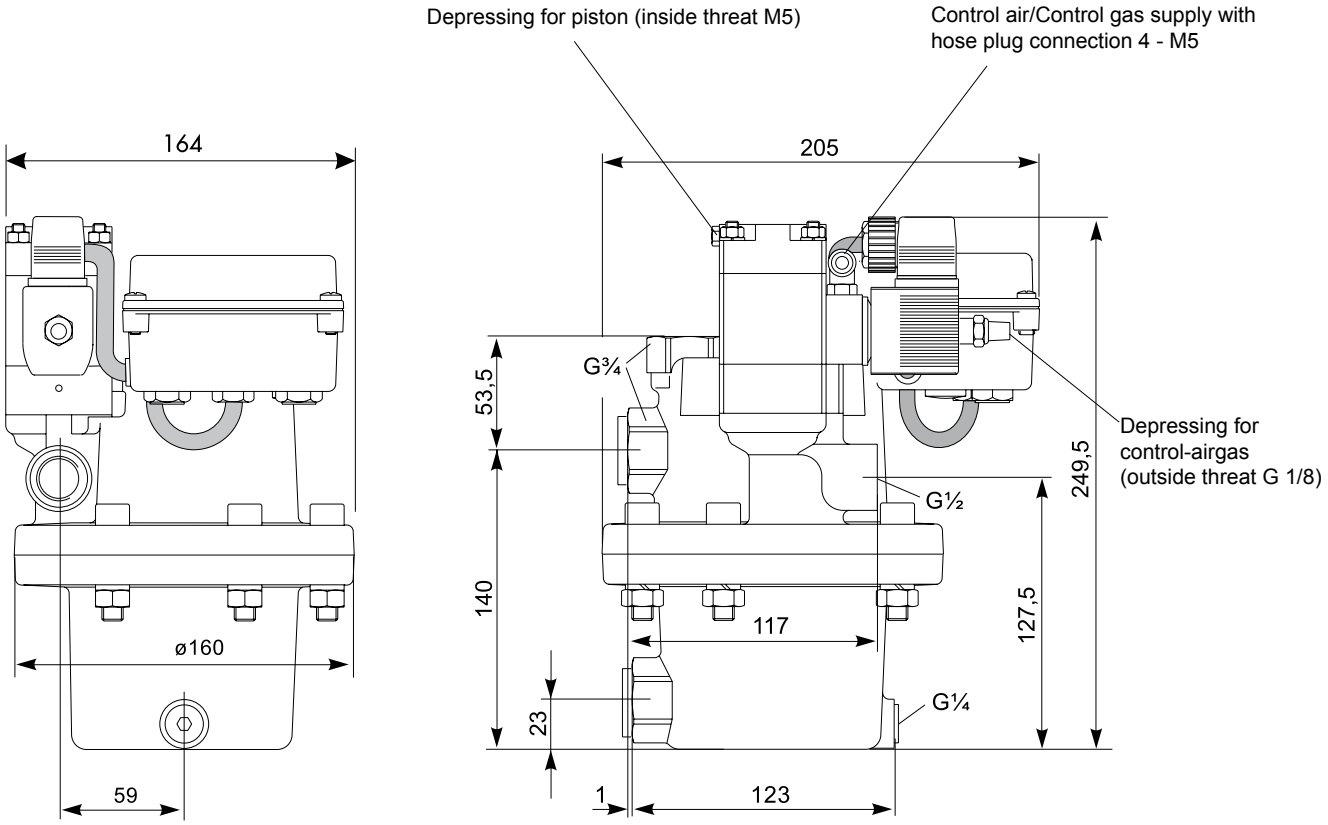

1.75
2.11
2.14
2.9
2.2
2.8
2.7
2.18
2.19
2.20
2.13
2.23
1.3
1.35
1.60
2.21
2.5
1.37
2.3
1.25
2.4
1.62
2.1
2.6
2.16
2.15
1.80
1.45
1.47
2.17
2.15
1.22
1.15
2.10
2.12
1.1
2.10-5
210-6
2.10-9
2.10-25
2.10-24
2.10-1
2.10-26
2.10-2
1.61
1.2
1.30
1.31
1.45
1.47
1.46
1.48
3.45
3.48
3.46

