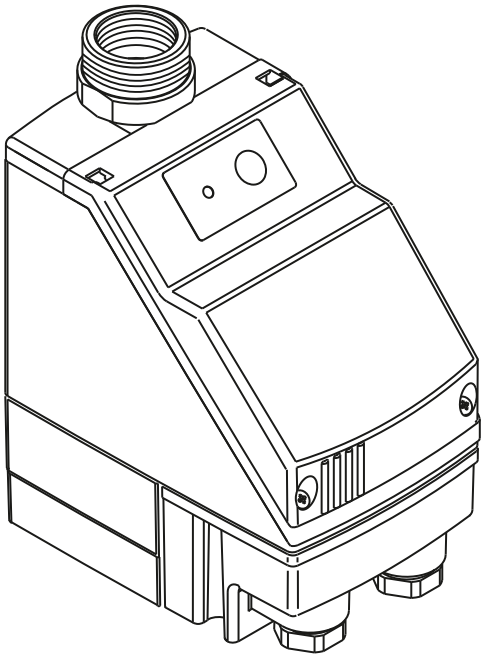
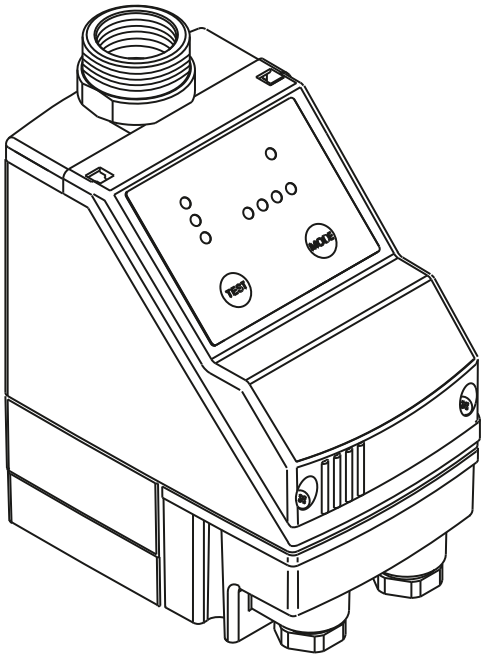
EN





Original installation and operation manual

BEKOMAT® 20
BEKOMAT® 20 FM

01-4318

Table of contents

1. Notes about the documentation

This documentation contains all the necessary steps for use and operation of the product and the accessories.

1.1 Contact

Manufacturer	Customer service and tools
BEKO TECHNOLOGIES GmbH Im Taubental 7 | 41468 Neuss Tel. + 49 2131 988 - 1000 info@beko-technologies.com www.beko-technologies.com	**BEKO** TECHNOLOGIES GmbH Im Taubental 7 | 41468 Neuss Tel. + 49 2131 988 - 1000 service-eu@beko-technologies.com www.beko-technologies.com

INFORMATION	Country-specific manufacturer representation
	You can contact the country-specific manufacturer's representative via the address listed in the address section on the rear cover or by using the contact form on the manufacturer's website.

1.2 Information about this installation and operation manual

INFORMATION	Copyright protection!
	The contents of the installation and operation manual in the form of text, figures, illustrations, photographs, technical drawings, diagrams and other representations are protected by the copyright of the manufacturer. This applies especially to duplication, reproduction, microfilming and storage as well as processing in electronic systems.

Publication date	Revision	Version	Reason for amendment	Scope of amendment
24 June 2021	01	00	Editorial revision	Editorial changes
24 June 2021	01	00	Change in technical data	Change in technical data

The installation and operation manual, hereinafter referred to as the manual, must always be kept close to the product and be in a permanently legible condition.

The manual must be handed over along with the product if it is sold or passed on.

NOTE	Follow the instructions given in the manual!
	This manual contains all the basic information required for safe operation of the product and must be read before any actions are performed. Otherwise personal and material hazards as well as malfunction and device failure are possible.

2. Safety

2.1 Use

The **BEKOMAT® 20 / 20 FM**, also referred to in the following as product or **BEKOMAT®** , is an electronically level-controlled condensate drain used for discharging condensate in pressurised systems. The **BEKOMAT®** is able to drain condensate at operating pressure with no pressure loss.

2.1.1 Intended use

Any use of this system other than the use described in this manual is hereby deemed to be non-intended and can cause a hazard for the safety of people and the environment.

The following must be noted for intended use:

- Read and follow the manual.
- Only use the product and the accessories in indoor areas.
- Only use the product and accessories within the operating parameters given in the technical data and the agreed delivery conditions.
- Only operate the product and accessories with media which are free of caustic, aggressive, corrosive, toxic, flammable, oxidising or inorganic components.
  In cases of doubt an analysis must be carried out.
- Only use the product and accessories in surroundings where splash water is the maximum possible water exposure that can occur. The splash water must be free of corrosive components.
- Only use the product and accessories in areas which are free of toxic and corrosive chemicals and gases.
- Only use the product and accessories within the piping system designed for the technical data with appropriate connections, pipe diameters and assembly clearance.
- Only use the product and accessories outside potentially explosive atmospheres.
- Only use the product and accessories away from direct solar radiation and heat sources as well as areas subject to frost.
- Only combine the product and accessories with the products and components named and recommended by **BEKO** TECHNOLOGIES in the manual.
- Adhere to the prescribed maintenance schedule.

Before using the product and the accessories, the operating company must make sure that all conditions and prerequisites for intended use are given.

The product and the accessories have been exclusively designed for stationary use in a commercial or industrial area. All of the assembly, installation, operation, maintenance, disassembly and disposal work described may only be performed by qualified skilled technical personnel.

2.1.2 Reasonably foreseeable inappropriate use

Reasonably foreseeable inappropriate use is deemed to have occurred if the product or the accessories are used in any other way than that described in the chapter "Intended use". Reasonably foreseeable inappropriate use includes the use of the product or the accessories in a manner not intended by the manufacturer or supplier but which may result from foreseeable human behaviour.

Reasonably foreseeable inappropriate use includes:

- The execution of any kind of modification, in particular constructive and process-technology related interventions.
- The suspension, bridging or non-application of existing or recommended safety equipment.
- Using the product and accessories in piping systems with carbon dioxide as the operating medium.

This list is not exhaustive as not all possible inappropriate use can be foreseen in advance. If the operating company is aware of any inappropriate use of the product or accessories which are not listed here, the manufacturer must be informed immediately.

2.2 Responsibility of the operating company

The responsible operating company must ensure the following to prevent accidents, incidents and adverse effects on the environment:

- Before all actions, check to ensure that the manual available does in fact belong to the product.
- The product and the accessories are used, serviced and repaired in accordance with the intended use.
- The product and accessories are only used with the recommended and fully operable safety equipment.
- All assembly, installation and maintenance work is carried out by qualified skilled technical personnel only.
- Personnel have the necessary personal protective equipment available and also use this equipment.
- Suitable technical safety measures are taken so that the permissible operating parameters are adhered to.
- Keep all safety symbols and the type plate on the product in a legible state. Replace damaged and illegible marking immediately.

2.3 Target group and personnel

This manual addresses the personnel listed below who are involved with work on the product or the accessories.

INFORMATION	Personnel requirements!
	The personnel may not execute any actions on the product or the accessories when they are under the influence of drugs, medications, alcohol or other substances that may impair their consciousness.

Operating personnel

Operating personnel are persons who are able to operate the product and the accessories safely on the basis of knowledge of the manual and instruction at the product and accessories. Operating personnel can recognise possible malfunctions and dangerous situations independently and arrange for corresponding measures.

Skilled technical personnel - transport and storage

Skilled technical personnel - transport and storage are people who, due to their training, professional experience and qualifications, have all the necessary skills to safely execute all actions in connection with the transport and storage of the product, to instruct, to recognise possible dangerous situations independently and to execute measures to avoid danger.

The capabilities include, in particular, experience with hoists, forklifts and lifting equipment and knowledge of local laws, standards and guidelines relating to transport and storage.

Skilled technical personnel - compressed gas technology

Skilled technical personnel - compressed gas technology are people who, due to their training, professional experience and qualification, possess all the necessary capabilities to safely execute actions, and instruct all actions related to pressurised fluids and systems, to independently foresee potential hazardous situations and implement appropriate measures to avert any danger.

The capabilities include, in particular, experience in handling Measuring technology and control technology as well as knowledge of the regionally applicable laws, standards and regulations for pressurised systems.

Skilled technical personnel - electrical engineering

Skilled technical personnel - electrical engineering are people who, due to their training, professional experience and qualification, have all the necessary capabilities to safely execute all actions related to electricity, to instruct and to independently foresee potential hazardous situations and take appropriate measures to avoid any danger.

The capabilities include, in particular, experience in handling electric voltage plants, measurement and control technology as well as knowledge of the regionally applicable laws, standards and regulations (e.g. VDE 0100 / IEC 60364 / ATEX) applicable for handling electrical technology.

Skilled technical personnel - customer service

Skilled technical personnel - customer service are people who have the skills and qualifications of the skilled personnel definitions named above. Skilled technical personnel - customer service must have documented proof of training for all work on the product and be authorised.

2.4 Explanation of the safety symbols used

The symbols used below indicate safety-relevant and important information which must be adhered to when handling the product and to ensure safe and optimum operation.

Symbol	Description / explanation
	General warning symbol (danger, warning, caution)
	Warning: pressurised system
	Warning: electric voltage
	Observe the installation and operation manual
	General note
	Wear safety footwear
	Use protective gloves (cut-proof and liquid-resistant)
	Wear safety goggles with side shields
	General information

2.5 Safety instructions and warning notices

This chapter provides an overview of all the important safety aspects for personal protection as well as for the safe and problem-free operation of the product and accessories.

The following chapters list the dangers posed by this product and the accessories even with intended use. To minimise the risk of personal injury and damage to property and to avoid dangerous situations, observe the safety instructions listed and adhere to the warning notices in the other chapters of this manual.

Basic warning notices and the necessary qualifications of skilled technical personnel are always listed at the beginning of the chapter in the “Warning notices” section.

Warning notices related to specific actions are printed directly before potentially hazardous procedures or sequences of actions.

2.5.1 Safe operation

Commissioning and operating the product and accessories outside the permissible limits and operating parameters may result in serious personal injuries or death. Unauthorised interference and unauthorised modifications of the product and accessories may lead to serious personal injuries or death.

To guarantee safe operation of the product and accessories, observe the following points:

- Use suitable protective equipment during all work on the product or accessories.
- Adhere to the limits and operating parameters specified on the type plate and in the manual.
- Adhere to the assembly conditions and ambient conditions.
- Check whether the permissible operating parameters have been amended or restricted by the use of accessories.
- Adhere to the maintenance intervals.

2.5.2 Pressurised systems

Contact with quickly or suddenly escaping fluids or bursting plant parts may result in serious personal injuries or death.

For the safe handling of pressurised systems, observe the following points:

- Set up a safety area around the working area during assembly, installation, maintenance and repair work.
- Before starting work, depressurise the pressurised system and secure it against unintentional pressurisation.
- Before pressurisation, check all system pipe connections for leak tightness and tighten if necessary.
- Slowly pressurise the system.
- Avoid pressure blows and high differential pressures.
- Compensate any vibrations occurring in the pipe network by using vibration dampers.

2.5.3 Electric voltage

Contact with live components may result in serious personal injuries or death.

To ensure the safe handling of live components, observe the following points:

- Set up a safety area around the working area during all installation and repair work.
- Before starting work, de-energise the product and accessories and secure them against being switched back on again unintentionally.
- Only connect the product and the accessories to the voltage supply if they are undamaged.
- Adhere to all applicable regulations (e.g. VDE 0100 / IEC 60364 / ATEX) during installation.
- Connect the protective conductor (earth connection) according to regulations.
- Only operate the product and accessories with the cover complete and closed or the housing closed.

2.5.4 Transport and storage

Inappropriate transport or storage may result in personal injury or damage to property.

For safe transport and storage of the product and accessories, observe the following points:

- Use personal protective equipment during all work with packaging material.
- Handle packaging, the product and accessories carefully.
- Transport and handle the packaged product and accessories according to the markings on the packaging (note lifting gear attachment points, the centre of gravity and alignment e.g. keep vertical, do not throw etc.).
- Only use proper means of transport and lifting equipment that is in proper working order.
- Always adhere to the permissible transport and storage parameters.
- Store the product and accessories only outside of areas exposed to direct sunlight and heat sources.

2.5.5 Installation

Inappropriate assembly or electrical installation of the product and accessories may result in personal injury and damage to property as well as impair operation.

For safe assembly and electrical installation, observe the following points:

- Install the product, the accessories, and all parts and materials used so that they are not subject to mechanical tension.
- Check all plug-type connections for a correct fit.
- Avoid a stumbling hazard by routing cables and hoses accordingly.
- Avoid mechanical strain on the cables.
- Fix and fasten hoses in such a way that they cannot flap around.
- Install the feed lines and drain lines as fixed pipes.

2.5.6 Maintenance

Inappropriate completion of maintenance and repair work may result in serious personal injuries or death.

