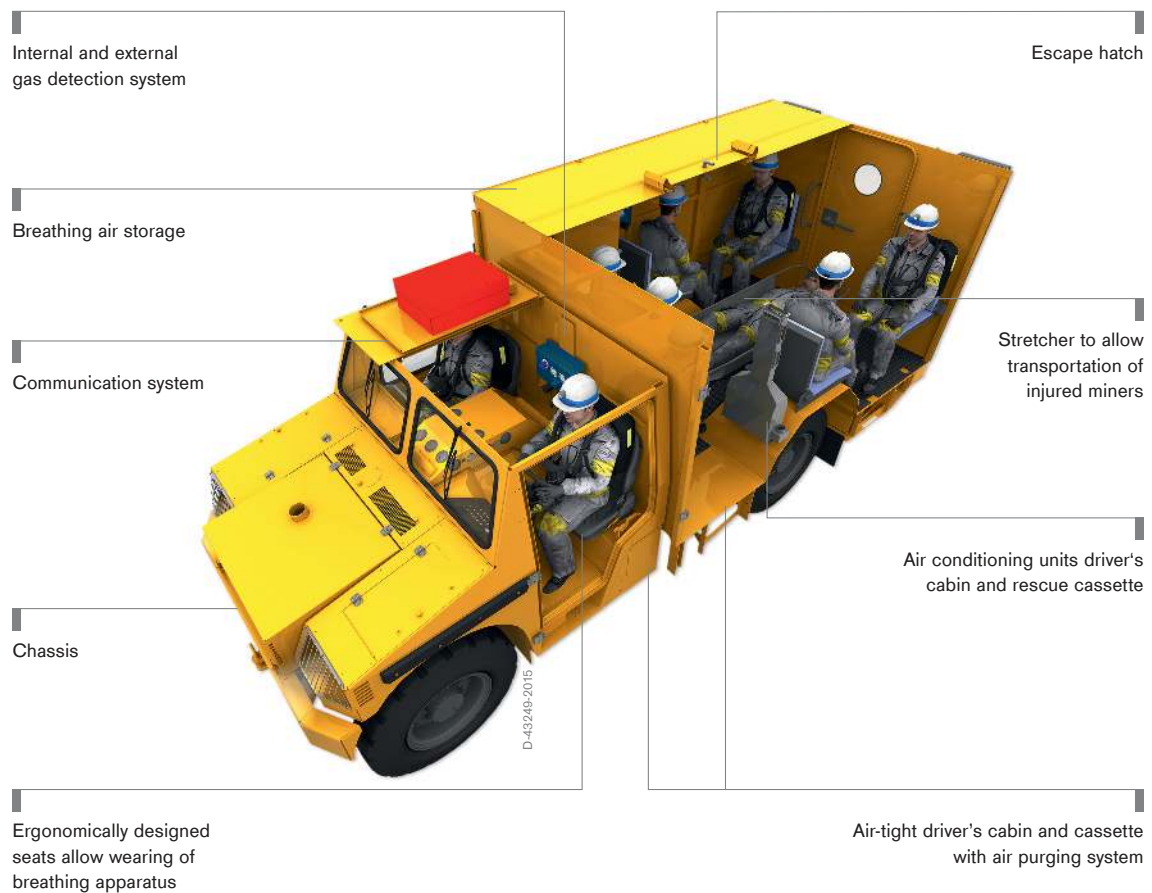
