

DENIOS.

ENVIRONMENTAL PROTECTION
& WORK SAFETY



Business division
Thermotechnology

**Efficient heating,
melting or cooling**

Many challenges: one solution



The right temperature for process substances

Companies in the chemical sector and the food industry work with additives on a daily basis. This could mean resins, additives or oil-based substances on the one hand or maybe fats, fillings or chocolate on the other. All these additives have one thing in common – they are used on a frequent basis and can only be optimally processed within a certain temperature range. Thermo-technical solutions from DENIOS keep your substances in a constant temperature range – whether it's heating technology for temperatures up to 250 °C or cooling and climate control technology down to - 25 °C.

At DENIOS, we began building up our skills in the safe and legally-compliant handling and storage of sensitive substances back in 1986. We know the challenges of each industrial sector and we meet these challenges together with our customers. The result: Solutions which effectively protect people, the environment and company values while ensuring your processes can run as efficiently as possible.



DENIOS know-how supporting your processes

We understand that the requirements for thermal treatment systems differ at a fundamental level from those for conventional storage. Thermo-technical solutions from DENIOS support you in the preparation of substances for your process chains, either in maintaining of viscosity or climate controlled storage of additives.

When storing substances which are potentially hazardous for people or the environment, for example if they are toxic, oxidising or even explosive, you can also rely on our specialist HazMat storage expertise. Denios products haven't just catered to the market, we've shaped it! Many solutions which are now a standard were originally developed by us. The first spill pallet came from DENIOS, as did the first fire-rated module container.

Whether you want to heat treat substances or store hazardous substances. DENIOS is always looking for the best solutions for our customers' requirements and constantly improving standard solutions. And when the standard solution does not meet your requirement? Then we'll design and build an individual project especially for you! Individual solutions from DENIOS are being used in all sectors of industry on a daily basis, but particularly so in the thermotechnology area.

Safe. Certified. Worldwide.

Just like our HazMat storage containers, our thermo-technical solutions are in-house projects at DENIOS. 2500 room systems a year are produced in our 6 productions sites across Europe and the USA. The same high level of quality is guaranteed for every DENIOS product. We ensure this is checked on a regular basis. Certification by well-known institutes is as much a matter of course for us as meeting European standards such as EN 1090 or REI 120. We often meet these requirements before they come into force. This makes our products a safe investment for the future, supporting you in ensuring your process costs are optimised and additional follow-on costs are avoided. We guarantee this as the market leader – not only in Germany.

Regardless of where you are in the world, DENIOS is nearby. Our decades of experience in international markets means that we have a large network of specialists available to help our customers. With over 700 employees in 17 locations, there's always a DENIOS expert at your side. Our customer service extends way beyond simple product advice. As part of our project management, we'll ensure a meaningful, efficient and economical integration of your new product into your processes on site. Even after delivery we offer comprehensive service and maintenance options to ensure the long life of your DENIOS product.

**We've got every
temperature covered.**



Thermotechnology from DENIOS

Our thermotechnology division offers a wide range of solutions for thermal process technology. From deep freezing to heating to 250 °C. Whether you are looking for climate control, heating or tempering. Many sectors find the right product for their application in our range.

Our well-thought-out product range covers many of your thermal processes. You will also benefit from an individual solution, with no compromises.

Are you already familiar with DENIOS AG as a competent and reliable partner for the storage of hazardous materials? We're much more than that. The requirements for the storage of hazardous substances differ from those for thermo-technical applications. Numerous standards and laws need to be observed by the operator as part of their employee and environmental protection obligations. This has a direct effect on the storage solution. Water-law approved spill pallets, devices for the targeted deflection of pressure waves in the event of an explosion, modern sensor technology or certified fire protection are only a few examples of specific features in this area. You can rely on DENIOS expertise - the specialists in hazardous materials storage.

Thermal technology

Do you need heating systems to reduce viscosity for example?

With our heat chambers you'll have an efficient and long lasting system for temperatures up to 150 °C. Choose your options from one to 18 IBCs (4 to 72 x 205 litre drums). There are four different energy sources for your heat exchanger. The system can be painted, galvanised or finished in stainless steel. A wide range of accessories are available to suit your needs. And if all that isn't enough, we can offer individual solutions with even more space and temperatures up to 250 °C.

Full information **from page 8**



35 °C <T< 250 °C

Cooling technology

Do you need cooled or climate controlled room systems with excellent energy efficiency?

Then you'll be certain to find a suitable solution in our cooling technology range. Temperature ranges from 0 °C to 35 °C are covered, with cooling or climate controlled equipment depending on requirements. Both our storage container systems model KK for 2 to 6 IBCs (8 to 24 x 205 litre drums) and our walk-in systems model KMC with an area of 5 to 13 m² offer plenty of space. For freezing applications down to - 25 °C, greater space requirements or environmental simulations, our specialist advisors will be happy to help define a custom solution.

Full information **from page 26**



-25 °C <T< 35 °C

Special requirements

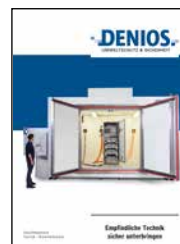
External factors may require special solutions when handling hazardous substances. Many of these have already been addressed in our well-thought-out standard solutions. In addition, our HazMat storage technology offers a range of excellent features which are not generally used in thermo-technology.

Solutions for these requirements can be found in our brochure **"HazMat storage technology"**:

- Temperature controlled storage systems with certified fire protection (eg for paint stores)
- Increase levels of safety (eg peroxide stores)
- Insulated system containers for frost-free storage, also suitable for other types of substances

Solutions for the following requirements can be found in our brochure **"Technical / safety rooms"**:

- Lab rooms with constant room temperatures
- Test benches with defined temperatures
- Li-Ion rooms with climate control features



Order our product brochures on hazardous materials storage technology or technical / safety rooms

- **Germany** + 49 (0) 800 753-000-4
- **Austria** + 43 (0) 6225 20 533
- **Switzerland** + 41 (0) 56 417 60 60

Or go to our website

www.denios.de | www.denios.at | www.denios.ch

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Cooling technology

Cooling and climate controlled chambers

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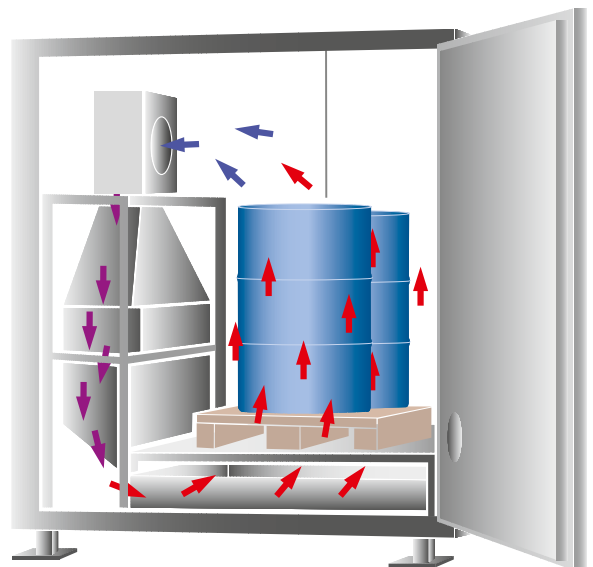
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Thermal technology

Operating principle

A radial fan draws the air from the upper part of the heat chamber and passes it through a downstream heat exchanger where it is heated. Air ducts channel the heated air back under the products. This turbulent air flow quickly creates uniform heating of the products.

The interaction between the heat exchanger, the air flow, the fan and the air duct geometry is essential to ensure an even temperature distribution around the entire system.



Heating system diagram;
turbulent flow around the container for
efficient heating

Heat chambers with the highest of standards

Each of our heat chambers is designed to ensure the required temperature is reached quickly and reliably, even when ambient temperatures are not stable. The main components ensure this is guaranteed

- **heat exchanger**
- **air distribution**
- **all round insulation materials and**
- **precise control system**

These components are selected to work together in an optimal way. Based on these core components, the system can then be customised with a wide range of equipment, for example doors, heating, ventilation, fire protection and many more. Every system is individually designed to meet your requirements - and at an attractive price.

Thermal preparation with added value

- **reliable constant temperatures**
- **energy-saving and efficient**
- **low operating costs**
- **short heating times**
- **spill pallet meets WHG regulations**
- **fire-rated design up to REI 120 (optional)**
- **explosion-proof ATEX version (optional)**
- **GMP-compliant design (optional)**
- **silicon free design (optional)**

System description

A solid frame in welded profile steel and a certified spill pallet which complies with the water laws (WHG) form the basis for our heat chambers. Insulation on all sides reduces heat transfer to a minimum. The insulation used consists of 100 mm thick sandwich elements, with a fire resistance classification of EI 120 (in accordance with EN 13501).

In the thermally insulated door area, silicon seals are used and integrated safety locks ensures minimum energy losses. Heaters and controls are fitted to meet your requirements. You decide the capacity and layout.

- 1** Insulation with a high thermal insulation value
- 2** Door contact switch (optional)
- 3** Air circulation fan with weather protection
- 4** Control system including temperature regulator
- 5** Heating system (electric, steam, thermal oil or warm water)
- 6** Safety temperature limiter
- 7** Pt100 sensor to record the temperature
- 8** Integrated spill pallet
- 9** Base plate for anchoring, 100 mm ground clearance
- 10** Spill guards
- 11** Safety bar
- 12** Tight sealing doors with a safety lock



For up to 12 drums or 3 IBCs

These heat chambers are ideal for use close to production facilities with their space saving design. Your additives will always be close at hand and ready to use for

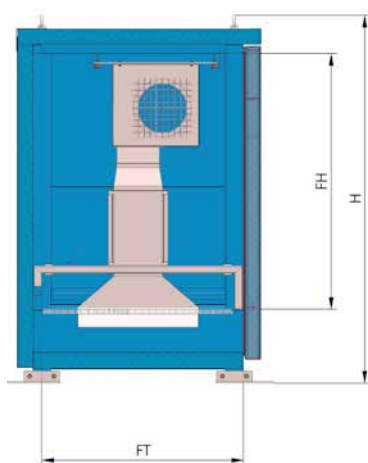
- Heating
- Melting
- Tempering
- Viscosity reduction

Heating and air distribution are ideally matched to ensure a uniform temperature profile.

Dispensing and dosing activities can therefore be carried out at any time.

The heat chambers are specially designed for tempering up to 150 °C and have enough capacity for up to 12 x 205 litre drums or 3 IBCs.

