



Oil-free | Catalytic Converter BEKOKAT®

Consistent oil-free and germ-free compressed air through certified catalysis technology: BEKOKAT®

Highest process safety

Do you not want to make any compromises in your production with regard to compressed air quality? Do you want to make sure at all times that the compressed air complies with ISO class 1 or better, i.e. that it contains no oil or germs? Then the TÜV-certified catalytic converter BEKOKAT® is an interesting solution.

ISO 8573-1 Class 1 or better

In highly sensitive applications, conventional compressed air preparation has technical and economic limits when it comes to particularly high requirements in the residual oil content of the compressed air.

The catalytic converter BEKOKAT® sets new standards in this respect by completely converting hydrocarbons into carbon dioxide and water through total oxidation on the catalyst. The process thus consistently produces oil-free compressed air with a maximum residual oil content of hardly measurable 0.003 milligrams per cubic meter. With this performance, the BEKOKAT® units exceed the residual oil content of 0.01 mg/m³ specified in Class 1. In other words, a quality that is required in particularly demanding production processes, e.g. in the food, pharmaceutical, automotive and electronics industries.

The BEKOKAT® unit is installed as a stand-alone solution behind the compressors or at point of use.

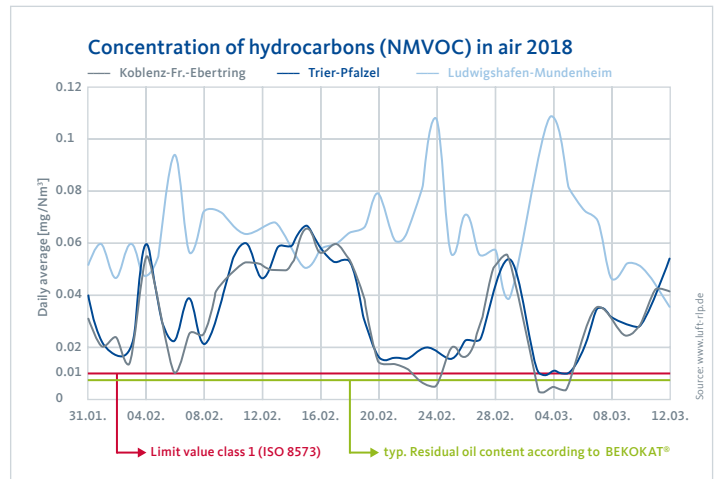
- › Highest process reliability through continuous process monitoring
- › Constant germ-free and oil-free compressed air in class 1 or better according to ISO 8573-1
- › Direct availability even after breaks in operation due to stand-by function
- › Particularly energy-efficient due to integrated heat recovery, effective insulation and low pressure loss
- › Safe partial load operation between 20 % - 100 %
- › Simple operation and clear display of the current operating status
- › Independent of ambient temperature, air humidity and oil input concentration
- › Flexible installation in central processing or at the terminal
- › Can be retrofitted in existing plants

BEKOKAT® – for constant oil- and germ-free compressed air independent of ambient conditions

The intake air for compressed air generation is usually contaminated with hydrocarbons. Even with oil-free compressed air generation, a treatment solution is therefore required.

The catalytic converter BEKOKAT® reliably cleans the compressed air and thus constantly provides oil-free compressed air better than class 1 according to ISO 8573-1.

The catalytic compressed air treatment breaks down all hydrocarbons in the compressed air into carbon dioxide and water. Due to process temperatures above 150°C, the escaping compressed air behind the BEKOKAT® is free of germs, bacteria and viruses.



Due to the ambient conditions alone, oil-free compressed air production cannot constantly ensure class 1 or better

Innovative technology with practical details

Display shows current operating data, temperatures and status messages

The network-enabled control system automatically closes the inlet and outlet valves in the event of unwanted system states or power failures

Stand-by circuit and fast heat-up time ensures full safety even after interruptions in operation

Service-friendly due to easy access to all components

Low maintenance angle seat valves protect downstream equipment



Oil-free compression as a guarantee for oil-free compressed air? Not necessarily

A main source of oil in compressed air is the compressor: In oil-lubricated machines, a proportion of the lubricating oil always gets into the compressed air. To prevent this, the installation of compressors with oil-free compression is a common procedure. Although this method prevents additional oil entering the

compressed air, it does not guarantee oil-free compressed air. In addition to hydrocarbons from the intake air, lubricated valves or contaminated pipelines can be further sources of oil and oil vapour in the compressed air.

