KAESER COMPRESSORS®

Instrument and Plant Compressed Air Systems in Containers

www.kaeser.com

Container – Design – Installation

KAESER container solutions are tailored to individual customer needs and can be operated in temperature ranges from –50 °C to +45 °C. Ambient temperatures over +45 °C require alternative turnkey solutions which can be offered according to requirement. **Low-temperature steels are used** for temperatures below –50 °C.

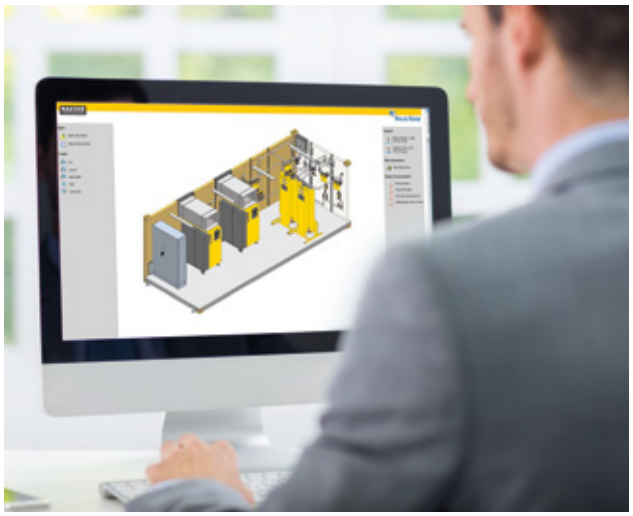
KAESER guides its customers every step of the way from inquiry, design, order, factory approval, packaging, loading and transportation to unloading and initial on-site start-up.

The compressor packages are manufactured according to specific customer and country requirements.

KAESER customers have the option of installing the ready-to-use compressor station(s) on-site thereby reducing both costs and time. The systems are tested at the KAESER plant in Austria where the agreed operating parameters are preset. If the compressed air installation comprises multiple containers, we ensure that they can be operated as a single unit, as well as in combination with one another. System operation, together with the proven SIGMA AIR MANAGER 4.0 master controller, guarantees best possible load efficiency (see image below). This type of installation reduces on-site compressor installation time to a minimum. In its Austrian plant, KAESER is able to operate and test multiple containers in combination and can even emulate system communication with a simulated control centre.

Planning

The entire planning process for the container system is implemented at KAESER Linz by specially trained in-house engineers. Construction and system layout are performed using the very latest 3-D planning tools in close partnership with **you**.



During this phase, the prevailing ambient conditions – such as temperature, dust exposure, humidity and other contaminants – are scrutinised **in addition to the required operating parameters**. Following the successful planning phase, the transportation conditions are checked. This involves route planning, access, unloading and on-site installation conditions.
Working drawings, pipe diagrams, production drawings and wiring diagrams are all created by the KAESER engineers.

Container design

The containers are insulated steel units and feature **ISO** container corners. The containers are statically designed in such a way that they can be lifted at the upper container corners. They are completely piped and wired and include a control cabinet with power sub-distribution, an automatic ventilation system, a heater, lighting and emergency lighting. The design is implemented in accordance with customer requirements and requests.

KAESER uses insulated containers that are specially produced for each specific application.

Insulated containers ensure far better thermal conditions within the container than non-insulated containers and prevent condensation from occurring on the inside. A further advantage is sound reduction and the minimisation of acoustic emission to the environment. All openings are reinforced to ensure that the structural strength of the container is maintained. Rain protectors are installed above the openings in order to prevent rainwater ingress.

External dimensions of L= 15,000 mm, W= 3,500 mm and H= 3,700 mm are available without the need for further planning. For larger dimensions, information regarding the installation location is necessary in order to allow a transportation feasibility check during the quotation phase.