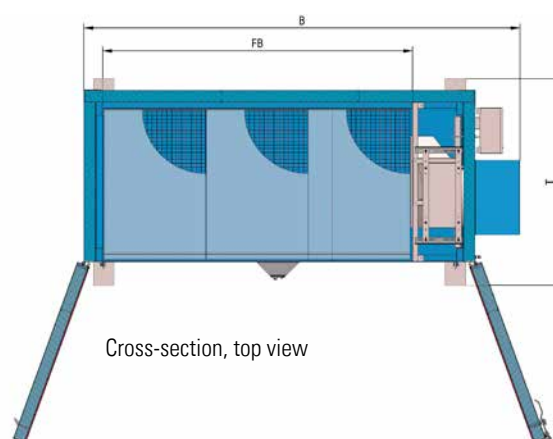
The integral spill pallet with WHG approval ensures your products can also be stored for a longer time in a legally-compliant manner. The bay height of this range also allows larger containers to be stored.



Cross-section, side view



Perspective



Cross-section, top view

B = Width
H = Height
T = Depth
FB = Bay width
FH = Bay height
FT = Bay depth



Explosion-proof designs are optionally available

Model	Structure	Containment volume (l)	Capacity				Bay dimensions (W x D x H mm)	External dimensions (W x D x H mm)	Empty weight (kg)	Load capacity (kg / m²)
			IBC	CP	EP	Drum				
WK 214-1		1000	1	1	1	4	1300 x 1340 x 1700	2340 x 1810 x 2700	1400	1250
WK 314-1		1000	2	2	3	8	2700 x 1340 x 1700	3740 x 1810 x 2470	1800	1250
WK 414-1		1000	3	3	4	12	3900 x 1340 x 1700	4940 x 1810 x 2400	2300	1250

IBC = Intermediate Bulk Container, 1000 l · CP = Chemical pallet for 4 x 205 litre drums · EP = Euro pallet for 2 x 205 litre drums · Drum = 205 litre drum directly on the grid

Note: Dimensions and weights may differ depending on optional equipment. We reserve the right to make technical changes.



WK 314-1 heat chamber for tempering 2 IBCs or drums on 2 chemical or 3 Euro pallets

Versions

Energy carriers:

- Electricity
- Steam
- Warm water
- Thermal oil

Spill pallet:

- integral
- removable
- volume-optimised
- without spill pallet

Surfaces:

- steel, painted
- galvanised
- stainless steel V2A
- stainless steel V4A

ATEX designs:

- Internal and external, not explosion-proof
- Internal Ex T3 or T4, Ex-Zone 1, external, not explosion-proof
- Internal Ex T3 or T4, Ex-Zone 1, external Ex T3 or T4 Ex-Zone 2
- Internal Ex T3 or T4, Ex-Zone 1, external Ex T3 or T4 Ex-Zone 1

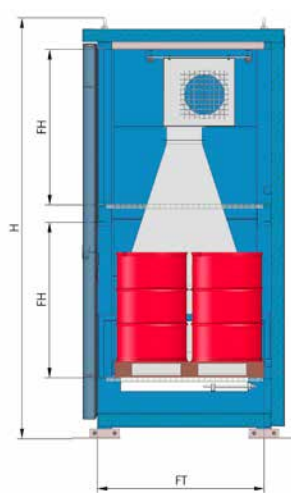
For up to 36 drums or 9 IBCs

This range of products has an excellent compact size. For DENIOS, compact means lots of space inside, but with a small foot-print. This gives the optimum conditions for

- storage of large quantities
- high throughput
- products with slow heating characteristics

These compact heat chambers reach an air circulation rate of 4000 m³/ hour. The relationship between heating and air circulation is optimally adjusted. Uniform temperature and quick heating are guaranteed.

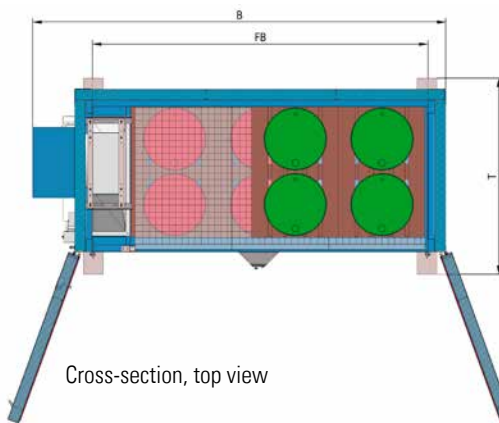
The single bay heat chamber offers space for up to 36 x 205 litre drums or 9 IBCs for thermal processes up to 150 °C. The integral spill pallet also ensures safe storage.



Cross-section, side view



Perspective



Cross-section, top view

B = Width
H = Height
T = Depth
FB = Bay width
FH = Bay height
FT = Bay depth



Explosion-proof designs are optionally available

Model	Structure	Storage levels*	Containment volume (l)	Capacity				Bay dimensions (W x D x H mm)	External dimensions (W x D x H mm)	Empty weight (kg)	Load capacity (kg / m ²)
				IBC	CP	EP	Drum				
WK 314-2-K		2	1000	4	4	6	16	2700 x 1340 x 1500	3740 x 1810 x 3910	2600	1250
WK 414-2-K		2	1000	6	4	8	20	3380 x 1340 x 1500	4425 x 1810 x 3910	2900	1250
WK 414-2-P		2	1000	6	6	8	24	3900 x 1340 x 1500	4950 x 1810 x 3860	3100	1250
WK 314-3-K		3	1000	6	6	9	24	2700 x 1340 x 1500	3740 x 1810 x 5550	3500	1250
WK 414-3-K		3	1000	9	6	12	30	3380 x 1340 x 1500	4425 x 1810 x 5550	4000	1250
WK 414-3-P		3	1000	9	9	12	36	3900 x 1340 x 1500	4950 x 1810 x 5520	4300	1250

IBC = Intermediate Bulk Container, 1000 l · CP = Chemical pallet for 4 x 205 litre drums · EP = Euro pallet for 2 x 205 litre drums · Drum = 205 litre drum directly on the grid

Note: Dimensions and weights may differ depending on optional equipment. We reserve the right to make technical changes.
* Please note that for systems with 3 storage levels, the system will be delivered in sections and assembled on-site.



Heat chamber WK 314-2-K for reliable tempering of drums and IBCs

Versions

Energy carriers:

- Power
- Steam
- Warm water
- Thermal oil

Spill pallet:

- integral
- removable
- volume-optimised
- without spill pallet

Surfaces:

- steel, painted
- galvanised
- stainless steel V2A
- stainless steel V4A

ATEX designs:

- Internal and external, not explosion-proof
- Internal Ex T3 or T4, Ex Zone 1 and 2, external not explosion-proof
- Internal Ex T3 or T4, Ex Zone 1 and 2, external Ex T3 or T4 Ex Zone 2
- Internal Ex T3 or T4, Ex Zone 1 and 2, external Ex T3 or T4 Ex Zone 1

For up to 72 drums or 18 IBCs

Keeping additives in large containers such as IBCs or on drum pallets tempered at a set temperature is a requirement of many manufacturing processes. Heat chambers from DENIOS offer the perfect environment for

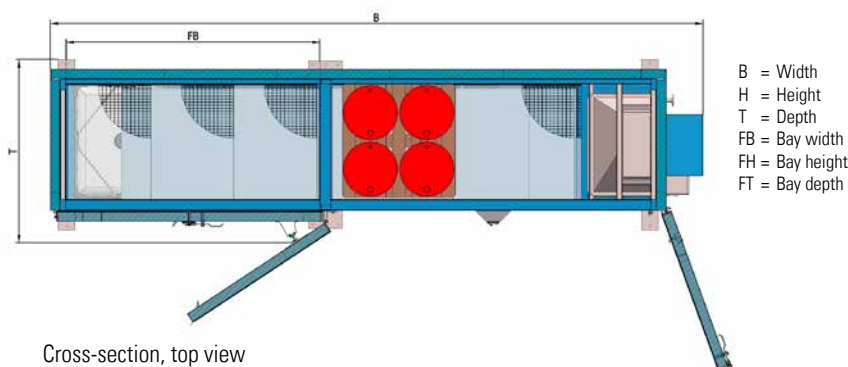
- protecting products at a constant temperature
- high throughput for various production stations
- storing varied products
- heating before delivery

With space enough for up to 18 IBCs or 72 x 205 litre drums, the heating performance of the 2 bay heat chamber is ideal for industrial use. 8000 m³ air is circulated per hour, ensuring the necessary heat reaches every container.



Cross-section, side view

Perspective



Cross-section, top view



Explosion-proof designs
are optionally available

Type	Structure	Storage levels*	Containment volume (l)	Capacity				Bay dimensions (W x D x H mm)	External dimensions (W x D x H mm)	Empty weight (kg)	Load capacity (kg / m ²)
				IBC	CP	EP	Drum				
WK 614-2-K		2	1000	8	8	12	32	2700 x 1340 x 1500	6870 x 1940 x 3790	4300	1250
WK 714-2-K		2	1200	12	8	16	40	3380 x 1340 x 1500	8230 x 1940 x 3840	5000	1250
WK 814-2-K		2	1200	12	12	16	48	3900 x 1340 x 1500	9270 x 1940 x 3820	5500	1250
WK 614-3-K		3	1200	12	12	16	48	2700 x 1340 x 1500	6870 x 1940 x 5430	6100	1250
WK 714-3-K		3	1800	18	12	24	60	3380 x 1340 x 1500	8230 x 1940 x 5500	6900	1250
WK 814-3-K		3	1800	18	18	24	72	3900 x 1340 x 1500	9270 x 1940 x 5480	7500	1250

IBC = Intermediate Bulk Container, 1000 l · CP = Chemical pallet for 4 x 205 litre drums · EP = Euro pallet for 2 x 205 litre drums · Drum = 205 litre drum directly on the grid

Note: Dimensions and weights may differ depending on optional equipment. We reserve the right to make technical changes.
* Please note that for systems with 3 storage levels, the system will be delivered in sections and assembled on-site.



Heat chamber WK 614-2-K with removable spill pallet (galvanised) and rear heater

Versions

Energy carriers:

- Power
- Steam
- Warm water
- Thermal oil

Spill pallet:

- integral
- Removable
- volume-optimised
- without spill pallet

Surfaces:

- steel, painted
- galvanised
- stainless steel V2A
- stainless steel V4A

ATEX designs:

- Internal and external, not explosion-proof
- Internal Ex T3 or T4, Ex Zone 1 and 2, external not explosion-proof
- Internal Ex T3 or T4, Ex Zone 1 and 2, external Ex T3 or T4 Ex Zone 2
- Internal Ex T3 or T4, Ex Zone 1 and 2, external Ex T3 or T4 Ex Zone 1

Heaters

The heater

We offer efficient combinations of heating and air recirculation systems to ensure a short warming time combined with uniform temperature distribution.

Choose between:

■ electrical supply:
complete flexibility and low costs when connected to your power network

■ valve controlled energy supply:
steam, thermal oil or warm water. Use the available process heat or make economic use of your waste heat.