Sources of oil and oil vapour in compressed air



Environment

Depending on the direct surroundings and individual circumstances, additional dangers may exist: In addition to dust and moisture, oil can also enter the compressed air system through the ambient air.



Compressor

Contamination can occur not only in oil-lubricated compressors: Oil can also enter the compressed air network through the ambient air drawn in for compression.



Valves / Fittings / Fittings

It depends on the execution: For example, even oil-lubricated valves can be a reason for oil in the compressed air network.



Pipeline

Once contaminated, there is a constant risk: over the years, deposits form in the pipe network, which even intensive cleaning cannot prevent.

Effective insulation saves energy

Internal temperature above 150°C eliminates not only oil but also bacteria, viruses and germs

Durable high performance catalytic material

Integrated heat recovery ensures high energy efficiency

Easy transport and installation

Concrete compressed air quality according to ISO 8573-1

According to ISO 8573, the oil contents are defined by classes (see illustration). In addition to the oil content, moisture and particle content are also specified in the compressed air classes. The required absence of particles is ensured by appropriate filter stages (CLEARPOINT®) and the required air humidity by matched dryers (DRYPOINT®). The current compressed air quality can be permanently measured and documented by measurement technology (METPOINT®). An alarm can be triggered automatically in case of deviations. This is real process reliability in the overall compressed air supply system.







| ISO 8573-1, 2010 | Oil content: liquid, aerosol, mist |
|------------------|------------------------------------|
| Class | mg/m ³ |
| 0 | stricter requirements than class 1 |
| 1 | ≤ 0.01 |
| 2 | ≤ 0.1 |
| 3 | ≤ 1 |
| 4 | ≤ 5 |

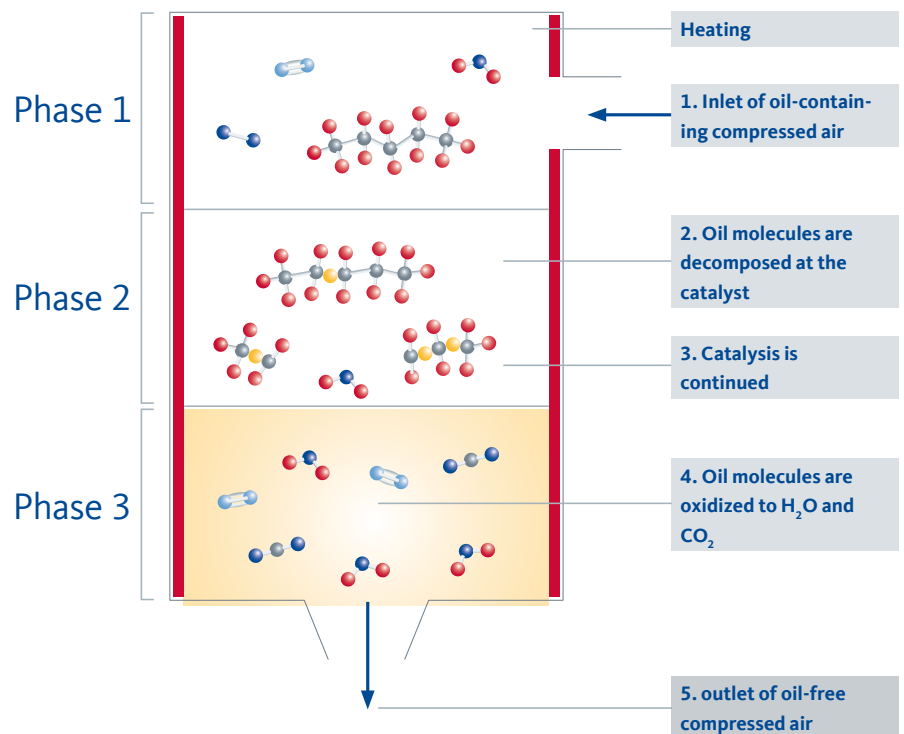
The functionality of the BEKOKAT®

For compressed air preparation with the BEKOKAT®, the specially developed granulate is heated in the pressure vessel to a temperature of 150 °C. In the catalyst, the oil molecules of the compressed air flowing through the heated container (1) are completely converted to water and carbon dioxide on the surface

of the catalyst granulate (2) (3). Completely deoiled, sterile compressed air emerges from the container.