1 Galvanised sheet steel
2 Emergency lighting
3 700 mm escape route
4 CSD compressor
5 DC desiccant dryer
6 Aquamat
7 Control cabinet
8 Pipes
9 Filters
10 Electric heater
11 Anchoring point

Container 3-D planning order for the oil and gas industry in England

Equipment

Exterior paint finish

The exterior paint finish is applied as per KAESER standard with a 120 µm thickness of the dry layer; walls are painted in broom yellow RAL 1032 and the frame in anthracite grey RAL 7016. Upon customer request, a different paint colour, thickness of the dry layer and requested layer structure can be applied.

Internal corrosion protection

The insulated standard container is lined on the inside with galvanised sheet steel. The stud plate floor is painted in light grey RAL 7035; the floor paint layer thickness is 80 µm.

Structural analysis evaluation

A certified structural analysis evaluation can be provided in English or German as required. However, this must be agreed upon prior to placing of the order. KAESER suppliers implement an internal structural analysis inspection for every order.

Container safety-related design features

The container interior is equipped with emergency lighting above the personnel doors in order to enable safe exit from the container in the event of a power failure. The emergency lights provide illumination for approximately 1 ½ hours.

The equipment is installed in the container in such a way as to allow a clear 700 mm wide escape route.

The personnel doors are equipped with panic locks which can be opened from the inside even when locked. Personnel can therefore exit the container at any time.

The necessary anchoring points for the equipment, piping and electrical equipment are already defined during the container construction phase.

Smoke and gas warning systems can be installed upon request.

Pipework

The pipework is implemented in accordance with **PED 97/23 EC** or ASME:

- Galvanised pipework with screw or grooved design.
- Stainless-steel pipework with welded or grooved design.

KAESER Linz is a certified specialised welding company and is independently able to weld and inspect the most varied of piping materials in its in-house workshop.

Pipe pressure stages PN 10 or PN 16 and PN 45.

Leakage tests and water pressure tests are carried out in the plant and are monitored by the QM system.
Based on a type approved by the German Technical Inspection Association (TÜV), the pipework may be independently certified in accordance with **PED 97/23 EC**.

Other pipe materials are available upon request.

Electrical equipment

The containers feature EN 60204 compliant control cabinets and are fully wired; further features include interior lighting, electric heaters for frost protection and emergency lighting.

Wiring is implemented with flexible light plastic-sheathed YSLY-JZ type cables in galvanised cable ducts and in plastic pipes for small consumers.

The system as a whole undergoes an internal test run in Linz under the specified conditions (as far as is possible) and only leaves the plant following a successful test run.

Oil leak tightness of container

If necessary for environmental or other reasons, the container floor can be designed as an oil-tight pan.

Container 3-D planning for filter and desiccant dryer pipework

Examples of container applications

SIGMA PET AIR

Container solutions are used in a wide range of areas, e.g. for pressure increase of nitrogen from 6 to 28 bar with boosters, for instrument and/or shop air containers, but also as booster solutions for PET applications up to 45 bar. These PET solutions are listed on the website at: Kaeser.com/Products/Reciprocating compressors/

SIGMA AIR UTILITY

Information regarding SIGMA AIR UTILITY compressed air contracting can be found on the KAESER website at: Kaeser.com/Products/SIGMA AIR UTILITY operator model. For SIGMA AIR UTILITY applications, the compressed air supply is installed in one or more containers. Only the actually incurred compressed air costs are calculated.

SOUNDPROOFED CONTAINER

In order to ensure compliance with applicable sound emissions regulations, it is possible to equip the container with appropriate soundproofing. During the planning stage, local conditions are taken into consideration to achieve the most effective sound level reduction. The illustrated example shows a container on a flat roof at a height of approx. 12 m; the required sound level at a distance of 10 m is 40 dB(A). The sound level measured at the Linz plant was in fact lower than the required sound level.

Test run and training

Internal test run

Prior to delivery to the customer, the entire system undergoes an internal test run at the plant in Linz, under the specified conditions, and is only delivered following a successful test run. The system test run is performed by the technician responsible for the initial on-site start-up – this therefore ensures complete familiarity with every system detail. The test runs can also be performed at different voltages: 690 V 50 Hz, 480 V 60 Hz, 440 V 60 Hz, 400 V 50 Hz, etc.