For safe maintenance and repair, observe the following points:

- Use suitable protective equipment during all maintenance and repair work on the product or accessories.
- Set up a safety area around the working area during all maintenance and repair work.
- Before starting work, depressurise the pressurised product and accessories and secure them against unintentional pressurisation.
- Before starting work, de-energise the product and accessories and secure them against being switched back on again unintentionally.
- Only use materials approved for the respective application.
- Use only suitable tools that are in proper working order.
- Only use cleaned pipes and hoses that are free of dirt and corrosion.
- Never use abrasive or aggressive cleaning agents or solvents which could damage the outer coating (e.g. markings, type plate, corrosion protection, etc.).
- Never clean the device with hard or pointed implements.
- Use an anti-static, damp cloth for cleaning the outside.
- Observe the regionally applicable hygiene regulations.
- Pay attention to cleanness and tidiness during maintenance and repair work. Prevent contamination from entering the opened product or accessories. Store the disassembled components and accessories directly in a safe place.
- After completing maintenance and repair work, remove all of the tools and cleaning media used as well as all parts that are no longer needed from the work area.
- Only dispose of the product and accessories when cleaned and freed of any media residue.
- Dispose of all components, parts, operating and auxiliary materials as well as cleaning media professionally and in accordance with regional legal specifications and regulations.
- Dispose of electrical and electronic components through a specialist waste disposal company or return to **BEKO** TECHNOLOGIES.

2.5.7 Handling hazardous substances

Contact with condensate containing substances which endanger health and the environment can pose a health hazard, causing irritation and/or damage to the eyes, skin and mucous membranes. In addition, polluted condensate must be prevented from entering the sewerage system, waters or the ground.

For the safe handling of polluted condensate the following points must be observed:

- Use suitable protective equipment when handling condensate.
- Pick up and dispose of any leaking or spilled condensate in accordance with applicable regional laws and requirements.

2.5.8 Use of spare parts, accessories or materials

The use of incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunction and device failure as well as material damage can occur.

- Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work.
- Only use the materials approved for the respective application and suitable tools in proper working order.
- Only use cleaned pipes that are free of dirt and corrosion.
- Only use electric components and materials that comply with regionally applicable specifications and regulations (standards, directives etc.) for electrical safety.

2.6 Warning notices

Warning notices warn against dangers when handling the product and accessories.

In order to prevent accidents, personal injury and damage to property as well as impairments during operation, it is essential to adhere to the warning notices.

Structural set up:

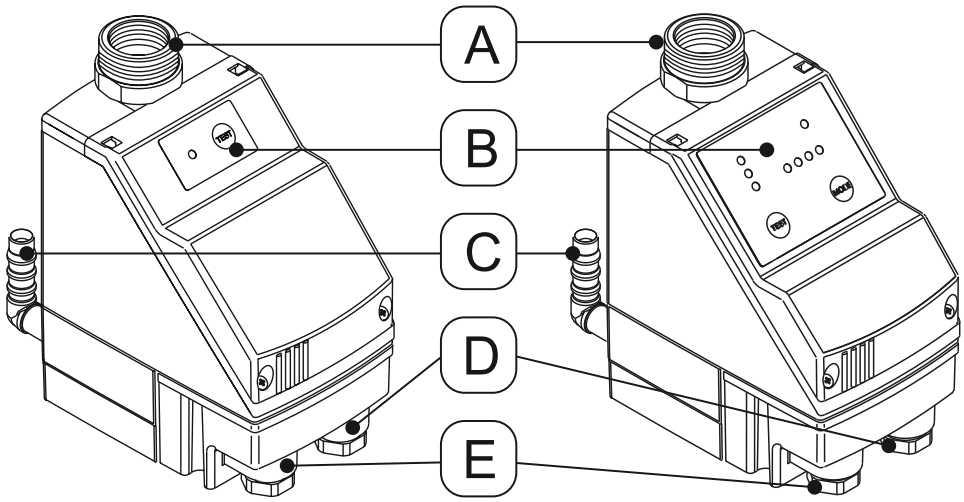
SIGNAL WORD	Type and source of danger!
 Symbol	Possible consequences if the danger is ignored • Measure to prevent the danger

Signal words:

DANGER	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury
WARNING	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury are possible
CAUTION	**Potential hazard** Consequences of non-compliance: Personal injury or damage to property are possible
NOTE	**Additional notes** Consequences of non-compliance: Damage to property, malfunction and device failure are possible. No hazard to people or endangerment of safe operation.

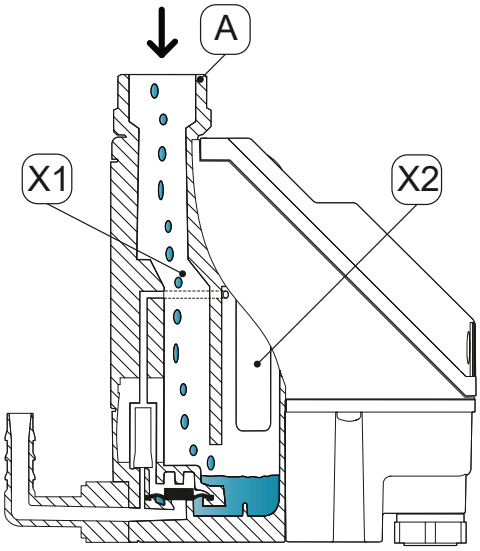
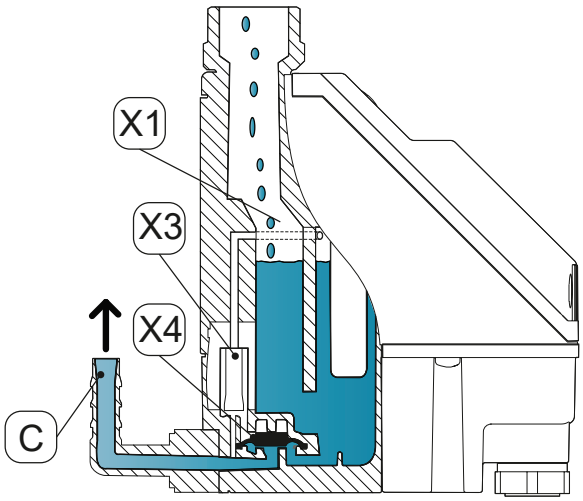
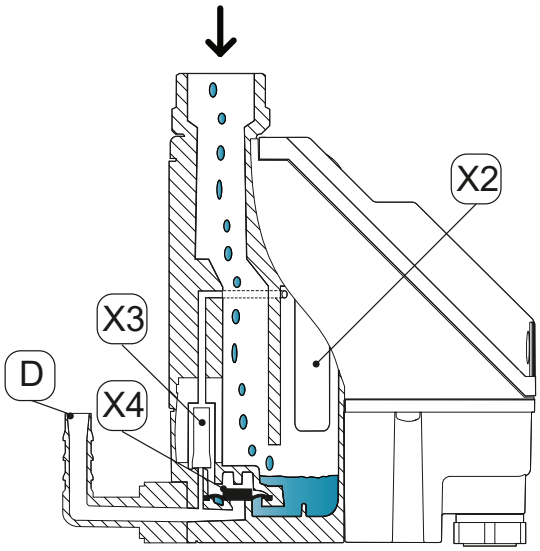
3. Product information

3.1 Product overview



Item	Description	Item	Description
[A]	Condensate inlet	**[D]**	Cable gland right: Potential-free contact
[B]	Operating label	**[E]**	Cable gland left: Voltage supply
[C]	Condensate discharge		

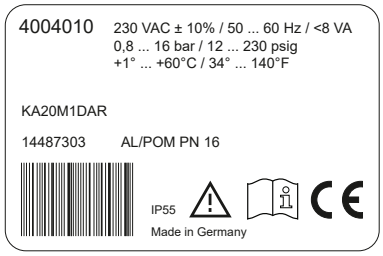
3.2 Function description

Illustration	Description / explanation
	The condensate flows via the condensate inlet **[A]** into the **BEKOMAT®** and collects in the housing **[X1]**. The filling level in the housing **[X1]** is monitored continuously by a capacitive sensor in the sensor tube **[X2]**.
	Once the condensate has reached the maximum filling level, the controller activates the pilot valve **[X3]**. The pilot valve **[X3]** switches and the area above the membrane **[X4]** is depressurised. The membrane **[X4]** lifts off the valve seat and the excess pressure in the housing **[X1]** forces the condensate into the condensate discharge **[C]**.
	When the sensor in the sensor tube **[X2]** is no longer covered by condensate, the controller switches the pilot valve **[X3]** and pressure builds up above the membrane **[X4]**. The membrane **[X4]** is pressed against the valve seat and the condensate discharge **[D]** is sealed and closed off. The cycle starts again with the inlet of condensate.

3.3 Type plate

The type plate, which contains the identification parameters and operating parameters of the **BEKOMAT®**, is located on the housing.

If you contact the manufacturer or supplier, always have this data ready for system identification.



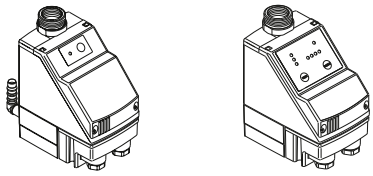
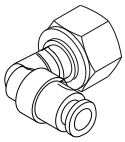
Example illustration

Position on type plate	Description / explanation
KA20M1DAR	Product name
0,8 ... 16 bar / 12 ... 230 psig	Operating pressure
+1 ... +60 °C / +34 ... +140 °F	Operating temperature
230 VAC ± 10 % / 50 ... 60 Hz / <8 VA	Operating voltage
4004010	Order reference
14487303	Serial number

For more information, see “2.4 Explanation of the safety symbols used” on Page 9.

3.4 Scope of delivery

The table below shows the scope of delivery of the **BEKOMAT®**:

Illustration	Description / explanation
	**BEKOMAT® 20 / 20 FM**
	Original installation and operation manual
	1 x connector

4. Technical data

4.1 Operating parameters

BEKOMAT®	20 / 20 FM
Ambient relative humidity	10 ... 80 %, without condensation
Maximum operating height	2000 m 2187.23 yd
Minimum / maximum operating pressure	0.8 ... 16 bar(g) 12 ... 230 psi(g)
Minimum / maximum operating temperature	+1 ... 60 °C +34 ... +158 °F
Ø - discharge rate	1.03 l/h 0.27 gal/h
Maximum discharge rate (short-term)	10.8 l/h 2.85 gal/h
Connection*, condensate inlet	1 x G½ inner max. screw-in depth 13.5 mm (½ in)
Connection, condensate discharge	1 x G¼ outer; hose connection, hose Ø 8 ... 10 mm inner (dia 0.31 ... 0.39 in)
Maximum fastening torque connector	3 Nm 2.21 ft-lb
Media	Condensate, oil-contaminated or oil-free
Empty weight	0.7 kg 1.5 lbs
Operating voltage	230 / 115 / ... / 24 VAC ± 10 %; 50 ... 60 Hz / 24 VDC ± 10 % See type plate
Power consumption	P < 8.0 VA (W)
Degree of protection	IP65
Overvoltage category (IEC 61010-1)	II
Degree of pollution (IEC 61010-1)	3
Recommended cable diameter	5.8 ... 8.5 mm 0.23 ... 0.33 in
Recommended wire cross-section (voltage supply)	0.75 ... 2.5 mm² AWG 14 ... 20
Recommended shortening of the cable jacket	PE= ~ 60 mm L/N: ~ 50 mm PE= ~ 2.36 in L / N: ~ 1.97 in
Recommended stripping length of the cable wires	~ 6 mm ~ 0.24 in
Connection data potential-free contact for switching load	AC: max. 250 V / 1A ; DC: max. 30 V / 1A
Connection data potential-free contact for small signal	min. 5 VDC ; 10 mA
Connection data of external test contact	on the device side 5 VDC; switching current ≥ 0.5 mA

* The NPT thread version is available as an option.

