

# -DENIOS-

ENVIRONMENTAL PROTECTION  
& WORK SAFETY



Business division  
Technical and safety rooms

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**Sensitive technology  
made safe**

# Housing high-value technology in a flexible way — the DENIOS plan

## **The force behind your production**

Modern, high-value technology controls and regulates processes or performs logistics workflows.

Production conditions change quickly and can't always be foreseen. Production sites are restructured or are completely outsourced. Mobile solutions make sense when space in workshops is limited and technical equipment becomes increasingly complex.

## **Market-leading room design**

DENIOS has supported its customers and partners for over 25 years in managing their changing requirements.

Together with our customers we have developed comprehensive solutions, which are made to measure from the planning stage right through to installation.

DENIOS is a rightful market leader in the safe housing of high-value technology. Our technical / safety rooms offer the highest levels of flexibility, mobility and reliability.

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We deliver our products and services exclusively in line with our General Terms and Conditions. These can be found at [www.denios.de](http://www.denios.de) or on the local websites.

The specialist information in this brochure has been prepared to the best of our knowledge. In parts it is however based on the opinions and evaluations of the authors. Therefore, if any guarantee or liability is expressed in any manner about this information being up to date, complete and correct, such guarantee or liability cannot be accepted by DENIOS AG.

# DENIOS — Manufacturer's competency and know-how

## Comprehensive production methods

Decades of experience in the planning and production of well-thought-out storage systems for hazardous substances ensure that DENIOS is well prepared for creating mobile container systems. The safe and secure housing of technical equipment is our main aim. Numerous variations of tested standard designs and individual solutions have all been produced in our own production facilities. This underpins the strength and flexibility of our company. Almost any customer requirement can be met exactly by broad based cooperation of our various project areas.

## Individuality as standard

As an engineering company, individual advice comes as standard. Our specialist advisors always look at your actual situation when analysing your needs. At the end of the advisory discussion the perfect, cost-efficient solution will have been found from our unique Europe-wide portfolio of over 10,000 products. Our team of experienced engineers are also happy to offer advice if you need an individually tailored turnkey project.

We will advise you on site and develop, design and manufacture a solution created especially for your needs. DENIOS offers you all of this from one supplier.

## A finger on the pulse

Your partners at DENIOS are specialists in all aspects of EU standards and current legislation. Depending on the customer request, attention must be paid to the relevant regulations and contexts. Our aim is to offer more than just advice. Right from the planning phase all legislative factors are taken into consideration, so that your project has a sound, legally compliant basis.



## Advice and planning

- Clarification of basic parameters, needs analysis
- Technical advice and design proposal
- Construction planning

Special projects need specialist advice. We will develop a solution for your particular project which is perfectly suited to your requirements and is legally compliant – and we'll offer concrete advice on site.

You'll be able to take advantage of the ideal combination of cost effective standard production and individual design.

## Project handling

Experienced project engineers will plan your project and monitor the production of the components.

## Production and assembly

- Precise implementation of your project, on-time, ensured by our specialist staff.
- Safe final assembly by our DENIOS Service team.

## Acceptance and start-up

- In addition to the FAT, you can also personally monitor the progress of the production phases.
- Training and instruction on site at your premises
- Service and maintenance

## DENIOS: Certified Quality

"Made by DENIOS" is synonymous with the highest quality in the manufacturing of products and sophisticated project management. The highest safety standards are followed at DENIOS across all areas of the company. Our processes are proven and are constantly monitored by internal and external checks.

DENIOS manufacturing quality has been DIN EN ISO 9001 certified for over 10 years.

Sustainability and environmental protection are a given for DENIOS own production. Only by living by our own standards can we successfully work with our customers in the same way. We set the highest standards in our handling of environmental resources. To demonstrate this, DENIOS has DIN EN ISO 14001 certification.



DENIOS planning



DENIOS manufacturing



DENIOS final installation

# Important facts about technical / safety rooms

## DENIOS — designs for the future

Being able to use high tech equipment in a flexible and mobile way is vital for today's successful production processes.

DENIOS makes it easy to react immediately to changing production requirements with its innovative technical / safety room (TSR) designs.

Mobile solutions from DENIOS make a sensible addition or expansion to your existing production equipment.

Size, configuration, safety equipment – each room is individually planned and constructed for the customer.

You'll be sure that all requirements for equipment and safety are met – both now and in the future.

## Safety in the event of damage

DENIOS BMC series of fire-rated containers are approved total systems that have received DIBt approval and F 90 rating by an official approval authority – vital for your insurance cover.

Often insurance companies will not pay out if you use systems which have not been tested or approved. In some cases this might put your entire business at risk.

DENIOS products offer you optimum protection.

## At DENIOS there is only "Your Solution"!

Comprehensive, professional project management lies at the heart of what we do at DENIOS.

Based on detailed advice from our project engineers and in accordance with your individual requirements, we start by planning your made to measure system solution. DENIOS is an experienced manufacturer of highly secure technical / safety rooms and offers ongoing assistance even after final assembly. With a service and maintenance plan which is tailored to you and your product, we guarantee a high quality, long lasting solution.

## The technical / safety room

In what environment will the technical / safety room be set? What basic conditions need to be considered?

Well-directed questions help our engineers clarify, right from the initial consultation, what your optimum design is going to look like.

Climate control, reliable temperature control, explosion or fire protection, access control or protection from break-ins and vandalism - our engineers will select the components which guarantee the best functionality of your technical / safety room.

Whether you select a walk-in container or a space saving cabinet, we have the right solution for every type of requirement.

## Installation and positioning

Technical / safety rooms from DENIOS offer countless possibilities for implementation at many locations thanks to their variable dimensions and low net weight. Regardless whether you are looking for indoor or outdoor installation, right next to another building or sited on a flat roof to save space, we've got the optimum solution for your situation.

Your room is completely finished in our production workshops, so you'll just need to connect it to local systems after delivery.

We are also happy to install your equipment into the system for you.

You could also use our premises for independent internal fitting, avoiding a transport journey and saving costly time.



Individuality is our strength





**Technical / safety rooms** from DENIOS can be transported ready fitted with customer-specific contents and offer comprehensive protection from break-ins, vandalism, fire etc.

## Functional down to the smallest detail

Easy maintenance saves money. This is true for our compact cabinet solutions too. If needed, heavy and bulky equipment can be easily moved on rollers, giving clear access from all sides. Long periods of downtime can therefore be avoided.

Take note of these other functional details:

- Adjustable shelving ensures an easy overview of contents
- Pre-fitted wall rails reduce construction costs
- Double floors or cable racks ensure organised cabling

## Advantages of technical / safety rooms

- **Can be pre-installed:**  
Contents can be fitted – by us directly in the factory or by the customer – prior to installation.  
This means your turnkey room system will be ready right after delivery.
- **Mobile:**  
Thanks to its low weight – compared to concrete solutions – the compact module can be located in practically any location. Even a change of location due to internal plant restructuring for example, can easily be carried out with the mobile system.
- **Protected against break-in and vandalism:**  
A solid steel construction protects your valuable technical components.  
In addition to the secure container shell, our systems offer a wide range of additional monitoring technology.

# Important facts about technical / safety rooms

## Room systems to meet your needs

DENIOS will support you in housing your sensitive technology in a secure, yet mobile solution. As every technical / safety room is completely individual, there's no standard solution for your requirements. Your solution will be individually prepared with you by our DENIOS experts. This service includes both design and manufacturing. The application examples for our technical / safety rooms are as individual as our customers' specific requirements. All DENIOS room solutions protect your installation from unauthorised access and damage by trespassers. In addition our technical / safety rooms offer an additional level of protection for your equipment - internal and external fire protection.

## Technical containers

The use as a technical container is one of the most varied and wide ranging applications for our technical / safety rooms. It covers both mobile and stationary containers, walk-in versions as well as cabinet designs. DENIOS technical containers offer sufficient space for fitting a wide range of components (eg machinery, generators, storage media, information and communication technology). Depending on the requirement profile, the focus will be on various construction features. The technical container can be sound-proofed for example. When a high level of noise is created inside, the container becomes important for emission control. The room climate can be clearly defined ensuring that your sensitive technology can be housed in optimum conditions. Installation of technical ventilation and specific air extraction systems are vital when housing technical components. Installation and channelling of cables is simple, for example in a double floor. This also protects the cables from damage.

from [page 10](#)

## Laboratory containers

A DENIOS technical / safety room is the perfect base for creating an external laboratory. Research and development facilities always need laboratories and test equipment which can be set up on site. They can also be used in the emergency services or security fields. One of the advantages of our technical / safety rooms is especially important here: mobility. A technical / safety room can be set up anywhere on your site. Space is generally at a premium in most works halls. When choosing a laboratory container from DENIOS, our customers get a complete package. In addition to a fire and explosion protected shell, the complete range of internal fittings can be selected from our comprehensive portfolio. For example, you might choose to fit effective worker protection measures. There's space for equipment for handling hazardous substances as well as for a fully fitted out ventilated workplace, requiring a specific air extraction system.

from [page 28](#)



F90 fire-rated container, cable routing in the double floor



Laboratory container in operation at a customer's site



## Safety rooms for process technology

Technical / safety rooms from DENIOS fit right in to your processes. No matter whether your room solution is centrally located in your production chain or decentralised in your works grounds. Depending on your company's specific requirements, a comfortable, walk-in design or a compact cabinet solution may be proposed. Do you need to install dosing technology in your technical / safety room? When planning the design, we'll ensure the largest internal dimensions possible and fit your room with a spill pallet in case there are any leaks. Fire protection and safety sensors can also be planned for any room if needed. The possibilities are endless. For the best advice, talk to one of our customer service team. Your DENIOS safety room will be delivered ready for operation.

from ➔ page 30

## Special containers

Are you planning a project that doesn't fit in to any of the other categories? Not a problem. DENIOS technical / safety rooms also can't be categorised so easily. "Special container" covers many applications, which have only just been thought of.

A special container could be a technical / safety room, which can be used as a decontamination room or as a store for crash test vehicles. From ➔ page 34 of this brochure, we've gathered a few examples of special containers. These examples show how varied the application of our technical / safety rooms can be. Talk to our experts to find the right special system solution for you.

from ➔ page 34

## Advice – the foundation for good service

DENIOS prides itself on building rooms which perfectly meet your requirements and the most stringent quality standards.

The following pages can therefore only offer an overview of sizes, wall construction, safety technology, and other high quality fittings options.

We'd be delighted to discuss the possibilities and solutions DENIOS can offer you for your particular requirement during an advisory meeting.



Process technology in a safety room



### Help is at hand:

Our experts will assist you right from the start when planning your specific technical / safety room.

Please see other contact information

➔ [www.denios.de](http://www.denios.de)

➔ visit **local websites**

➔ **specific numbers** for your country on the back cover.

# Technical containers

## Li-ion battery test rooms

### Proven solutions not vague experiments

Due to changes in the trend for energy storage media, new ground must now be explored in many areas. Alternative designs for battery technology, especially for E-mobility, are based on Li-ion technology. These new batteries offer a promising solution compared to other forms of energy storage media. Very high energy density in a small module size is already making Li-ion technology a leading alternative for the automotive field. The heavily restricted space available in this industry can therefore be optimally used.

As with any innovation there are however important disadvantages. As we do not yet have that much data from experience, there is a not yet fully understood risk involved with these media. This situation means that special requirements are needed for personal protection and fire protection.