Factory Acceptance Test (FAT)

Upon request, KAESER will also perform Factory Acceptance Tests (FAT) in the presence of the customer and/or an independent expert. During these tests, the contractually agreed parameters are checked and also changed, if requested. Depending on the agreement and the scope, the time period for a FAT is one to 8 days and longer.

Following a successful FAT or internal test run, and upon customer approval, the systems are released for packaging and final cleaning.

Training in Linz or on-site

Upon request, we provide training in Linz or on-site for the operator personnel. The duration depends on the scope of the training. The training is held in English or German and training documentation is also available in English or German.

Documentation and approvals

Documentation

Comprehensive documentation for the entire scope of delivery in accordance with Machine Directive 2006/42/EC is included in English or German. However, the documentation can also be provided in other languages as required.

Quality management: ISO 9001:2008

KAESER Linz has been certified in accordance with ISO 9001:2008 and is inspected annually by the LGA-Intercert institute. In addition to standard quality management, we have also obtained ISO 29001 approval for the oil and gas industry.

International approvals for the containers

The following approvals exist for the containers as finished machines:

CE For the European market: **CE** approval pursuant to Machine Directive 2006/42/EC and Pressure Equipment Directive PED 97/23/EC module B+D.

UL For the American market **UL** Pre FES.

EAC For the Russian market: **EAC** in accordance with valid TR CU Rules from 2015. Technical passport, safety expertise and TR 010/2011, 004/2011 and 020/2011.

Complete documentation is available in English or German. Documentation can be provided in other languages as agreed upon request.

Installation and commissioning

Commissioning process following successful on-site setup

As described below, it takes on average 2-3 days from installation of the container until initial commissioning. The key prerequisite is that the supply cables for the container, the compressed air line and the condensate line are located at a distance of 1-2 m from the container installation location. The external wiring and piping of the container is the customer's responsibility.

All internal approvals for the initial commissioning of the container must be available.

Day 1: Completion of cable connection comprising installation and connection of the prepared cable in the control cabinet and container system. This work is to be performed on-site. **The power supply must be provided by the customer.**

Day 2: Completion of the remaining 1-2 m of compressed air line and condensate line. This work is to be performed on-site.

Day 3: Inspection of the entire system for possible transport damage, and checking of the cable connections in the container system control cabinet. Once the check has been performed and the safety of the system has been verified, the compressor station is commissioned step-by-step by the KAESER technician responsible for initial start-up.

On-site commissioning with inclusion of the local branch office or partner

On-site commissioning is performed by the KAESER technician responsible for initial start-up who has been involved with the system from the outset at the KAESER plant through to delivery. The local KAESER branch office or KAESER partner is involved in the system commissioning phase.

Key hand-over to customer

Shipping

Packaging and final cleaning

- The packaging is suited according to the applicable shipping method.
- The systems undergo a rigorous final cleaning process prior to the delivery.
- The shipment is released following final cleaning approval.
- The systems are packed in single-use plastic sheeting for standard transportation by lorry.
- Seaworthy packing crates are used for sea transport.
- Single-use plastic sheeting is used for air transport.
- Packaging takes place at the plant in Linz.
- Information required for transportation and loading is attached on the outside of the packaging: Centre of gravity, attachment points, chain angles, address.

