



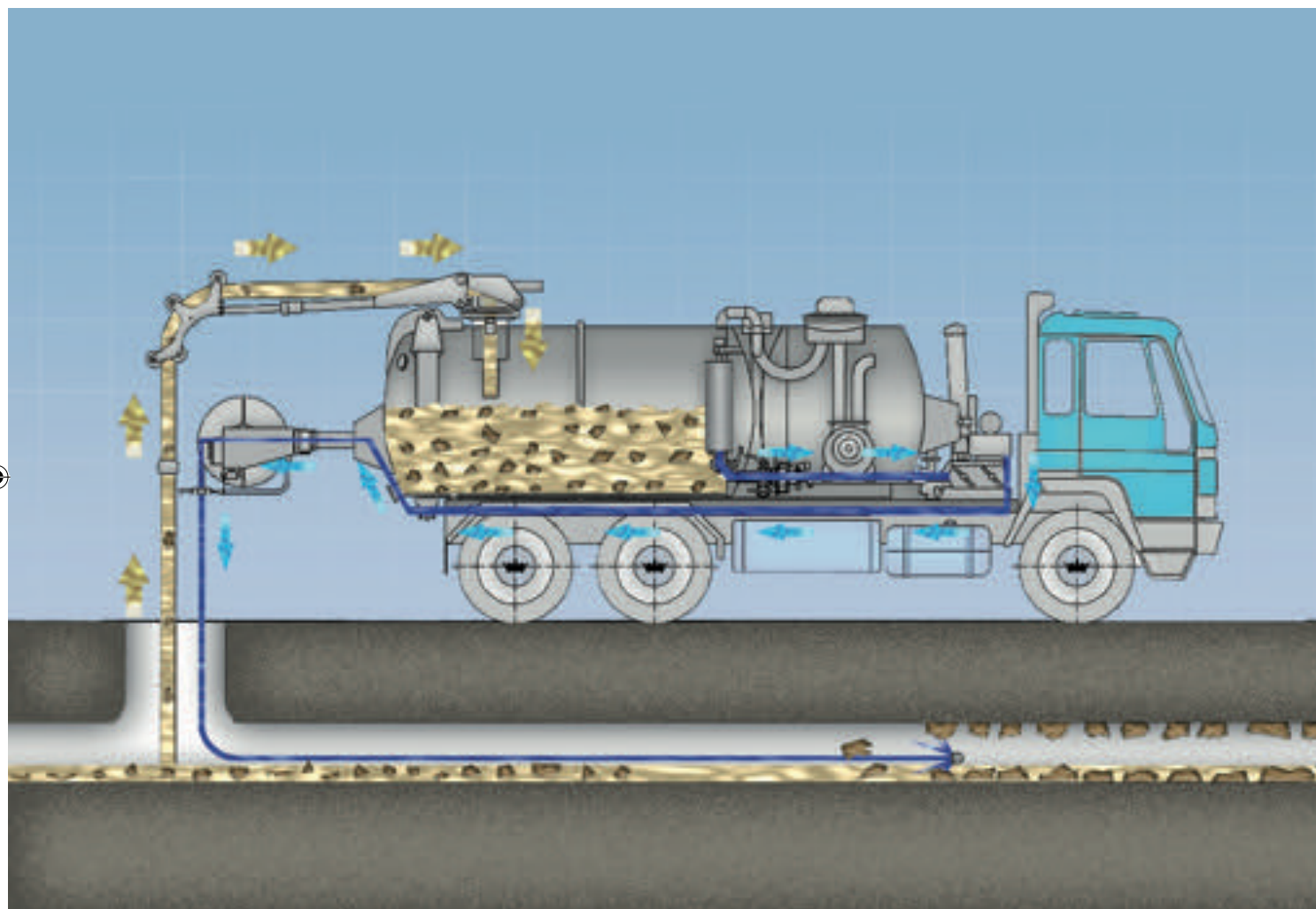
What do customers appreciate most about KAISER vehicles?

Technology and quality

KAISER vehicles impress with innovative technology and outstanding workmanship, making them a match for the toughest tests offered by rugged continuous operation.

Flexibility and economic efficiency

They are considerably more flexible and economical in terms of cost/benefit comparisons than the vehicles of other suppliers.