Technical faults or incorrect handling of the modules may lead to an accident. Electrical charge may be uncontrollably converted into thermal energy, increasing temperatures and causing a fire. The pressure increases and in the worst case scenario, the module explodes.

Comprehensive tests – including above the actual loading limits are required. The effects of various environmental factors, for example

variations in temperature, humidity, vibration or severe shocks, on the life of the module are thoroughly tested.

Things are further complicated by the fact that there are no binding regulations or laws from legislative bodies. Even the trade associations have not come to any agreement on this. If you build and operate a testing site, there are only recommendations to follow. Safety designs are based more on insights, rather than standards. Plans of measures to take in the event of an incident are also rare as are general statements on accident prevention.

It is left to the people building the facility, **in their own risk assessment**, to determine the details of the safety plan. It is best to involve specialist insurers early on in the constructional preventive plan for the facility - and to choose a manufacturer with decades of experience in hazardous substance storage.



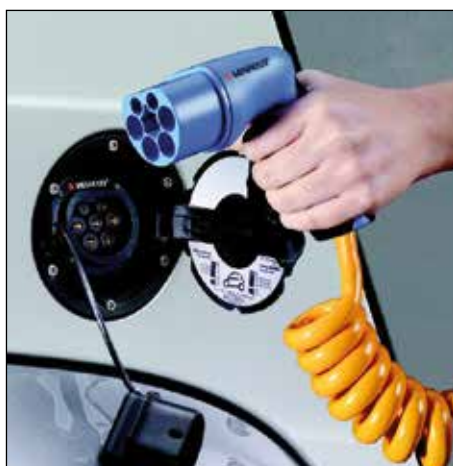
Walk-in F90 fire-rated container with integral climate chamber



View into the open climate chamber when not in operation



Image source:  
MENNEKES Elektrotechnik GmbH & Co. KG



Lithium-ion batteries – the power source of the future



## Evaluate the risks

In principle, every employer is obliged, in accordance with section 5 of the Labour protection law (section 3 Industrial safety regulations), to assess the risks which could arise from technical equipment or facilities, evaluate them and take any necessary protective measures. This applies to the manufacturing as well as to the storage and transport of sensitive goods.

This also applies regardless of whether you are handling cells, modules or complete battery systems. You need to evaluate which risks may occur, with what probability and what consequences (see Overview of Hazard Level → page 15).

## Organisational protective measures:

- Take constructional protective measures
- Avoid mechanical damage and high temperatures over a long period
- Observe safety distances
- Ensure sufficient ventilation
- Provide separated storage
- Train employees on the potential risks and recommendations for handling
- Develop extinguishing plans



DENIOS has a wide range of valuable experience to help you!  
Our walk-in F90 / REI 120 systems are ideally suited for use as a test room with internal and external fire protection

### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Usable surface area (m <sup>2</sup> )	Walk-in	Racking system	Fire rated	Crane eyes	Fittings (example)
	exterior	interior						
TSR 38.25	3790 x 2510 x 2520	3440 x 2190 x 2100	8	•	—	•	•	<ul style="list-style-type: none"> <li>■ Fire rated / Explosion proof</li> <li>■ Room monitoring / sensors</li> <li>■ Connection to extinguishing system</li> </ul>
TSR 50.25	4990 x 2510 x 2520	4640 x 2190 x 2100	10	•	—	•	•	
TSR 62.30	6160 x 2990 x 2920	5840 x 2650 x 2500	16	•	—	•	•	

# Technical containers

## Li-ion battery test rooms

### Constructional preventive measures — the DENIOS Technical container

#### Active safety:

Pressure release surfaces in the roof allow for controlled pressure equalisation in extreme cases.

The destruction of the room or the endangerment of workers by doors being blown off and an uncontrolled release of energy can therefore be avoided right from the outset.

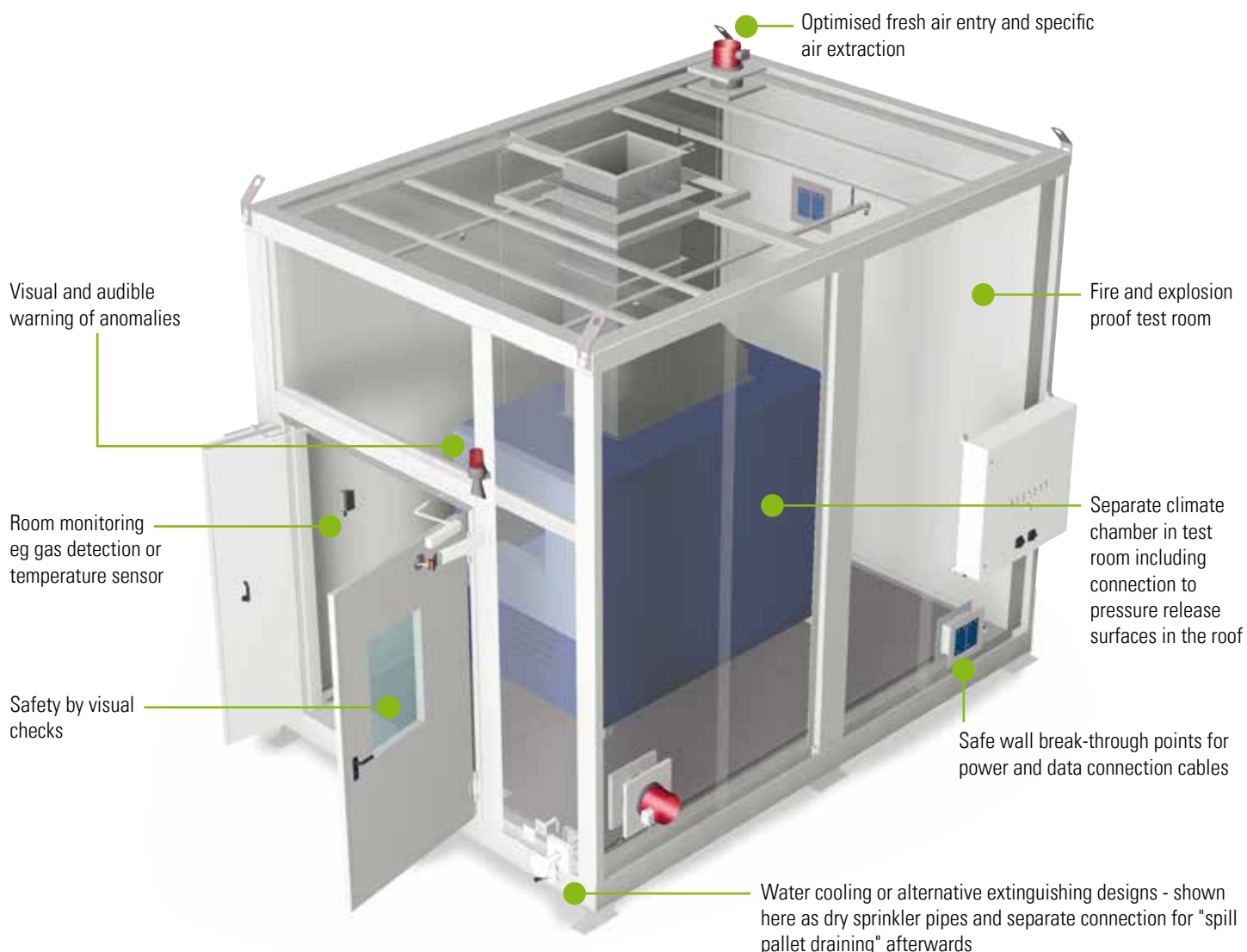
High performance technical ventilation also ensures that any harmful and potentially explosive gases are removed from the room. Correct operation is constantly monitored.

#### Monitoring:

Comprehensive monitoring is vital for safety reasons. Whether it's gas detection, temperature monitoring or just fire early warning, the provision of potential free contacts for risk-free transmission, for example to a (works) fire department, offers you the highest level of protection for your workers, equipment and company.

#### Disposal:

In the event of an accident, contaminated cooling water may collect in the spill pallet for example. An acid resistant, anti-static inliner gives an additional level of safety. A separate connection is provided for emptying the WHG spill pallet. A slight slope inside the spill pallet makes this process easier. Then the cooling water can be properly disposed of.



## Test container for stationary energy storage units

The energy revolution needs rethinking – in many respects. More and more energy is being taken from renewable sources, for example wind farms or solar farms. Energy is often produced at sites and at times of the day when it can't be used directly. This also means that electrical energy storage is becoming an increasingly relevant subject.

With this in mind, DENIOS has developed an F-90 test room in a cooperative project, as a test bench for stationary energy storage units. Very large batteries, within the permitted test volume of up to 30 m<sup>3</sup>, can be subjected to defined thermal and electrical stresses. Under the most real test conditions possible, within a temperature range of - 20°C to + 60°C, an artificial ageing process was simulated, which also tested the cycle stability of the batteries. Abuse tests were not part of the project scope.

In addition to basic test, the test scope covered:

- Simulation of extreme environmental conditions by loading up to the permitted temperature limits, as well as testing behaviour under temperature variations
- Effects of high humidity on the test pieces, eg formation of condensation
- Loading with minimum and maximum power supply, looking at upper and lower voltage limits

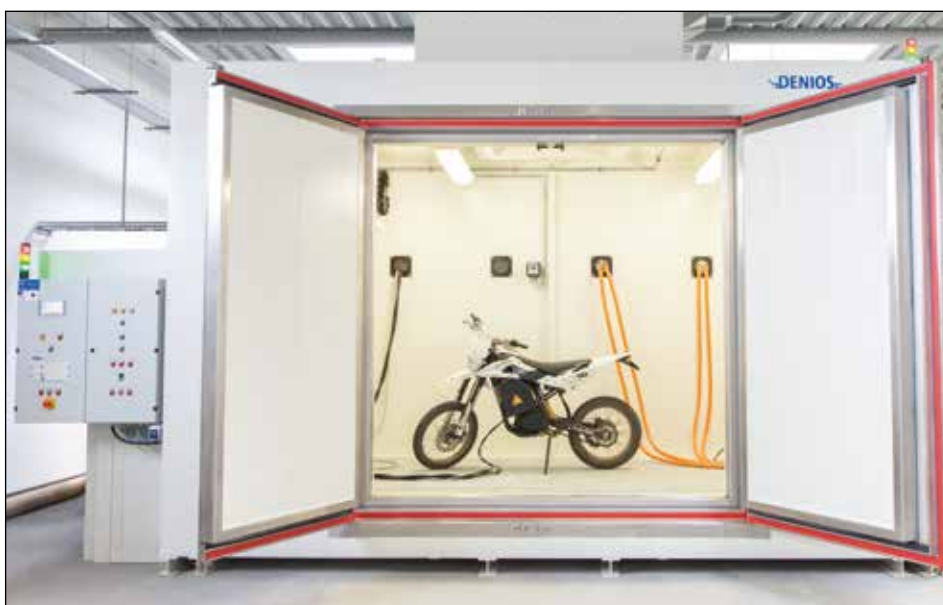
and also customer specific evaluations.

**All this was done without a separate climate chamber in the test container!**

You'll receive an innovative and ready-to-use solution. What's also important for you: Your test results will be reproducible every time!



View into the F-90 test room



Generous test room volume – even for large test objects



Test pieces: Batteries



# Technical containers

## Li-ion battery storage

### Hazardous materials – safely stored

The hazard potential when incorrectly handling Li-ion batteries is very high. Deep discharge, fire, chemical reactions, in the worst case explosion of the batteries – each individual situation means a risk for workers and the environment. Considerable financial losses and production downtime may follow. Organisational and constructional protective measures help to limit the potential for risks at an early stage.