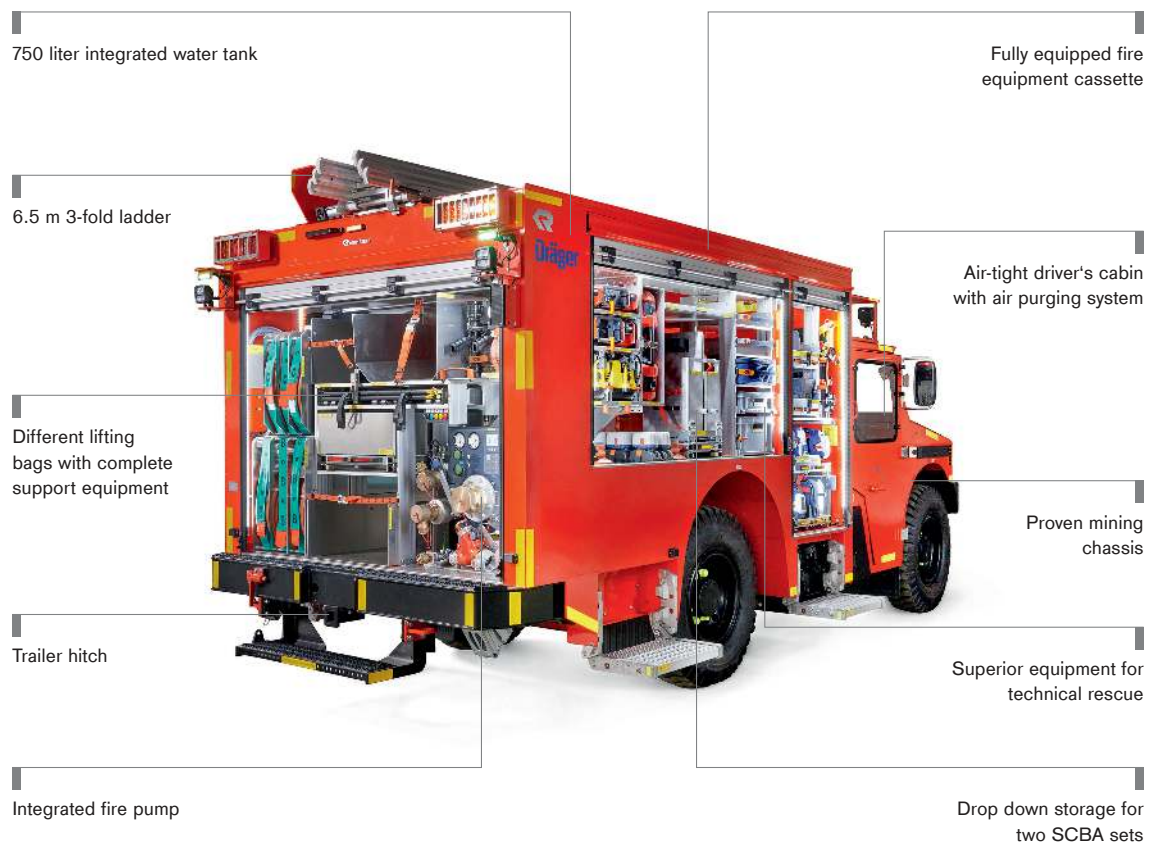