Jetting – Vacuuming – Water recycling

Jetting

A high-pressure water hose with a sewer jetting nozzle is fed into the soiled sewer. The high-pressure water jet dislodges the dirt and flushes into the gully hole. At the same time, the water jet pushes the hose further into the sewer.

Vacuuming

The material flushed into the gully hole is extracted by means of a vacuum system. Solids and water are thus conveyed by the suction hose into the sludge tank.

Combined sewer cleaning

If jetting and vacuuming work can be performed simultaneously, we talk of a combi cleaning/vacuuming vehicle.

Sewer cleaning with water recycling

Water and solids are separated in the sludge tank. The filtered water is reused for jetting purposes via the jetting pump.





What does it mean to have
5 plants and a network of
100 sales and service partners
across 5 continents?

Customer proximity and
regional support.

Kaiser. Performance counts.

**KAISER technology –
powerful and reliable**

In the sewer cleaning and waste disposal trade the name KAISER is synonymous with innovative technical solutions. As a vehicle manufacturer and system supplier, KAISER is worldwide leader in the sewer cleaning with water recycling sector.

KAISER pressure converter - KDU Jetting pump

Technical data

KDU jetting pump	102	148	2x148
Max. delivery rate (USgal/min)	150 (40)	320/400/500 (85/106/132)	800 (211)
Max. operating pressure (PSI)	170 (2465)	200 (2900)	200 (2900)

Function

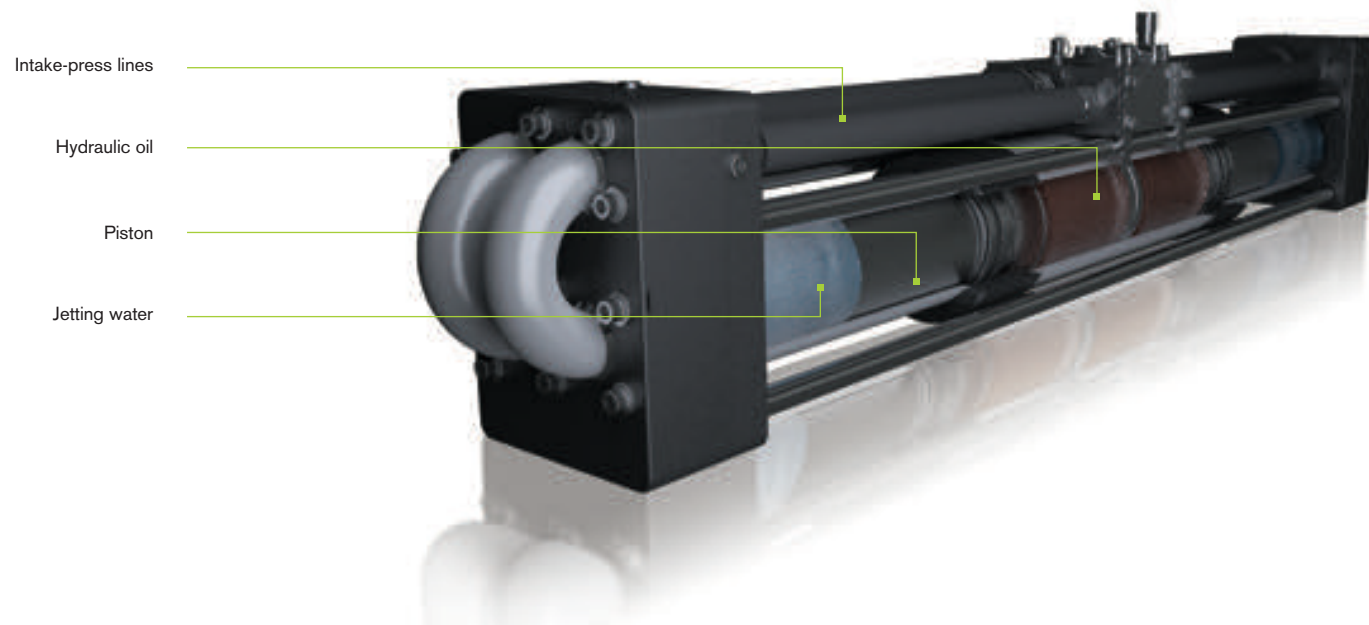
The pressure transformer principle developed by KAISER has proved its worth for over 30 years as the perfect solution for cleaning sewers, especially when combined with water recycling. The KDU is a hydraulically driven jetting pump that directly converts oil pressure into water pressure. Pressure and flow rate can be set independently of one another.