### Safety with System

DENIOS containers have been specially constructed for the safe storage of hazardous materials. A racking system optimised for the available space inside the container makes it easier to store items on pallets or special carriers. The DIBt approved System container with integral spill pallet is perfectly designed for collecting any leaked electrolyte. In combination with our electrically conductive PE inlay spill pallet, damage to materials and the environment can be avoided.

The reliable heating / cooling equipment fitted to DENIOS Systems ensures ideal storage conditions. A constant climate ensures the batteries do not discharge in an uncontrolled manner.

Sufficient air exchange is ensured by technical ventilation. Gas detectors offer additional safety.

Depending on the requirements and location for installation, the storage container may also be fitted with fire/explosion protection. A sprinkler system offers the required cooling for the batteries in the event of an accident. The spill pallet can then be drained afterwards using the separate connection.

A pressure release surface in the roof area ensures specific and above all safe equalisation of excess pressure.



Storage container with wing doors and 5 shelves

## High levels of safety need the best possible advice

Due to the potential for risk, the risk assessment often produces a classification of Level 5 in accordance with EUCAR.

With the DENIOS team, experts are available to assist you with the development of a sustainable safety solution which is perfectly adapted to your application.

The thought-through designs offer the optimum basic conditions for the storage of your Li-ion batteries - hazardous goods storage couldn't be safer or more effective!



Specific temperature control for a battery storage container



Racking system for optimised storage of batteries on carriers

### Definition of potential risk in accordance with EUCAR Hazard Level

Hazard Level	Effect	Classification / Consequence
0	no effect	no effect on operation
1	passive safety	cells suffer reversible damage, repair needed
2	defect / damage	cells suffer irreversible damage, repair needed
3	leak	slow leak of electrolyte, electrolyte reduction in weight < 50%
4	bursting	partial spraying out of electrolyte, electrolyte reduction in weight ≥ 50%
5	fire / flames	fire
6	breakage	flying parts, breakage of solid parts
7	explosion	explosion of the cells

### Example option (other versions available on request)

Model*	Approx. dimensions L x W x H (mm)		Useful area	Walk-in	Racking system	Fire rated	Crane eyes	Fittings (example)
	exterior	interior**						
TSR 314.27	3860 x 1850 x 3400	2700 x 1340 x 820		—	•	•	•	<ul style="list-style-type: none"> <li>■ Fire rated / Explosion proof</li> <li>■ Pressure relief</li> <li>■ Temperature control</li> </ul>
TSR 614.30	7080 x 1850 x 3700	2700 x 1340 x 920		—	•	•	•	
TSR 626.30	7080 x 3120 x 3740	2700 x 2610 x 920		—	•	•	•	

\* Design with ground clearance to allow loading using a hand operated electric stacker \*\* Bay dimensions

# Technical containers

## Emergency Power Supply containers

### Reliable power supplies from EPS containers

An emergency power supply is an essential component of a safety system design, for example for providing the uninterruptible power supply (UPS) for hospitals, computer centres, the chemicals industry or at telecommunications sites.

However important these systems are, there are often problems when installing a system as an add-on: lack of space, safety concerns, or any required conversion work can mean high additional costs.

Especially in cases where small, portable equipment is not longer sufficient, DENIOS offers a space saving, mobile solution with its technical container, all with an attractive price-performance ratio.

The most varied kinds of energy producing equipment (diesel generators, fuel cells or similar) and storage media such as batteries may be safely housed in our fire and vandalism protected technical / safety rooms, while remaining mobile.

We would be happy to produce a room design especially optimised for your equipment.

The weather-proof container can be sited outdoors and thanks to its low net weight, can be located on a flat roof to save space. Indoor locations are of course also suitable.

The system is fully assembled in our production

facilities, so that connection to the local system is all that is needed when the system is delivered.

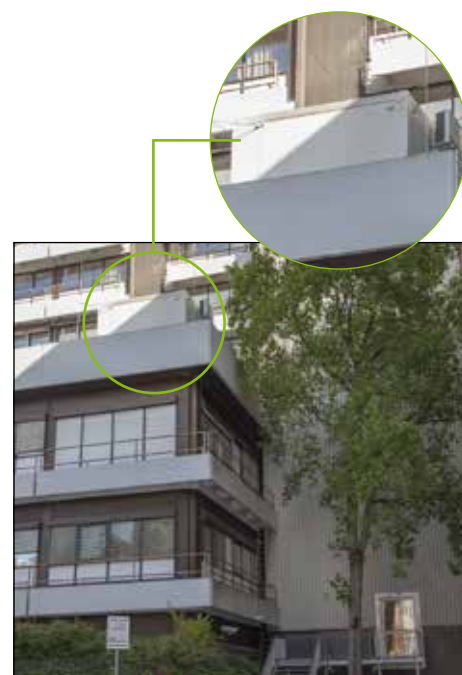
DENIOS offers a comprehensive, user friendly Plug & Play solution, making it possible to set up your emergency power supply quickly and safely – making a real contribution to your works safety! As your service and maintenance partner we're always there to support you.



View into the uninterruptible power supply (UPS) in the container



F90 fire-rated container, cable routing in the double floor



Location for the technical container on the roof of a hospital

#### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 15.10	1510 x 1160 x 2470	1190 x 870 x 2070	1	•	–	•	–	<ul style="list-style-type: none"> <li>■ Container / shell</li> <li>■ Double floors</li> <li>■ Climate control</li> <li>■ Technical ventilation</li> <li>■ Plug &amp; Play</li> </ul>
TSR 25.25	2590 x 2510 x 2520	2240 x 2190 x 2100	5	•	–	•	–	
TSR 38.25	3790 x 2510 x 2520	3440 x 2190 x 2100	8	•	–	•	–	
TSR 50.25	4990 x 2510 x 2520	4640 x 2190 x 2100	10	•	–	•	–	



In addition to fuel cells, photovoltaic equipment was also sited on the container roof to provide a source of energy



Separate area for H<sub>2</sub> cylinders



View into the technical room with fuel cells and corresponding storage media

## Fuel cells are the technology of the future

Fuel cells are being increasingly used as an energy source which does not depend on the power grid. This technology has been used in the mobile communications field and in military applications. These sensitive systems are often found in climatically difficult environments.

As part of a cooperative project, a system was developed to ensure that fuel cell technology could be safely and suitably housed:

- Creation of defined room temperatures, optimised to suit the application
- Use of an F90 / REI 120 protective shell
- Pressure relief surfaces in the roof

For safety reasons the container was divided into two separated fire areas. One provided the storage area for the H<sub>2</sub> cylinders, and so had an Ex zone design. The other was a technical room, which housed the fuel cells and the required storage media.

The result: a mobile room, which was perfectly designed to house this sensitive technology - suitable for both indoor and outdoor use.

### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 30.25 (10')	2991 x 2438 x 2591	2700 x 2200 x 2250	6	—	•	—	•	<ul style="list-style-type: none"> <li>■ Partition between fuel cells and H<sub>2</sub> supply</li> <li>■ Climate control</li> <li>■ Technical ventilation</li> <li>■ Pressure relief panels</li> <li>■ Break in security</li> </ul>
TSR 38.30	3760 x 2990 x 2920	3440 x 2650 x 2500	9	•	—	•	—	
TSR 50.30	4960 x 2990 x 2920	4640 x 2650 x 2500	12	•	—	•	—	
TSR 60.25 (20')	6058 x 2438 x 2591	5750 x 2200 x 2250	13	—	•	—	•	
TSR 62.30	6160 x 2990 x 2920	5840 x 2650 x 2500	16	•	—	•	—	



# Technical containers

## Walk-in radio container

### Safe and resilient

DENIOS offers individual, comprehensive solutions with its technical / safety room designs, which are ideal for housing your radio equipment outdoors.

Radio containers from DENIOS meet the highest requirements for protection from environmental influences, for example lightning strike or external temperature, which is needed for the interruption-free operation of your equipment.

Important for you: The indestructible, durable design ensures your technology is efficiently and reliably protected from vandalism!

Your complete system will have been fully tested.

#### Advantages at a glance:

- Large capacity thanks to optimum use of available space
- Can be flexibly extended thanks to module construction
- Simple access and maintenance
- Meets the most stringent safety requirements (RC4 certification in accordance with DIN EN 1627) and is long lasting
- Remote monitoring possible via safety contact – request a quote
- Fire protection: 30 to 120 minutes
- Useful double floor or cable ducting around the sides
- DIBt certified



Cable duct for clean routing of internal wiring



Inner room climate control, with space saving mounting



Switch cabinet and data transfer point

#### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 30.25 (10')	2991 x 2438 x 2591	2700 x 2200 x 2250	6	–	•	–	•	<ul style="list-style-type: none"> <li>■ Double floors</li> <li>■ Climate control</li> <li>■ Plug &amp; Play</li> </ul>
TSR 74.30	7360 x 2990 x 2920	7040 x 2650 x 2500	19	•	–	•	–	
TSR 120.25 (40')	12192 x 2438 x 2591	11900 x 2200 x 2250	26	–	•	–	•	



## Radio container cabinet

### High quality non walk-in systems

DENIOS offers all the advantages of the container solution. The dimensions of the container offer maximum space with low net weight. The simple, uncompromising construction of the cabinet creates a one-piece unit.

All the structural analyses and certifications available for the container also apply to the cabinet. Here too, the equipment is durable and approved.

Why not opt for this space saving alternative: for technical / safety rooms on a flat roof. Our experts will work with you to develop a suitable solution, which will easily meet any requirements for the installation of radio rooms on a roof:

- Low net weight
- Low surface loading
- Protection from overheating with insulation and climate control
- Optimal arrangement of your technology in the smallest space
- Pre-installed and fitted out – ready to use right away



The modules can be easily maintained using slide-in rollers. No disassembly required



Technicians can work easily behind the racks



Radio centre with technical / safety room on the flat roof of an administration building

#### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 13.10	1300 x 1050 x 2400	1000 x 750 x 2000	0.75	•	–	•	–	<ul style="list-style-type: none"> <li>■ Technical ventilation</li> <li>■ Pull out rack (load rollers)</li> <li>■ Plug &amp; Play</li> </ul>
TSR 23.10	2300 x 1050 x 2400	2000 x 750 x 2000	1.5	•	–	•	–	
TSR 28.10	2800 x 1050 x 2400	2500 x 750 x 2000	2	•	–	•	–	

# Technical containers

## IT containers

### Individual, quick – sustainable

Data safety is vital! We design and manufacture secure, mobile housings for your sensitive IT technology. Regardless of whether you are looking to mirror data in redundant servers (security) or are looking to bring in mobile server capacity (space), the DENIOS IT Container offers a new, secure space which can be located on your premises. And it's equally at home inside or outside.

You can even select the fittings for your IT Container yourself. Choose what's important to you from our comprehensive portfolio. Your complete safety design might include the following:

- **Break-in / vandalism protection**

We offer RC4 (previously WK4) class system solutions which have been tested and approved in accordance with DIN EN 1627. This means your expensive equipment has the optimum level of protection at all times.

- **Uninterruptible power supply (UPS)**

The UPS equalises network variations and ensures back-up power in the event of a power cut. To avoid data loss, in the event of a long power cut, the UPS makes it possible to carry out a controlled server shutdown. For safety reasons, the server room can be separated to ensure a dust-free environment.