Loading

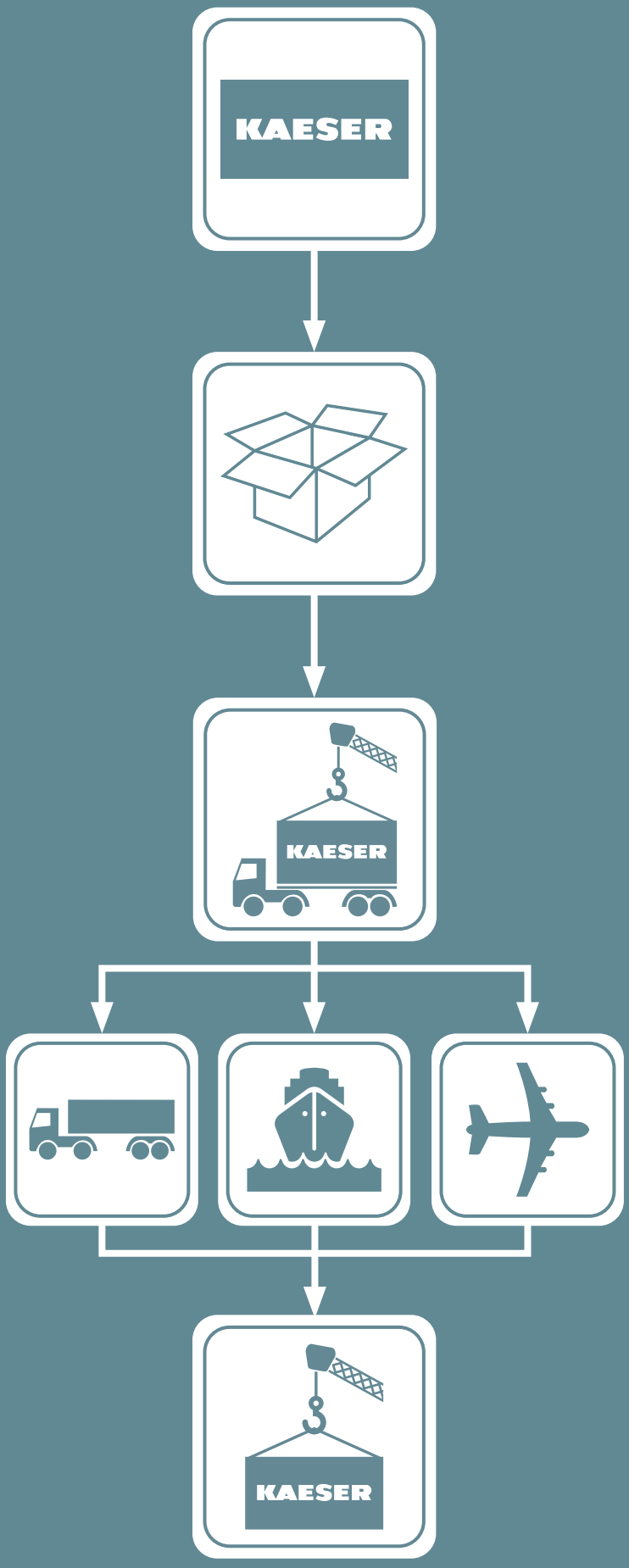
The containers are loaded using 32-ton capacity in-door cranes in the installation hall.

Transportation

Transportation is performed by KAESER as requested by road, sea or air, or a combination thereof. Route planning and the necessary approvals are organised by the respective shipping company.

Unloading

On-site unloading of the systems is the customer's responsibility. KAESER provides the necessary documentation, such as centre of gravity drawings, unloading drawing with brackets for the hoisting devices and attachment points. The container should be placed on an even and horizontal foundation.



Packaging

Loading

Transportation

Unloading

Skid solutions

For oil and gas applications and for Sigma PET Air Packages. We will gladly design a tailored skid solution for you that meets your exact needs.