The condensate produced when the compressed air cools down is also oil-free and can be discharged into the sewerage system without treatment.

| | |
|------------------------------------|---|
| Oil molecule (carbon and hydrogen) |  |
| Catalyst |  |
| N ₂ -nitrogen |  |
| O ₂ -oxygen |  |
| CO ₂ -carbon dioxide |  |
| H ₂ O-water |  |



Safety and cost efficiency from the very beginning - for years

The highly efficient air-to-air heat exchanger in BEKOKAT® keeps the average power consumption at a very low level. Even in partial load operation of up to 20 %, the catalyst technology of the BEKOKAT® unfolds its effectiveness without restrictions. The enormous service life of the special catalyst granulate is also extremely advantageous from an economic point of view.

In addition to cost efficiency, a high degree of process reliability is also required. On the one hand, the intelligent control system monitors all relevant parameters of the plant. If, in the event of an accident, so much oil should enter that the compressed air can no longer be reliably treated, precision valves close and prevent any oil spillage.

The BEKOKAT® is extremely flexible in its installation. It can be installed centrally in the compressed air station and thus treat 100 % of the generated compressed air oil-free, or it can be installed in partial lines or in direct proximity to the compressed air consumer in order to treat directly only the compressed air flow that is required oil-free.

By connecting several BEKOKAT® in parallel, high capacities can be achieved and a by-pass can be implemented, e.g. for maintenance purposes, to ensure a continuous supply of conditioned compressed air.

Certified safety for your processes through oil-free and germ-free compressed air

Together with TÜV Nord, it has been proven under real operating conditions that compressed air treated with the BEKOKAT® exceeds the Class 1 specification of ISO 8573-1.

In a second series of tests with the Gesellschaft für Produktionshygiene und Sterilitätssicherung mbH (GfPS) it was confirmed that compressed air contaminated with bacteria is treated aseptically in the BEKOKAT®. After treatment, no living bacteria could be detected in the compressed air flow.



Intelligent and network-capable control ensures simple and safe operation

The menu navigation via the colour backlit display of the SIEMENS control system enables safe and easy operation of the system. Thus, warnings or instructions can be displayed in addition to the respective plant status. It permanently checks the condition of the plant and displays temperatures, operating hours and times until the next maintenance interval if required.

The intelligent control system regularly checks the operating parameters by means of the integrated sensors and automatically closes the inlet and outlet valves in the event of unwanted system conditions or power failures in order to prevent contamination of the downstream pipeline and thus the product. It reliably prevents this. This helps to comply with even the most demanding standards and specifications and protects the entire system from expensive damage and longer downtimes.

Due to its network capability (Modbus converter), it is compatible with a wide range of control systems and can be integrated into control centre systems.

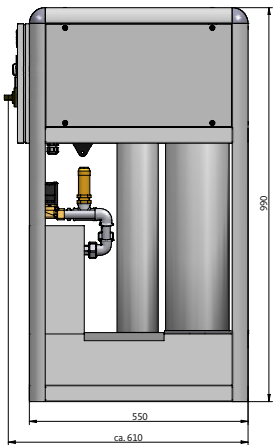
This intelligent and network-compatible control is integrated in all BEKOKAT® converters, except the compact version BEKOKAT® CC-018.



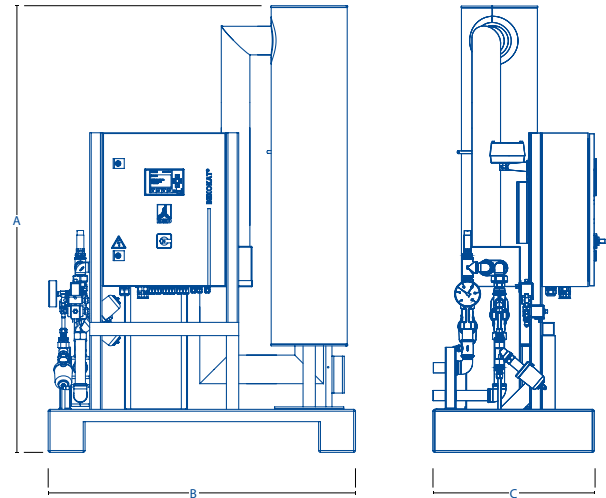
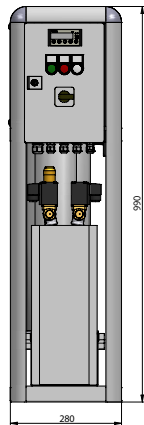
The menu navigation of the SIEMENS control system enables safe and easy operation of the plant and can display the respective plant status, warnings or instructions

The optionally available Shiny Package shows from a distance through different colours which operating state the system is in.