- **Extinguishing technology**

If the worst happens, various extinguishing systems will operate to protect your equipment in the best possible way. We'll work out the best protective system for you, whether that's an option integrated into your 19" racks or a complete room variant.

Protection of workers, environmental concerns and the quick return to operation are important factors when considering how to secure your equipment and avoidance of damage following the use of the extinguishing systems.

- **Fire early warning**

Recognise the risks and take preventive action – fire early warning systems make this easy. Early detection of smouldering fires using smoke particle detection for example can often prevent major losses, whether that's an option directly integrated into your 19" cabinet or a complete room variant.

- **Fire avoidance**

The amount of oxygen in the container is reduced to avoid critical situations. By the addition of inert gases such as argon or nitrogen, an atmosphere is created which prevents fires from starting in the first place.

- **Redundant climate control**

Constant and reliable climate control is of fundamental importance for the operation and durability of your IT technology. For this reason the climate control systems in our IT Container are redundant. For improved safety. Regardless of whether you are looking at a space saving external unit or want a central position between the racks, our experts will be happy to advise on the optimum design for your particular application.

We design and deliver a shell, optimised to suit your requirements, ready for the installation of your equipment. Or you can select a ready-to-use option.

Take a look through the following pages and consider the ideas and suggestions for new builds, extensions or refurbishments of your existing IT facilities.



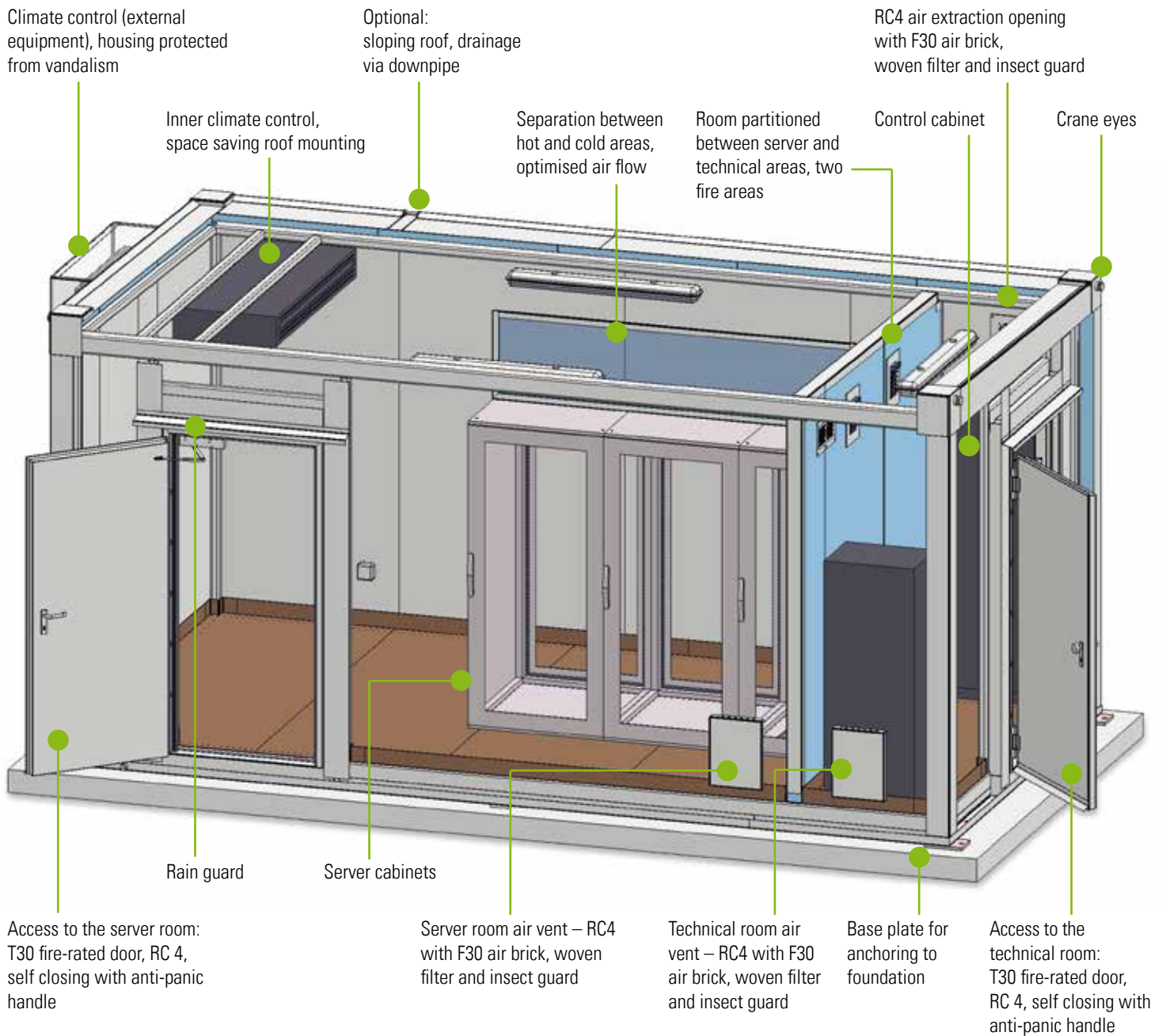
Climate control equipment: in this example, fitted under the roof to save space



Passive IT infrastructure - ready for customer to fit out



Precision climate control equipment in RZ - side air flow with horizontal air cooling



The UPS is separated from the IT technology – in a second fire area



View of the active IT components

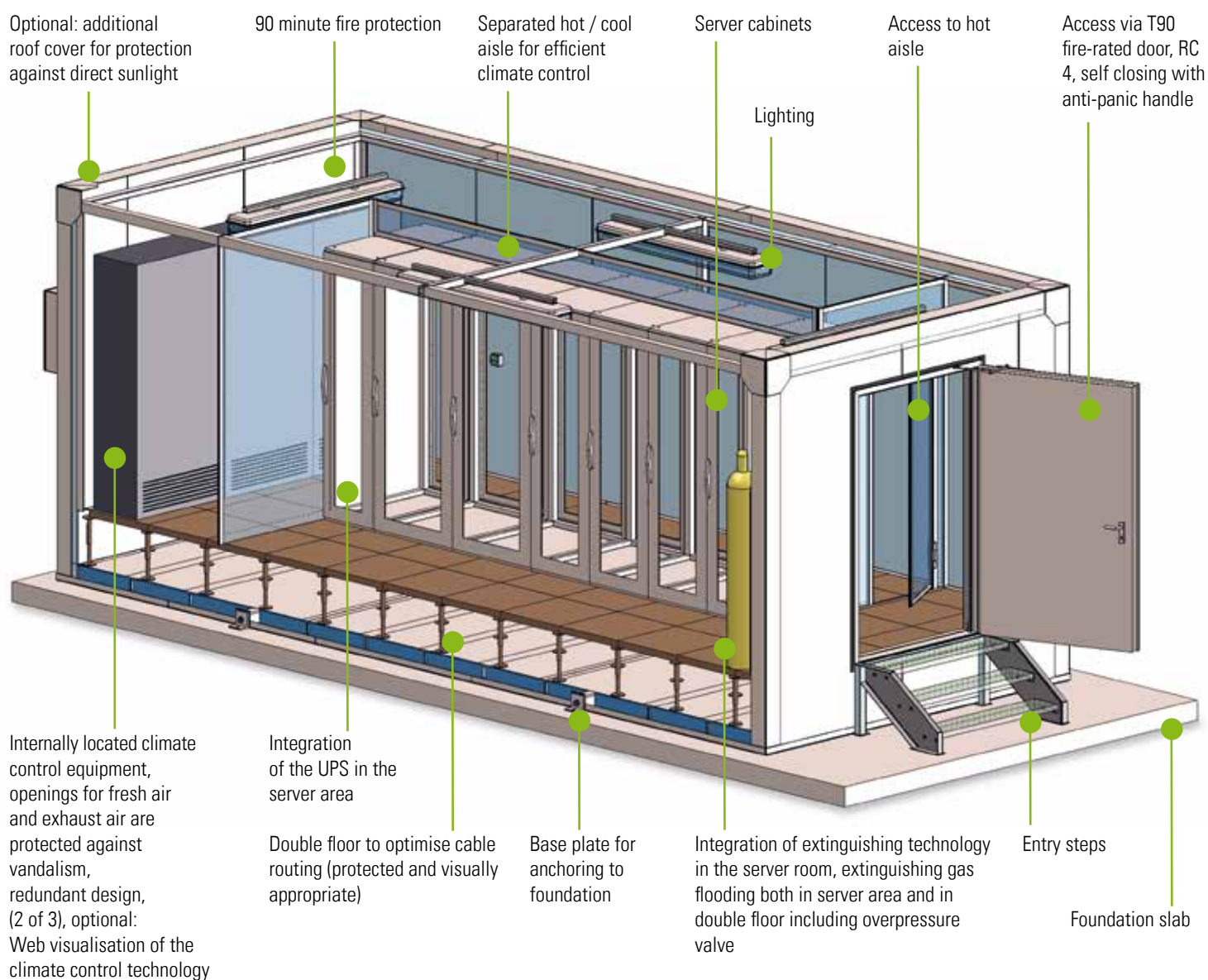


Impact protection barriers offer additional protection for the IT Container



# Technical containers

## IT containers



### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 30.25 (10')	2991 x 2438 x 2591	2700 x 2200 x 2250	6	—	•	—	•	<ul style="list-style-type: none"> <li>■ Air conditioning</li> <li>■ Hot/cool aisle separation</li> <li>■ Fire extinguishing</li> <li>■ Double floors</li> </ul>
TSR 62.32	6160 x 3200 x 2920	5840 x 2860 x 2500*	17	•	—	•	—	
TSR 85.30	8560 x 2990 x 2920	8240 x 2650 x 2500*	22	•	—	•	—	
TSR 120.25 (40')	12192 x 2438 x 2591	11900 x 2200 x 2250	26	—	•	—	•	

\* For designs with a double floor, the internal height is correspondingly reduced.  
Alternatively, the external height of the container can be altered



## Ready-to-use Plug & Play solution – the DENIOS Complete-Data-Center

We have worked with qualified companies in various fields. A wide network of contacts has allowed us to propose a comprehensive, flexible configuration to meet your application requirements. You'll benefit from the vast experience of our – space needed partners. Strong partners make a strong team!

Of course, we will handle all the communications and deliver the complete ready-to-use solution. All engineering and integration work is done

in house at DENIOS. We will be your main point of contact-you'll get everything from one place. This means we can guarantee your project will run smoothly.

Our Complete-Data-Center is a secure, fire and vandalism protected IT Container System. It's fitted out with all the infrastructure components needed for operation. They are all perfectly integrated and state of the art, yet easy to use. A complete ready-to-use solution, ready for direct connection to your network and power supply. Take a look for yourself at [www.cdc-info.com](http://www.cdc-info.com)!