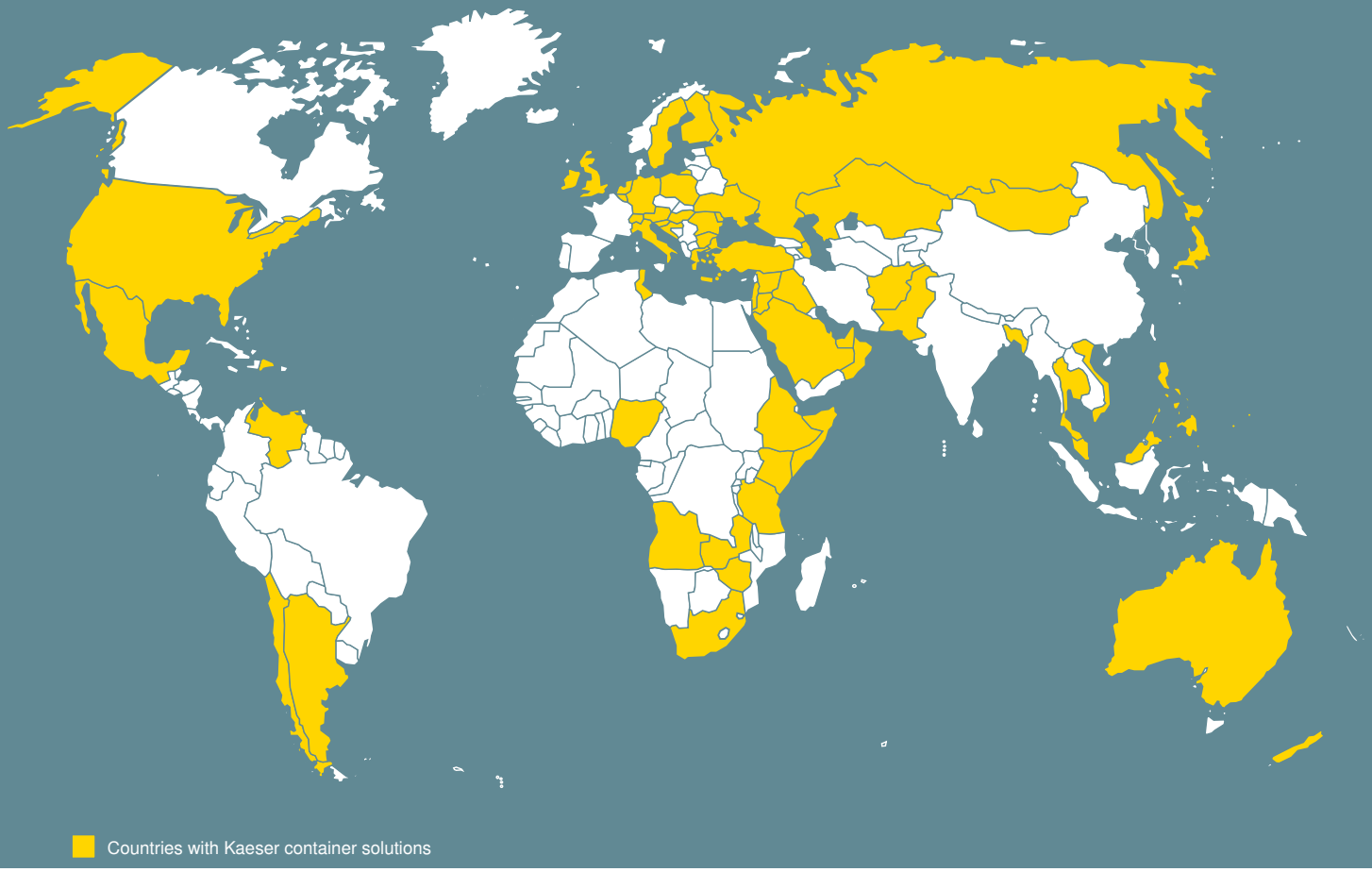
KAESER skid solutions for ambient temperatures of over 45 °C and up to 60 °C have already been implemented in the United Arab Emirates, Tunisia, Oman, Saudi Arabia, Qatar, the Philippines, Syria, Malaysia, etc. and are mainly used in the oil and gas industry. These systems are modified in accordance with oil and gas requirements, e.g. for installation under a flying roof with specially developed sand separators for the cooling and compression air.

KAESER Sigma Pet Air Packages

For ambient temperatures up to 45 °C; systems are installed in Japan, Pakistan, Australia, Nigeria, Iraq, Afghanistan, Ethiopia, Azerbaijan, Mexico, Somaliland, Angola, Venezuela, Bangladesh, Tunisia, Zambia, Tanzania, Lebanon, Vietnam, Greece, Mongolia, Zimbabwe, Chile, Kenya, New Zealand, Dominican Republic and Aruba. (See map on the next page)

SIGMA PET AIR Packages

KAESER skid solutions are suitable for oil and gas applications with ambient temperatures of up to 60 °C, high sand load and for installation under a flying roof.