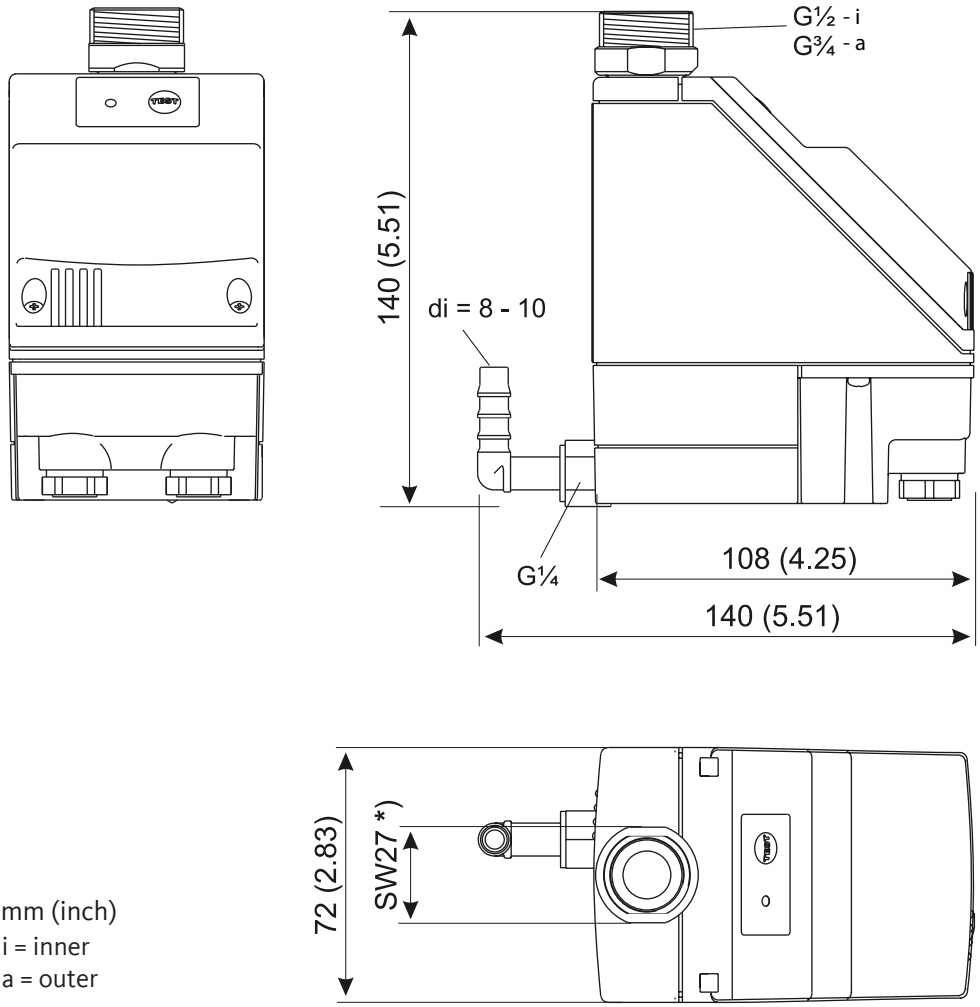
4.2 Storage and transportation parameters

BEKOMAT®	20 / 20 FM
Minimum / maximum storage and transport temperature	+1 ... +60 °C +34 ... +140 °F

4.3 Materials

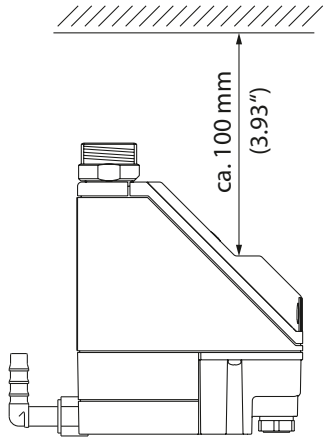
BEKOMAT®	20 / 20 FM
Housing	Aluminium and plastic, glass fibre reinforced
Membrane	FKM

4.4 Dimensions



mm (inch)
i = inner
a = outer

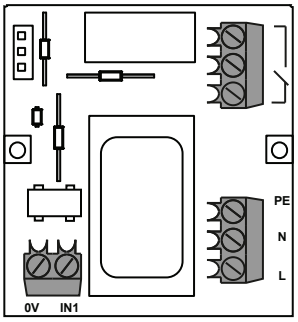
4.5 Installation dimensions

Illustration	Description / explanation
	At the place of installation, allow sufficient assembly space above the top cover so that the LEDs are visible and the TEST button can be pressed.

4.6 Terminal diagrams

4.6.1 Power control board AC

Illustration



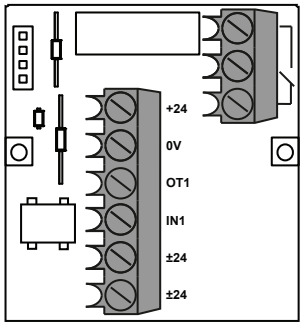
n.o.
com.
n.c.
Potential-free contact

PE
N/-
L/+
Voltage supply

0 V
IN1
External test

4.6.2 Power control board DC

Illustration



+24
0 V
OT1
IN1
±24
±24
Voltage supply

n.o.
com.
n.c.
Potential-free contact / external test

5. Transport and storage

WARNING	Insufficient qualification!
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• The work on the product and accessories described below may only be executed and documented by skilled personnel - transport and storage.

CAUTION	Inappropriate transport or storage!
 	Inappropriate transport or storage may result in personal injury or damage to the device.
	• Use personal protective equipment during all work with packaging material. • Handle packaging, the product and accessories carefully. • Pack all parts impact-proof using suitable material. • Transport and handle the packaging according to the markings (note lifting gear attachment points, the centre of gravity and alignment e.g. keep vertical, do not throw etc.). • Only use proper means of transport and lifting equipment that is in proper working order. • Always adhere to the permissible transport and storage parameters. • Store the product and accessories only outside of areas exposed to direct sunlight and heat sources.

NOTE	Handling packaging material!
	Inappropriate disposal of packaging materials can cause environmental damage.
	• Dispose of the packaging material in accordance with the applicable legal requirements and provisions of the country and place of use.

5.1 Transport

After transporting and removing the packaging material, inspect the product for possible transport damage. If you find such damage, notify the carrier company, **BEKO** TECHNOLOGIES or one of its agents immediately.

Transport the product as follows:

- Only transport the product in its original packaging.
- Handle packaging and the product with care.
- Note the transport weight specification and marking on the packaging.
- Secure the packaging and the product against slipping and falling during transport.

5.2 Storage

Store the product and the accessories as follows:

- Adhere to the storage parameters in chapter “4.2 Storage and transportation parameters” on Page 19.
- Store in a closed, dry as well as frost-free room.
- Store protected from external influences of the weather, direct sunlight and sources of heat.
- Secure against falling over and protect against vibrations at the storage location.

6. Assembly

6.1 Warning notices

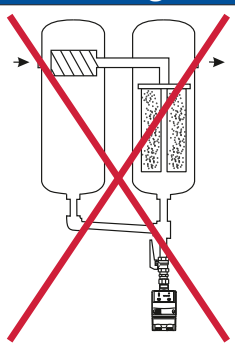
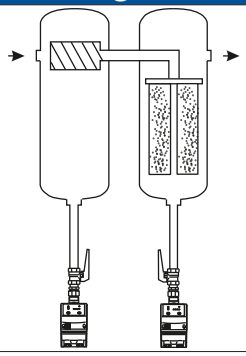
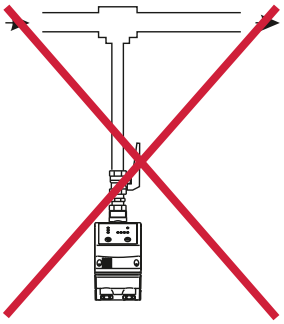
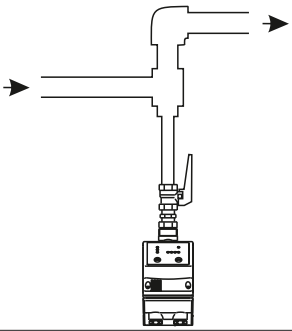
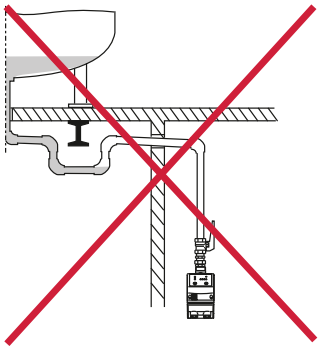
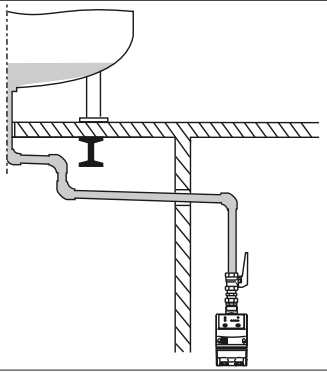
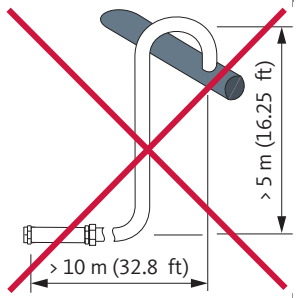
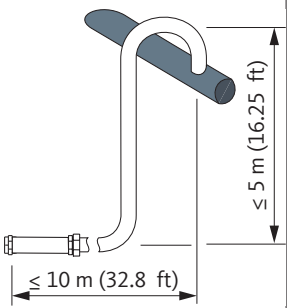
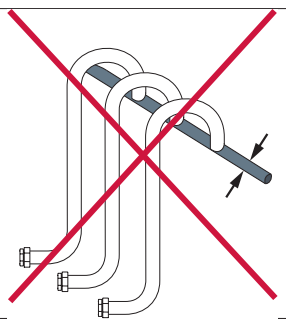
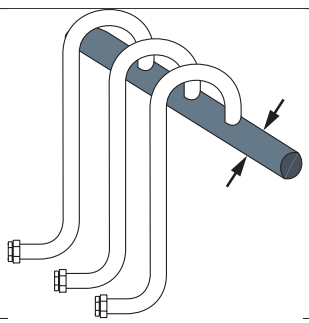
DANGER	**Use of incorrect spare parts, accessories or materials!**
	The use of incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunction and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Only use the materials approved for the respective application and suitable tools in proper working order. • Only use pipes that are free of dirt, damage and corrosion.

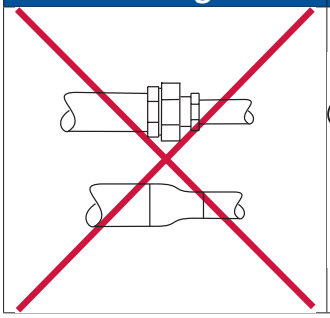
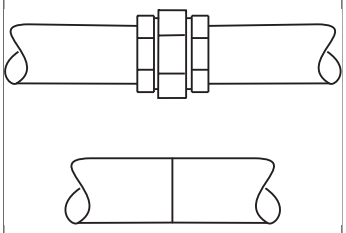
DANGER	**Pressurised system!**
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurise the pressurised system and secure it against unintentional pressurisation. • Set up a safety area around the working area during assembly, installation, maintenance and repair work. • Before pressurisation, check all system pipe connections for leak tightness and tighten if necessary. • Slowly pressurise the system. • Avoid pressure blows and high differential pressures. • Assemble all pipes free of mechanical stress. • Install the feed lines and drain lines as fixed pipes.

WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and accessories may only be carried out by skilled technical personnel - compressed gas technology.

CAUTION	**Inappropriate assembly!**
	Inappropriate assembly of the product and the accessories can lead to personal injury and damage to property as well as impair operation.
	• Install the product, the accessories, and all parts and materials used so that they are not subject to mechanical tension. • Fix hoses in such a way that they do not flap around.

6.1.1 Assembly conditions

Wrong	Right	Description / explanation
		**Bypassing filters** • Discharge each condensate collection point with a separate **BEKOMAT®**. • Do not create any filter bypass points.
		**Discharge from pressurised pipes** • Divert the flow of gas to provide a deflecting surface to discharge the fluid components in the gas.
		**Continuous slope > 3 % in pipes** • When installing the feed line pipe, ensure a continuous slope > 3 %. • Do not form water pockets.
		**Drain line version** • Do not use shut-off valves in the drain line. • Only connect the **BEKOMAT®** to the drain line using a hose. → The hose compensates for assembly tolerances, vibrations and thermal expansion. • Do not install the drain line on storage or transportation surfaces. • The drain line may be a maximum of 10 m (32.8 ft) long and installed at a maximum of 5 m (16.25 ft) rise. → The minimum operating pressure increases by 0.1 bar (ü) (1.5 psi(g)) per metre of incline.
		**Manifold design** • The cross-section of the manifold must be at least equal to the sum of the individual cross-sections of the connected feed lines. • Lay the manifold with a continuous slope > 3 %.

Wrong	Right	Description / explanation
		**Diameters of the connected lines** • The minimum diameter of the feed line and the drain line must be at least 1/2" (interior diameter at least 13 mm (0.5 in)). • Do not fit any reductions in the line (e.g. using reducing nipples or fittings).

6.2 Installation steps

6.2.1 Installation

For assembly work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Spanner or adjustable end wrench	• Sealants e.g. PTFE • Feed line • Drain line • Hose, interior diameter 8 ... 10 mm (0.31 ... 0.39 in), length approx. 30 cm (1 ft) • Hose clamp	**Always to be worn:** 

Preparatory tasks	
1.	Depressurise the pressurised system or the respective system section and secure it against unintentional pressurisation.
2.	Get the hose and hose clamp ready for connection to the condensate discharge.

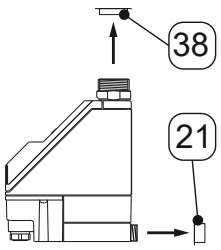
Illustration	Description / explanation
	1. Remove the plugs **[38, 21]**.