DENIOS Complete-Data-Center – a ready-to-use complete solution



View into the technical room:  
Oxygen reduction equipment, UPS, monitoring



Also in the technical room:  
redundant climate control equipment



The passive IT infrastructure  
is located in the server room

### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
CDC 98.28	9800 x 2820 x 3530	9480 x 2615 x 2500*	25	•	–	•	–	<ul style="list-style-type: none"> <li>■ Plug &amp; Play (incl. climate control technology, UPS, extinguishing or fire avoidance system, passive IT technology)</li> <li>■ Security Management and Monitoring</li> </ul>
CDC 78.28	7800 x 2820 x 3530	7480 x 2615 x 2500*	20	•	–	•	–	

\* Design with suspended ceiling



# Technical containers

## Switchgear container

### For tough conditions — safe at all times

Decentralised technology is often sited at unusual and remote locations.

Fire, break-in, vandalism — many serious risks can limit the operation of electrical switchgear or prevent its operation altogether. Not to mention the risks to life and financial losses due to downtime and repairs.

Technical / safety rooms from DENIOS meet the highest requirements in terms of load capacity and safety. Their low net weight allows them to be sited in practically any location. The stable base components and steel frame construction are always part of the DENIOS protection design:

- Internal and external fire rating (from REI 30 to REI 120) — also suitable for indoor use
- Technical ventilation
- Break-in protection

This means we can guarantee reliable, secure operation of your stations.

Regardless of whether you opt for a cabinet or larger, walk-in system. The type and scope of the technical equipment, the installation location and your individual requirements are the deciding factors when selecting the right type of container. For more information take a look at ➔ pages 18 and 19 of this brochure.

Our team will be happy to discuss what your individual safety solution could look like.



Substation with decentralised technical / safety room



Use in a port terminal location



Flexible installation - can even be used as switch stations on railways



Technical / safety room with transformer in brown coal surface mine



View into the technical / safety room

#### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 30.25 (10')	2991 x 2438 x 2591	2700 x 2200 x 2250	6	—	•	—	•	<ul style="list-style-type: none"> <li>Double floor (optimum cabling)</li> <li>Heavy duty design for crane transport to final location</li> </ul>
TSR 60.25 (20')	6058 x 2438 x 2591	5750 x 2200 x 2250	13	—	•	—	•	
TSR 85.30	8560 x 2990 x 2920	8240 x 2650 x 2500	22	•	—	•	—	

# Technical containers

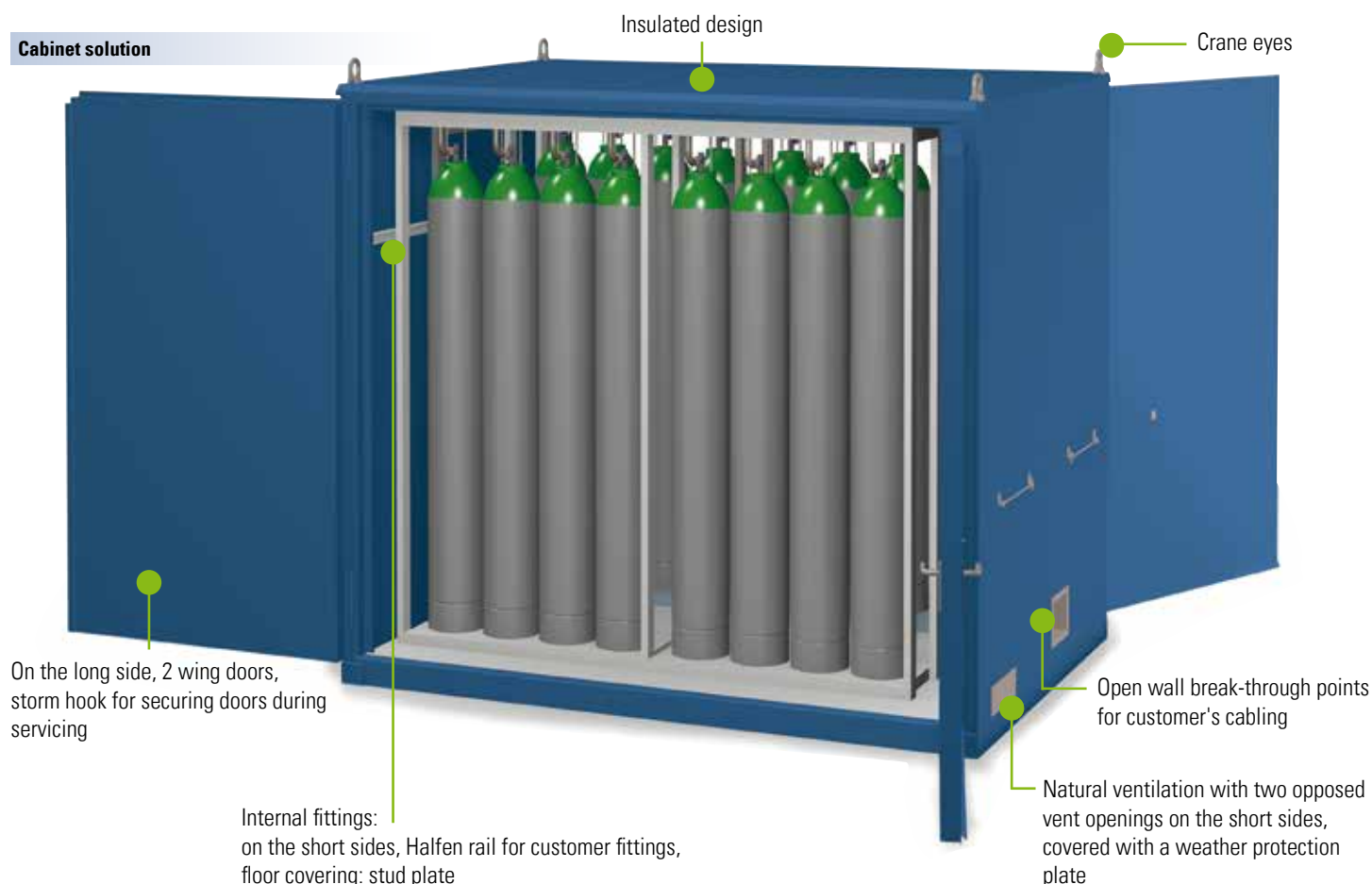
## Extinguishing room

### Extinguishing gases — safe and efficient

A fire can, in principle, start anywhere. In the worst cases, every second is vital. It is vital to detect it and extinguish it as quickly as possible, in order to keep injury, downtime or total losses as small as possible.

The market for automatic fire extinguishing systems is constantly developing. Depending on the equipment to be extinguished, both foam and powder are available alongside inert gas extinguishing systems (CO<sub>2</sub>, N<sub>2</sub>, argon,...).

Sensitive extinguishing equipment also needs optimum housing and protection so that it is ready when it's needed to be used. A secure and economic solution for housing your extinguishing technology is offered by DENIOS technical / safety rooms, regardless of extinguishing medium used.



#### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 26.10	2650 x 1150 x 2200	2400 x 900 x 2000	2	—	•	•	—	■ Easy access from 1 or 2 sides, giving access to the full container width.
TSR 26.19	2650 x 1900 x 2300	2400 x 1800 x 2150	4	—	•	•	—	

Whether you choose a walk-in or non-walk-in solution, our extinguishing rooms offer the right safety design. By siting them outdoors, any issues with space are instantly solved. This could be connected to the hall wall to save space or located separately on the grounds with easy access from all sides.

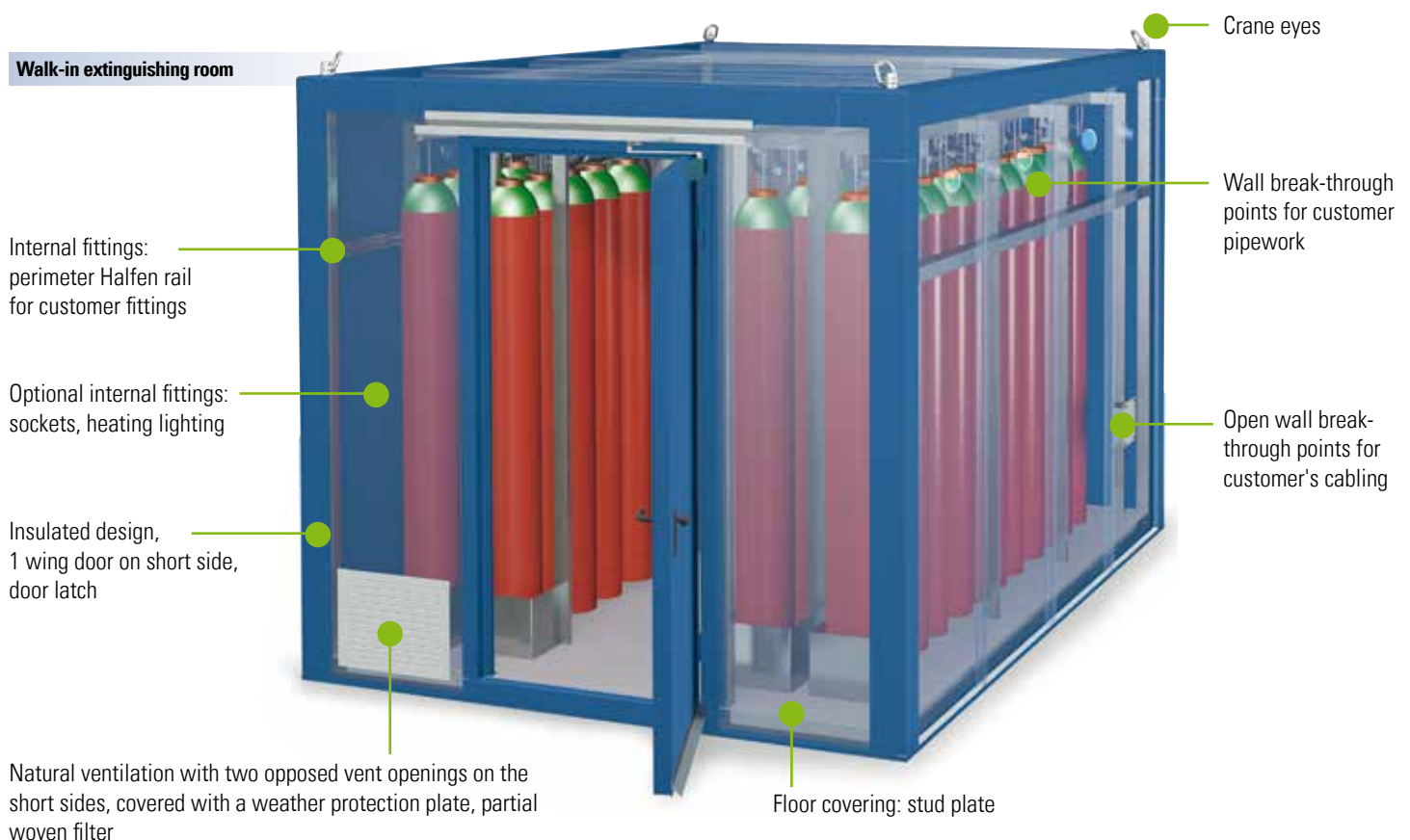
Of course, we develop our made to measure

designs for the fire protection of your equipment in cooperation with the manufacturers of well-known extinguishing equipment. And we always work to all national and international guidelines and standards.

Help is at hand: Ask your insurer what financial

incentives are available for your specific fire protection precautions.

If your extinguishing room also needs to be protected from potential external fire risks, instead of the insulated shell, we can supply a fire protection variant with up to 120 minutes fire resistance.