Heaters to meet your individual requirements

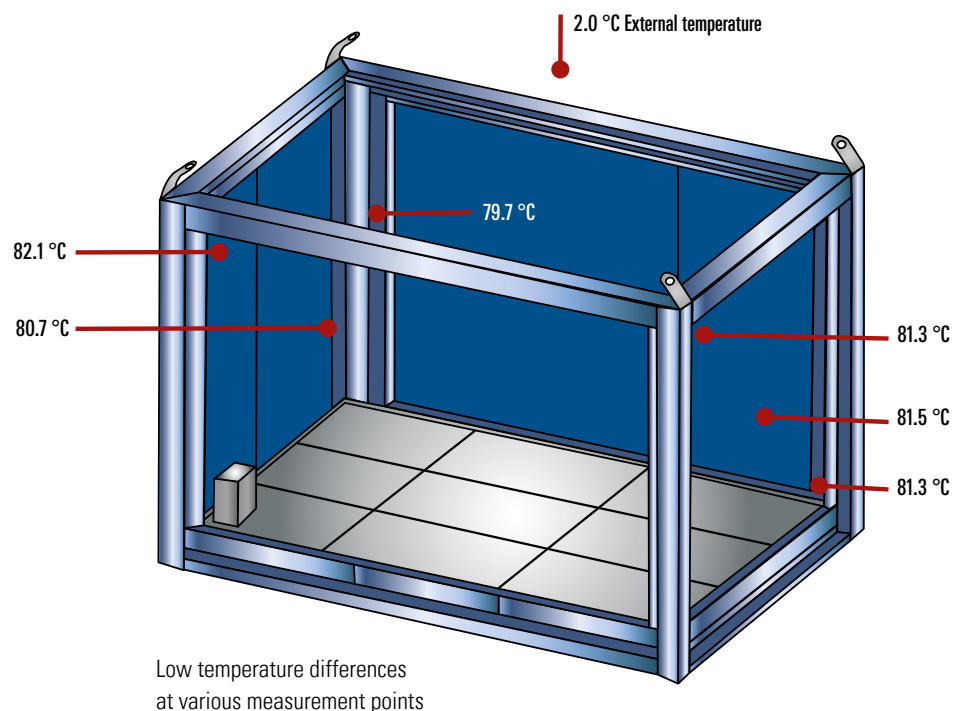
The heater must suit your requirements. Factors such as energy carrier, safety or space available play a deciding role. DENIOS will produce heating equipment for your thermal system, which is directly suited to your product requirements and on-site heating systems.

The arrangement of heaters is completely flexible. Heat transfer performance can be adjusted to meet your requirements, to save resources. Individual adjustments can be made using our wide range of accessories. For example explosion protection according to the ATEX guidelines is possible, regardless of heating medium.

Schematic diagram

This shows virtually uniform temperature distribution at all the relevant measuring points.

An external temperature of 2 °C and a target internal temperature of 81 °C yields temperature differences of just 2.4 Kelvin. This result is achieved by making use of the very best heating, ventilation and insulation components.





Steam heating with temperature regulation, mechanical, without auxiliary power

Also suitable for warm water and heat transfer oil as heating media

- heat exchanger for 12 bar operating pressure
- designed in accordance with ADR 2000
- control valve with thermostat setting range 20 °C to 120 °C or 50 °C to 150 °C (others on request)
- incl. dirt trap
- safety temperature limiter mechanical trigger, pre-set if customer requires
- electrical signal on trigger (optional)
- condensate side: flange connection
- optional condensate separator
- air recirculation fan with motor protection switch
- temperature gauge via analogue thermostat



Steam heating with temperature regulation, electrical

Also suitable for warm water and heat transfer oil as heating media

- heat exchanger for 12 bar operating pressure
- designed in accordance with ADR 2000
- control valve with electric drive and a digital position regulator, which closes if the power is off
- incl. dirt trap
- safety temperature limiter mechanical trigger, pre-set if customer requires
- optionally with electro-pneumatic drive
- condensate side: flange connection
- optional: condensate trap
- air recirculation fan with motor protection switch
- control system incl. digital temperature regulator
- Pt100 sensor to record the temperature



Electric air recirculation heating with digital temperature regulation

- electric heat exchanger
- heating rods and stainless steel housing material
- integrated overheating protection
- controller incl. self-optimising digital controller
- digital target and actual value displays
- temperature range pre-set if customer requires
- Pt 100 to record the temperature
- safety temperature limiter, electrical trigger, freely configurable
- delivered ready to connect



Explosion-proof designs are optionally available

Control system

Control components to suit your requirements

All heating systems (with the exception of steam or auxiliary power) are fitted with micro-processor controllers, which ensure high quality control. Only established brands are used for the fitted electrical components. All connections are fully pre-wired and a compliant wiring diagram is provided. The systems are delivered ready for connection.

Our control systems offer the best possible troubleshooting for a long life. So we can best meet your needs with the minimum investment, choose from three control versions and add additional options to complete your operational requirements.

Function	Basic	Comfort	Premium
PID or PWM control	√	√	√
Collective alarm	√	√	√
Heat chamber temperatures below 50 °C	–	√	√
Integration of air extraction function (option)	–	o	o
Time-controlled fan run-on	–	o	√
Operation timer	–	√	√
Integration of door contact switch	o	o	√
Integration of automatic door locking	–	o	o
Data display with historical function <ul style="list-style-type: none"> Operating time Door opening Ambient temperature Room temperature Operating status Fault notifications 	–	–	√
Data output by USB-interface	–	–	√
Stepped operation (time dependent temperature process) ¹⁾	–	–	√
Temperature adjustment in Ex Zones ²⁾	–	–	√
MODBUS connection	–	–	√
Touch screen display (also in Ex design)	–	–	o
WEB – interface for remote control	–	–	o

¹⁾ For improved temperature control we recommend stepped function to be fitted with an air extraction fan

²⁾ Design with ATEX conform Touch Panel

– not available o optional √ feature



Digital controller for the Basic control option



Digital controller for the Comfort and Premium variants



Optional touch panel display for the Premium control option



Explosion-proof designs are optionally available

Variants

Explosion protection according to ATEX

When handling flammable substances you need to consider the creation of explosive atmospheres, especially with thermal processes. The operator should carry out a risk analysis and then implement suitable protective measures.

DENIOS is able to offer support and will configure your heating systems in accordance with your Ex Zone evaluation. This means that together, we can ensure safe, legally-compliant handling of your hazardous substances.

Versions:

- Internal and external, not explosion-proof
- Internal Ex T3 or T4, Ex Zone 1 and external, not explosion-proof.
- Internal Ex T3 or T4, Ex Zone 1 and external Ex T3 or T4 Ex Zone 2
- Internal Ex T3 or T4, Ex Zone 1 and external Ex T3 or T4 Ex Zone 1



Heat chamber in ex-proof design inside and out



Heater arrangement

Depending on the storage requirements, the heaters can be fitted in various positions.



Surface design options

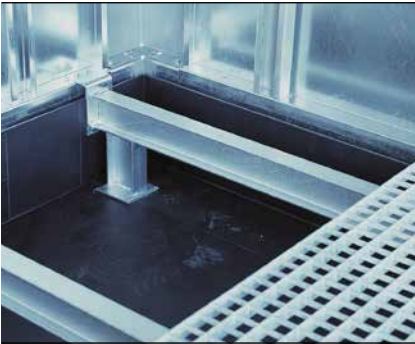
Each heating system or individual component can be painted or galvanised. A full stainless steel design is also available.



Separate heating rooms

Makes it possible to heat substances to different temperatures in the same system.

Internal accessories



Spill pallets

In addition to the WHG spill pallet, the system may also be fitted with the following variants:

- slide-out spill pallet for easy cleaning
- spill pallet with slope and drain outlet
- without spill pallet

Spill pallets in PE (up to 80 °C), steel (galvanised) or stainless steel are available



Built-in components

The Basic version has grids on each storage level. You can also choose from:

- supports for horizontally stored drums
- rollers
- trolley rail systems

Double-depth systems give great access in a compact space.



Door locking

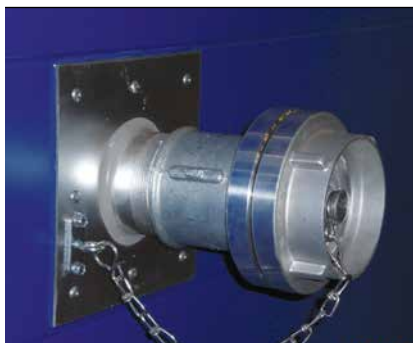
The wing doors of the heat chamber are fitted with safety locks. Alternatively, we offer:

- additional locking from inside
- vertical locking bars
- espagnolette lock



Insulation

The mineral wool insulation meets the highest requirements for fire protection and has very good insulation properties. If required, thicker insulation can be fitted, significantly lowering the U value. For certain applications, insulation using a PU hard foam may be suitable. This almost doubles the thermal insulation for the same material thickness!



Safety technology

The safety of people and the environment is our priority. We offer a wide range of options to protect your workforce

- semi-fixed extinguishing systems
- fire alarm equipment
- leak sensors
- signal transfer and much more

! Additional internal accessories

If required we would be happy to offer additional components to make using your thermal system easier:

- mixers
- lifting equipment
- pumping equipment
- wall break-through points
- internal lighting
- and much more

External accessories



Door design

The door has a major influence on loading and unloading processes. Choose between:

- wing doors, as standard with the best insulation properties
- roller doors (up to 80 °C), easy to use, with automatic opening if required



Door hold-open devices

Especially outdoors, workers need to be protected from the wing doors closing by themselves. We offer:

- door bolts
- retaining magnets
- electro-magnetic door hold-open devices



Outdoor locations

To reduce the effects of the weather and ensure long life for your thermal system, even when used outdoors, we offer:

- moisture-proof designs
- canopies
- rain protection roofing



Air extraction

If hazardous vapours are created (eg harmful, toxic or flammable) in the internal room, the air extraction system can be turned on to remove the contaminated atmosphere and make it safe to open the doors. The extraction system can be operated manually or timer-controlled.



Safety technology

DENIOS uses many solutions to ensure early recognition of any faults. Monitor your system with acoustic and visual warning systems for example. Direct data evaluation and signal transfer to control systems are also possible.

Your system can also be fitted with access controls as an option.

! Additional external accessories

If required we would be happy to offer additional components to make using your thermal system easier:

- door contact switch
- collision protection
- viewing window
- external lighting
- and much more

Heating systems for individual containers



Solutions for practical warming of individual containers

Do your production processes need precisely prepared substances, but the place they are needed varies? For individual containers, drum heaters and heating jackets of various sorts are ideal. Whether buckets, canisters, hobboscks, drums or IBCs need to be warmed, you'll always find the right product for your container at DENIOS. The range of applications is varied:

- to reduce viscosity of a fluid so it can be more easily pumped and filled
- to melt solids before they are used in a process
- to temper substances so they are at the optimum working temperature
- to avoid crystallisation or coagulation
- and many other applications.