Outstanding level of efficiency

Using the truck's auxiliary output drive, the KDU is driven via a power and pressure-controlled hydraulic pump. The required power is adjusted to the different jetting jobs. In combination with flow-optimised, symmetrical line running, fuel consumption is perceptibly reduced.

Fail-safe and low-maintenance

In contrast to a jetting pump based on the 3-piston plunger principle, the piston action of the KDU is very slow. The KDU can thus run dry safely and is impervious to soiled water. The few moving parts ensure exceptionally quiet running and low-noise operation. The valves on the water side can be used repeatedly. Due to the hydraulic drive, maintenance on the mechanical drive is minimal. The water pressure is set and controlled on the hydraulic side. A pressure control bypass valve, which is susceptible to wear, can thus be dispensed with on the high-pressure water side.



KAISER water ring pump - KWP

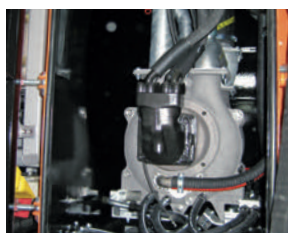
Vacuum pump

Technical data

KWP vacuum pump	900i	1600i 2000i	2400i 3100i	7000i
Max. air flow in m ³ /h	900	1600	2400	7000
Max. air flow in cfm	530	943	1414	4120
		1178	1825	
Max. vacuum rate in % (in Hg)	90 (26.6)	90 (26.6)	85 (25.1)	80 (23.6)
Max. pressure in bar (PSI)	1 (14.5)	1 (14.5)	1 (14.5)	1 (14.5)
Weight in kg (lb)	95 (209)	180 (397)	210 (463)	650 (1433)



Eccentric rotor



KWP in fresh water chamber

Function

As early as the mid-1980s, KAISER developed the first water ring pump in a light construction for mobile applications. In the KWP housing, an eccentric rotor produces a ring of water using centrifugal power. Volume changes in the rotor chambers ensure that air is sucked in and compressed. This construction type features high resistance to dirt particles and is ideally suited to vacuuming wet and dry media. The contact-free rotor ensures extremely quiet running and a long life cycle. The KWP causes no contamination of the pump exhaust air by lubricants and oils. The oil-bath bearings require no maintenance.

Light-weight and reliable

The light construction increases the vehicle's useful load. The integrated intercooler system ensures a consistently low temperature budget for the service water. Even in the case of high exterior temperatures, continuous operation is possible and even extended vacuuming jobs in the end vacuum range result in no overheating of the KWP.

Mounting in the fresh water chamber - patented

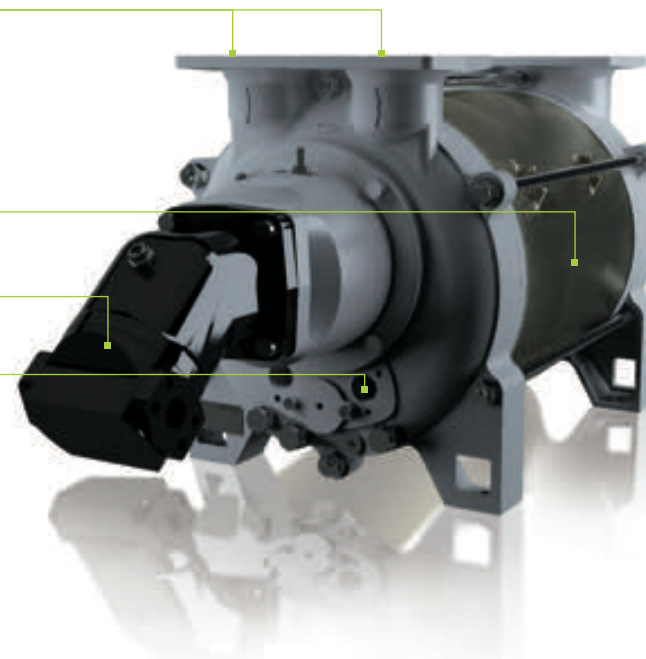
By building the KWP into the fresh water chamber, additional natural cooling, frost protection via water insulation and reinforced sound insulation are achieved. The short suction lines to the sludge tank ensure an optimum degree of efficiency. This construction type also permits vacuum/pressure operation when tilted.