Example option (other versions available on request)								
Model	Approx. dimensions L x W x H (mm)		Surface area (m²)	Fire rated*	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 30.25	3060 x 2500 x 2500	2900 x 2400 x 2300	7	—	•	•	—	■ Walk-in system for large spatial requirement
TSR 40.25	4000 x 2500 x 2600	3840 x 2400 x 2400	9	—	•	•	—	

\*Upon request.



# Laboratory containers

## Sampling / analysis room

### Worker safety

When working with dusts and vapours which are hazardous to health, there are often requirements to use a technical solution in place of or in addition to personal protective equipment (PPE).

DENIOS can custom-integrate its certified workbenches and extraction equipment into mobile technical / safety rooms. Using fire and/or explosion protection measures, it is possible to integrate the sampling / analysis room either directly into the production process or to create a completely self-sufficient system outside production.

Dust and vapours are widely extracted from within the technical / safety room using specific air ventilation. The most modern air extraction filters permit emission-free air extraction. Constant production conditions require the intake air to be temperature controlled.

Fire-rated underbench cabinets offer additional safety, for example for intermediate storage of retained samples or sample substances in small quantities.

Comprehensive worker protection and ergonomically designed workbenches are always a priority.

#### DENIOS protects your workers with:

- Fire and explosion protection
- T90 doors with integral F90 glazing
- Alarm and warning lights
- Ergonomic working conditions
- Complete fitting-out of internal areas, e.g. with racking systems for storing retained samples, as well as PPE, emergency equipment and work equipment from our catalogue range.

Sound safety designs from the experts mean worker safety, environmental protection and safe production. This is why DENIOS feels that offering you in-depth advice is of paramount importance.

We will assess with you the various safety designs available and select the most suitable options. Alternatives will also be offered in terms of optimum cost/effectiveness.



Sampling / analysis room with air technology workplace and emergency shower. Additional safety is offered by fire-rated underbench cabinets for retained samples



## Everything from one supplier

Our sampling / analysis rooms bring together all six DENIOS areas and core competencies in one product: hazardous materials storage, worker safety, thermotechnology, air technology, service, and mobile technical / safety rooms. This ensures that you only have to deal with one company, our systems offer a perfectly unified, quality solution – all from one supplier.

And once your project is complete, we're ready to be your competent advisor for the future. Regular product maintenance from our service team ensures the long life of your equipment.



A walk-in F90 system with integral hazardous substance workstation and extraction system in use



Flexible source capture



Technical / safety room in operation at customer's premises

### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 38.25	3790 x 2510 x 2520	3440 x 2190 x 2100	8	•	–	•	–	<ul style="list-style-type: none"> <li>■ Fire rated / Explosion proof</li> <li>■ Specific air extraction</li> <li>■ Laboratory workplace</li> <li>■ PPE</li> </ul>
TSR 74.30	7360 x 2990 x 2920	7040 x 2650 x 2500	19	•	–	•	–	
TSR 42.30	4250 x 2890 x 2920	3900 x 2650 x 2500	10	–	•	•	–	
TSR 82.30	8220 x 2890 x 2920	7900 x 2650 x 2500	21	–	•	•	–	

# Safety rooms for process technology

## Containers for housing dosing stations

### Specialist solutions for any requirements

What do made to measure solutions from DENIOS look like in practice?

In this case (→ photos 1, 2 and 3) DENIOS developed and manufactured a mixing room for dyes and paints. There were special requirements for the production and safety technology:

- Climate control to ensure a constant temperature which protects the dyes from loss of quality
- Technical ventilation to extract flammable vapours which were produced during production
- Silicone free design
- Internal area is explosion protected
- Spill pallet in accordance with WHG, in case of any leaks

Our engineers will plan the most ergonomic internal arrangement for you. Mounting rails are pre-fitted on delivery, ready for your equipment.

Advantage: The internal arrangement may be altered at any time to suit a change in your requirements.

For example, storage containers and a dosing unit for an acidification plant could be housed in an insulated container. As a dilution unit for the hydrochloric acid is part of the technical equipment used, an acid-resistant PE inliner would be needed in the WHG spill pallet. An additional container lining increasing resistance to aggressive media is also recommended. A hollow section mounted on the rear wall makes it easier for the customer to fit the dosing pump controller.

#### Additional fittings:

- Flexible access to the long or short sides of the container with wing doors for walk-in systems
- Non-walk-in systems may have a sliding door or a space-saving roller door, instead of wing doors
- Flexible door design ensures optimum conditions for loading and changing containers at a later date
- Large internal height ensures it is easy to fill or mix substances in the stored containers
- Fire-rated design



1 Access via T90 door with door latch



2 Equipment mounting in paint mixing room



3 Ergonomic layout with space to move around



Fuel metering in safety room with fire protection



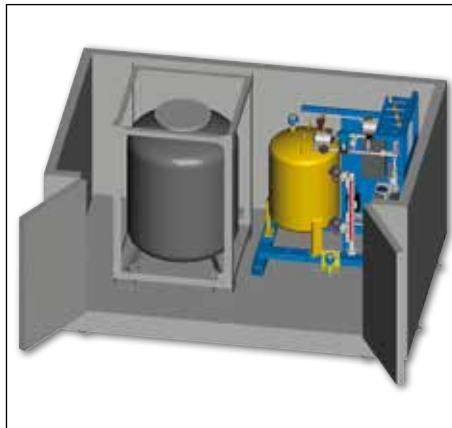
Fuel metering for engine test rigs -internal view



Electrolyte dosing



Active, fire-rated storage of flammable substances



Housing for an amine dosing station



Operator panel for dosing unit

**Example option (other versions available on request)**

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 33.17	3300 x 1640 x 3200	3000 x 1280 x 2620	4	—	•	•	—	<ul style="list-style-type: none"> <li>High internal dimensions: optimum housing of customer's dosing equipment / mixing equipment/ ..</li> <li>Spill pallet with PE inliner</li> </ul>
TSR 37.17	3680 x 1640 x 3200	3380 x 1280 x 2620	4.5	—	•	•	—	
TSR 33.30	3300 x 2840 x 2880	3000 x 2360 x 2300	7	—	•	•	—	
TSR 62.30	6160 x 2990 x 2920	5840 x 2650 x 2500	16	•	—	•	—	



# Safety rooms for process technology

## Containers for housing process gas technology

### Process gases — economically located

The use of technical / safety rooms enables the safe integration of process gases directly at the production area, even, as outside, without a safety distance. We will plan and manufacture, according to your requirements, an insulated design of our technical / safety room or a fire-rated and/or explosion proof variant.

The use of DENIOS safety rooms is not just reserved for companies which are mainly active in the chemical industry or in metal preparation. Or for companies in the automotive, medical, environmental technology or general research and development fields. The possibilities offered by flexible and above all economic integration of process gas technology offers all companies huge advantages if their daily work includes handling process gases.

DENIOS will supply a ready-to-use system with the following features, for example:

- Pre-fitted mounts for retaining gas cylinders
- Halfen rails for fitting mounts for rows of cylinders
- Wall break-through points for pipes (gas supply for test laboratories, general process chains, etc.)
- Pressure relief
- Fire and/or explosion protection
- Climate and temperature control
- Noise reduction

The housing of complex gas dosing stations is also possible. The interfaces can be determined by you. DENIOS can supply a turnkey Plug & Play solution or you can opt to carry out the internal fittings yourself. We will be happy to determine the optimum solution with you.

In this case (→ photos 1 and 2) DENIOS supplied an insulated room for housing a gas extraction station in Vietnam. Due to the high humidity at the external location, a dehumidifier was also supplied alongside the cooling equipment. The equipment handled hydrofluoric acid which was dosed and then used directly in the productions process.



1 Easy to load with 2 wing doors in the long side



2 Gas extraction station in Vietnam



## Tried and tested solutions for your requirements

Depending on the details of each application, we will develop a safety room for housing process gas technology in accordance with your individual needs.

### Here are two examples:

#### Variant 1:

Insulated technical / safety room with technical ventilation for central storage of process gases. Additionally fitted with climate control equipment to maintain a set room temperature. Halfen rails fitted around all sides for easy customer installation, as well as on-site pipe installation. Visually appealing aluminium chequer plate flooring. If required, floor level at walk-in height.

#### Variant 2:

Walk-in F90 / REI 120 fire-rated container with separate fire areas for separated storage of toxic, corrosive or flammable gases for example. The storage area for spare cylinders is also separated from the dosing equipment. This creates a separate level with access control. The internal area is defined as an Ex Zone. An increased air extraction volume is required. The temperature in the inner area is kept at a constant level by heating. The container also has gas warning equipment fitted, which uses both visual and audible signals. An automatic increase in the air exchange rate when the gas alarm is triggered can be provided as can closure of the doors. The pipes from the dosing equipment to the laboratory buildings run through the container walls. Fire protection

is provided by a double wall for these points. It would be advisable for the customer to also fit additional external impact protection.

Our specialists will provide a static tested construction. Full documentation for your records is provided with every technical / safety room.

See what configuration you can create.  
Just get in touch.



Housing for technical gases in a climate controlled safety room with fire protection



Firestop brick and piping into building



CO<sub>2</sub> extinguishing gas cylinders, ready connected

### Example option (other versions available on request)

Model	Approx. dimensions L x W x H (mm)		Surface area (m <sup>2</sup> )	Fire-rated	Insulation	Crane eyes	Corner castings	Fittings (example)
	exterior	interior						
TSR 25.25	2590 x 2510 x 2520	2240 x 2190 x 2100	5	•	—	•	—	<ul style="list-style-type: none"> <li>■ Fire protection</li> <li>■ Explosion-proof design</li> <li>■ Specific air extraction</li> <li>■ Security</li> </ul>
TSR 65.17	6480 x 1700 x 3200	2 x 3000 x 1280 x 2640	8	—	•	•	—	
TSR 50.25	4990 x 2510 x 2520	4640 x 2190 x 2100	10	•	—	•	—	
TSR 85.30	8560 x 2990 x 2920	8240 x 2650 x 2500	22	•	—	•	—	

# Special containers

## Decontamination room

### (Almost) anything is possible

The DENIOS special containers push the boundaries of the standard range. Custom made solutions for individual customers requirements are made, completely independent of business branch.

Based on the technical / safety room, DENIOS supplied a decontamination room for the cleaning of tools and parts with surface radioactivity contamination. The cleaning is a required procedure before the tools can leave the plant controlled area. This cleaning had previously been carried out in a provisional room. However, as personal safety is always of the utmost priority, especially when handling parts contaminated with radioactivity, this provisional arrangement was to be replaced as quickly as possible with a professional room solution.

The solution was to install a decontamination room as a house-in-house system, which would make it possible for all workers to carry out cleaning activities with full protection and an external air supply. This so called "Decon-box" washing station, with external dimensions

of 4200 x 2850 x 2300 mm (W x D x H) was manufactured in stainless steel inside and in sendzimir galvanised sheet steel outside. Thermal insulation was 80 mm polyurethane hard foam. The customer erected the system on site, where the room was welded so that it was sealed. The connection of customer-side media and electrical connections was also taken into consideration, as was the connection for drainage to the customer's own disposal system. Doors with viewing windows and additional service hatches were additional special features alongside a personnel airlock and a tool airlock with motorised opening in the roof area.

DENIOS provided the necessary approvals in accordance with section 15 StrISchV (Radiation protection regulations) for working in controlled areas.



View into the inner room, lined with stainless steel



Easy access even for bulky parts via a large door in the front and a hatch in the roof



Working in the "Decon-box"

## Storage of a crash test vehicle including Li-ion batteries

### Safety round the clock

The requirement for this project was the safe housing of a complete crash test vehicle - 24 hours a day. Especially at night, there was an increased risk from the unmonitored test systems.