The controlled range extends up to 90 °C for a heating jacket and up to 300 °C for a drum heater. Often, explosive gas-air mixtures are created during warming, meaning that ATEX certified heating equipment is needed. Regardless of your individual container application, DENIOS has the right solution.

Your advantages

- 1. Lightweight, compact, cost-effective:** Heating equipment is light in weight and needs just a small space for storage. This investment is ideal for small quantities or temporary use.
- 2. Practical and space-saving:** This heating equipment can temper your containers right where you need them to be used. Onward transport of the container is not needed.
- 3. Simple to use:** All heating equipment is fitted with all the required components such as cables, plugs, thermostats etc to ensure safe and reliable operation. They are quick to fit and just as easy to remove.
- 4. Flexible and adaptable:** Heating jackets fit snugly round the shape of the container to be heated. Oval, flattened or convex containers can easily be heated.
- 5. Efficiency:** Thanks to the direct contact between the heating equipment and the container, highly effective, uniform heat transfer takes place through the container wall. The integral insulation limits heat losses to the environment and ensures that external contact temperatures are not too high.
- 7. Quick delivery:** All heating equipment is generally available from stock. In addition to quick delivery, we also offer our 5 year DENIOS guarantee.



Help is at hand - the DENIOS main catalogue

Get more information on our complete product range in our main catalogue or get expert advice on the phone

- **Germany** + 49 (0) 800 753-000-2
- **Austria** + 43 (0) 6225 20 533
- **Switzerland** + 41 (0) 56 417 60 60



Heating jackets for drums and IBCs

Heating jackets are ideal for occasional or seasonal use. Or, when a high degree of flexibility or long term use is required. They are easy to use and cost-effective.



Heating jacket HM 3A, for a 205 litre drum



Heating jacket HM 3A Ex, for a 205 litre drum



Heating jacket HM 4 for IBCs



Heating jacket HM 4 Ex for IBCs

Type	Heat production (W)	Controlled range: (°C)	External dimensions (mm)	Weight (kg)	Application		Explosion-proof
					IBC	Drum	
Heating jacket HM 3A	900	0 - 90	1800 x 1950	5	-	•	-
Heating jacket HM 3A Ex	720	Up to 80, automatic	1800 x 1950	12	-	•	•
Heating jacket HM 4	2000	0 - 90	4060 x 4310	15	•	-	-
Heating jacket HM 4 Ex	1800	Up to 55 automatic	4060 x 4310	20	•	-	•

Drum heaters for quick, uniform tempering

Drum heaters are specially developed to be used at various locations. Stepless, digital control ensures accurate adjustment of the heating performance to your application. Effective warming is guaranteed thanks to the shape of the heater.



Drum heater model FH-M 4.0, with jacket heater



Drum heater, model FH-K 5.5 with separate temperature regulation for base or side heating



Induction drum heater model JHG

Model	Heat production (W)	Controlled range: (°C)	External dimensions (Ø x H mm)	Weight (kg)	Application		Explosion-proof
					IBC	Drum	
Drum heater FH-M 4.0	4000	0 - 300	1000 x 1190	120	-	•	-
Drum heater FH-K 5.5	5500	0 - 300	1000 x 1190	140	-	•	-
Induction heater JHG	2250	Up to 120, automatic	750 x 710	48	-	•	•

Practical example

Hazardous material storage technology



System container ISO for frost-free storage

Energy efficient construction and a high quality finish are the continual focus of DENIOS development. Special requirements for the storage of temperature sensitive substances are also considered, such as

- reliable maintenance of the required temperature, despite varying environmental temperatures
- uniform temperature throughout the inside of the system
- uniform air exchange
- non-flammable insulating materials for the storage of flammable liquids
- explosion protection (optional)

If you need to protect your substances from the effects of Winter, the ISO System Container is the right product. You'll be able to prevent crystallisation of your products at low ambient temperatures.

This is just one example from our hazardous substance storage technology product range. For more information, take a look at our brochure.

Fluidity even in Winter

The construction principle of the System Container is also used for the insulated version. The sturdy welded steel frame design is covered on all sides with insulating sandwich panels.

PUR panels (construction material class B-s3-d0 in accordance with EN 13501-1) are generally used for the storage of non-flammable substances. If flammable liquids are to be stored, the storage container is covered with non-flammable mineral wool panels (construction material class A2-s1-d0 in accordance with EN 13501-1) as required by law.

The all-round ISO System Container wall insulation protects against energy losses for frost-free storage.

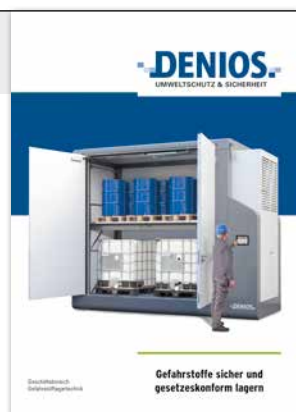
Overview of product features

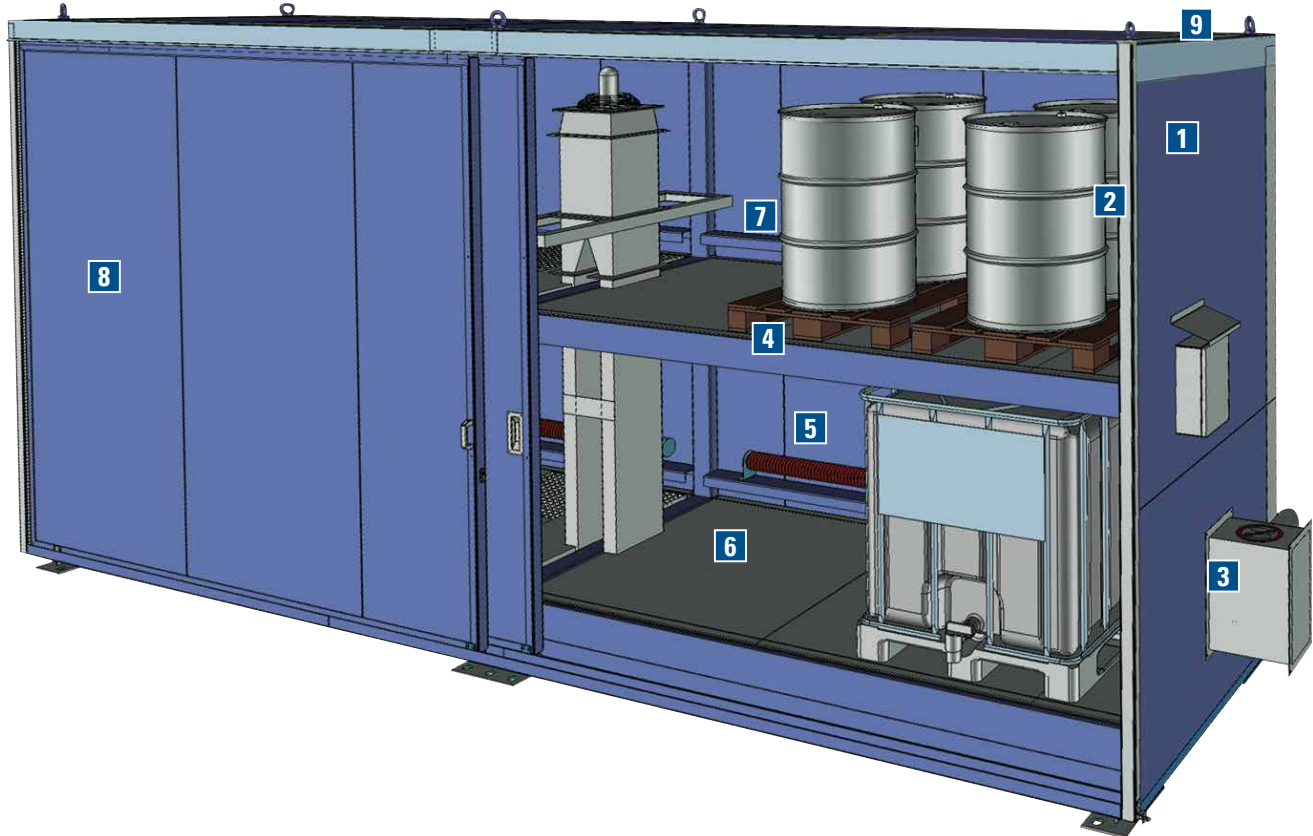
- insulated design for the storage of frost-sensitive substances
- approved for the storage of water-polluting substances in all water-polluting classes (all WGK classes) and for the passive and active storage and handling of flammable liquids (flash point $\leq 60^\circ\text{C}$, classed as H224, H225 or H226)
- efficient insulation thanks to sandwich panels with mineral wool or PUR core
- with electric heating system

! Help is at hand - the HazMat storage technology brochure

Get more information on our complete product range in our hazardous material storage technology brochure or get expert advice on the phone:

- **Germany** + 49 (0) 800 753-000-3
- **Austria** + 43 (0) 6225 20 533
- **Switzerland** + 41 (0) 56 417 60 60





- 1** efficient insulation with PU hard foam or mineral wool
- 2** welded steel frame construction
- 3** technical ventilation for flammable liquids
- 4** stable storage surfaces for IBCs and drums
- 5** finned tube heating with additional air recirculation
- 6** spill pallet tested to WHG
- 7** safety bar
- 8** front closing with thermal insulated sliding, wing or roller doors
- 9** crane eyes

PU panels

- sandwich panels with an insulating core in polyurethane hard foam (PUR)
- very good insulation against heat losses
- material thickness 50 mm, construction material class B-s3-d0, U value = 0.45 W/(m²K)



Wall insulation in PUR panels

Mineral wool panels

- sandwich panels with an insulating core in mineral wool
- good insulation, long life and fire protection classification (EI 45)
- material thickness 50 mm, construction material class A2-s1-d0, non-flammable, U value = 0.77 W/(m²K)



Wall insulation in mineral wool

Heating systems

All heating systems are designed for frost-free storage (-15 °C external temperature, +5 °C internal temperature).

The ISO System Container is fitted with finned tube electric heating. For dual bay containers additional air guides for optimum air / temperature distribution are fitted.



Finned tube heater

Cooling technology

Operating principle

When we're looking at cooling technology at DENIOS, we pay special attention to the specific requirements of the operator. Whether it's a storage container system or a walk-in version, all our cooling and climate control chambers are designed to meet individual requirements. All-round thermal insulation is generally provided by PUR insulation with a minimum thickness of 100 mm. The climate control or cooling equipment and the control system are designed in accordance with the requirements and the overall system. With an integral spill pallet, hazardous substances in all water-polluting classes may be safely stored. If required, in addition to an EnEV compliant design, we can also include fire protection and explosion protection.