Technical data:



BEKOKAT® CC-018



BEKOKAT® iCC-060 to iCC-1200

| BEKOKAT® | CC - 018 | iCC - 060 | iCC - 120 | iCC - 180 | iCC - 360 | iCC - 720 | iCC - 1200 |
|--|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Volume flow (m ³ /h) * ¹ | 18 | 60 | 120 | 180 | 360 | 720 | 1200 |
| Max. Operating pressure (bar [g]) | 11 | 16 | 16 | 16 | 16 | 16 | 11* ² |
| Power supply | 230 V, 50 Hz, 1 Ph | 230 VAC, 50 Hz, 1 Ph, PE | 400 VAC, 50 Hz, 3 Ph, PE | 400 VAC, 50 Hz, 3 Ph, PE | 400 VAC, 50 Hz, 3 Ph, PE | 400 VAC, 50 Hz, 3 Ph, PE | 400 VAC, 50 Hz, 3 Ph, PE |
| Install. Power (kW) | 0.58 | 1 | 1.64 | 2.64 | 5.14 | 8.74 | 13.84 |
| Average power (kW) | 0.20 | 0.52 | 0.86 | 1.33 | 2.17 | 3.26 | 3.75 |
| Connection | G1/2 | R1 | R1 | R1 | R1 1/2 | R2 | R2 1/2 |
| Dimensions | | | | | | | |
| A (mm) | 990 | 1450 | 1530 | 1530 | 1250 | 1530 | 1760 |
| B (mm) | 280 | 1000 | 1000 | 1000 | 1750 | 1910 | 2030 |
| C (mm) | 610 | 560 | 560 | 560 | 700 | 770 | 920 |
| Weight (kg) | 61 | 140 | 175 | 200 | 325 | 530 | 742 |

Flexible use

The technical data are given for an operating pressure of 7 bar [g]. Pressures deviating from this are simply possible. We will be pleased to design a system individually for your application. Talk to us.

Economical operation

The installed power is mainly required in the heat-up phase after switching on the BEKOKAT®. The BEKOKAT® works economically and efficiently during operation due to the integrated heat exchanger with low energy consumption.

Other voltages on request.
Other models on request.

*¹ referred to +20 °C and 1 bar [a]
*² 16 bar [g] Version on request.

BEKOKAT®: The solution for highly sensitive processes

According to ISO 8573, the oil contents are defined by classes. The catalytic splitting process in BEKOKAT® reliably breaks down all oils. This allows class 1 and better to be achieved. If, in the event of

an accident, so much oil should enter that the compressed air can no longer be reliably treated, precision valves close and prevent any oil spillage.



Compressed air makes ice cream creamy

In ice cream production, "whipping" refers to the blowing of compressed air into the ice cream base to give it its creamy-creamy consistency.

The compressed air comes into very intensive contact with the ice cream. Smallest oil contents or even only a few germs make the ice cream inedible.



Oil-free for a steady recovery

In the production of pharmaceuticals, the strictest hygiene standards apply and also apply to the compressed air required. This is used, for example, in the production of tablets: After the tablet press,

compressed air is used to remove dust. Oil content in the compressed air is a hygiene problem here and could also lead to swelling of the pressed tablets.



Oil-free for a perfect paint finish

The automotive industry places extremely high demands on the quality of compressed air in the painting process.

The process air comes into intensive contact with the paint and the surface. Any contamination, no matter how small, leads to irregularities in the paint appearance.



For technology that works

In the electronics industry, compressed air is used, for example, as a transport and cleaning medium or as an energy source for pneumatic tools. In every application the requirements for purity of

the compressed air enormous. Even the slightest contamination can lead to defective products when exposing printed circuit boards. Absolutely oil-free compressed air is one of the most important requirements for trouble-free production.



For all applications: Compressed air drying

Moisture can also endanger the operating process. Our comprehensive range of refrigeration, membrane and adsorption dryers covers a wide spectrum of drying degrees and quality classes and can achieve pressure dew points between +15 and -70 °C for any volume flow. Everything from one source for your success!

Everything from one source for your success!

 Filtration



 Condensate technology



 Drying



 Oil-free



 Measurement technology

Do **you** have questions about the best way of processing your compressed air?

We have the answers! We offer efficient solutions for any type of processing chain. Please contact us with all your queries. We would be delighted to tell you more about our condensate

treatment, filtration, drying, measuring and process technology, and our comprehensive services.

Visit us at



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