Intake-press junction

Pump body made of aluminium

Hydraulic motor

Intercooler connection



KAISER ROTOMAX Water recycling system

Patented KAISER system

The centrepiece of the ROTOMAX water recycling system is an oscillating rotary filter drum. Built into the front part of the sludge tank, this one-stage filter system separates solids from sewer water. The filtered water is channelled directly (without settling basin) to the KAISER pressure transformer for further jetting processes.

Outstanding efficiency

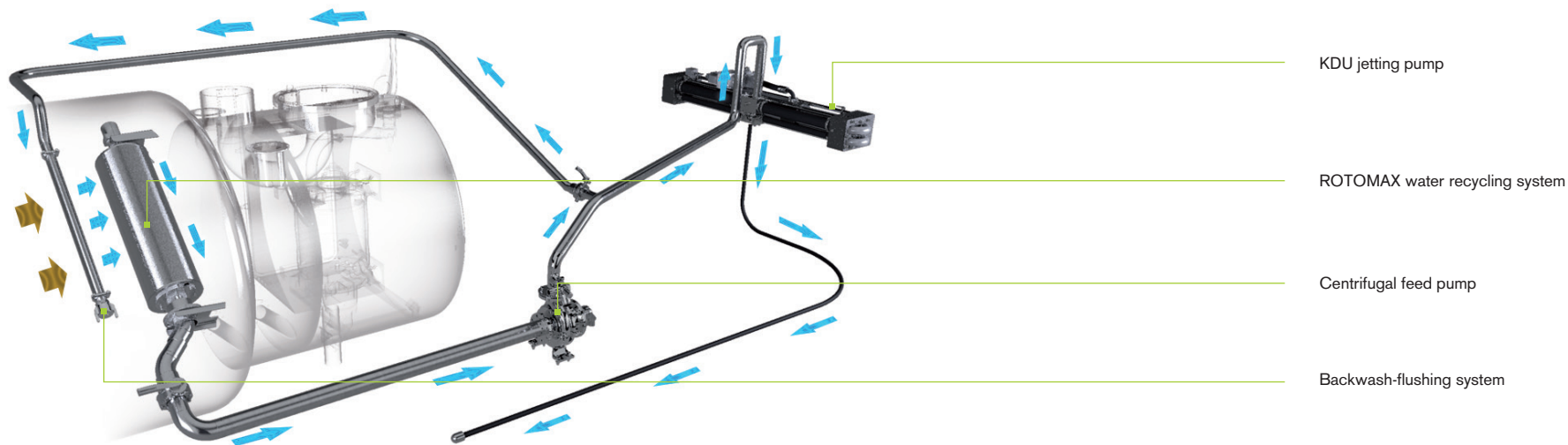
Runs to refill with jetting water are dispensed with, fuel and water consumption reduced. A multi-stage filter system is not needed if the KDU is used. This reduces body weight and cuts cleaning and maintenance outlay. In comparison with other sewer cleaning vehicles, KAISER vehicles offer up to 4.5 tons more payload.