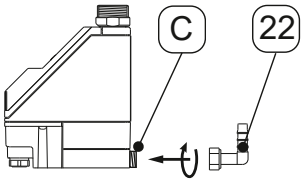
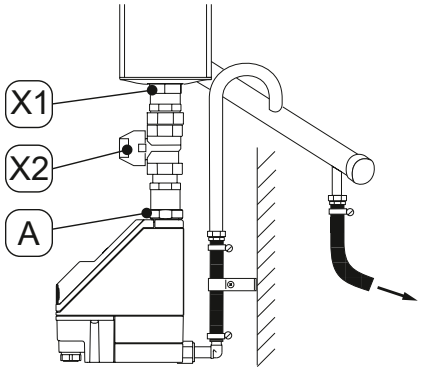
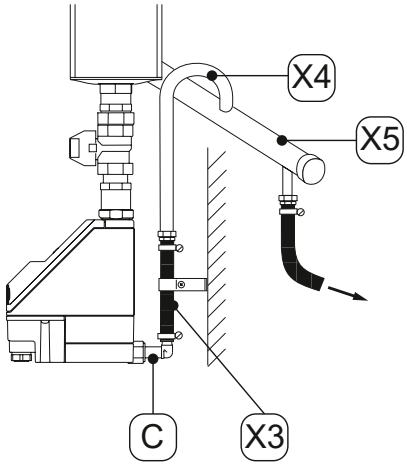
Illustration	Description / explanation
	2. Screw the enclosed hose connection **[22]** to the condensate discharge **[C]**.
	**Recommendation:** Equip the condensate inlet line **[X1]** with a shut-off valve **[X2]** to simplify product maintenance. 3. For the condensate inlet line **[X1]**, apply sealant to the end of a pressure-resistant pipe and screw this in at the condensate inlet **[A]**.

Illustration	Description / explanation
	4. For the condensate discharge, connect a short pressure hose **[X3]** to the condensate discharge **[C]** and the condensate discharge line **[X4]** using a hose clamp.

7. Electrical installation

7.1 Warning notices

DANGER	**Use of incorrect spare parts, accessories or materials!**
	The use of incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunction and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Only use the materials approved for the respective application and suitable tools in proper working order. • Only use electric components and materials that comply with regionally applicable specifications and regulations for electrical safety.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only carry out installation, maintenance and repair work on the product and accessories when they have been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during all installation and repair work. • Adhere to all applicable regulations (e.g. VDE 0100 / IEC 60364 / ATEX) during installation. • Connect the protective conductor (earth connection) according to regulations.

WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and the accessories may only be carried out by skilled technical personnel - electrical engineering.

CAUTION	**Inappropriate electrical installation!**
	Inappropriate electrical installation of the product and the accessories can lead to personal injury and damage to property as well as impair operation.
	• Check all plug-type connections for a correct fit. • Avoid stumbling hazard through appropriate cable routing. • Avoid mechanical strain on the cables.

7.2 Connection work

For connection work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Stripping tool • Crimping tool for wire-end ferrules • Screwdriver - cross-head size PZ2 • Screwdriver – flat head size 2.5 mm (0.09")	• 3-wire shielded connection cable: 3 wires for current supply • 3-wire shielded connection cable: 3 wires for potential-free contact • 2-wire shielded connection cable: 2-wires for external TEST button • Wire-end ferrules	**Always to be worn:** 

Preparatory tasks	
1.	Assembly must have been completed

7.2.1 Voltage supply connection

7.2.1.1 Power control board AC

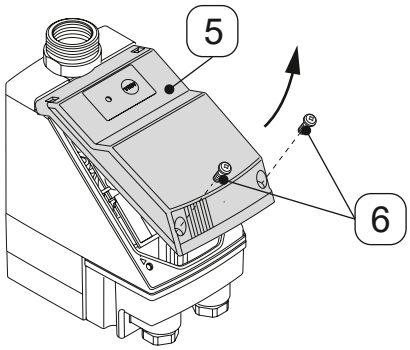
Illustration	Description / explanation
	1. Loosen the 2 screws **[6]** of the top cover **[5]** and lift the top cover **[5]** off.

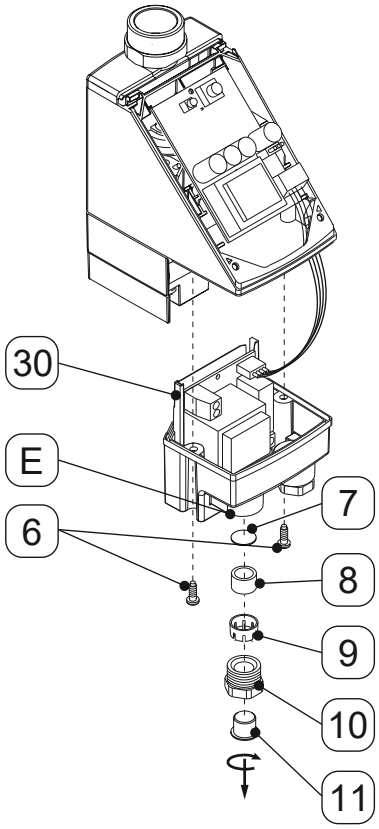
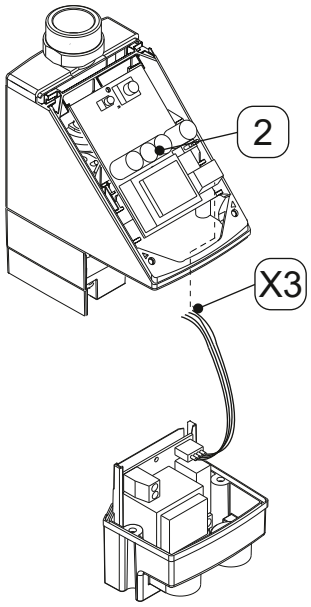
Illustration	Description / explanation
	2. Screw out the components **[7, 8, 9, 10, 11]** of the cable gland left **[E].** 3. Loosen the 2 screws **[6]** of the power supply housing **[30]** and take the power supply housing **[30]** off.
	4. Pull the plug-type connector **[X3]** off the control circuit board **[2]**.

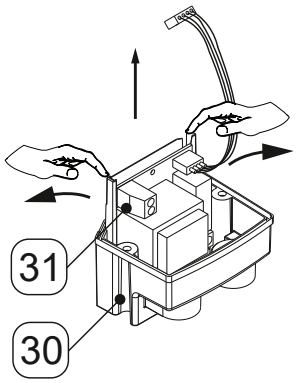
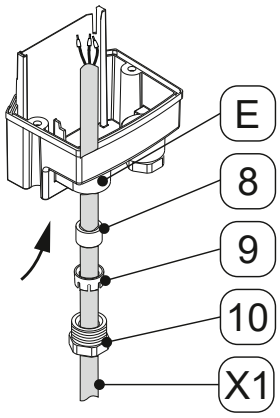
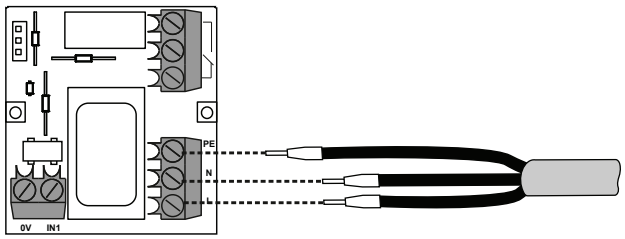
Illustration	Description / explanation
	5. Press the rail of the power supply housing **[30]** slightly apart using your fingers, and pull the power control board **[31]** up and out.
	6. Prepare the voltage supply connection cable.
	7. Draw the connection cable **[X1]** taut and screw the counter nut **[6]** onto the cable gland right **[C]**. 8. Fit the components of the cable gland **[8, 9, 10]** over the voltage supply cable **[X1]** and insert into the cable gland left **[E]**.
	9. Connect the voltage supply connection cable **[X1]** in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20.

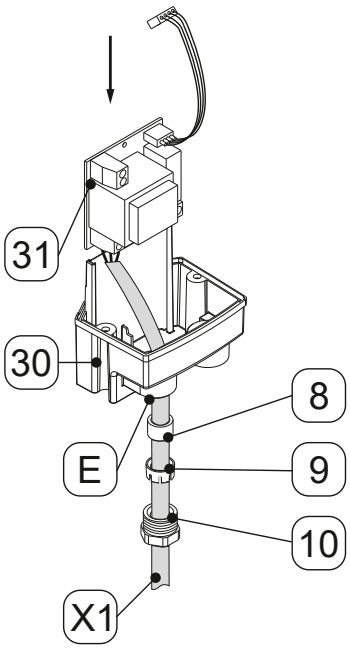
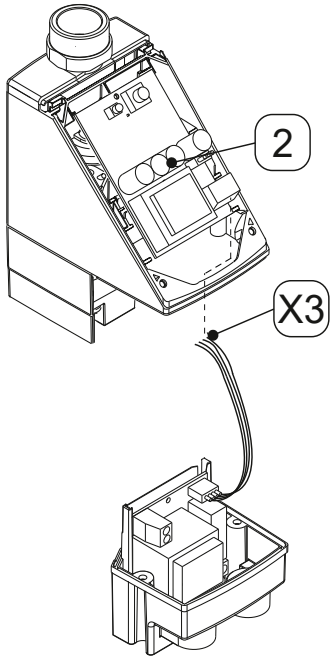
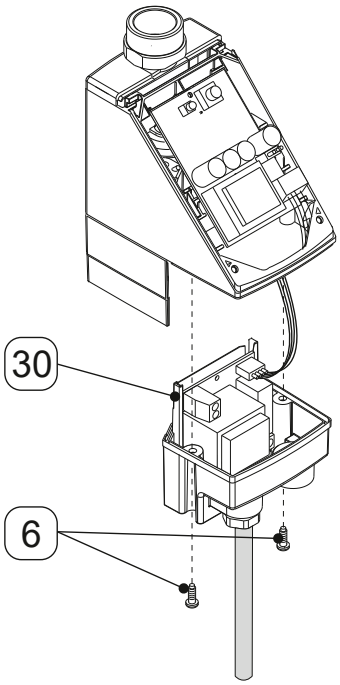
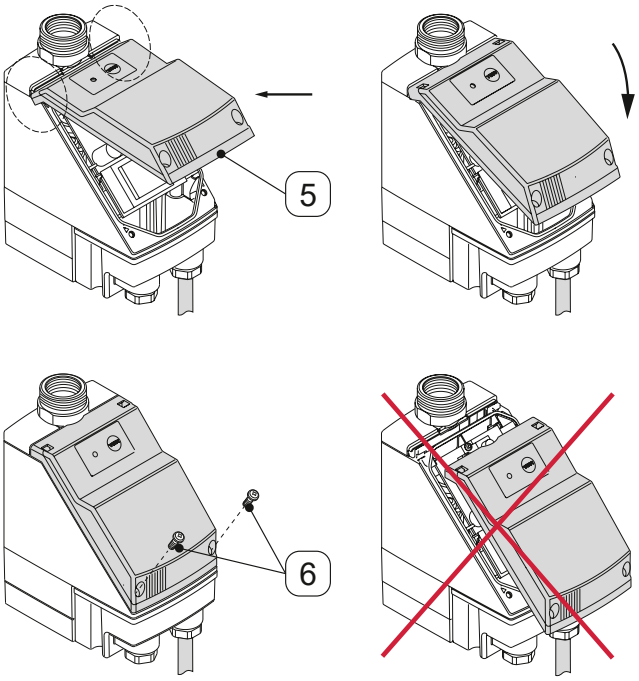
Illustration	Description / explanation
	10. Insert the power control board **[31]** back into the power supply housing **[30]**. 11. Pull the voltage supply cable **[X1]** taut while doing so and screw the counter nut **[10]** with the components **[8, 9]** back into the cable gland left **[E]**.
	12. Insert the plug-type connector **[X3]** onto the control circuit board **[2]**.

Illustration	Description / explanation
	13. Screw the power supply housing **[30]** tight using the 2 screws **[6]**.
	14. Set the top cover **[5]** in place as shown and fasten using the 2 screws **[6]**.

7.2.1.2 Power control board DC

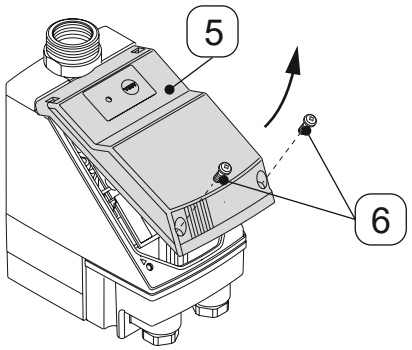
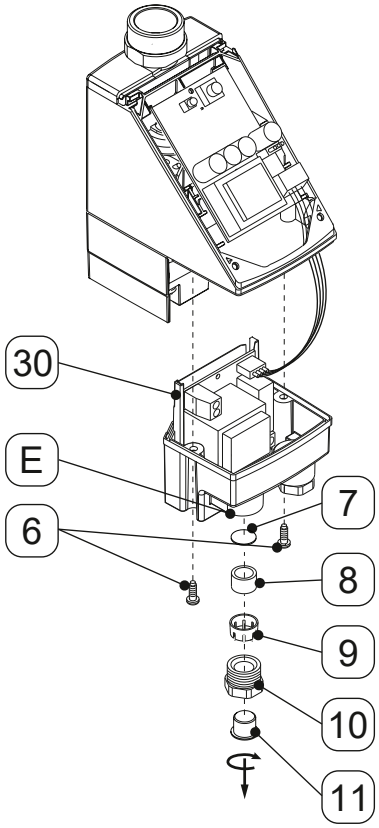
Illustration	Description / explanation
	1. Loosen the 2 screws **[6]** of the top cover **[5]** and take the top cover **[5]** off.
	2. Screw out the components **[7, 8, 9, 10, 11]** of the cable gland left **[E].** 3. Loosen the 2 screws **[6]** of the power supply housing **[30]** and take the power supply housing **[30]** off.