## Dräger MRV Mines Rescue Vehicles

Mine rescue teams have long distances to travel before they arrive at the location of the emergency. The Dräger MRV 9000 and MR Fire Truck exactly target this challenge by providing safe transportation as close as possible to the incident without the need to activate the breathing apparatus.



## Dräger MRV



## Benefits

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### Developed for challenges in an ever-changing mining environment

The Dräger Mine Rescue Vehicles MRV 9000 and MR Fire Truck are innovative solutions based on the needs of an ever-changing mining environment.

Mines evolve, they expand and get deeper, they move further from the portal. Mine rescue teams now have longer distances to travel before they arrive at the location of the emergency and only a limited amount of time is available with the breathing apparatus. The Dräger MRV 9000 and MR Fire Truck exactly target this challenge by providing safe transportation as close as possible to the incident and back for team and rescued miners without needing to activate the breathing apparatus. Consequently, the mine rescue teams have more time for their on-site mission.

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### Independent from ambient air

The driver's cabins and the rescue cassette are equipped with an air purging system. This system is independent of the ambient air and provides breathing air for the onboard personnel. Once a team member or the complete team has exited the vehicle equipped with personal breathing protection, the air flow in the relevant compartment can be manually reduced. As a result, breathing air from the onboard cylinders can be conserved to provide additional time for the overall mission. Once the team returns to the vehicle and the compartment has been successfully flushed, their individual breathing apparatuses are no longer required.

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### Assistance systems for safety underground

A gas monitoring system reliably measures the concentrations of oxygen, carbon dioxide and carbon monoxide inside each vehicle and optional in the ambient air. If thresholds are exceeded or fall short, the onboard personnel will be warned by visual and acoustic signals. Thermal imaging and CCTV cameras installed outside of the vehicle support the driver's orientation in forward and backward motion in a dusty, smoke-filled environment and can help detect trapped miners. Deep underground, where temperatures are extremely balanced and when no navigation aids are installed, a navigation package which combines the information from thermal imaging cameras and 24 GHz radar sensors into one picture, may enhance further the rescue vehicle's capabilities.

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### Combined expertise

The chassis of both vehicles have been designed by Hermann Paus Maschinenfabrik GmbH, a renowned vehicle manufacturer specializing in mining applications. The chassis is well-tested, strong and robust for harsh underground mines conditions. In addition, cooperation with a specialized vehicle manufacturer enables low maintenance efforts as PAUS only uses components established and proven in mining and tunneling. By combining the knowledge and expertise of PAUS together with the well-known competence of Dräger in the field of rescue and refuge solutions, breathing protection and gas monitoring, the MRV family provides both quality and industry-specific design.

## Benefits

The renowned specialist for fire extinguishing equipment Rosenbauer completes the vehicle to make it an advanced fire-fighting truck for underground scenarios.

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### Customer driven

Close cooperation with our customers initiated and drove the development of a mine rescue solution based on the current and future challenges of a mine. The in-depth knowledge of our customer together with our competences made it possible to not only develop a mine rescue vehicle, but to create a customer driven innovative solution. Each component of the mine rescue vehicles mirrors the needs of the mine rescue team in deeper and longer mines taking mines rescue into the twenty-first century.

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### Paying off the investment

Facts as

- the robust design
- that each single part well selected
- the good off-road performance
- the superior transport capabilities
- the low total cost of ownership
- the customer's ability to avoid loss of production time by reacting quickly on incidents
- the importance of having appropriate equipment to rescue people and save lifes

are making these vehicles to a highly profitable investment in comparison to conventional off-road trucks.

## System Components



D-10206-2022

### PAUS Carrier Vehicle

The carrier vehicle of the MRV 9000 and the MR Fire Truck is part of the PAUS MinCa series proven in the Mining and Tunneling for decades. The MinCa series was designed especially for the challenging underground conditions in mines. The hydrostatic traction drive of the vehicle provides an optimal travelling speed combined with efficient fuel consumption especially when driving ascents.



D-41445-2015

### Rescue Cassette of the MRV 9000

The air-tight rescue cassette offers space for seven persons. Six comfortable seats which allow sitting while wearing a breathing apparatus, as well as a holder for a laying person in a basket stretcher. Like the driver's cabin the rescue cassette has an integrated rollover and falling object protection structure and has been tested accordingly.



D-10183-2022

### Fully equipped Fire Equipment Cassette of the MR Fire Truck

Furnished by Rosenbauer with aluminum roller shutters, aluminum shelving and drawer system the equipment cassette houses all necessary equipment in a compact and neat manner. The equipment cassette is also equipped with a 750 L polyurethane water tank, an electrically driven hose reel and a fixed installed fire pump with a capacity of 1500 l/min at 7 bar outlet pressure. On top, the equipment cassette is fully furnished with a well selected range of tools and equipment for fire-fighting and technical rescue.



D-43249-2015

### Dräger Air Purging System

The air purging system provides positive pressure inside the cabins to prevent the ingress of harmful substances. Hazardous substances are purged and breathing air flushes into the vehicle. The Dräger air management panels are used to adjust the flow of breathing air according to the number of people inside. The positive pressure as well as the flow of purged air can be monitored with gauges.