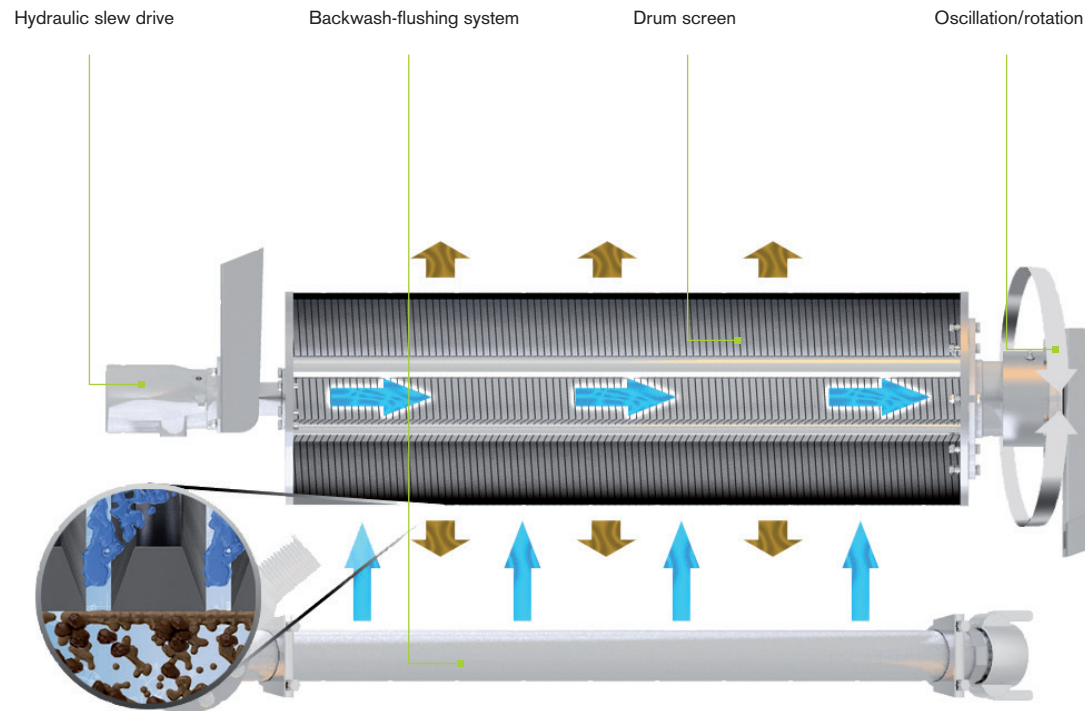
Reliable in the toughest conditions

The self-cleaning effect of the oscillating rotary filter drum is additionally enhanced by a backwash-flushing system. No other system on the market can match the performance of the KAISER ROTOMAX system with backwash-flushing in continuous operation in sewers featuring a high grease content and extreme soiling.

Sparing use of natural resources

With the water recycling system, 90,000 litres of fresh water are saved given a jetting rate of 300 litres per minute and a jetting period of 5 hours. Waste gas and noise emissions are substantially reduced due to fewer retanking and waste depot runs.





What can you expect from
KAISER's patented water
recycling system?

A saving of over 24,000,000 litres
of water a year per vehicle.

Kaiser. Performance counts.

The benefits of KAISER technology for the customer:

Superior economy and performance

Outstanding efficiency. Automatic adjustment of the required power. Lower fuel consumption. Substantial reduction in the number of trips required for refilling and disposal. Significantly higher payload.

High on reliability, low on emissions

Insensitive to contaminated water. Continuous operation with high levels of soiling filter self-cleaning effect due to oscillating rotary motion. Low maintenance requirements. Consistently low temperature budget. Low noise emissions. No contamination of exhaust air.



Why can you find KAISER vehicles
in operation on 5 continents, in 114
countries and well over 1000 cities?

Our vehicles cannot fail to impress
with their innovative technology and
outstanding workmanship. 2013 will
mark 100 years of experience for
KAISER.

Kaiser. Performance counts.



KAISER AquaStar

Top performance for versatile deployment and flexible applications

AquaStar

Efficient performance

The KAISER AquaStar offers a perfect combination of performance and versatility. The KDU jetting pump delivers water at a rate of 320 to 500 litres per minute (with a double KDU up to 800 litres) and water pressure of up to 200 bar. The large-size hose reel can accommodate a 300 m jetting hose. On the KAISER vacuum pump the maximum air throughput is 3100 m³/h (with a double KWP up to 6200 m³/h). Due to the selection of various suction booms, the vehicle can be optimally adapted to the respective implementation requirements.

Versatility

- With ROTOMAX, AquaStar represents a benchmark for the industry in the high-performance recycling sector.
- With a tiltable divider door, the vehicle can vacuum up and dispose of two different media.
- A dry vacuum device permits the pick-up of dry material.
- Streets can be cleaned with high-pressure water from wash booms.
- The ADR equipment¹⁾ is used for the disposal of dangerous waste materials.