DENIOS cooling system
with 2 wing cooling room door

Main features

- Reducing energy consumption by up to 50 % compared to traditional systems
- Even temperature distribution inside the container
- Integrated spill pallet
- Uniform insulation properties over the entire outer shell
- Use of high-quality climate control doors with low temperature transfer
- EnEV compliant design
- Fire protection
- Explosion-proof design

Climate control in accordance with DIN EN 13779

The European standard EN 13779 classifies the air quality in rooms which are not residential but are designed for people to stay in. The quality of the air in the room, the inlet air and extracted air as well as the external air are all classified.

EN 13779 specifically highlights the responsibility of planners. In concrete terms this means that everyone involved with the construction of a climate control system must work together at an early stage to avoid misunderstandings and unnecessary costs.

Let the project managers at DENIOS take control from the start of your planning stage to ensure that your cooling and climate control systems meet all the necessary requirements.

Efficient cooling and climate control

- **Storage systems and walk-in systems**
- **High-performance cooling units (split units) with high-quality regulation to ensure an accurate temperature window**
- **Maximum energy efficiency**
- **The very best insulating materials**
- **High-performance systems for optimum air circulation**

System description

Whether you're looking for climate control or cooling down to temperatures of 0 °C, both our chamber systems fitted with shelving and our walk-in systems can be designed for this purpose. The basic frame for our cooling and climate control chambers is in solid welded steel profiles with an integral WHG approved spill pallet. With all-round built-in insulation in polyurethane hard foam with a U value of 0.24 W/m²K, we ensure that high quality insulation is achieved. Insulated doors are used for the access area which can

be fitted with anti-icing heating if required. Depending on the temperature range needed, climate control split equipment or cooling equipment can be used. With a comprehensive range of accessories available, these systems can be customised to suit your individual requirements. This means our standard solutions can be adapted to suit the requirements of many sectors: chemical, pharmaceutical, automotive or food industry.

Features table

	Storage container system	Walk-in system
Climate control	√	√
Cooling (down to 0 °C)	√	√
Hazardous material storage (WHG)	√	√
Large container storage	√	–
Small container storage	–	√
Fire protection	o	o
Explosion protection	o	o
EnEv compliance	o	o
Freezing (below 5 °C) down to -25 °C Special solution on customer request	o	o

– not available o optional √ feature



KK 314-1 in fire-rated design
with 2 wing door, door hold-open device
and integral climate control equipment

Storage container systems Model KK

Storage container systems from DENIOS with cooling and climate control technology offer a great range of possibilities. Individual requirements can be met with our comprehensive range of equipment and modular designs.

The use of precise control technology with defined set temperatures allows the storage of sensitive substances in the temperature range 0 °C to 35 °C. The water-law compliant spill pallet forms the basis for safe, legally-compliant storage. Fire protection and explosion protection are also available if required.



Climate controlled chamber in fire-rated design with integral regulation ensuring constant temperature for flammable substances.

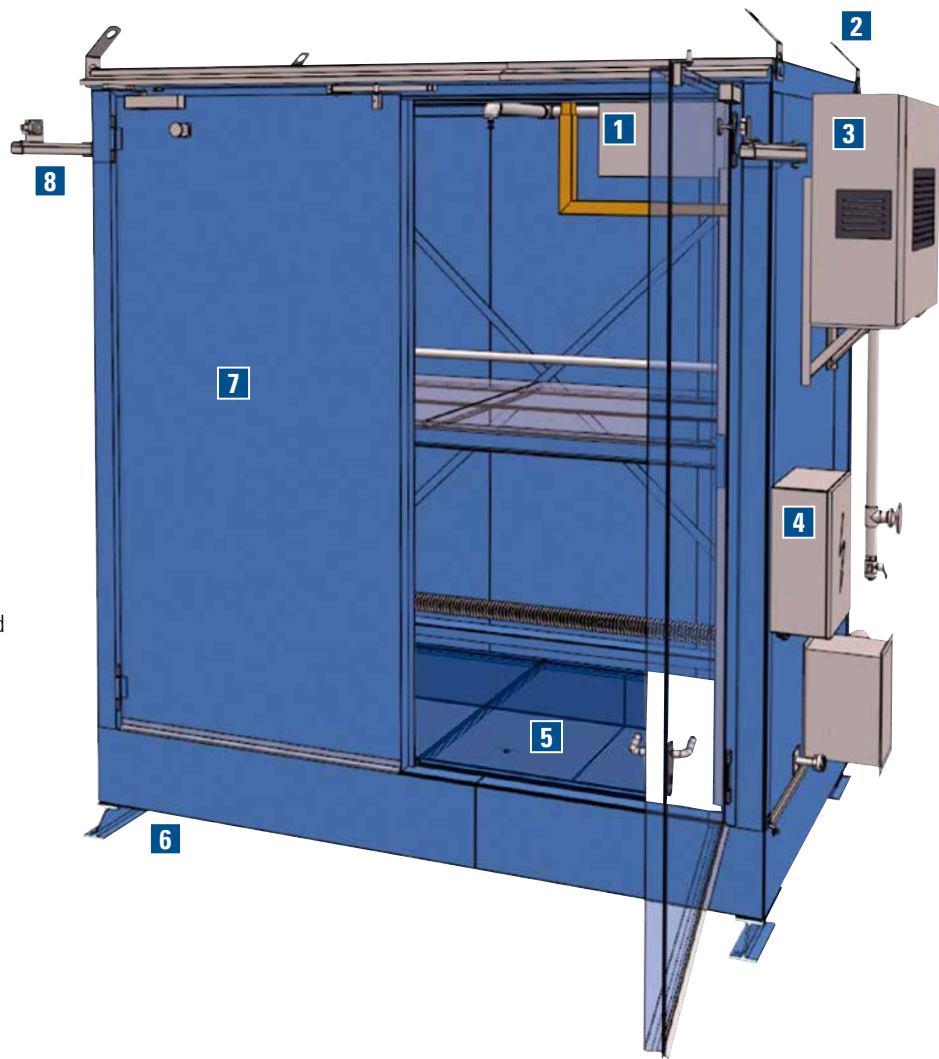


Explosion-proof designs
are optionally available

Model	Structure	Containment volume (l)	Capacity				Bay dimensions (W x D x H mm)	External dimensions (W x D x H mm)	Empty weight (kg)	Load capacity (kg / m ²)
			IBC	CP	EP	Drum				
KK 214-1-K		1000	2	2	3	8	2700 x 1280 x 2570	2920 x 1650 x 3180	1800	1250
KK 214-2-K		1000	4	4	6	16	2700 x 1280 x 1500	2920 x 1650 x 3750	1800	1250
KK 314-1		750	—	2	3	10	3000 x 1280 x 2640	3220 x 1650 x 3120	2400	1000
KK 314-2		750	—	4	6	20	3000 x 1280 x 1250	3220 x 1650 x 3210	2400	1000
KK 414-2-K		1180	6	4	8	20	3380 x 1280 x 1500	3600 x 1650 x 3690	2900	1250
KK 414-2		1100	—	6	8	24	3900 x 1280 x 1250	4120 x 1650 x 3120	2900	1000

IBC = Intermediate Bulk Container, 1000 l · CP = Chemical pallet for 4 x 205 litre drums · EP = Euro pallet for 2 x 205 litre drums · Drum = 205 litre drum directly on the grid

- 1** Internal climate control system
- 2** Removable crane eyes
- 3** External climate control system
- 4** Switch cabinet with full control system
- 5** Spill pallet, approved for all water hazard classes
- 6** 100 mm ground clearance, accessible with lifting equipment
- 7** Lockable wing doors
- 8** Door hold-open device



Thought through

The cabinet is accessible underneath, allowing loading using lifting equipment, the integral spill pallet enables storage of hazardous substances in all water-polluting classes.

The system construction combined with the use of explosion-proof components (optional) also makes it possible to store flammable, oxidising and combustible toxic substances (storage classes 3 / 5.1 / 6.1 A) with temperature control.

Powerful performance

The loss of cool air when the system is opened is compensated for with powerful cooling equipment. These units are designed so that a loss of energy can be compensated for in a very short time, without risking a rise in the temperature of the stored containers. This minimises the risk of damage to the materials that are being cooled.

Economic

The heart of every DENIOS cooling and climate control system is formed by the climate control components, consisting of an interior unit with a heat exchanger and fan, and an exterior unit with a condenser and a facility to enable switching over between cooling and heating.

Walk-in systems Model KMC

The walk-in cooling and climate control systems in the KMC range are based on a sturdy steel frame, have all round insulation and an integral spill pallet. They are ideally suited to the safe and legally-compliant temperature controlled storage of hazardous substances in all water-polluting classes. The control system reliably regulates temperatures in the range 0 °C to 35 °C.

The cooling and climate control container KMC is available in two versions:

- KMC base is the basic version with standard insulation
- KMC eco is the highly energy-efficient version with EnEV certification

If required, these walk-in systems can be provided in a fire-rated and explosion proof design.



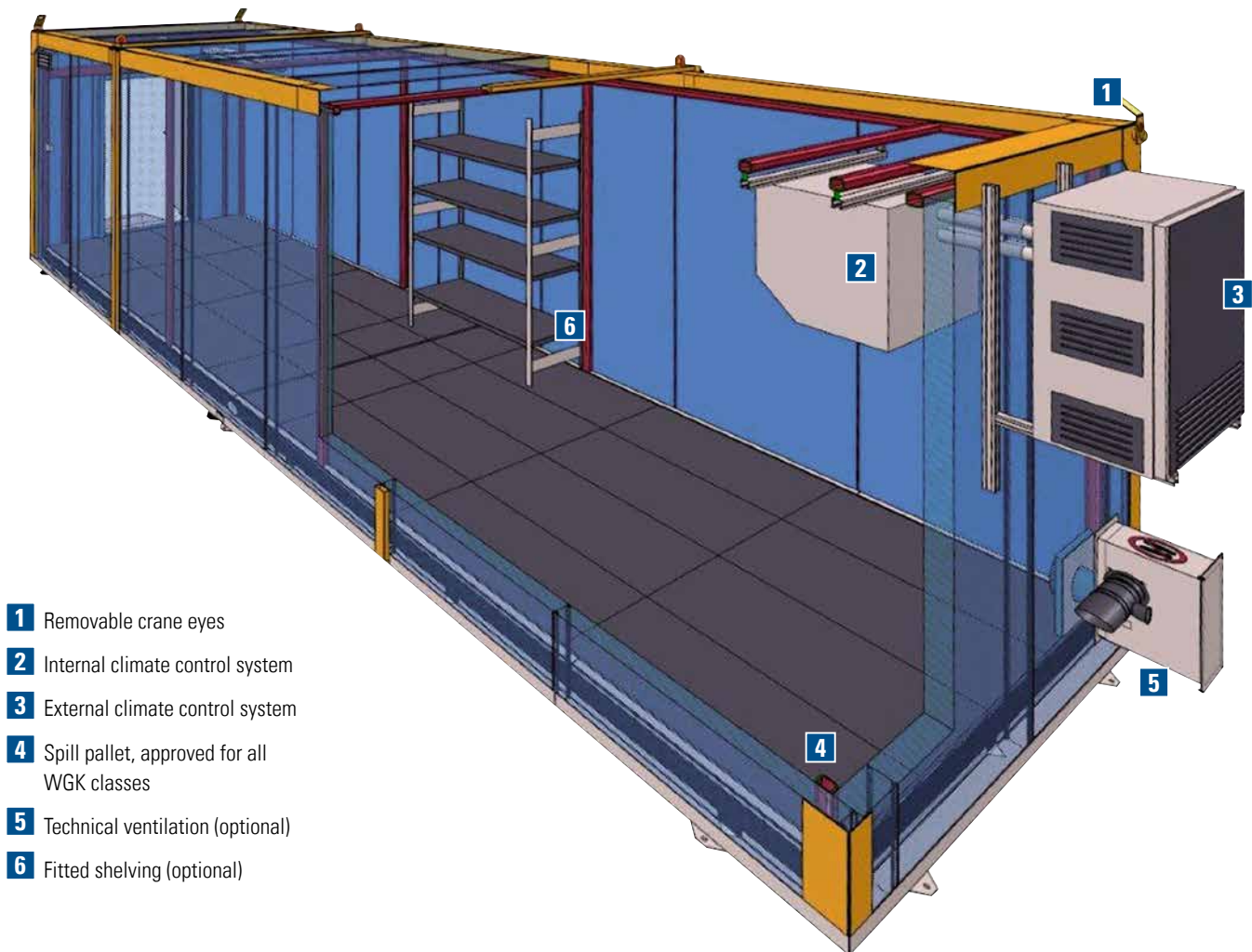
Cooling and climate control
container Model KMC
with integral climate control
equipment and dispensing station