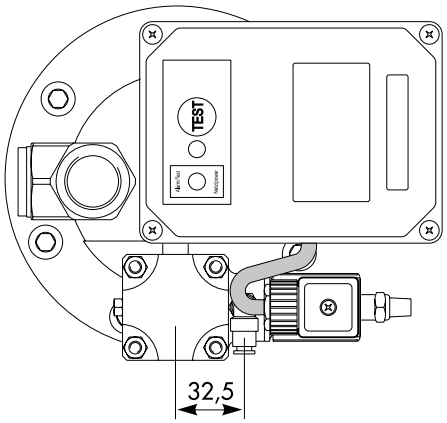
Components

1.1	Housing top
1.2	Housing bottom
1.3	Top of cover
1.12	O-ring 10 x 1,5 (not shown)
1.15	Diaphragm ø 43 FKM 83°
1.17	Contact screw
1.18	Earthing screw
1.20	Earthing cable
1.22	Spring 1,00/12,50/17,5/2,5/1,79
1.25	Sensor PCB
1.27	Pressure spring for bottom
1.30	Sensor tube
1.31	Rising pipe
1.32	Screw M10 x 40 - A2 - 70
1.33	Screw M6 x 16 - H - A2 LiKr
1.35	Screw M5 x 14 - H - A2
1.36	Screw M4 x 70 shortened to 62
1.37	Screw St 3,9 x 13 - F - H - C15
1.38	Screw M4 x 8 - H - 4.8
1.39	Lock ring DIN471 30 x 1,5 - A2
1.40	Washer 6,4 - St
1.41	Nut M10 - A2 - 70
1.43	Washer DN10 x 1,6 - A2
1.44	Spring washer DIN128 B4-St
1.45	Screw plug G¾ A2
1.46	Screw plug G¼ A2
1.47	Flat gasket 26 x 33 x 2
1.48	Flat gasket 13,5 x 17 x 1
1.60	Cord packing
1.61	O-ring 104 x 3 FKM 75°
1.62	O-ring 27 x 2 FKM 80°
1.63	O-ring 20,35 x 1,78 FKM 80°
1.64	O-ring 7,5 x 2 FKM 70°
1.75	Push bottom
1.80	Bottom of cover
1.96	O-Ring 36,09 x 3,53 FKM 70°

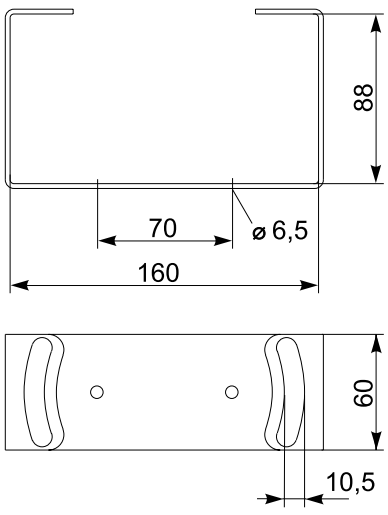
2.1	Diaphragm block
2.2	Valve cap
2.3	Plunger
2.4	Piston rod
2.5	Washer
2.6	Diaphragm cap
2.7	Spring 2,00/16,00/30,0/3,5/9,78
2.8	Spring 1,25/8,00
2.9	Silencer M5 external
2.10	Solonoid valve 3/2 12Vdc
2.10-1	Valve core
2.10-2	Spring 311 - 37
2.10-5	Valve connector with cable
2.10-6	Fixing screw
2.10-9	O-ring 11,1 x 1,78
2.10-24	Core guide pipe
2.10-25	Countersunk screw M4 x 10
2.10-26	Oval ring 21,8 x 1,5 x 2,5
2.11	Nut M5 - A2
2.12	Silencer G1/8 internal
2.13	Plug connector WES 6 - G1/8 drehbar
2.15	O-ring 6 x 1,5 FKM 70°
2.16	O-ring 18,77 x 1,78 FKM 80°
2.17	O-ring 6,07 x 1,78 FKM 70°
2.18	Threaded rod M6 x 100 A2 - 70
2.19	Nut M6 - A2
2.20	Spring washer DIN128 A6 - FST
2.21	O-ring 5 x 1,5 FKM 80°
2.23	O-ring 36,9 x 3,53 FKM 70°