KAISERtronic

The consumption-optimised hydraulic system reduces fuel consumption amongst others by adapting the suction power in accordance with the vacuum rate. In the recycling mode, the water flow rate is also automatically adapted to the available water supply. Cleaning quality is enhanced by the constant jetting hose drive with speed control. Additional interfaces make it possible to link up with recording and information systems for the planning and organisation of sewer maintenance.

Greater operating comfort

The information display with integrated analysis system gives the operator qualified feedback on current performance parameters. Data such as jetting hose metre counter, vehicle weight and component status are transmitted directly to the radio remote control and presented in graphical form on the display. The display and control of the water pressure at the jetting nozzle also make sewer cleaning considerably easier.



¹⁾ European agreement on the road carriage of dangerous goods.





Vehicles with water recycling

KAISER Eco 3.0 Reliable in the toughest conditions

Eco 3.0

Benchmark for water recycling

The Eco 3.0 stands for the latest generation of the Eco-Combi series which sets new standards in the area of efficient sewer cleaning with water recycling.

Very compact dimensions thanks to an extremely short wheelbase, modern design and the combined hose boom are the most striking new features along with the proven high-power components KDU, KWP and ROTOMAX.

This vehicle has a maximum jetting capacity of 400 litres a minute and a maximum water pressure of 200 bar. The vacuum pump delivers a maximum air flow rate of 3100 m³/h. The combined jetting and suction hose boom can take a suction hose length of up to 20 m and enables an extremely low overall height of less than 3.5 m. The flexibility of the boom – offering swivel and telescoping functions as well as up and down movements – further expands the working range.

Efficient and user-friendly

The ultramodern KAISERtronic control system has enabled further optimisation of the hydraulic drive. Output-regulated pumps which only deliver the capacity that is actually required make the Eco 3.0 decidedly more fuel-efficient while providing consistently high performance.

The integrated remote maintenance system and even simpler handling enhance the operational efficiency of the vehicles and facilitate maintenance.



KAISER compact vehicles 15–18 tons Equipped with proven KAISER components

CityCycler

Continuous water recycling in compact dimensions

The CityCycler is the smallest sewer cleaning vehicle with continuous water recycling, built on a 2-axle chassis with a gross vehicle weight of 15-18 tons. The vehicle's compact dimensions give it maximum mobility in tight spaces. The jetting and suction hose boom at the rear of the vehicle reduces the space required at the job site. With the integrated fresh water tank, jetting operations can also be performed with clean water.

Proven, high-performance KAISER components

KDU, KWP and ROTOMAX are the proven core components of the vehicle. The maximum jetting performance of 220 litres per minute and 200 bar, an air flow of 900 m³/h and the ROTOMAX filter technology make deployment with water recycling possible even under tough conditions. The KAISERtronic control system ensures top operating comfort as well as efficient working performance.

CityCleaner

Jetting and vacuum vehicle with high flexibility – also for emergency response

The CityCleaner is a compact jetting and vacuum vehicle in the 15 to 18-ton class with the capability to use dirty water for jetting operations. A filtration facility incorporating a flat screen with pneumatically operated scraper makes it possible to draw water from natural sources, canals and sewers. This reduces the number of refilling trips and guarantees rapid deployment. The KDU jetting pump delivers a maximum flow rate of 220 litres a minute and 200 bar; the KWP vacuum pump has a capacity of up to 900 m³/h.

User-friendliness and safe handling

User-friendly operation, safe handling and brief familiarisation periods make the CityCleaner particularly flexible in application. Winter protection allows operation at low temperatures.







Wet vacuum vehicles

KAISER vacuum vehicles Powerful and flexible on the job

KAISER builds vacuum vehicles for the differing requirements of international markets. All models are characterised by proven KAISER technologies.

Customised KAISER wet vacuum model

This vehicle concept offers a wide spectrum of variants and performance categories. The choice of vacuum pump rates ranges from 900 to 3100 m³/h. By building in two vacuum pumps, suction power can be increased to 6200 m³/h. Various additional options are available such as suction boom variants, radio remote control and an efficient high-pressure water system.

One application for wet vacuum vehicles is sewer cleaning. As the systems for collecting rainwater and surface water differ fundamentally from one market to another, these vehicles are specially designed to suit the specific requirements.