Explosion-proof designs
are optionally available

Model	Structure	Containment volume (l)	Storage surface ca. (m²)	Door arrangement		Internal dimensions (W x D x H mm)	External dimensions (W x D x H mm)	Empty weight (kg)	Ø U value (W/(m² K))
				short side	long side				
KMC base 240		750	5	•	•	2200 x 2180 x 2150	2420 x 2320 x 2470	1800	0.62
KMC base 360		1200	7	•	•	3400 x 2180 x 2150	3620 x 2320 x 2470	2100	0.59
KMC base 480		1600	10	•	•	4600 x 2180 x 2150	4820 x 2320 x 2470	2500	0.56
KMC base 600		2000	13	•	•	5800 x 2180 x 2150	6020 x 2320 x 2470	2800	0.55
KMC eco 240		750	5	•	•	2200 x 2180 x 2150	2520 x 2420 x 2570	1900	0.24
KMC eco 360		1200	7	•	•	3400 x 2180 x 2150	3720 x 2420 x 2570	2200	0.24
KMC eco 480		1600	10	•	•	4600 x 2180 x 2150	4920 x 2420 x 2570	2600	0.24
KMC eco 600		2000	13	•	•	5800 x 2180 x 2150	6120 x 2420 x 2570	2900	0.24

IBC = Intermediate Bulk Container, 1000 l · CP = Chemical pallet for 4 x 205 litre drums · EP = Euro pallet for 2 x 205 litre drums · Drum = 205 litre drum directly on the grid



- 1** Removable crane eyes
- 2** Internal climate control system
- 3** External climate control system
- 4** Spill pallet, approved for all WGK classes
- 5** Technical ventilation (optional)
- 6** Fitted shelving (optional)

Efficiency with System

The special System construction combined with the use of explosion-proof components also makes it possible to store flammable, oxidising or toxic substances.

The Systems have the following features:

- minimised energy consumption
- minimal temperature variations
- even temperature distribution inside the containers
- absence of any influence of external temperature variations on the temperatures inside the containers
- ability to overcome a temperature difference of 10 Kelvin in 20 minutes.
- cooling temperatures as low as -25 °C (upon customer request).

Cooling equipment

Cooling equipment for cooling and climate control chambers

DENIOS uses high performance cooling equipment to ensure the reliable and trouble free operation of its cooling systems.

Due to the potential risk inherent in some substances, failure prevention can be a key requirement for customers. Because of this risk, the climate control system design is configured on the basis of a simulation of the actual circumstances.

In practice, combination units are often selected, which combine both cooling and heating functions.

The equipment consists of two components:

1. An interior unit with a heat exchanger and a fan that works as an evaporator in the cooling circuit. When the unit is used for heating it is used as a condenser.
2. An exterior unit that dissipates the heat from the heat exchanger to the outside air by condensing the refrigerant. Heat transport is reversed if the system is used for heating.

To achieve free air flow through the inner room, the optimum installation position is determined taking into account type, size and quantity of the goods to be stored, specifically for the system in question.

High-resolution controllers and temperature sensors ensure that the required temperatures are carefully complied with. In addition an explosion proof design for the climate control system can also be considered.

Technical ventilation with a 5 times air exchange rate can be achieved when flammable substances are to be tempered. The resulting energy loss is minimised by using a heat exchanger. The heat energy is extracted from the exhaust air and is returned to the system.



Split cooling unit (outside view)



Split cooling unit (inside view)



Split cooling unit (inside view)
in explosion proof design

Accessories for cooling and climate control chambers

With our comprehensive accessories range we can fit out your cooling and climate control system to meet your requirements and wishes exactly.

From ventilation and heating systems to the right equipment for storing aggressive or flammable substances:

Our DENIOS specialists are there to advise you on the exact design and configuration of your cooling and climate controlled system.

We will be happy to help you select the right product and accessories.

Accessories



Pressure relief panels

Pressure relief panels in the roof open at a certain load and close automatically once the pressure wave has been dissipated. This provides protection for the container in the event of an explosion.



Climate control doors

A cooling system with effective insulation requires a climate control door, preferably of the same quality, that specifically ensures good sealing at the joints. DENIOS can offer you several insulated door designs with U-values of up to 0.21 W/(m²K) for different applications. Fire-rated design upon request.



Technical ventilation

Various ventilation systems are offered to provide continuous air exchange. For passive storage a 0.4 times per hour air exchange rate is required and for active storage a 5 times per hour air exchange rate is needed.



Explosion-proof designs are optionally available



Mineral wool insulation

- Sandwich panels with an insulating core in mineral wool
- Good insulation, long life and fire protection classification (EI 120)
- Material thickness 100 mm, building materials class A2-s1-d0 according to EN 13501, non-flammable



Polyurethane insulation

- Sandwich panels with an insulating core in polyurethane hard foam (PUR)
- Very good insulation properties
- Building materials class B-s3-d0 in accordance with EN 13501, U value = 0.24 W/(m²K)



Surface design

Each system and each individual component can be designed to meet your requirements. In addition to the standard design with painted surfaces, galvanised and high resistance stainless steel are also available.



Accessories set for climate controlled storage of flammable substances

With container marking and an earth strap for customer earthing (creation of equipotential bond).



Door hold-open device

For easy loading of the system.



Explosion-proof designs are optionally available

The background of the page is a technical drawing, likely a mechanical or architectural plan, featuring various lines, circles, and dimension lines. A large, detailed drawing of a compass is visible in the lower half of the page, resting on the technical drawing. The compass is a standard drafting tool with two sharp points and a pencil lead, used for drawing precise circles and arcs.

Individual solutions

Project solutions from specialists

DENIOS systems have proven themselves worldwide in many sectors and numerous applications. Our range of standard solutions has continually developed and offers optimum products for individual applications. In addition, DENIOS has extensive experience in creating individual projects such as tempering large quantities or seamless integration into production processes.

It's not an issue if there is a limited space available, or in-house company components need to be used in the project. The DENIOS team will take care of your project from the planning stage right to manufacture and then regular maintenance.

DENIOS: a partner you can rely on!



Our recommendation

Our DENIOS specialists are there to advise you on the exact design and configuration of your thermal system. Together we will find the right selection of accessories so that your product is specified to meet your exact requirements.

Contact us on the numbers below:

- + 49 (0) 800 753-000-3 for **Germany**
- + 43 (0) 6225 20 533 for **Austria**
- + 41 (0) 56 417 60 60 for **Switzerland**

Customer advice from A to Z

We are convinced that an integrated approach works best. This is why we are at your side right from the first point of contact right through to commissioning and beyond. It all starts with expert advice and planning. Together with you our experienced engineers will prepare the first designs. Close contact with our Engineering department ensures technically sound solutions.

Our specialists are experts in current legislation and will support you with all the procedures relating to authorities and approvals processes. Your personal project engineer will be available throughout the development phase, ready to give you up to date information on the current state of the project. He will coordinate the project, from design to our in-house manufacturing through to on-site installation. In addition he is available to answer any interface questions and will ensure on-time completion. Our service department will carry out all the logistics and install the system for you. Commissioning and handover including training is all included.

Individuality as standard

Large capacity in even the smallest space

If a large storage capacity is required but the available space is limited, DENIOS offers solutions with up to three storage levels and double depth compartments. If space considerations prevent the use of wing doors, insulated roller doors enable space and time-saving opening and closing. We can also offer individual systems with vertical lift or sliding doors.

Individual equipment

As is also the case with our other thermal systems, we offer a comprehensive range of special equipment and bespoke solutions. Depending on the size of the system, several climate control systems may be used, with different temperatures for substances that require different tempering regimes, if need be. The modular design of our thermal systems leaves plenty of room for flexibility.

Equipment for outdoor use

DENIOS also offers large systems for outdoor use. The DENIOS Engineering Department can fulfil requests for an extremely large capacity for storing substances to be heated. We also offer large thermal systems with roofs over the aisles between the systems. This is an ideal, storage hall-type of solution if your existing premises do not offer a sufficient storage area.



Heat chamber WK 614-2K
with internal galvanised panels,
roller doors and electric heater
(internal temperature 80 °C)

Heat chambers

Flow-through heat chamber

This flow-through heat chamber uses roller conveyors to deliver the media placed in the container to another station in the production process according to the “first in, first out” principle while heating. Further conveyors at the other side of the container take over the drums. In addition, separating the zones where the drums are placed in the container and removed from it has optimised the logistics in the company and, as a result, the overall process.



Heat chamber with stainless steel vertical lift doors

In this case, narrow passage widths in front of the heat chamber and space restrictions required a special door solution.

DENIOS found the right solution with automatic vertical lift doors. These guarantee very good access to the useful space inside, without affecting the passageway. In addition the vertical lift doors had the same thermal properties as the rest of the insulation. The heat chamber was finished in stainless steel, both inside and out.



Large capacity, short heating time

The customer's brief was as follows: create a large capacity for substances to be heated, with three heating areas that can be controlled separately and a removable stainless steel (V4A) spill pallet.