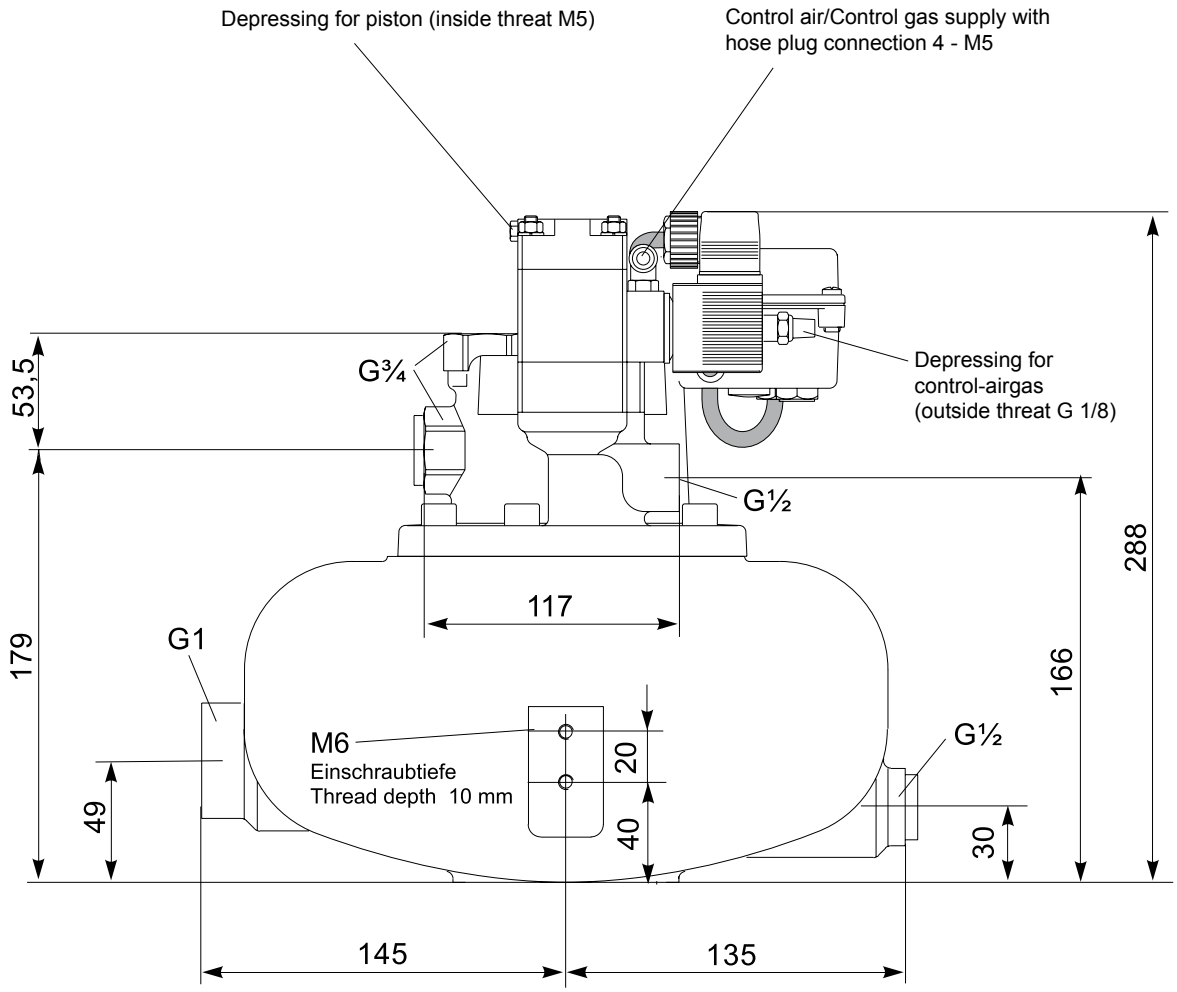
3.45	Plug G1 PE
3.46	Screw plug G½ A2
3.48	Flat gasket 21,5 x 27 x 2