## System Components



D-15210-2019

### Breathing Air Storage

The air needed to breathe, provide positive pressure and purge driver's cabin and/or cassette is stored in a rack. The cylinders can be charged quickly through a integrated filling connection.



D-43253-2015

### Electrical System/ Power Supply

The electrical system controls the distribution of electrical power to all sub-systems. These include: the lighting, the digital gas monitors, and as an option: power for the thermal imaging cameras and the intercom. The electrical power supply is provided from the vehicle's battery system.



D-10322-2022

### Internal Gas Monitoring

The Dräger X-am multi gas detector monitors the air inside the driver's cabins and rescue cassette for concentration of O<sub>2</sub>, CO<sub>2</sub> und CO.

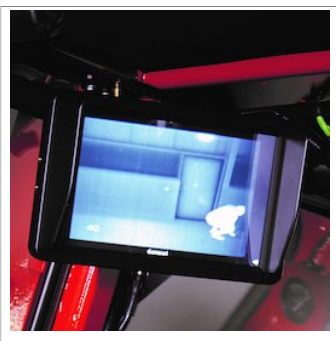
## Accessories



D-10322-2022

### External Gas Monitoring

A gas measuring device monitors the most relevant gases that you would expect outside the vehicle and those are CH<sub>4</sub>, O<sub>2</sub>, NO<sub>2</sub> and CO<sub>2</sub>. The gas readings are visible to all occupants of the vehicle.



D-10371-2022

### Thermal Imaging Cameras and Monitoring

A system of excellent quality thermal imaging cameras, consisting of one front and one rear camera, provide a view of the area surrounding the vehicle during travel to assist the driver when sight is limited because of an increase in smoke or dust. A 10" monitor showing both, the front and rear view, is located in the driver's cabins and the rescue cassette of the MRV 9000.



D-10221-2022

### Package "Safe Navigation in zero Visibility"

Deep underground, where temperatures are extremely balanced and when no navigation aids are installed, a navigation package which combines the information from thermal imaging cameras and 24 GHz radar sensors into one picture, may enhance the rescue vehicle's capabilities further. Combining both means overlaying the information from both systems, the thermal imaging cameras and the radar system into one picture, provided on a 10"-screen to the driver.



D-43249-2015

### Air Conditioning

The air conditioning system contributes to the wellbeing of persons since the regulation of body temperature may be affected by high humidity.



## Accessories



D-10365-2022

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### Communication System

An optional intercom system for private communication between the crew in the front cabin and the team in the cassette can be integrated.



D-42462-2016

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### Hydraulic Lift MRV 9000

The air needed to breathe, provide positive pressure and purge drivers cabin and/or cassette is stored in a rack. The cylinders can be changed quickly.

## Related Products



D-609-2022

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### Dräger BG ProAir

Specially designed for longer durations: The Dräger BG ProAir is a positive pressure closed circuit breathing apparatus that combines uncompromising safety with the highest level of breathing and carrying comfort. Easier to carry, easier to breathe - giving you more time to get the job done and return safely.



## Related Products



D-42461-2015

### Dräger MRC 5000

During an emergency, Dräger-Simsa mine refuge chambers provide mining personnel both shelter and breathing protection with the highest quality and safety standards. The robust and highly portable construction, as well as a low cost of maintenance, makes them ideally suited for diverse underground conditions.



D-35109-2011

### Dräger Oxy® 3000/6000

Robust and always under control: the oxygen self-rescuers Dräger Oxy® 3000 and 6000 are designed to handle the harshest conditions. Their new product concept reliably protects the internal functional unit against damage. The Safety Eye provides an additional level of security: the status window allows the user to assess whether the device is operational within seconds.



D-6491-2017

### Dräger X-am® 8000

Clearance measurement was never this easy and convenient: The 1 to 7 gas detector detects toxic and flammable gases as well as vapours and oxygen all at once – either in pump or diffusion mode. Innovative signalling design and handy assistant functions ensure complete safety throughout the process.