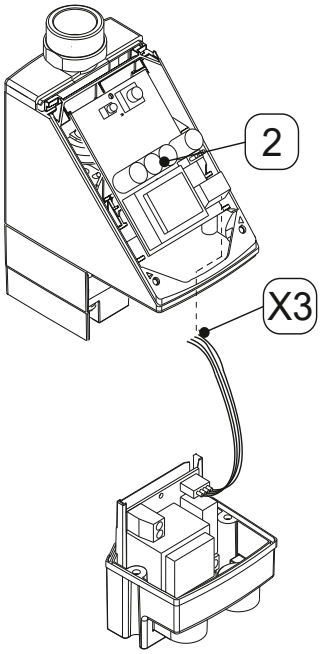
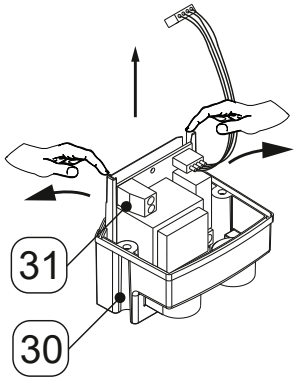
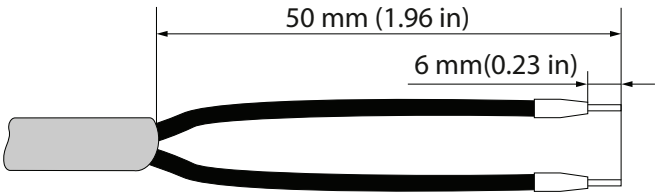
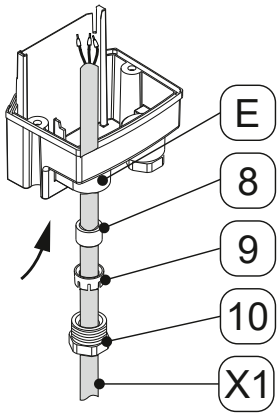
Illustration	Description / explanation
	4. Pull the plug-type connector **[X3]** off the control circuit board **[2]**.
	5. Press the rail of the power supply housing **[30]** slightly apart using your fingers, and pull the power control board **[31]** up and out.
	6. Prepare the voltage supply connection cable.
	7. Fit the components of the cable gland **[8, 9, 10]** over the voltage supply cable **[X1]** and insert into the cable gland left **[E]**.

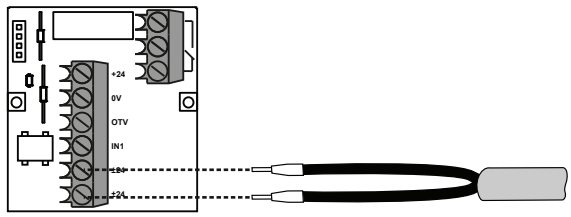
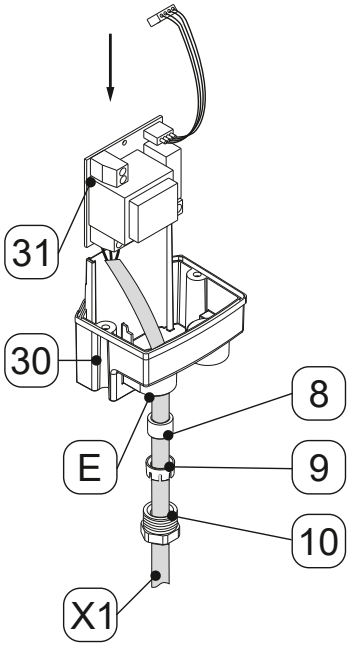
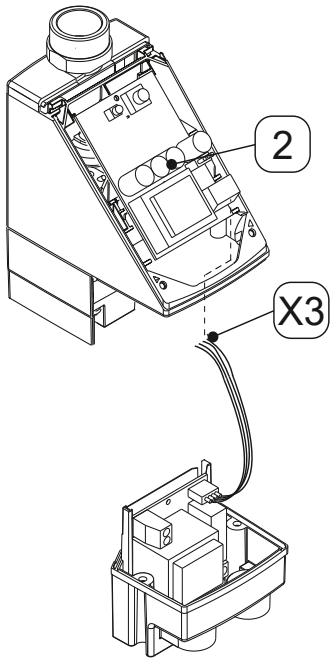
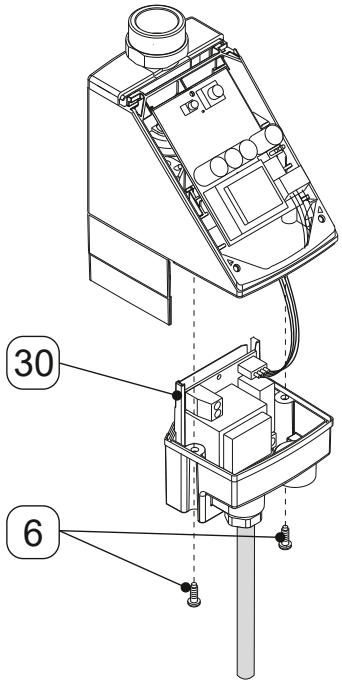
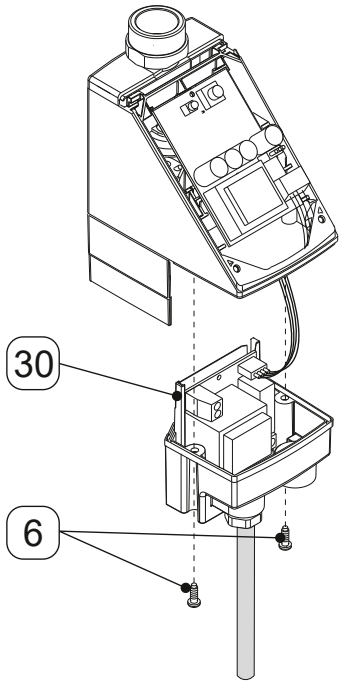
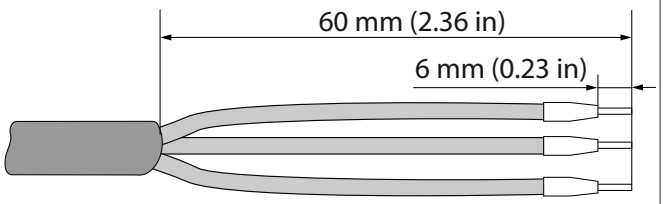
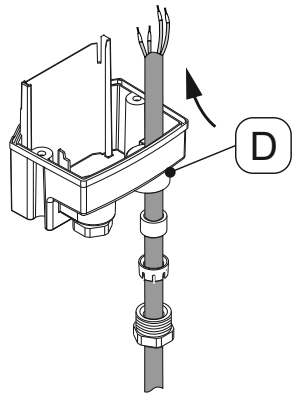
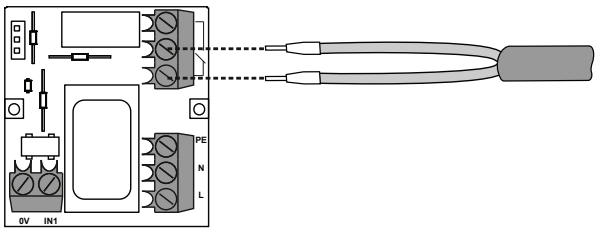
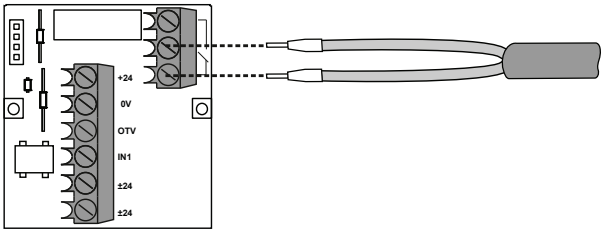
Illustration	Description / explanation
	8. Connect the voltage supply connection **[X1]** in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20. In the case of 24 VDC operation there is no galvanic isolation between the voltage supply and the **BEKOMAT®** electronics. The housing is connected to the switching mass.
	9. Insert the power control board **[31]** back into the power supply housing **[30]**. 10. Pull the voltage supply cable **[X1]** taut while doing so and screw the counter nut **[10]** with the components **[8, 9]** back into the cable gland left **[E]**.
	11. Insert the plug-type connector **[X2]** onto the control circuit board **[2]**.

Illustration	Description / explanation
	12. Screw the power supply housing **[30]** tight from below using the 2 screws **[6]**.
	13. Set the top cover **[5]** in place as shown and fasten using the 2 screws **[6]**.

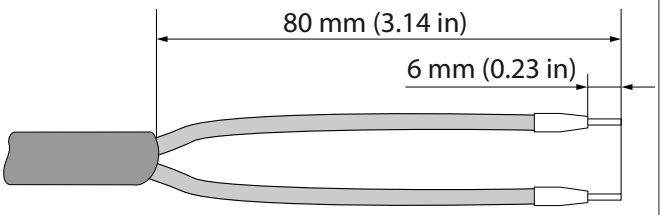
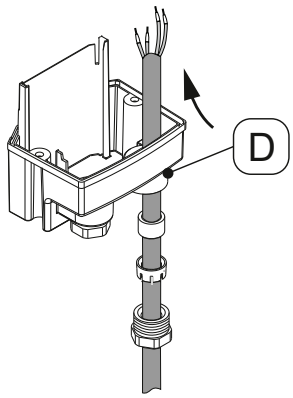
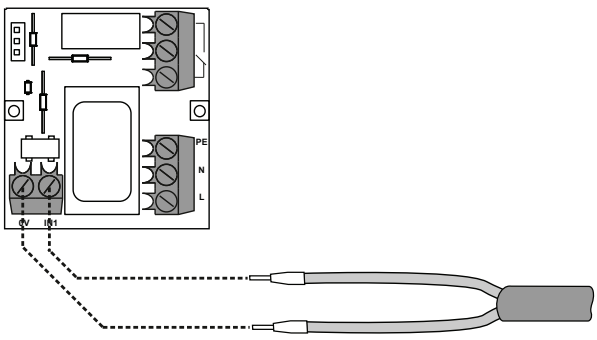
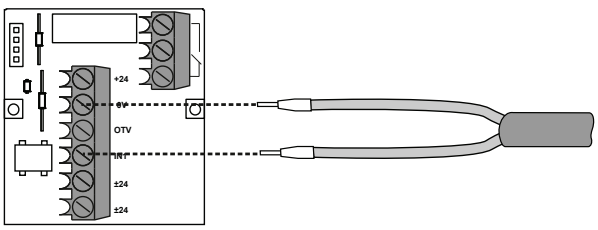
7.2.2 Connection of potential-free contact

The **BEKOMAT®** has a potential-free contact on the power control board. This can be used to display a fault signal at a remote maintenance centre.

Illustration	Description / explanation
	1. Prepare the connection cable for the potential-free contact (depending on the application). If the external TEST button is to be connected in addition to the potential-free contact, a 4/5-wire cable must be used for the connection (depending on the application).
	2. Use the right-hand cable gland **[D]**for connection.
	**Power control board AC** 3. Connect the connection cable for the potential-free contact in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20.
	**Power control board DC** 4. Connect the connection cable for the potential-free contact in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20.

7.2.3 Connection of external TEST button

The **BEKOMAT®** has an option for the connection of an external TEST button. This enables condensate to be discharged via remote control. If the external contact is closed, the solenoid valve opens in the same way as when the TEST button is pressed on the top cover and the **BEKOMAT®** discharges condensate.

Illustration	Description / explanation
	1. Prepare the connection cable for the external test (depending on the application). If the external TEST button is to be connected in addition to the potential-free contact, a 4/5-wire cable must be used for the connection (depending on the application).
	2. Use the right-hand cable gland **[D]**for connection.
	**Power control board AC** 3. Connect the connection cable for the potential-free contact in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20.
	**Power control board DC** 4. Connect the connection cable for the potential-free contact in accordance with the terminal diagram “4.6 Terminal diagrams” on Page 20.

8. Commissioning

8.1 Warning notices

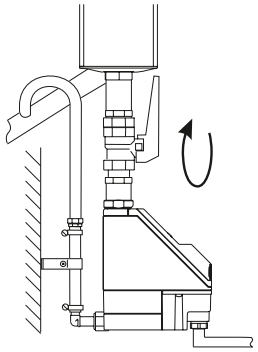
DANGER	**Operation outside the permissible limit range!**
	Operation of the product and accessories outside the permissible limits and operating parameters, unauthorised intervention and modifications may result in death or serious injury.
	• Adhere to the limits and operating parameters specified on the type plate and in the manual. • Check whether the operating parameters have been amended or restricted by the use of accessories.

DANGER	**Pressurised system!**
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before pressurisation, check all system pipe connections for leak tightness and tighten if necessary. • Slowly pressurise the system. • Avoid pressure blows and high differential pressures.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only operate the product with the cover complete and closed or the housing closed.

WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and accessories may only be carried out by skilled technical personnel - compressed gas technology and skilled technical personnel - electrical engineering.

8.2 Commissioning work

Illustration	Description / explanation
	1. Connect the voltage supply. 2. Slowly pressurise the system section.

9. Operation

9.1 Warning notices

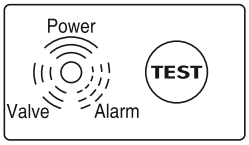
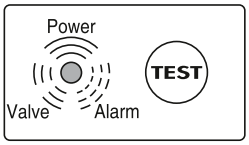
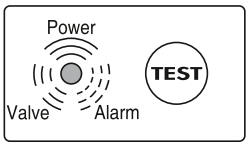
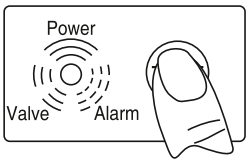
DANGER	**Operation outside the permissible limit range!**
	Operation of the product and accessories outside the permissible limits and operating parameters, unauthorised intervention and modifications may result in death or serious injury.
	• Adhere to the limits and operating parameters specified on the type plate and in the manual. • Adhere to the assembly conditions and ambient conditions. • Check whether the operating parameters have been amended or restricted by the use of accessories. • Adhere to the maintenance intervals.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only operate the product with the cover or housing complete and closed.

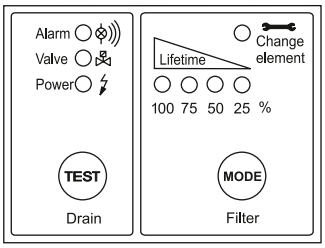
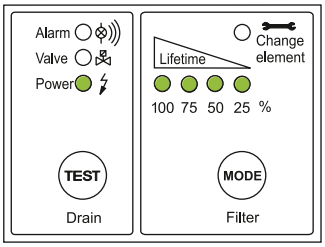
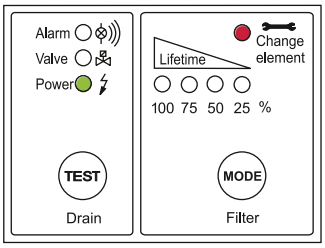
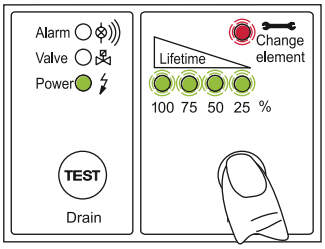
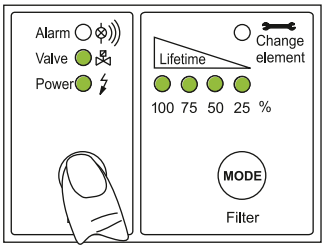
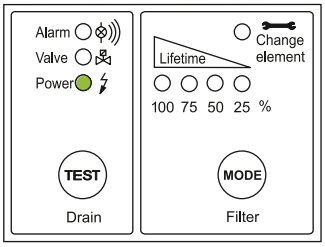
NOTE	**Operating personnel!**
	Insufficient knowledge of the product and the accessories can lead to damage to property and the environment as well as impair operation.
	• The product and accessories may only be operated and used by qualified operating personnel.

9.2 Operating states

9.2.1 BEKOMAT® 20

Illustration	Description / explanation
	**Disconnected** • All LEDs are off.
	**Ready for operation (normal operating mode)** • The green Power LED is lit.
	**Discharge procedure** • The green Power LED is lit.
	**Manual drainage** • Press the button for approx. 2 seconds.

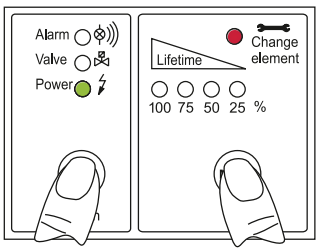
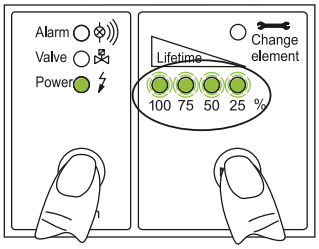
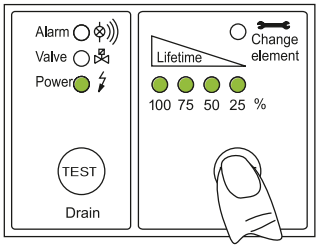
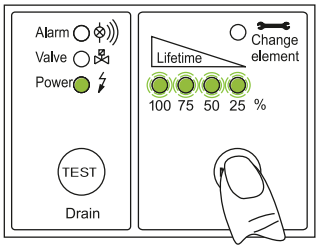
9.2.2 BEKOMAT® 20 FM

Illustration	Description / explanation
	**Disconnected** • All LEDs are off.
	**Ready for operation (normal operating mode)** • The green Power LED is lit. • All 4 green Lifetime LEDs are lit. 100 % to 76 % service life available. • At 75 % to 51 % only 3 LEDs are lit. • At 50 % to 26 % only 2 LEDs are lit. • At 25 % to 1 % only 1 LED is lit.
	**Filter change** • The green Power LED is lit. • The red Change Element LED is lit.
	**Function control LEDs** • Keep the MODE button pressed. → The green Power LED is lit. → All green Lifetime LEDs flash. → Change Element flashes.
	**Discharge procedure (TEST button pressed briefly)** • The red Alarm LED is off. • The green Valve LED is lit during the discharge procedure. • The green Power LED is on.
	**Operating voltage / operating function** • The green Power LED is lit. Operating voltage, valve function and alarm are shown in the left-hand "Drain" field.

For further information about fault indications during operation, see “15. Troubleshooting and fault repair” on Page 57.

9.2.2.1 Filter management reset function

After filter replacement, the filter management function must be reset. For reset, carry out the following steps after filter replacement.

Illustration	Description / explanation
	**Starting the reset function** • To start the reset mechanism, press the TEST button and the MODE button at the same time. The action of the button pressed first starts. When the second button is pressed as well, the first action triggered is stopped.
	**Reset mechanism** • Keep both buttons pressed for longer than 10 seconds. → All Lifetime LEDs start to flash. The standard **BEKOMAT®** functionality is active in the background. If no button is pressed, it remains in this state. • Release both buttons.
	**Cancelling the reset mechanism** • Press the TEST button briefly. → The reset mechanism is cancelled immediately. • Do not press any button. → The reset mechanism cancels automatically after 60 seconds.
	**Reset filter lifetime to the initial value** • Press the MODE-button. → The filter lifetime counter is reset to the initial value. → The **BEKOMAT®** returns to its normal operating state.

10. Maintenance

10.1 Warning notices

DANGER	**Pressurised system!**
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• All maintenance and repair work on the system must be carried out in the depressurised state and with the system secured against unintentional pressurisation. • Set up a safety area around the working area during all maintenance and repair work. • Before pressurisation, check all system pipe connections for leak tightness and tighten if necessary. • Slowly pressurise the system. • Avoid pressure blows and high differential pressures. • Assemble all pipes free of mechanical stress. • Compensate any vibrations occurring in the pipe network by using vibration dampers. • Install the feed lines and drain lines as fixed pipes.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only carry out maintenance and repair work on the product when it has been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during all maintenance and repair work. • Only operate the product with the cover complete and closed or the housing closed.

DANGER	**Use of incorrect spare parts, accessories or materials!**
	The use of incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunction and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Use only the approved materials and suitable tools for the respective purpose and make sure that they are in proper working order. • Only use cleaned pipes that are free of dirt and corrosion. • Only use electric components and materials that comply with country-specific regulations (standards, directives etc.) for electrical safety.

WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and the accessories may only be carried out by skilled technical personnel - customer service.

10.2 Maintenance schedule

Maintenance	Interval
Wear part replacement	After 2 x 8760 operating hours or 1 million switching cycles*; at least every 2 years
Cleaning	Annually
Visual inspection	Weekly
Leakage test	After all assembly as well as maintenance works on the product

* based on 7 bar(g) (101.5 psi(g)) and pH-neutral condensate

10.3 Maintenance work

For assembly work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Screwdriver – flat head size 2.5 mm (0.09") • Spanner or adjustable end wrench	• Sealants • Suitable lubricant for greasing the O-rings • Mild cleaning agent • Cotton or disposable cloth	**Always to be worn:** 

Preparatory tasks	
1.	Decommissioning and disassembly of the **BEKOMAT®** have been completed.

10.3.1 Wear part replacement

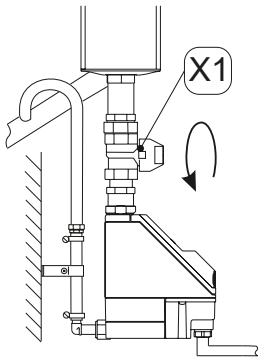
Illustration	Description / explanation
	1. Close the condensate inlet line **[X1]**.

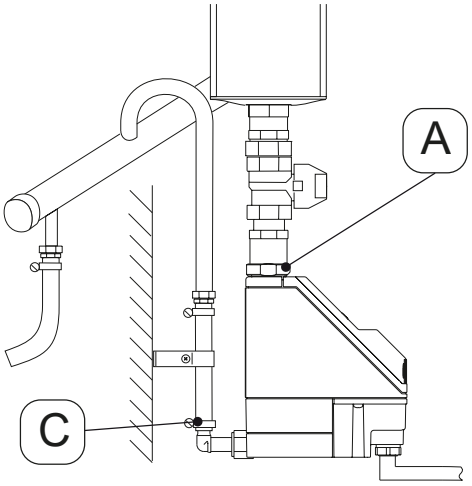
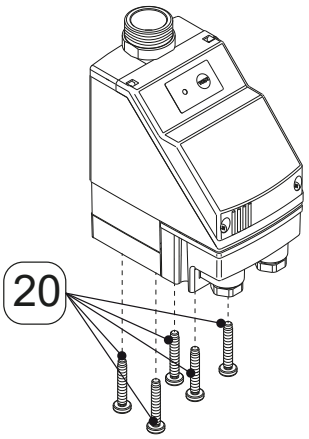
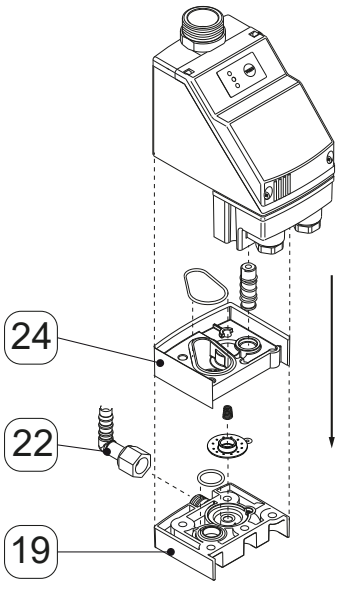
Illustration	Description / explanation
	2. Disassemble the condensate inlet line **[A]** and condensate discharge line **[C]**.
	3. Loosen the 5 screws **[20]**.
	4. Remove the elbow connector **[22]**. 5. Carefully remove the membrane retainer **[19]** and the membrane cap **[24]**.

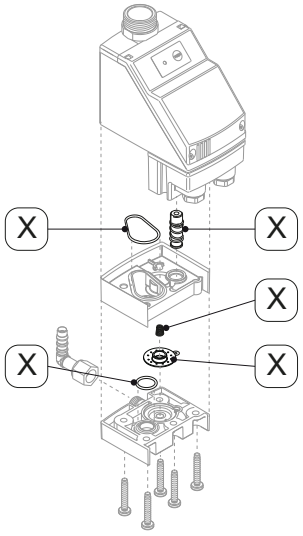
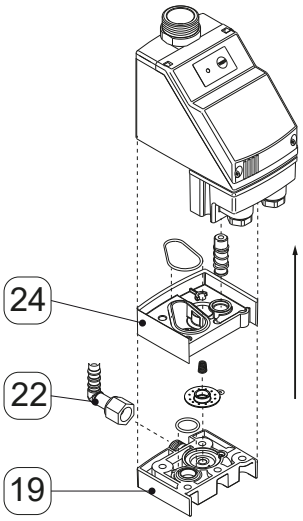
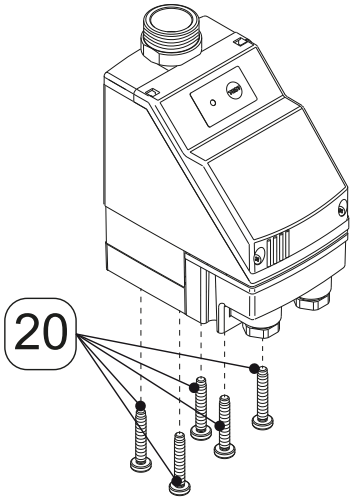
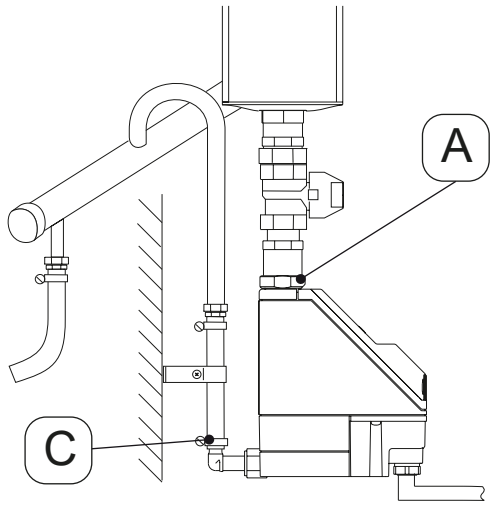
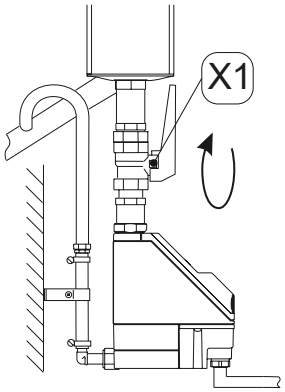
Illustration	Description / explanation
	The components **[X]** are included in the set of wear parts and must be replaced. 6. Grease the O-rings in the set of wear parts. Use a lubricant suitable for this purpose.
	7. Bring the membrane retainer **[19]** and the membrane cap **[24]** together as shown. 8. Fit the elbow connector **[22]**.
	9. Screw the 5 screws **[20]** tight.