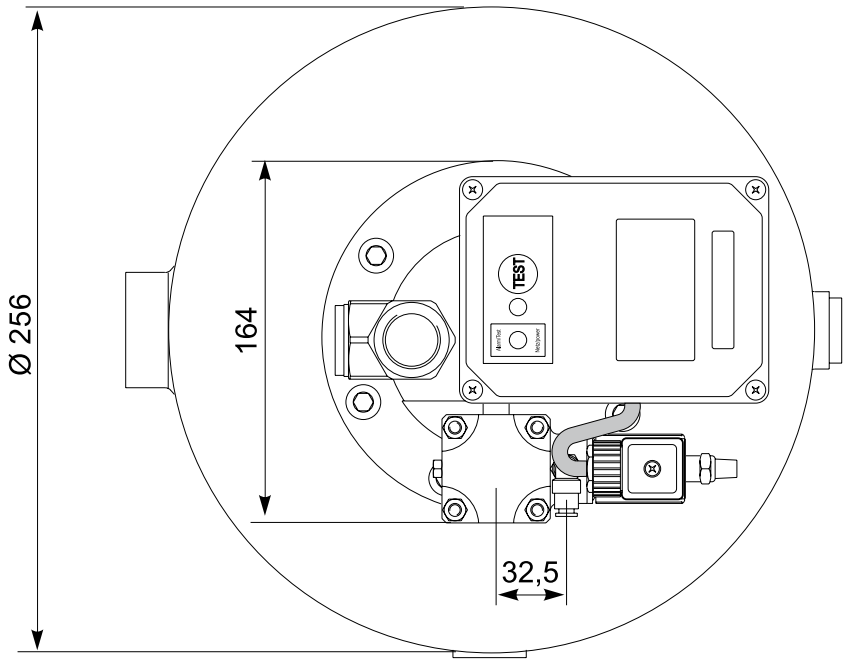




Floor bracket




Depressing for piston (inside threat M5)
Control air/Control gas supply with
hose plug connection 4 - M5
53,5
G¾
Depressing for
control-airgas
(outside threat G 1/8)
G½
288
179
117
G1
166
M6
Einschraubtiefe
Thread depth 10 mm
20
G½
49
40
30
145
135

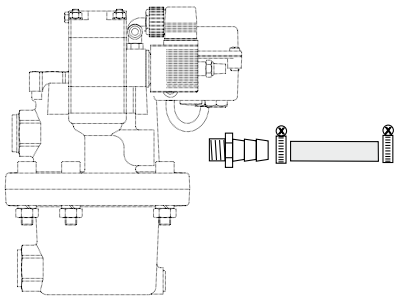
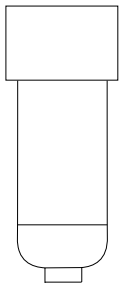
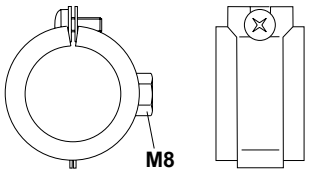