DENIOS created a high-performance large thermal system with individual steam heating units at the rear wall in every container compartment. With a volume flow rate of 4000 m³ of air per hour they enabled reliable temperature control for up to 6 t of stored materials in the controlled range from 40 °C to 120 °C.



Solutions for rapid loading and unloading

The ability to load thermal systems quickly is a key product requirement for many users. DENIOS offers versatile options to ensure optimum integration with the flow of goods. In this case, a manufacturer of medicinal products uses an overhead conveyor to transport its drums for immediate use.

In order not to interrupt this process, DENIOS has created a heat chamber that can be operated from both sides and has an integrated overhead conveyor. The heat chamber works according to the "first in, first out" principle and heats the drums in accordance with the process parameters. Separate handling is no longer required.



Cooling technology

Cooling chambers for temperature-controlled storage of explosive gases

The main customer requirement for the safe temperature controlled storage of explosive gases is a stable inner room temperature of -20 °C. The need to use technical ventilation with a 0.4 times air exchange rate meant that an especially powerful cooling system was needed, with an automatic defrosting function. Due to the hazard class of the gases stored, the interior is explosion-proof and has automatic fire detection. The high level of safety with good thermal insulation combined with fire protection on all sides resulted in a highly specialised cooling system that can satisfy the highest technical demands.



Stainless steel store for the food industry

Storing flammable liquids at controlled temperatures calls for special, tailored systems, especially in this industry. This project for a manufacturer of confectionery involved the production of a fully stainless steel container system for storing flammable flavours. A high-precision control system was employed to maintain a narrow temperature window. Explosion protection and a sprinkler system complete this technically sophisticated system.



Temperature-controlled storage of organic peroxides

Peroxides are hazardous substances that become unstable outside a defined temperature window, which leads to an explosion hazard. The requirements imposed on a suitable storage system are equally complex and sophisticated. Organic peroxides are used in several industries, but predominantly in the chemical, plastics and pharmaceutical industries.

DENIOS has responded to these special needs and offers systems with extensive safety facilities, fitted out especially for this purpose. These facilities include an air conditioning combination with high-quality regulation, fire protection and a pressure relief flap in the event of an explosion.



Simulation chamber for emergency slides

It's a good thing they exist, but better if they are never needed. Emergency slides form part of the safety equipment on every commercial aircraft. The emergency slides are checked on a regular basis to guarantee their operation. The DENIOS climate control simulation chamber makes realistic testing possible. During the test phase a temperature window of -20 °C to +60 °C is passed through in a short time. Temperatures and times are documented.



DENIOS: comprehensive service

Comprehensive service – before and after delivery

After your product has left our production facilities, our transport specialists and assembly technicians take over. Our worldwide logistics network ensures smooth travel arrangements and on-time delivery. This means the process is completely stress and problem free for our customers. Overview of our services:

- transport of your product to the installation site
- installation and assembly
- technical training for your employees

In addition, once your thermal system is up and running, our comprehensive service and maintenance teams are ready to assist. With regular maintenance you'll improve the life and performance of your product. You'll also be complying with the legal regulations.

Important: laws, regulations and rules

If you store hazardous substances or handle them on a daily basis, you'll know that you need to follow numerous laws and regulations. These laws vary widely in Europe. This fact alone makes it hard for customers, if not impossible, to keep an overview of the situation.

Our specialist knowledge, for your benefit

The legislation for your project is considerable and it's also what the whole project revolves around. The problem: the laws in Europe are not uniform and change all the time. This is why we regularly update our HazMat Manual. Here you'll find 60 pages giving a comprehensive overview of the most important laws and regulations. And if you've still got questions? Then just get in touch.



Help is at hand – the HazMat Manual

Its 60 pages will guide you through the principal rules and regulations governing the storage of hazardous materials and work safety.



Test and leased chambers

Flexibility without long term obligations

The introduction of new products often requires extensive tests to be carried out before their launch. So that thermal behaviour can be analysed, test chambers are available from DENIOS. Whether you carry out your own investigations or work with our test engineers, you'll get to know your new substances better.

Make sure you can respond flexibly and are ready to deliver even at peak times. Our leased chambers will help you deliver on time to your customers if you're having capacity issues.



Transport and assembly

Safe transport to your site

The HazMat storage container has been produced and is on the way to the customer. Depending on where the installation site is, DENIOS has a variety of options for delivery. A comprehensive logistics network makes the end stages of the project simple and easy for the customer. On-site assembly is carried out by our experienced specialists. They carry out an operation test and ensure your employees receive technical training.



Service and maintenance

Securing your investment in the long term

A HazMat storage container is only a safe environment for hazardous substances if there are no technical faults. At DENIOS service and maintenance means maximum safety with regular maintenance.



Test chambers



Testing is better than studying - the DENIOS test heat chamber

Do you have a new product in your range and want to understand how it will react at various temperatures? How long are the heating periods? Or is tempering in a heat chamber the right solution for you? Why not simply try it out?

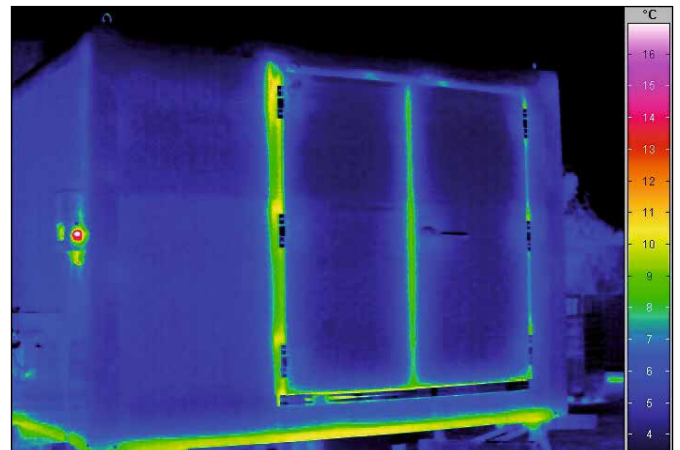
Tests in the DENIOS test heat chamber will give you certainty in your design and manufacturing. Individual series of measurements are performed to study the thermal behaviour of your products under real-life conditions. Our test systems can also be used to accurately analyse heating times, or the melting behaviour of substances for example. At the end of the series of tests, our experts will provide you with extensive measurement reports and analyses that you can use to make sure that your investment will be safe and sustainable.

Infra-red analysis at DENIOS

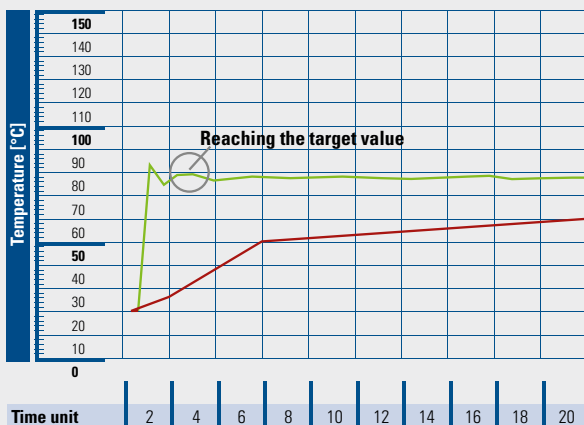
The infra-red picture shows the outer skin of the unit with very low temperatures on its surface, indicating excellent insulation of the interior relative to the exterior. The increase in temperature visible at the door frame and in the lower section relates to joints that have a limited overall effect on the energy balance.

Their green/yellowish colour indicates the minimal loss of heat.

This new construction is designed for optimum energy efficiency by making use of high quality components which enables energy consumption to be lowered by up to 50 % compared to conventional systems.



Infrared photograph of a walk-in thermal system



Measurement curves in the context of a trial evaluation:

The red measurement curve clearly shows the increase in temperature of the medium during the time period examined, for a constant ambient temperature (green).

- Heat chamber internal temperature
- Temperature of the medium (temperature behaviour is dependant on substance)

Leased chambers

DENIOS thermal systems - lease instead of buy

Why can leasing be an alternative option?

As a logistics company, you need to keep products in temporary temperature controlled storage, but there's no certainty this will be a long term requirement. With a leased system you have known costs and can avoid major investments.

At times of peak production you might have a short term need for additional capacity. DENIOS offers you flexibility, giving you the chance to react to the most recent changes in your company.

Every year you face the problem that products are harder to process in the colder months of the year due to increased viscosity. A leased heat chamber is an attractive option for this period.

You may have many reasons. We'll offer a range of alternatives. Many systems are taken on by our customers so we always have a regularly changing range of systems to offer. Ask about the currently available range of DENIOS leased systems.

Overview of advantages

- full flexibility with a good cost overview, you decide when and for how long
- no major investment needed for new products or short term orders
- leasing offers flexibility, which is essential for innovation
- better planning of follow-on costs, as service, maintenance and repair are covered
- more room to play with capital reserves, which can be profitably invested



Heat chamber WK 314-2-K with galvanised surfaces (internal) and electric heating system

Transport and assembly



On the road world wide – on-site assembly

Whether we use our own DENIOS flat bed trailer or a trusted freight forwarder, we ensure your goods are transported safely and simply. Standard long containers can be transported on telescopic crane vehicles. Special oversized load transport for oversize widths or heights can also be arranged. We will take care of all the arrangements including obtaining the necessary special permits.

Would you prefer to fetch your container yourself or come and see it being assembled or commissioned? Not a problem. Your personal contact will happily arrange things for you and accompany you on your visit.

As your international partner, we'll bring our products directly to you - even overseas! Long term partnerships with logistics companies and freight forwarders enhance our international distribution channels. Your product will be delivered safely and on time.

Our containers are prepared in our facilities so that they can be quickly set up at your site. Pre-assembled and with all necessary connections in place, our containers can be put into service immediately. We will also undertake the technical training of your workers on site too.



Service and maintenance



Maintenance services

- One-off assessment or maintenance contract
- Trained and certified service technicians
- Small repairs can be carried out directly on-site, more involved repairs will be quoted for separately.
- Production of a service report and test report
- Fitting of the inspection plate
- Travel costs and small consumables are always included in the maintenance price.

Your advantages

- Legal requirements for maintenance intervals are observed
- Maintenance of your insurance protection including limitation of company liability in the event of a loss
- Save the expense of costly repairs with regular maintenance
- Minimise the risk of downtime and extend the life of your product
- Don't worry about burdensome scheduling. With a maintenance contract, we'll remind you in good time when maintenance is due
- Safety for your workers and your company

Service

Service - for DENIOS, this means our overall approach to your project, from the needs analysis to official acceptance. We guarantee world wide competent advice in accordance with the relevant local legislation.