Versatile applications for industry – with ADR and ATEX

In the case of industrial cleaning, vacuum vehicles are used for emptying oil, grease or petrol separators as well as for the removal of acids and alkalis. ADR or ATEX equipment permits the transportation of hazardous liquids as well as work in explosion-prone areas.



KAISER Twister with a modular design concept

The Twister is based on a modular design concept. Two basic types form the basis for a vehicle version for standard suction applications or an extended deployment range.

Standard Twister

Various vacuum pump rates up to 3100 m³/h can be selected. By mounting a jetting pump up to 50 litres and 100 bar, smaller-scale jetting and cleaning jobs can be performed.

Premium Twister

The control system offers a whole gamut of options such as tiltable divider doors, various suction nozzle versions as well as a radio remote control for all work functions. Furthermore, a high performance KDU jetting pump up to 150 litres and 170 bar, as well as various hose reel versions, can be added.







Special vehicles application-oriented solutions

Developed in partnership with the customer

Our many years of experience give us an in-depth understanding of the customer's working environment and enable us to build special vehicles and attachments for customer-specific applications:

- Clean water preparation by means of flocculation. Extension of our recycling vehicles to cover specific applications: vehicles for cleaning catch pits with clear water treatment, vehicles for oil, petrol and grease separators
- Special vehicles for rail track-related maintenance and cleaning work in tunnels
- Jetting vehicles in different design configurations, e.g. for working in tight spaces
- Suction and jetting superstructures for different transport and carrier systems such as semi-trailers and hook-lifts
- Road and tunnel washing bar with specially adapted boom geometry
- Flushing vehicles for street cleaning
- Stationary system construction

When it comes to special vehicles, KAISER stands for the utmost care and attention in technical design and workmanship as well as reliability in service and spare parts availability.







Hurricane and Hercules

Premium range dry vacuum vehicles

Hurricane

KAISER Hurricane

With maximum air volumes of 7000 m³/h, the Hurricane can be used for dry and wet suction media. The sucking-up of cement, building debris, etc. or emptying of sludge tanks is performed effortlessly.

A specialty in the rehabilitation of flat roofs is sucking off gravel and then blowing it back up again using a built-in blow injector. The exhaust air filtering is performed via a low-maintenance dry filter made of sintered plastic with fully automatic dedusting of the filter elements.

Besides vacuuming jobs, jetting and wet cleaning jobs can also be performed using the additionally mounted jetting pump. In comparison with conventional dry vacuum vehicles, the Hurricane can also perform classic wet jobs.

The ADR equipment permits the sucking-off and disposal of dangerous waste material.

Hercules

Hercules by EUR-MARK

The high-performance dry suction vehicle has a powerful positive displacement lobe pump which delivers an air flow of up to 9000 m³/h. With 90% vacuum and an overpressure of up to 1 bar, this vehicle is ideally equipped for all dry suction and blowing operations. Exhaust air filtration is performed by over 72 filter pockets with fully automatic cleaning of the filter elements.

With the aid of a blow injector, dry media such as gravel on a flat roof can be blown upwards and pneumatically distributed. The flexible suction boom offers ample reach and can be optimally positioned for any application, irrespective of whether the suction operation is to be performed in a downward or upward direction. All operating functions can be carried out by radio remote control. A high-pressure water pump is also available as an option.

The Hercules can be also used for the suction of wet media.



ArcticCombi

Top performance and reliability
in arctic temperatures

ArcticCombi

ArcticCombi by EUR-MARK

The ArcticCombi is a combined suction/jetting vehicle which is specially designed for sewer cleaning at low outdoor temperatures down to -30°C . All water-carrying components and the high-pressure hose reel are insulated and protected by heated chambers. This enables the vehicles to be driven to the respective sites and to perform sewer cleaning operations at very low temperatures without any problem.

The subdivision into fresh water and sludge tank takes the form of a "tank-in-tank" construction. The design is in stainless steel and a large proportion of the vehicles are optionally fitted with ADR equipment. On the vacuum side, the core component is the positive displacement lobe pump with a maximum air volume of $2400\text{ m}^3/\text{h}$ and up to 90% vacuum. The high-pressure pump used is the KAISER jetting pump, with a capacity of up to 500 litres per minute and a maximum of 200 bar.

KAISER water recycling

This vehicle concept is also available with water recycling under the name EcoCycler. The filter system used is the proven KAISER ROTOMAX.