Illustration	Description / explanation
	10. Fit the condensate inlet line **[A]** and condensate discharge line **[C]** again.
	11. Open the condensate inlet line **[X1]** slowly.

10.3.2 Visual inspection

During the visual inspection of the **BEKOMAT**®, inspect all components for mechanical damage and corrosion. Replace damaged components immediately.

10.3.3 Leakage test

The leakage test is a non-destructive test method and is used to prove leak tightness in vacuum and overpressure systems. The leakage test can be carried out in different ways. **BEKO** TECHNOLOGIES provides no recommendations for selecting a testing process. The operator of the pressurised system is responsible for the selection and specification of the test method to be used, which should be executed in corresponding to with valid standards and regulations (e.g. DIN EN 1779).

10.3.4 Cleaning

CAUTION	**Inappropriate cleaning and use of the wrong cleaning media!**
	Inappropriate cleaning and the use of the wrong cleaning media may result in minor injuries as well as damage to health and damage to property.
	• Never clean the device with a dripping wet cloth. • Never use abrasive or aggressive cleaning agent or solvents which could damage the outer coating (e.g. markings, type plate, corrosion protection, etc.). • Never clean the device with hard or pointed implements. • Use an anti-static, damp cloth for cleaning the outside. • Immediately replace any product markings (pictograms, markings) that have become illegible.

NOTE	**Local hygiene regulations!**
	In addition to the cleaning instructions listed, any regionally applicable hygiene regulations must be observed.

Preparatory tasks	
1.	The **BEKOMAT®** must have been properly shut down.

Cleaning work	
1.	Spray mild cleaning agent onto a cotton cloth or disposable tissue until it is damp (not wet).
2.	Rub the surfaces of the product with the damp cloth.
3.	Begin operation of the product.

Concluding work	
1.	Put the **BEKOMAT®** together.
2.	Assemble the **BEKOMAT®** (see “6. Assembly” on Page 23).
3.	Put the **BEKOMAT®** into operation (see “8. Commissioning” on Page 40).

11. Consumables, accessories and spare parts

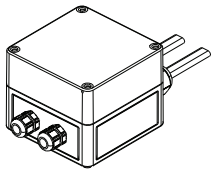
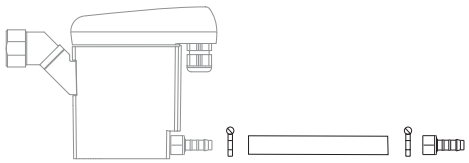
11.1 Order information

BEKO TECHNOLOGIES Service requires the following data for an inquiry or order:

- Serial number (see type plate)
- Material number and designation of the accessory or spare part
- Required quantity of accessories or spare parts to be delivered

The contact data for the **BEKO** TECHNOLOGIES customer services responsible are listed in chapter “1.1 Contact” on Page 5.

11.2 Accessories

Illustration	Description / explanation & order reference
	**Trace heater 230 VAC** 4041657
	**Drain kit** 2000045

11.3 Spare parts and set of seals

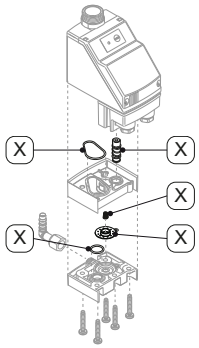
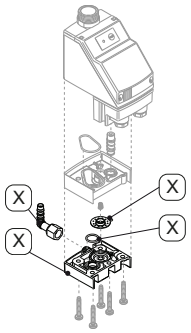
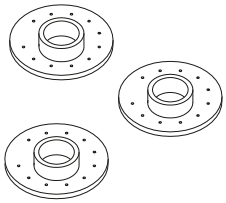
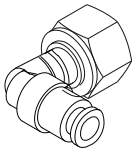
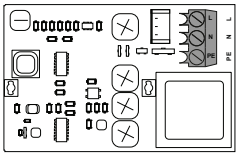
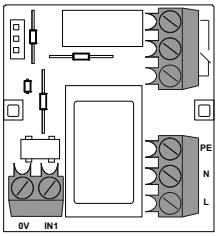
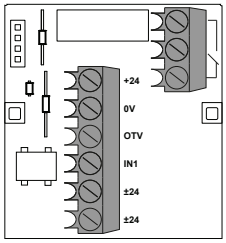
Illustration	Description / explanation & order reference
	**Set of wear parts** 4003701

Illustration	Description / explanation & order reference
	**Membrane seat** 4003700
	**Membrane** 4010167
	**Connection adapter** 4010155
	**Control circuit board** 4047964 (20 Vario)
	**Power control board 230 VAC** 2001501
	Power control board 115 VAC 2001502
	Power control board 24 VAC 2001504
	**Power control board 24 VDC** 2001915

12. Decommissioning

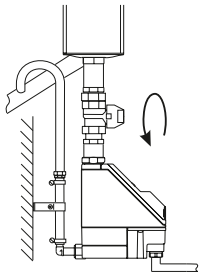
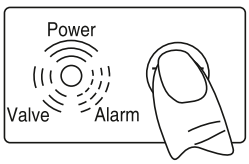
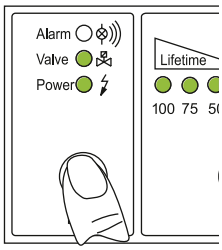
12.1 Warning notices

DANGER	**Pressurised system!**
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• All work on the system must be carried out in the depressurised state and with the system secured against unintentional pressurisation. • Set up a safety area around the working area during all maintenance and repair work.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only carry out maintenance and repair work on the product when it has been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during all maintenance and repair work.

WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and the accessories may only be carried out by skilled technical personnel - customer service.

12.2 Decommissioning work

Illustration	Description / explanation
	1. Close the condensate inlet line.
 	2. Press the TEST button briefly multiple times to discharge the remaining condensate out of the **BEKOMAT®**. 3. Disconnect the **BEKOMAT®** from the voltage supply and switch off all power.

13. Dismantling

13.1 Warning notices

DANGER	**Pressurised system!**
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• All work on the system must be carried out in the depressurised state and with the system secured against unintentional pressurisation. • Set up a safety area around the working area during all maintenance and repair work.

DANGER	**Electric voltage!**
	There is a danger of death or serious injuries as well as malfunction and device failure following contact with components which are in contact with electric voltage.
	• Only carry out maintenance and repair work on the product when it has been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during all maintenance and repair work.

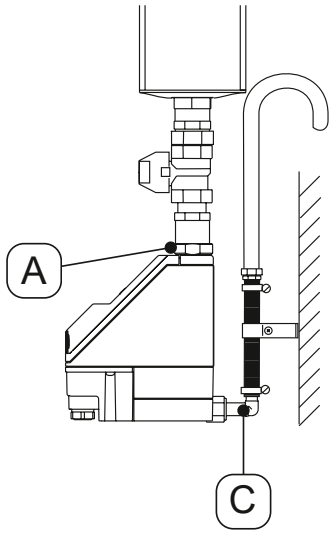
WARNING	**Insufficient qualification!**
	Insufficient qualification of the personnel carrying out work on the product and accessories can lead to accidents, personal injury and damage to property as well as impair operation.
	• All work on the product and the accessories may only be carried out by skilled technical personnel - customer service.

13.2 Dismantling work

For dismantling work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Spanner or adjustable end wrench	• No material necessary	**Always to be worn:** 

Preparatory tasks	
1.	Decommissioning has been completed.
2.	Depressurise the pressurised system or the respective system section and secure it against unintentional pressurisation.

Illustration	Description / explanation
	1. Close the condensate inlet line **[A]** and disassemble it. 2. Disassemble the condensate discharge lines **[C]**.

14. Disposal

14.1 Warning notices

NOTE	Inappropriate disposal!
	Inappropriate disposal of parts and components, operating and auxiliary materials as well as cleaning media can cause environmental damage.
	• Dispose of all components and parts, operating and auxiliary materials as well as cleaning media professionally and in accordance with regional legal provisions, regulations and requirements. • In case of uncertainties regarding disposal, always consult a regional waste management company.

INFORMATION	Disposal of electrical and electronic equipment
	Electrical and electronic equipment (EEE) contains materials, components and substances which can be dangerous and harmful to human health and the environment if the waste from electrical and electronic equipment (WEEE) is not disposed of properly. Electrical and electronic equipment are marked by the crossed out rubbish bin. The crossed out rubbish bin symbolises that electrical and electronic equipment must be collected separately and must not be disposed of together with unsorted domestic waste. For this purpose, all communities have set up collecting systems where waste from electronic equipment or electrical and equipment can be handed in free of charge to recycling stations or other collecting points or can be collected directly from households. Contact the technical office of your local authority for further information. Electrical and electronic equipment may not be disposed of with normal household waste. Users must use the communal collecting systems to reduce the environmental impact of the disposal of electrical and electronic appliances and improve the possibilities for recycling and reusing used electrical and electronic equipment.

14.2 Disposal of operational materials and components

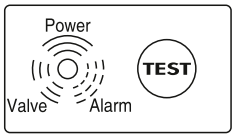
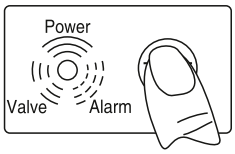
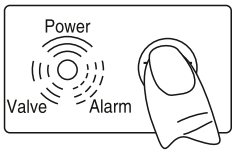
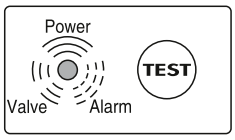
Ensure the following prerequisites are met before disposal:

Preparatory tasks	
1.	The **BEKOMAT®** has been decommissioned.
2.	The **BEKOMAT®** is disassembled.
3.	The **BEKOMAT®** is clean and free from all media residues.

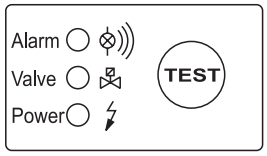
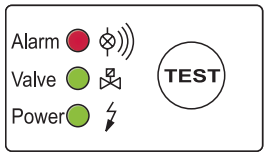
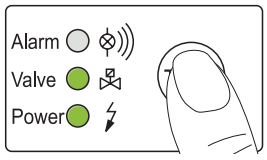
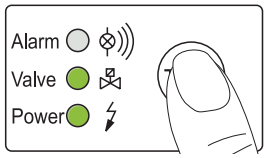
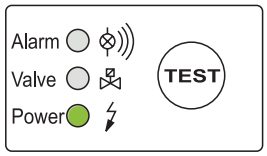
Operating material / components	EU waste code
Adsorption materials, filter materials, cleaning wipes and protective clothing - contaminated by oils or other hazardous substances	15 02 02
Adsorption materials, filter materials, cleaning wipes and protective clothing - with the exception of those classified by 15 02 02	15 02 03
Packaging - paper and cardboard	15 01 01
Packaging - plastic material	15 01 02
Electric and electronic devices with the exception of those covered by 20 01 21, 20 01 23 and 20 01 35	20 01 36

15. Troubleshooting and fault repair

15.1 BEKOMAT® 20

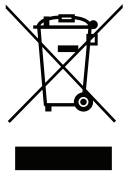
Illustration	Description / explanation	Troubleshooting
	No LED is lit.	• Read off the operating voltage on the type plate and check it. • Check whether voltage is applied to the terminals of the power control board (L, N, PE). • Check the plug-type connection power control board to control circuit board.
	TEST button has been pressed but no condensate is being discharged.	• Check feed lines and drain lines. • Replace wear parts. • Check whether valve clocking can be heard by pressing the TEST button several times. • Check the plug connections of the terminal on the control circuit board.
	Condensate is only discharged when the TEST button is pressed.	• Install feed line with a slope > 3 %. • Clean sensor tube. • Check whether the necessary minimum pressure has been reached.
	Device blows off air continuously.	• Clean entire valve unit. • Replace the set of seals. • Clean sensor tube.