Ø 256
164
TEST
32,5

Ersatzteil-Sets • Spare part kits

Lieferbare Ersatzteil-Sets Available sets of spare parts	Inhalt / Content	Bestell-Nr. order reference
ECP Filterelement X1 / Element of filter X1	----	FE 111 X1
Membranset / Diaphragm kit (AU)	3 x (1.15, 1.22)	XE KA00 020
Sensorplatine / Sensor PCB	1.25	XE KA03 105
Verschleißteilsatz / Set of wearing parts	1.15, 1.22, 1.61, 2.1, 2.3, 2.4, 2.5, 2.7, 2.8, 2.10, 2.11, 2.16, 2.19, 2.20, 2 x 2.15, 2.21, 2.23	XE KA03 302
Ventil, komplett / Valve unit, complete	1.15, 1.22, 2.1, 2.10, 2.10-1, 2.10-2, 2.10-6, 2.11, 2.12, 2.13, 2.16, 2.17, 2.18, 2.19, 2.2, 2.20, 2.21, 2.23, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8	XE KA03 356
Dichtungssatz / Set of seals	2 x 1.47, 1.48, 1.60, 1.61, 2 x 1.62, 1.63, 1.64, 2.10-9, 2.10-26, 2 x 2.15, 2.16, 2.17, 2 x 2.21, 2.23	XE KA03 334

Bei allen Ersatzteil-Bestellungen zum BEKOMAT 3 E Ex 63 / 6 E Ex 25 immer die Ex-No. angeben und diese Teile auch nur für das Gerät verwenden! (siehe Abbildung unten)
Always specify the EX no. for all replacement part orders for the BEKOMAT 3 E Ex 63 / 6 E Ex 25, and only use these parts for the device! (See fig. below)

Zubehör • Accessories

		Bestell.-Nr. Order ref.
	Ablauf-Set Discharge set	XZ KA12 001
	Steuerluft-/Steuergas-Filter Control air/control gas filter	FA 006 X1
	Halterung für Feinfilter Mounting for fine filter	XZ KA03 301

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EG-Konformitätserklärung

Wir erklären hiermit, dass die nachfolgend bezeichneten Produkte den Anforderungen der einschlägigen Richtlinien und technischen Normen entsprechen. Diese Erklärung bezieht sich nur auf die Produkte in dem Zustand, in dem sie von uns in Verkehr gebracht wurden. Nicht vom Hersteller angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt.

Produktbezeichnung:	Kondensatableiter
Modell:	BEKOMAT 06E EX PN25
Betriebsspannung:	12 VDC
Betriebsdruckbereich:	0,8 – 25 bar
Produktbeschreibung und Funktion:	Kondensatableiter zur elektronisch niveauregulierten Ableitung von Kondensat der Fluidgruppe II in Druckluftnetzen in Bereichen, in denen damit zu rechnen ist, dass eine explosionsfähige Atmosphäre aus Gasen, Dämpfen, oder Nebeln gelegentlich auftritt.

Explosionsschutz-Richtlinie 94/9/EG

Nummer der Baumusterprüfbescheinigung:	BVS 03 ATEX E 214 X + BVS PP 03.2131 EG
Angewandte Normen:	EN 60079-0:2009 (Allgemeine Anforderungen) EN 60079-11:2007 (Eigensicherheit)
Qualitätssicherung Produktion:	BVS 09 ATEX ZQS/E218
Benannte Stelle nach 94/9/EG, Artikel 9:	DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum

Druckgeräte-Richtlinie 97/23/EG

Einstufung gemäß Artikel 9 DGRL	Behälter für Fluide der Gruppe 2
Angewandtes Konformitätsbewertungs-verfahren gemäß Artikel 10 DGRL:	Modul A: Interne Fertigungskontrolle, Kategorie I

EMV-Richtlinie 2004/108/EG

Angewandte Normen:	EN 55011:2009 EN 61326-1:2006

Die Produkte sind mit dem abgebildeten Zeichen gekennzeichnet: CE 0158

Neuss, 24.02.2011

BEKO TECHNOLOGIES GMBH

i.V. Christian Riedel
Leiter Qualitätsmanagement

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Technische Änderungen und Irrtümer vorbehalten.
Subject to technical changes without prior notice; errors not excluded.
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