In order to house the complete vehicle together with the associated test equipment, the technical / safety room needed the following dimensions: 7400 x 3000 x 3000 mm (W x D x H). An Ex-proof roller door extended along the whole of the long

side. In this way it was possible to position the crash test vehicle easily. From where the vehicle was stored, personnel could exit the container through a single wing T30 escape door.

On the opposite short side, a heavy duty rack offered sufficient room for the storage of Li-ion batteries. The racks were loaded via a double wing T30 door with upper door closer, The spill pallet offered protection in the case of any battery leaks. The inside of the technical / safety room was

declared as Ex-Zone 1. All built-in equipment, for example the lighting, air circulation heating and technical ventilation was therefore Ex protected.

For the technical ventilation, a power monitoring system was installed for safety reasons. Gas warning equipment was also installed.



Special container with heavy duty rack for the storage of Li-ion batteries. T30 door



Ex-roller door on the long side, 1 wing. T30 exit door in the short side

# Technical / safety room fittings

## System construction and flexible configuration

### Individual advice

DENIOS prides itself on building rooms which perfectly meet your requirements and the most stringent quality standards. There is a wide range of sizes and fittings available, from which our engineers will help you develop your perfect solution.

The following pages can therefore only offer an overview of sizes, wall construction, safety technology, and other fittings options. We'd be delighted to discuss the possibilities and solutions DENIOS can offer you for your particular requirement during an advisory meeting.

### Basic dimensions

What size space do you need?

In the table below you'll find some examples from our range. Of course, our technical / safety rooms are also available in the standard ISO sizes 10 foot, 20 foot and 40 foot.

Details are shown in the overview at the bottom of this page. If you don't find the right size, either here or in the specific applications pages, we would be happy to quote for a custom intermediate size in your required dimensions on request.

Further modules can easily be added to existing rooms.

### Made to measure transport

The technical / safety rooms described here in standard ISO external dimensions are usually supplied with Corner Castings for optimum overseas transport.

Containers for road-only transport are fitted with crane eyes as standard. These ensure easy handling with a crane and can also be used to secure the container during transport on the low bed trailer.



Crane eyes – for transport over land



For sea transport, Corner Castings are used

#### Example variations for sea transport

Model	Approx. dimensions L x W x H (mm)		Surface area (m²)	Walk-in	Rack system	Fire-rated	Insulation	Crane eyes	Corner castings
	exterior	interior							
TSR 30.25 (10')	2991 x 2438 x 2591	2700 x 2200 x 2250	6	•	–	–	•	–	•
TSR 60.25 (20')	6058 x 2438 x 2591	5750 x 2200 x 2250	13	•	–	–	•	–	•
TSR 120.25 (40')	12192 x 2438 x 2591	11900 x 2200 x 2250	26	•	–	–	•	–	•

#### Example variations for land transport (\* bay dimensions)

TSR 38.25	3790 x 2510 x 2520	3440 x 2190 x 2100	8	•	–	•	–	•	–
TSR 614.30	7080 x 1850 x 3700	2700 x 1340 x 920*		–	•	•	–	•	–
TSR 85.30	8560 x 2990 x 2920	8240 x 2650 x 2500	22	•	–	•	–	•	–



## Flexibility with DENIOS modular design

The DENIOS modular design concept covers not only the room dimensions, but also the type and construction of the whole system, as well as the internal construction and any fitted equipment. In this overview, you will find a wide range of possible fittings, **which are described in more detail on the following pages**.

There are no limits to flexibility in configuring your container, thanks to the comprehensive knowledge and engineering skills of your DENIOS advisors. Working closely alongside you, we will develop a system that is ideal for your needs, which will be delivered along with comprehensive product documentation and tested structural analysis calculations.

You decide where the interfaces will be positioned for connection to your services. We will also be happy to integrate components you provide or to work with other suppliers. If required, we will supply a ready-to-use Plug & Play solution.

Features		Technical containers	Laboratory containers	Safe rooms	Special containers
<b>General</b>	Indoor / outdoor location	•	•	•	•
	House-in-house solution possible	—	—	—	•
	With / without safety distance	•	•	•	•
	Fire-rated / Explosion proof	•	•	•	•
	Painting in all RAL colours	•	•	•	•
<b>Walls</b> (page 38)	Wall construction (fire-rated / insulated)	•	•	•	•
	Room partition	•	•	•	•
<b>Floors</b> (page 38)	Floor construction	•	•	•	•
	Floor break-through points	•	—	•	•
	With / without spill pallet	•	•	•	•
<b>Access solutions</b> (page 39)	Wing doors, sliding doors or roller doors	•	•	•	•
	Variable number and position	•	•	•	•
<b>Break-through points</b> (page 39)	Cable ducts	•	•	•	•
	Ventilation bricks	•	•	•	•
<b>Safety</b> (page 40 / 41)	RC Classification	•	•	•	•
	Alarm equipment	•	•	•	•
	Access control system	•	•	•	•
	Fire alarm	•	•	•	•
	Gas detectors	•	•	•	•
<b>Internal fittings</b>	Lighting	•	•	•	•
	Halfen rails	•	•	•	•
	Shelving	•	•	—	•
	Workstations	•	•	—	•
<b>Climate control technology</b> (page 42 / 43)	Internal / external fitting	•	•	•	•
	Compact / split systems	•	•	•	•
	Free cooling	•	•	•	•

# Configuration

## Technical construction and fittings

### Wall construction

Walls and ceilings can be covered with various materials:

- Sheet steel
- PU foam insulation panels
- Stonewool panels



Fire protection and noise insulation, break-in prevention, effective insulation against heat and cold - our walls offer protection against all kinds of factors.

All in all the steel outer shell satisfies the highest lightning protection, dissipation and EMC requirements. The load-bearing capacity of the walls and ceiling is also unrivalled: Considerable loads can be suspended from them without any problems.

### Stonewool panels

DENIOS uses panels which have DIBt approval.

#### Features:

- excellent fire protection (up to REI 120 in accordance with EN 13501-2)
- good insulation
- 50 mm A-Material, non-flammable,  $U = 0.77 \text{ W/m}^2\text{K}$
- 100 mm A-Material, non-flammable,  $U = 0.43 \text{ W/m}^2\text{K}$



50 and 100 mm panels in stonewool

### PU panels

PU panels have a polyurethane foam centre.

#### Features:

- very good insulation against heat / cold.
- 50 mm B-Material, flame retardant,  $U = 0.45 \text{ W/m}^2\text{K}$



50 mm panels in PU foam

### Floors

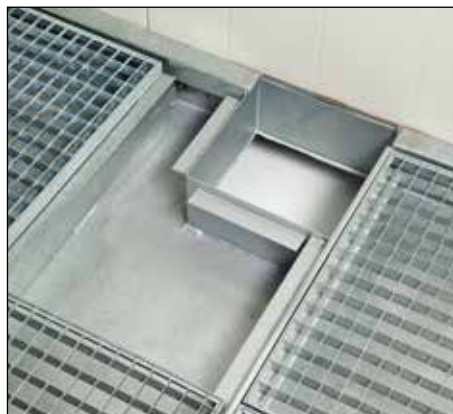
Server rooms, analysis rooms or test rooms require different floor constructions. This is why we offer the most suitable flooring for each application:

- Double floor for housing cables and pipework
- Heavy duty flooring
- Grids
- Anti-static linoleum flooring

Floor break-through points can be easily made. Whether this is as a simple opening in the floor at a point you determine or a fire and water protected break-through point, it's easy.



➡ Left hand photo: Floor break-through points with fire and rodent protection, gas and water-tight



Floor opening for protected media supply



Double floor with inspection flap

## Access solutions

You have a choice of access solutions: 1 or 2 wing doors, sliding or roller doors. There are many options for the position of the wing doors. Depending on application, purely insulated, fire-rated or Ex protected designs can be supplied. The various types of access door can also be combined in some cases.



Example sliding door



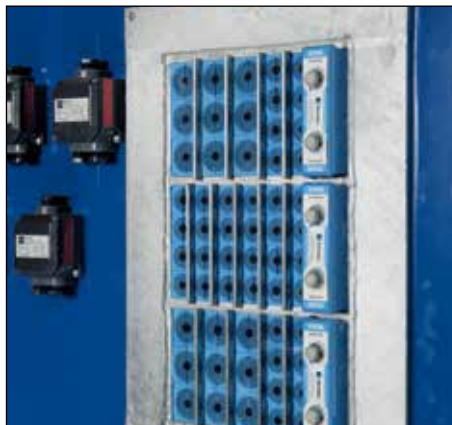
Example roller door and wing door

## Break-through points and ventilation

The cable and pipe break-through points offer protection from water, fire, gas and pressure as well as sand, dust and dirt. Vermin and rodents are also safely kept away. There is no risk of problems or damage due to cables being pulled out, explosion pressure, vibration or noise.

### Features:

- Sealed against rain and snow
- Excellent insulation
- Dust and noise-proof
- Rodent secure
- Lightning protection
- Break-in protection to RC4 in accordance with DIN EN 1630
- Break-through points for power and data cables
- Fire-rated to REI 120
- Additional break-through points and mounting can be added to the panels at a later date without losing the fire protection approval
- Approved to EN 13501-2 and DIBt



Cable ducts



Ventilation brick with safety melt feature



Fire protected break-through points for cables in a side wall



Fire protected break-through points for pipework in a side wall

# Configuration

## Burglar resistance and safety equipment

### Stay safe with us!

The European standards DIN EN 1627 ff "Burglary resistance" describe a classification of risk areas, as well as the technical requirements for a system resulting from individual test procedures (EN 1628 to EN 1630). The individual test procedures are described as follows:



**EN 1628** Test methods for determining resistance under static load. Pressure forces are created by the application of static loads so that basic strength can be determined.

**EN 1629** Test method for determining resistance under dynamic load. Loads similar to a kick or shoulder charge are simulated using an impactor.

**EN 1630** Test method for determining resistance to manual break-in attempts, carried out under laboratory conditions.

Technical / safety rooms from DENIOS are certified in accordance with DEN EN 1630 up to resistance class RC 4.



Resistance class	Resistance time	Maximum total test time	Type of burglar, method of burglary
RC 1 N	—	—	Basic protection against break-in attempts with bodily force (mainly vandalism)
RC 2 N	3 minutes	15 minutes	Opportunist burglar – additional use of simple tools such as screwdriver, pliers and wedge (standard window glass)
RC 2	3 minutes	15 minutes	Opportunist burglar – additional use of simple tools such as screwdriver, pliers and wedge (from this class safety glazing in accordance with EN 356 is required)
RC 3	5 minutes	20 minutes	Habitual burglar – additional use of two screwdrivers and a crowbar
<b>RC 4</b>	<b>10 minutes</b>	<b>30 minutes</b>	<b>Experienced burglar – additional use of sawing and impact tools such as axe, chisel, hammer and pick, as well as a battery powered drill</b>
RC 5	15 minutes	40 minutes	Experienced burglar – additional use of electrical tools such as drill, jigsaw, hacksaw and angle grinder (max. disc diameter 125 mm) – Glazing must resist direct attack during the test
RC 6	20 minutes	50 minutes	Experienced burglar – additional use of more powerful electrical tools such as drill, jigsaw, hacksaw and angle grinder (max. disc diameter 230 mm) – Glazing must resist direct attack during the test



## Safety equipment

In addition to a burglary-safe container shell design, your equipment can also be effectively custom-protected with our large range of monitoring technology.