15.2 BEKOMAT® 20 FM

Illustration	Description / explanation	Troubleshooting
	No LED is lit.	• Read off the operating voltage on the type plate and check it. • Check whether voltage is applied to the terminals of the power control board (L, N, PE). • Check the plug-type connection power control board to control circuit board.
	All LEDs are permanently lit.	• Isolate the device from operating voltage and reconnect after > 5 seconds. • Inspect circuit board for potential damage.
	TEST button has been pressed but no condensate is being discharged.	• Check feed lines and drain lines. • Replace wear parts. • Check whether valve clocking can be heard by pressing the TEST button several times. • Check the plug connections of the terminal on the control circuit board.
	Condensate is only discharged when the TEST button is pressed.	• Install feed line with a slope > 3 %. • Clean sensor tube. • Check whether the necessary minimum pressure has been reached.
	Device blows off air continuously.	• Clean entire valve unit. • Replace wear parts. • Clean sensor tube.

16. Appendices

16.1 Approval certificates and declarations of conformity

Symbol	Description / explanation
CE	**CE marking** The CE marking indicates that a product fulfils all the EU directives applicable for this product and that basic safety and health requirements were met during manufacturing of the product. The product may be sold on the European market.
EAC	**EAC marking** The EAC marking indicates that a product fulfils all the Eurasian directives applicable for this product and that basic safety and health requirements were met during manufacturing of the product. The product may be sold on the Eurasian market.
	**WEEE marking** The crossed out rubbish bin marks an electrical or electronic product that must not be disposed of with domestic waste at the end of its service life. Free collecting points for used electrical equipment as well as further acceptance points for reuse of the products are available for them to be returned. Addresses can be obtained from the local authorities.

17. Declaration of Conformity

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EU-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
Modelle:	BEKOMAT 20 ..., 20 FM ..., 20V ..., 20VFM ...
Spannungsvarianten:	24 VDC, 24 VAC, 48 VAC, 100 VAC, 115 VAC, 200 VAC, 230 VAC
Max. Betriebsdruck:	16 bar (g)
Produktbeschreibung und Funktion:	Kondensatableiter zur elektronisch niveaugeregelten Ableitung von Kondensat im Druckluftnetz.

Niederspannungs-Richtlinie 2014/35/EU

Angewandte harmonisierte Normen:	EN 61010-1: 2010 Kapitel 1-14, 16, 17, Anhang A-D, F, G, I-L, ZA

Die Geräte mit einer Betriebsspannung von 24VDC, 24VAC und 48 VAC fallen nicht in den Anwendungsbereich der Niederspannungs-Richtlinie.

EMV-Richtlinie 2014/30/EU

Angewandte harmonisierte Normen:	EN 55011: 2009 + A1: 2010, Gruppe 1, Klasse B EN 61326-1:2013

ROHS II-Richtlinie 2011/65/EU

Die Vorschriften der Richtlinie 2011/65/EU zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten werden erfüllt.

Der Hersteller trägt die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung.

Unterzeichnet für und im Namen von:

Neuss, 07.11.2016

BEKO TECHNOLOGIES GMBH

i.V.

i.V. Christian Riedel
Leiter Qualitätsmanagement International

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EU Declaration of Conformity

We hereby declare that the products named below comply with the stipulations of the relevant directives and technical standards. This declaration only refers to products in the condition in which they have been placed into circulation. Parts which have not been installed by the manufacturer and/or modifications which have been implemented subsequently remain unconsidered.

Product designation:	Condensate drain
Types:	BEKOMAT 20 …, 20 FM …, 20V …, 20VFM …
Supply voltage versions:	24 VDC, 24 VAC, 48 VAC, 100 VAC, 115 VAC, 200 VAC, 230 VAC
Max. operating pressure:	16 bar (g)
Product description and function:	Condensate drain for electronically level-controlled discharge of condensate in the compressed-air system.

Low Voltage Directive 2014/35/EU

Applied harmonised standards:	EN 61010-1: 2010 Section 1-14, 16, 17, Annex A-D, F, G, I-L, ZA

The devices with working voltage of 24 VDC, 24 VAC and 48 VAC are not in the scope of the Low-Voltage Directive.

EMC Directive 2014/30/EU

Applied harmonised standards:	EN 55011: 2009 + A1: 2010, group 1, Class B EN 61326-1:2013

RoHS II Directive 2011/65/EU

The products meet the requirements laid down in European Directive 2011/65/EU concerning the restriction of the use of certain hazardous substances in electrical and electronic devices.

The manufacturer shall have sole responsibility for issuing this declaration of conformity.

Signed for and on behalf of:

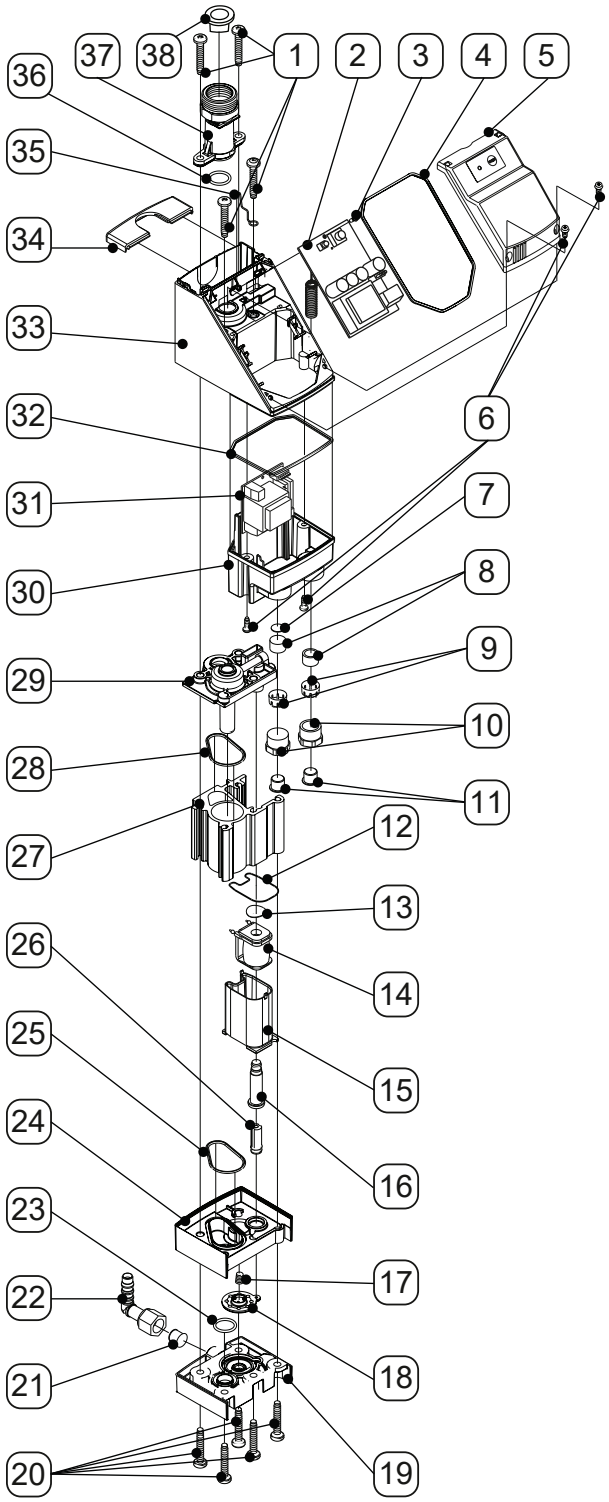
Neuss, 07/11/2016

BEKO TECHNOLOGIES GMBH

i.V. Christian Riedel
Head of International Quality Management

18. Exploded view BEKOMAT® 20

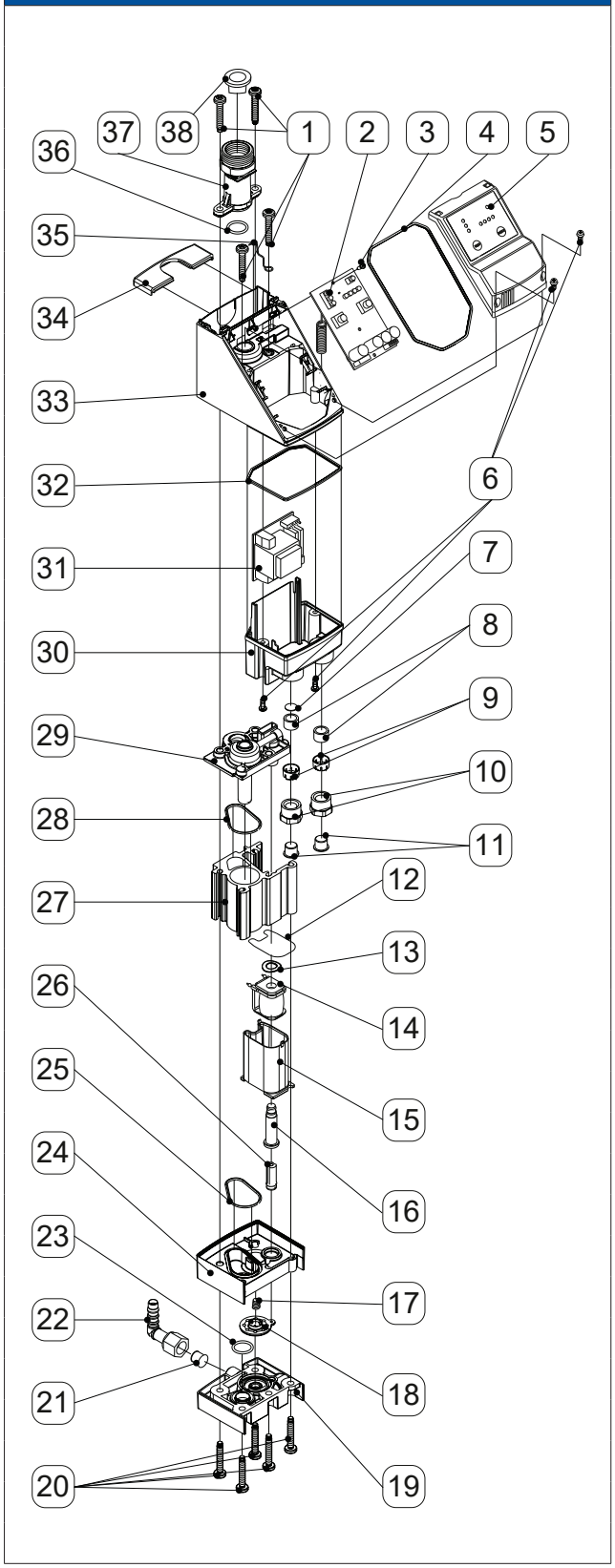
BEKOMAT® 20 PRO



Pos. no.	Description / explanation
[1]	Screw M5 x 30
[2]	Control circuit board
[3]	Screw M2,5 x 8
[4]	Cord packing 2 x 295 mm
[5]	Front cover
[6]	Screw M3.5 x 10
[7]	Dust protection pane
[8]	Sealing ring
[9]	Clamp cage
[10]	Pressure screw
[11]	Locking screw ø10 mm
[12]	Moulded seal
[13]	Spring washer
[14]	Solenoid coil with cable
[15]	Coil housing
[16]	Core guide pipe ⅜way
[17]	Pressure spring
[18]	Membrane
[19]	Membrane seat
[20]	Screw M5 x 30
[21]	Tapered cone plug
[22]	Elbow connector G¼
[23]	O-ring 14 x 1.78 mm
[24]	Membrane cap
[25]	O-ring 31 x 2 mm
[26]	Valve core
[27]	Sensor housing
[28]	O-ring 31 x 2 mm
[29]	Sensor tube plate
[30]	Power supply housing
[31]	Control circuit board
[32]	Cord packing 2 x 212 mm
[33]	Card cage
[34]	Cover
[35]	Mass contact
[36]	O-ring 14 x 1.78 mm
[37]	Adapter inlet G¾ outer, G½ inner
[38]	Locking screw G½

19. Exploded view BEKOMAT® 20 FM

BEKOMAT® 20 Vario FM



Pos. no.	Description / explanation
[1]	Screw M5 x 30
[2]	Control circuit board
[3]	Screw M2,5 x 8
[4]	Cord packing 2 x 295 mm
[5]	Front cover
[6]	Screw M3.5 x 10
[7]	Dust protection pane
[8]	Sealing ring
[9]	Clamp cage
[10]	Pressure screw
[11]	Locking screw ø10 mm
[12]	Moulded seal
[13]	Spring washer
[14]	Solenoid coil with cable
[15]	Coil housing
[16]	Core guide pipe ³⁄₂way
[17]	Pressure spring
[18]	Membrane
[19]	Membrane seat
[20]	Screw M5 x 30
[21]	Tapered cone plug
[22]	Elbow connector G¼
[23]	O-ring 14 x 1.78 mm
[24]	Membrane cap
[25]	O-ring 31 x 2 mm
[26]	Valve core
[27]	Sensor housing
[28]	O-ring 31 x 2 mm
[29]	Sensor tube plate
[30]	Power supply housing
[31]	Control circuit board
[32]	Cord packing 2 x 212 mm
[33]	Card cage
[34]	Cover
[35]	Mass contact
[36]	O-ring 14 x 1.78 mm
[37]	Adapter inlet G¾ outer, G½ inner
[38]	Locking screw G½

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