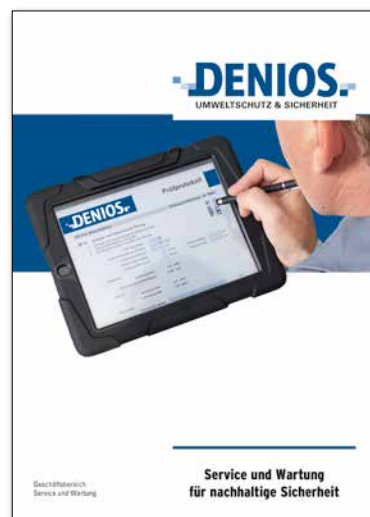
We are also your reliable partner for maintenance. We will ensure that the maintenance and repair of your technical equipment meets the legal requirements at the required intervals for your project.

Our maintenance programmes are as individual as our products, and custom made for your requirements.

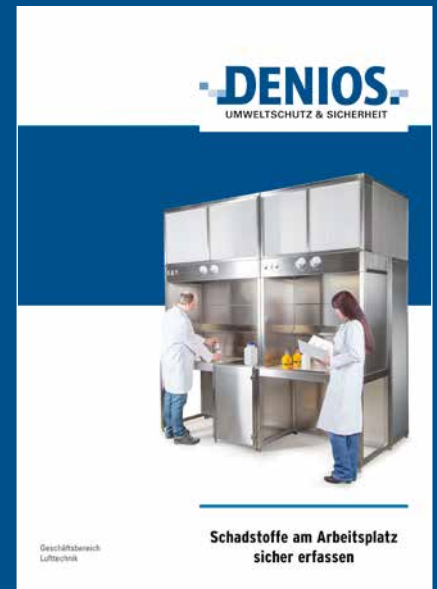
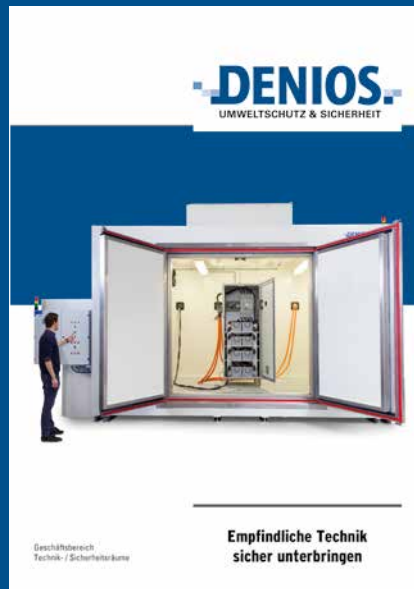
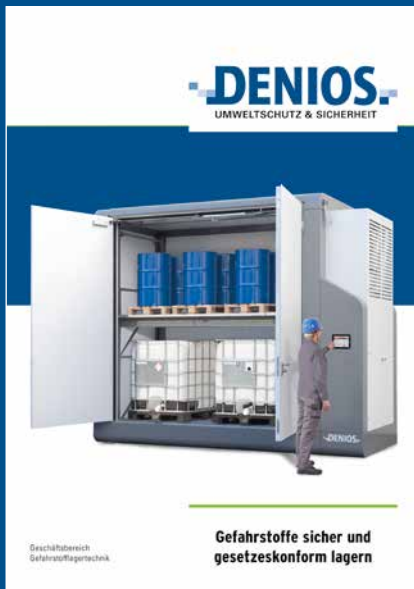
From one-off "on demand" maintenance to a cost saving, long-term maintenance contract, DENIOS offers made to measure solutions for everyone.

Request your free personal Service booklet

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Business divisions overview



Hazardous material storage technology business division

Storing hazardous materials safely and in compliance with the law

Flammable substances pose a potential risk for both people and the environment every working day. They can start a fire, or even be potentially explosive. For this reason, correct storage of these substances not only makes sense, but it's obligatory. HazMat cabinets and containers offer secure storage for flammable liquids and hazardous substances.

Technical & safety rooms business division

Handling sensitive materials safely

Server room, radio technology or emergency power supply: DENIOS technical and safety rooms make the use of high-tech equipment and applications possible in virtually all locations. Flexible and mobile. Safe and protected.

As a separate unit, integrated with ongoing production or as an autonomous system: always adapted to operational requirements.

Air technology business division

Capturing harmful substances in the workplace safely

Handling hazardous substances as part of industrial, chemical or pharmaceutical processes may cause harmful substances to be emitted into the air. Safely capturing these is a challenge that DENIOS ventilation technology addresses. Safeguarding people and the environment, DENIOS engineers develop the optimum design for every workplace.

These range from laboratory extraction systems to workbenches and multi-task workstations as well as bespoke solutions for chemical and pharmaceutical applications.

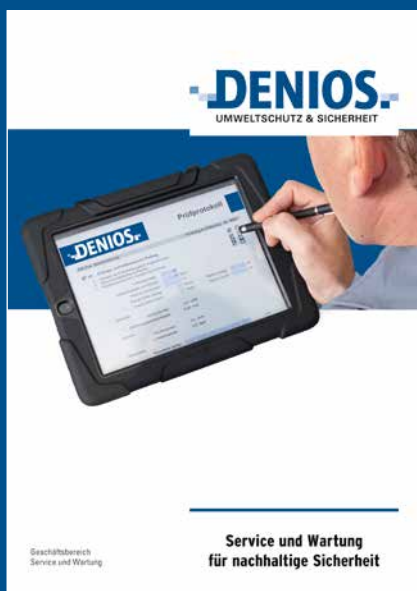
Would you like to know more about DENIOS?

Contact us on the numbers below:

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Or go to our website

www.denios.de | www.denios.at | www.denios.ch

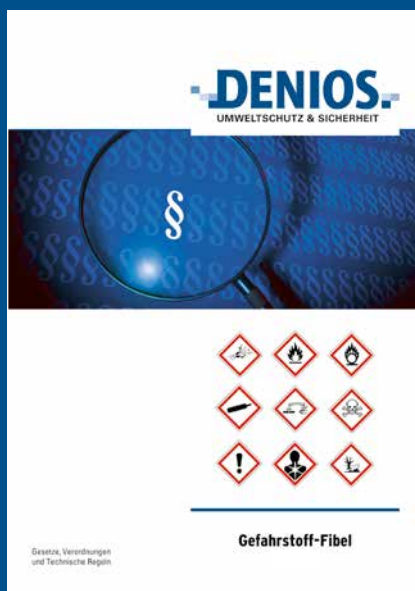


Service and maintenance business division

Service and maintenance for improved safety

Regular inspections are needed to ensure the protection offered by safety cabinets and hazardous goods containers is maintained in the long term.

Building on our many years of manufacturing experience in HazMat storage, DENIOS AG offers a comprehensive concept for the maintenance of safety equipment.



Laws, regulations and technical rules

HazMat Manual

DENIOS experts always offer advice based on the current legislation. You can find this expertise in the DENIOS Hazmat Manual.

Its 60 pages will guide you through the principal rules and regulations governing the storage of hazardous materials and provide comprehensive health and safety information.



Main catalogue and Online Shop

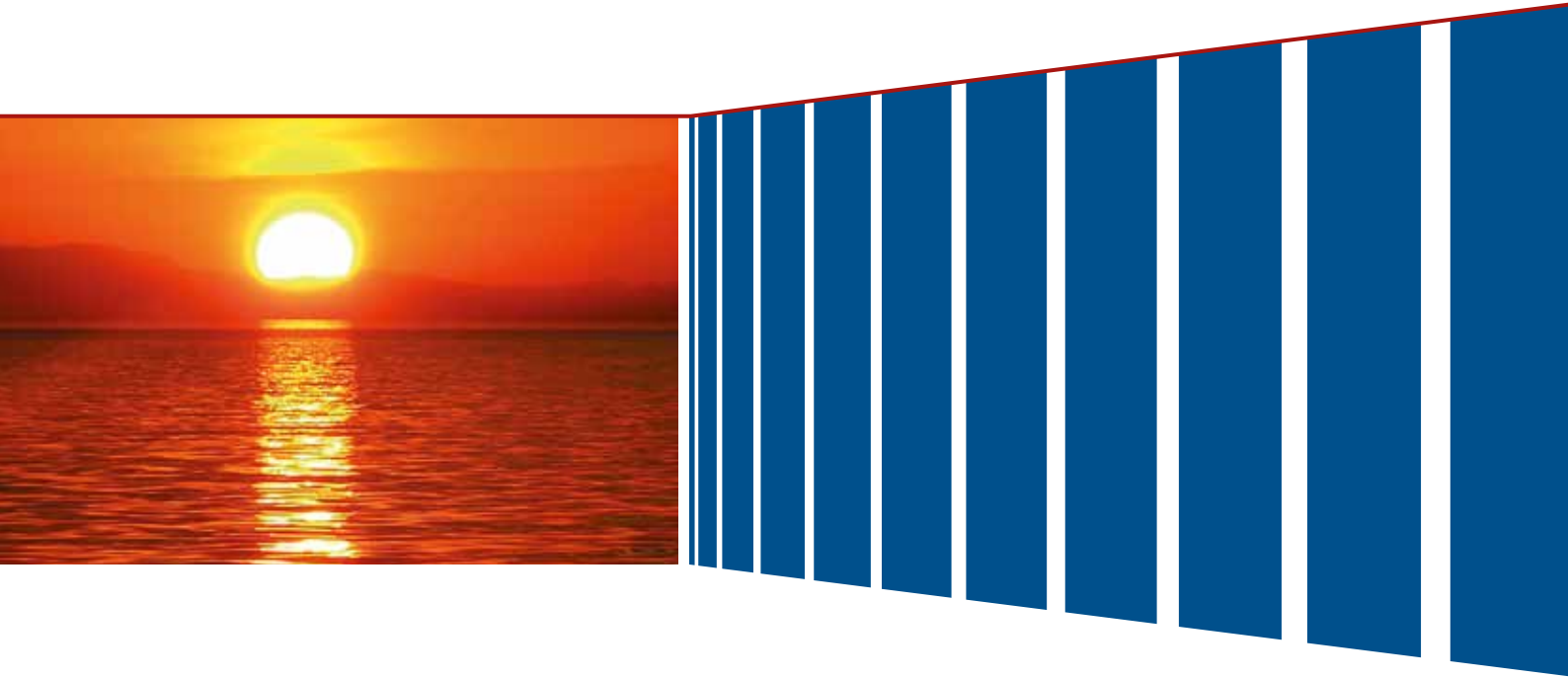
From a spill pallet to a fire-rated storage container

As a product designer and manufacturer with nearly 30 years of experience, DENIOS has demonstrated a real flair for creating efficient solutions:

The 800 page main catalogue covers everything a customer may need from a spill pallet to a fire-rated storage container.

The catalogue also contains service pages giving useful advice and tips for the storage of hazardous materials and for work safety based on both German and European regulations.

The DENIOS homepage provides you with an online portal covering hazardous substance storage, works safety and current environmental legislation. The latest professional information on handling hazardous substances and the individual solutions we have provided is offered in a practical and conveniently arranged manner, another example of DENIOS AG's competency as the market leader.

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