References

KAESER has been successfully meeting the specific needs of the most varied sectors of industry for decades.

Renowned company names such as Linde, Shell, Air Liquide, Magna or Techno Alpin confirm KAESER's exceptional expertise.

KAESER's special focus is on customised solutions and the resulting innovations.

With its 25 years of experience in plant engineering and manufacturing – during which time over 100 container systems, as well as approx. 200 base frame systems for oil and gas applications and 250 base frames systems for PET applications for pressures up to 40 bar have been produced for a wide range of industrial sectors – KAESER's professional expertise grows ever stronger through close partnership with its customers. This results in innovative solutions based on proven technology.

Countries where you can find KAESER container and base frame solutions:

Germany, Austria, Switzerland, Croatia, Slovenia, Italy, Belgium, Holland, England, Ireland, Sweden, Finland, Kazakhstan, Russia, Moldova, Ukraine, Poland, Hungary, Romania, Bulgaria, Turkey, Malta, Jordan, South Africa, Thailand, USA and Argentina.

Contacts have already been established in many other countries: providing fast and effective local support, KAESER Linz is closely networked with individual country subsidiaries and authorised KAESER dealers.

KAESER Linz – The Competence Centre

KAESER Linz has been building customised solutions since 1990 and has grown to become a competence centre for base frame and compressed air container solutions. The customer-tailored solutions are built in two areas covering a floor area of approximately 2,200 m². We employ qualified engineers in the areas of electronics, piping and ventilation who implement these solutions. Multiple systems are constantly produced in parallel and are supervised by the respective engineers and foremen. Two testing bays are available for performing system test runs and checks. Final cleaning and packaging takes place inside the plant halls – not outside. The production process is monitored by the project engineers and our quality management system every step of the way right up to, and including, loading. Transportation, logistics and customs clearance are organised by our internal Logistics department. The project engineer and the Documentation department are responsible for documentation for the respective product.

Contact: info.austria@kaeser.com

Sales centre:

- Linz
- Wr. Neudorf
- Hart bei Graz
- Wiesing
- Weiler

Certificates


Certificate

Standard ISO 9001:2015

Certificate Registr. No. 01 100 2100058/48


Certificate

Standard ISO 14001:2015

Certificate Registr. No. 01 104 2100058/48


Certificate

Standard ISO 45001:2018

Certificate Registr. No. 01 213 2100058/07


CERTIFICATE

EN ISO 3834-3


EU-Baumusterprüfbescheinigung


Zertifikat

Richtlinie 2014/68/EU, Anhang III, Modul D


EU-Baumusterprüfbescheinigung


Certificate

Standard ISO 14001:2015

Certificate Registr. No. 01 104 2100058/48

Organization: KAESER KOMPRESSOREN SE
Carl-Kaeser-Str. 26
96450 Coburg
Germany

Site: c/o KAESER KOMPRESSOREN Ges.m.b.H.
Dallingerstr. 8
4031 Linz
Austria

Scope: > Engineering, sale and servicing of the following product range:
Rotary screw and reciprocating compressors for compressed
air and vacuum, blowers, portable compressors, compressed
air dryers, compressed air filters, condensate drains, condensate
separators, air receivers, compressor controllers and compressed
air management systems, teleservice, heat recovery systems,

The world is our home

As one of the world's largest manufacturers of compressors, blowers and compressed air systems, KAESER KOMPRESSOREN is represented throughout the world by a comprehensive network of wholly owned subsidiaries and authorised distribution partners in over 140 countries.

By offering innovative, efficient and reliable products and services, KAESER KOMPRESSOREN's experienced consultants and engineers work in close partnership with customers to enhance their competitive edge and to develop progressive system concepts that continuously push the boundaries of performance and technology. Moreover, decades of knowledge and expertise from this industry-leading systems provider are made available to each and every customer via the KAESER group's advanced global IT network.

These advantages, coupled with KAESER's worldwide service organisation, ensure that every product operates at the peak of its performance at all times, providing optimal efficiency and maximum availability.

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