- Break-in protection with resistance class 1-4
- Break-in alarm
- Video surveillance
- Access control
- Gas warning detector
- Temperature sensor
- Warning lights
- Fire alarm
- Extinguishing technology, for example sprinkler system
- Fire avoidance technology

The earlier an incident can be detected and an alarm raised, the better any damage through fire, gas or water for example can be limited or even prevented. DENIOS offers a wide range of optional safety equipment, just in case.

We are also happy to install any equipment you may provide. For example fire warning systems which are part of your fire alarm system and are already used in other parts of your company. Do you need defined climatic conditions for your technology? We offer a varied range of climate control equipment and heating equipment for this purpose.

### Help is at hand:

**More information on climate control technology** can be found on  
➔ **pages 42 and 43 of this brochure**



Gas warning detector



Fire alarm



Motorised control fire protection flap



Fire alarm



Extinguishing system sprinkler in action



Warning lights

# Configuration

## Climate control technology

### The right solution for any challenge!

DENIOS technical / safety rooms are also ideal for use in regions of the world where unfavourable climatic conditions are found. The wide range of application variants require varied solutions in terms of climate control technology.

The climate control technology solutions shown here are designed for external temperatures of -20 to +45 / 50°C. All configurations can be fitted with an optional Winter kit. In this case, optimal operation without limitation can be guaranteed down to an external temperature of -40°C.

The precision climate control equipment shown here for internal or external mounting is designed for long term operation and guarantees the highest levels of operational safety.

### Custom climate control solutions

Fitted on the outer wall or on the roof, the space in your technical / safety room can be used to full advantage.

Externally mounted equipment works quietly and also has a night-mode. An external operator / monitoring unit can also be fitted as an option. This makes remote diagnosis of your installation possible.

Climate control equipment fitted inside the room has the advantage that it is protected from external influences. This minimises the risk of damage by third parties (vandalism) as well as possible damage from unforeseeable environmental factors, such as bad weather for example.

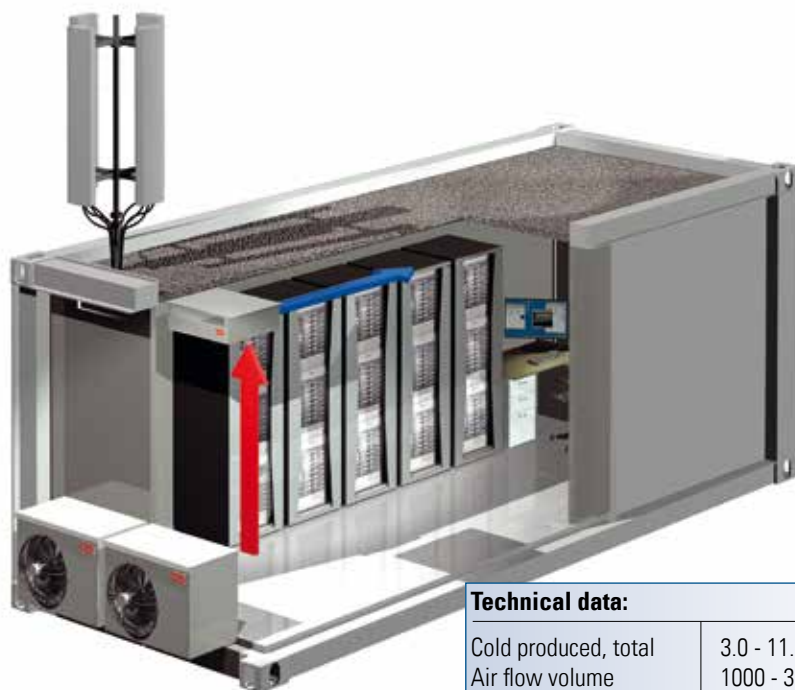
We offer the right climate control system solution for your needs. Our experts will be happy to advise you!

### Precision climate control equipment for external mounting



Technical data:	
Cold produced, total	4.0 - 15.5 kW
Air flow volume	1000 - 3600 m³/h

### Compact climate control equipment for space saving roof mounting



Technical data:	
Cold produced, total	3.0 - 11.0 kW
Air flow volume	1000 - 3000 m³/h

### Precision climate control equipment for internal mounting



Technical data:	
Cold produced, total	4.0 - 13.0 kW
Air flow volume	1000 - 3200 m³/h

## Precision climate control equipment for use in data centres

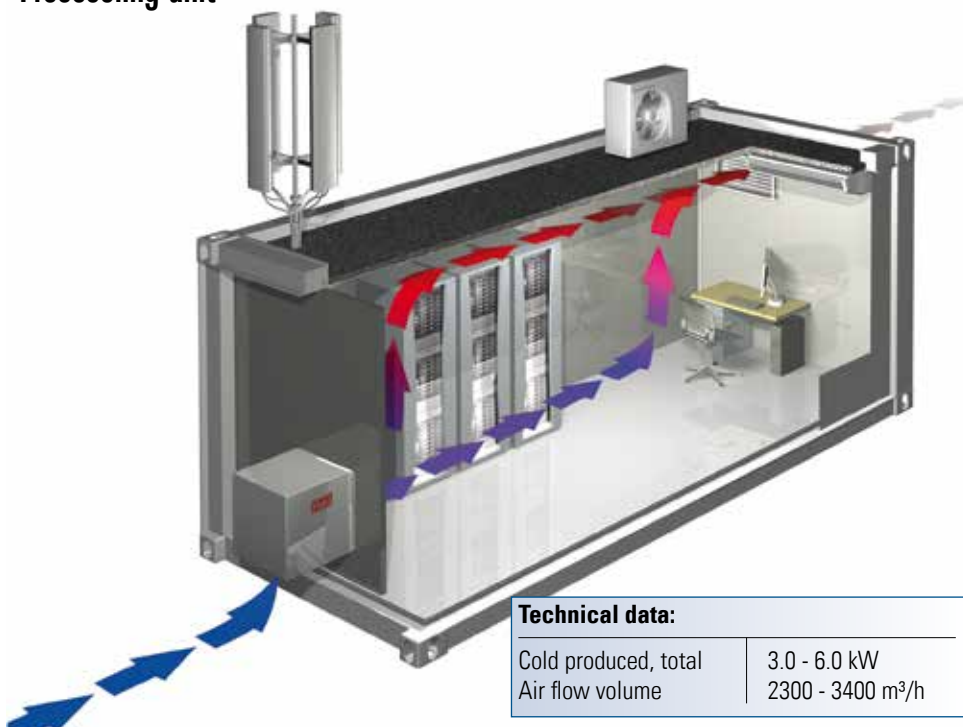


Optimised cooling directly in front of the racks

### Technical data:

Cold produced, total	24.0 - 56.5 kW
Air flow volume	4700 - 10800 m³/h

## Freecooling unit



### Technical data:

Cold produced, total	3.0 - 6.0 kW
Air flow volume	2300 - 3400 m³/h

## Optimised for your IT

This precision climate control equipment for installation in your room system is optimised for IT applications. All equipment is constructed to fit the conventional 19" format.

Installed between racks, the sideways air flow ensures horizontal cooling.

The equipment can be used independently of any other components in the room design, for example double flooring or hot/cold aisle separation.

## Use your energy saving potential!

Whether precision climate control technology, designed as a hybrid system with indirect free-cooling, installed in a temperate climate zone lowering power usage by up to 60%. Or a free-cooling unit, which, depending on the ambient temperature, contributes to quick payback of your investment, giving a high energy saving potential of up to 84%.

We always think and act with the best interests of our customer - and the environment of course - at heart!

Our experts would be happy to have a detailed discussion of your precise application requirements at any time.



# Service

## transport and assembly

### Safe transport to your site!

Whether we use a trusted freight forwarder or our own DENIOS flat bed trailer, 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.



With our own fleet of vehicles – here with a low loader – we'll transport your container to your site



Easy to transport onto your premises



Unloading with a truck-mounted crane, installation on the prepared foundation



Last stages of preparation for sea transport



The walk-in fire-rated system is climate controlled, fully assembled and ready for operation



## Secure your investment — save money



### 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 in 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.

### Maintenance services

- One-off assessment or maintenance contract
- Trained and certified service technicians
- On-site repair of defects and damage (as far as possible -large scale repairs will be quoted for and carried out 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 compliance
- 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

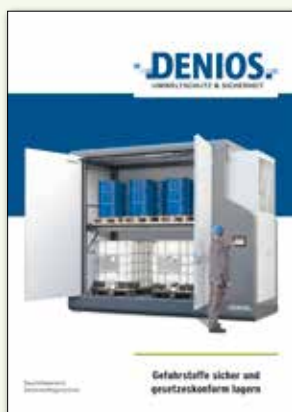


The service and maintenance team

# DENIOS: Competence and flexibility

## Hazardous substances storage range

Hazardous materials are handled on a daily basis in many industrial sectors. At DENIOS we've set ourselves the challenge to make it safer to handle these materials. With a wide product range from a spill pallet to a fire-rated storage container. From finished standard products to individual custom-made solutions. For legally compliant and efficient storage of flammable, toxic, oxidising and water-polluting substances. For safeguarding people and the environment.



## Thermotechnology range

Heating, melting, cooling; thermal treatment of substances is important in many industrial sectors.

This is where DENIOS products show their worth. From heat chambers and heat boxes to climate controlled and cooling containers. To protect valuable goods from the negative effects of temperature variations or to ensure additives are correctly temperature controlled.



## Air technology range

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. To safeguard 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.



## DENIOS Complete-Data-Center

Complete-Data-Center (CDC): a secure, fire and vandalism protected IT Container System. All of the infrastructure components required for operation come from well-known suppliers. They are all perfectly integrated and state of the art yet easy to use.

CDC is supplied ready to use and ready for direct connection to the network and power supply.



## Main DENIOS catalogue

As a product designer and manufacturer with over 25 years of experience, DENIOS has demonstrated a real flair for creating efficient solutions: More than 10,000 practical products, from spill pallets to fire-rated containers, on more than 700 pages of our main catalogue meet virtually all of our customers' wishes. 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.



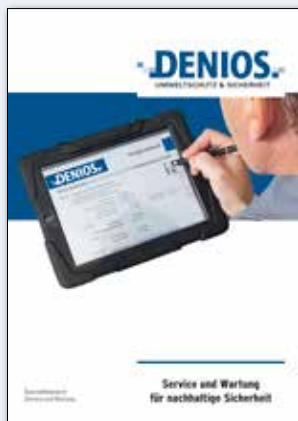
## DENIOS Online Shop

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's competency as the market leader. The DENIOS online shop is a modern, customer-friendly platform that features more than 10,000 items for storing hazardous substances, health and safety and industrial requirements. The site offers handy search functions and information on product availability.



## Service and maintenance

Regular inspection and maintenance of our products goes without saying. We don't leave anything to chance at DENIOS.



From the repair of damage on site, to a regular maintenance schedule for your hazmat store, we offer a full range of service options, tailored to your requirements. Let's talk about what you need, preferably in person.

## The DENIOS Hazmat Manual

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

## Would you like to know more about DENIOS?

Please see other contact information

➔ [www.denios.de](http://www.denios.de) ➔ visit **local websites** ➔ **specific numbers** for your country on the back cover.

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