## Technical Data

### Dräger MRV 9000

Ambient temperature	-20 °C to 40 °C / -4 °F to 104 °F
Air conditioning inside	15 to 30 °C / 59 °F to 86 °F
Internal gas detection	CO, CO <sub>2</sub> , O <sub>2</sub>
Dimensions of the vehicle	Height 2,640 mm / 8 ft 8.0 in Width 2,200 mm / 7 ft 2.6 in Length 6,200 mm / 20 ft 4.1 in
Operating weight	Approx. 9 t
Doors on cassette	One backdoor for main entrance One emergency hatch on the roof
Doors on driver's cabin	Driver and passenger door
Persons in cassette	4 persons rescue staff in cassette + 3 patients (1 lying)
Persons in driver's cabin	2 persons (1 driver, 1 rescue staff)
Air purging system	8 pressure cylinders, each with 50 L water volume and 300 bar filling pressure

### Exemplary mission scenario

Operation time	5 hours
Travel in: 1.5 hours	4 persons rescue staff in cassette 1 person rescue staff and 1 driver in the cabin
Mission: 6 hours	1 driver in the cabin 5 persons rescue staff with BG4
Travel out: 1.5 hours	4 persons rescue staff in cassette + 3 patients (1 lying) 1 person rescue staff and 1 driver in the cabin
Purging capacity	4 times purging of cabin and 3 times cassette (possible additional purging reduces operation time of the breathing protection)
Recharge time	Between 48 minutes and 6 hours, depending on the recharging solution

### Dräger MR Fire Truck

Ambient temperature	-20 °C to 40 °C / -4 °F to 104 °F
Air conditioning inside	15 to 30 °C / 59 °F to 86 °F
Internal gas detection	CO, CO <sub>2</sub> , O <sub>2</sub>
Dimensions of the vehicle	Height 2,800 mm / 9 ft 2.2 in Width 2,200 mm / 7 ft 2.6 in Length 6,200 mm / 20 ft 4.1 in
Operating weight	Approx. 11 t
Doors on driver's cabin	Driver and passenger door
Persons in driver's cabin	2 persons (1 driver, 1 rescue staff)
Air purging system	4 pressure cylinders, each with 50 L water volume and 300 bar filling pressure

### Exemplary mission scenario

Operation time	8.5 hours
Travel (in, out, change place)	1 person rescue staff and 1 driver in the cabin
Purging capacity	4 times purging of driver cabin (possible additional purging reduces operation time of the breathing protection)
Recharge time	Between 36 minutes and 3 hours, depending on the recharging solution

## Technical Data

### Chassis

Engine (standard configuration)	Deutz, TDC 2012 water-cooled diesel engine
Power	95 kW
Exhaust stage	EU Stage 3A / EPA Tier 3
Exhaust system	Catalyst with measuring points
Chassis	Rigid frame chassis
Drive	Hydrostatic
Payload	Maximum 2 t
Axles	Both axles are powered, and the front axle is a steering axle
Tires	9.00-20
Speed	33 km/h in both directions
Climbing rate	Maximum 40%

## Ordering Information

### Options (selection)

Air conditioning system
External gas monitoring
Rear view camera
Thermal imaging camera system
Different fire suppression systems
Handheld fire extinguishers incl. Bracket
Engine Type DEUTZ BF4M 2012C, 93 kW, EU Stage II/ EPA Tier 2, catalyst with measuring points
Engine Type TCD 3.6 L4, 90 kW, EU Stage V/ EPA Tier 4F, DOC, DPF and SCR
Different vehicle color
Foam filled tires
Green, amber or blue flashing lights
Electric hydraulic pump for cabin tilt
External electric power supply
Pre-Start alarm
Open door safety sensor (parked)
Package "Safe Navigation in zero Visibility"
Router for wireless data transfer

## Notes

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