Innovative KAISER technology also for OEM customers

KWP and KDU

Leading manufacturers of sewer cleaning vehicles in Europe and Asia have been building KAISER high-pressure and vacuum pumps into their vehicles for many years.

Due to the efficiency and reliability of KAISER components, these companies have been able to extend their market position to a considerable degree.

Recycling systems – under licence

KAISER supplies to selected manufacturers all the necessary components for equipping vehicles with water recycling systems under licence: KDU148 including oil tank and support frame, filling pump, ROTOMAX with backwash device, KWP3100i, changeover head, fresh water chamber parts, shut-off valves, KSR20 spiral suction hose.

All performance calculations and drive design for the mounted units are conducted by KAISER.





Liechtenstein, Italy, Finland, Austria and Slovakia. What does it mean to have 5 plants and a network of 100 sales and service partners across 5 continents?

Customer proximity and regional support.

Kaiser. Performance counts.



S3 Allroad, Sântis 2501m

KAISER History

The path to becoming international technology leader

- 1913 foundation as a business enterprise for agricultural vehicles (auto tractors), trading with tractors, spinning and weaving mills
- Development into an industrial company with the production of suction vessels for the agricultural industry
- 1963 first sewer cleaning vehicle
- 1965 first walking excavator

Today

Technology leader in sewer cleaning vehicles and walking mobile excavators. Numerous patents in both sectors. Clear world number one for vehicles with water recycling.

KAISER AG – Schaanwald, Liechtenstein
MORO KAISER S.R.L. – Fiume Veneto, Italy
OY EUR-MARK AB – Nykarleby, Finland
KAISER Fahrzeugtechnik GmbH – Nenzing, Austria
KAISER Eastern Europe s.r.o. – Krakovany, Slovakia

Over 400 employees with a focus on performance, qualifications and long-term employment. To this day, a family business, CEO and Majority Shareholder: Markus Kaiser

Innovative

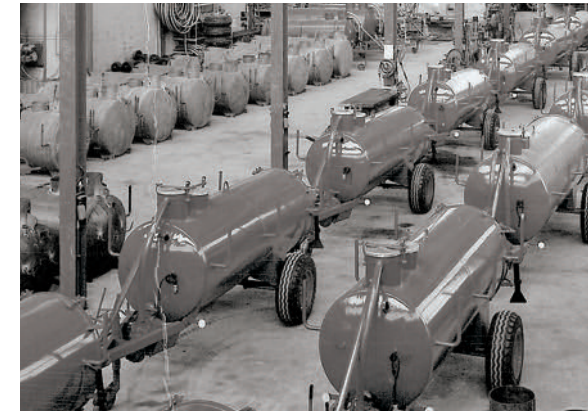
We strongly believe that innovations, which are targeted at increasing customer benefits, are of key importance to keep our lead in technology and to further strengthen our market position in the future.

Established

Our many years of international experience provide us with a thorough understanding of our customers' environment. In a cooperation based on mutual trust, we develop application-oriented solutions which will provide you with crucial competitive advantages.

Customer-oriented

For us, the sale of a product is not a conclusion but a beginning. We provide help and support to enable you to fully utilise the potential of our vehicles. Our mission is to impress you with the excellence of KAISER products and services.





Our strong points

Competent partnering

KAISER places top priority on competent consultancy and customer care. In our own companies, customers can draw on the support of experienced, technically qualified employees. Expertise in areas with direct customer contact is of prime importance to KAISER:

- Technical competence in sales
- Technology and development
- Training
- Customer care

Technology as core competence

KAISER products are characterised by a high level of technological individuality and in many countries have already become synonymous with specific technical solutions. As a consequence, our Technology & Development Department plays a key role within the company. Having a large team of development and design engineers enables us to cover many areas of technological competence:

- Mobile hydraulics, fluid technology and fluid mechanics
- Control technology, mobile electronics, software development
- Drive technology
- Steel construction and mechanical engineering
- Tank and vessel engineering (transportation of dangerous substances)
- Welding technology

The availability of key competencies within the company is a fundamental part of corporate strategy. A policy of targeted and project-based collaboration with universities and colleges is aimed at promoting applied research centring on practical questions.

