

# Mission-Ready, Anywhere in the World

Heating and Air-Conditioning Systems for Defense Vehicles and Shelters





# When vehicles and the crew deliver top performance, that's Feel the Drive.



### Advantages at a glance:

- Crew, vehicles and equipment are mission-ready in adverse climates
- Air conditioning improves the performance of the crew
- Heating systems save money by reducing fuel consumption as well as wear and tear by avoiding cold starts and idling

### Global mission readiness

Defense vehicles, regardless of design or size, must perform perfectly anywhere in the world and must therefore withstand extreme climates. Webasto continues to meet this challenge with time-tested and innovative customized solutions.

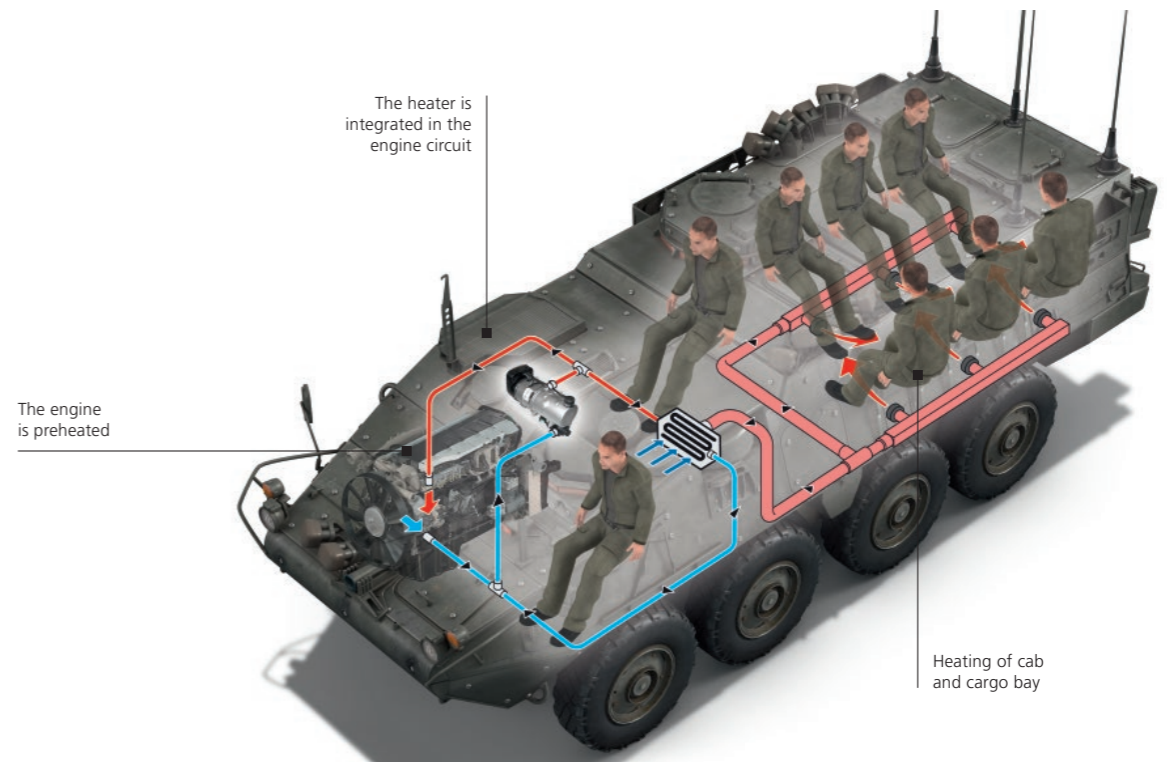
Webasto air-conditioning and heating systems allow the crew to be mission-ready and also help save costs. As a result, even with the engine off, hydraulic fluids and equipment can be kept at an optimum temperature, also with outside temperatures down to -46°C. Vehicles and equipment are always mission-ready – around the globe.

### Global competence

For more than 75 years, Webasto has been a leader in design and innovation. As one of the top 100 automotive suppliers we have the competence and experience to deliver a temperature management system to meet your needs. Filled with passion and the goal to exceed your expectations, Webasto delivers top performance before, during and after the sale.

Our 50 global locations share the same goal. This is what we mean when we help our customers to "Feel the Drive."





Engine preheating protects the mission even at record low temperatures of up to -46°C!

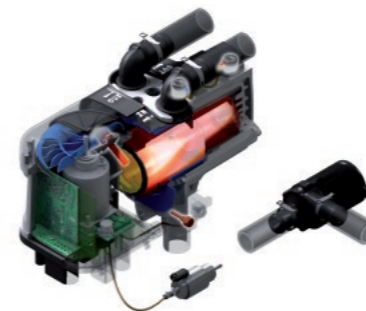
## When troops are mission-ready even in extreme cold.

Extreme cold is hard on people and the equipment. To ensure that vehicles and equipment are mission-ready even in very low outside temperatures, vehicles should be heated while the engine is turned off.

Webasto provides heating systems to preheat the interior quickly and generate the proper temperature for the entire engine circuit: as a result, all systems and the entire electronic equipment remain operation-ready. The crew remains ready during long surveillance missions.

### Efficiency through heating

Using heaters during silent watch results in fuel savings of up to 90%! What is more, engine wear and tear and maintenance costs are also reduced.



### Coolant heaters: engine preheating and comfort

In cold regions starting the engine can be difficult. It first has to reach the optimum temperature. Webasto coolant heaters are directly integrated into the coolant circuit of the engine and preheat the engine and the interior with the vehicle's own heat exchanger. This protects the engine and reduces fuel consumption even during start-up – as a result, you not only save fuel but also repair costs.

### Air heaters: the fast and efficient way towards a warm interior

Air heaters heat up the crew compartment with the engine off. They allow for silent watch missions with reduced fuel costs. Less than 4 liters of fuel will allow the heater to operate for a 20-hour mission without engine noises. We call this low-noise engine-off heating solution “stealth heat”.

#### Advantages of the coolant heater:

- Safe engine start even at extremely low temperatures
- No paraffin deposition in the fuel
- Low repair and maintenance costs because preheating extends engine life

#### Advantages of the air heater:

- Long-lasting constant temperature when the engine is off
- Low-noise and cost-efficient operation during silent watch missions
- Compact and easy to install





## When you demand the highest level of engineering expertise.

Webasto heating products have been designed based on COTS (commercial off the shelf) technology and modified to meet all applicable military standards of your project.

Webasto engine-off heaters meet most military requirements and can be modified to your specific needs. They are approved for all military fuels as well as biodiesel. The PC diagnosis makes on site maintenance easy.

Coolant heaters from 5 – 40 kW heating performance available.



### Thermo Pro 90 HDD (Heavy Duty Design)

Water heater for engine preheating of medium-sized and large engines

- Heating power up to 9.1 kW
- Fuel consumption: 1.14 l/h max.
- Dimensions L x W x H: 355 x 131 x 224 mm
- Weight: 5.2 kg
- -40°C to +80°C (successfully started at -46°C)

### Thermo Pro 50 Eco

Water heater for engine preheating of small-sized and medium-sized engines

- Heating power up to 5 kW
- Fuel consumption: 0.65 l/h max.
- Dimensions L x W x H: 218 x 91 x 147 mm
- Weight: 2.2 kg
- -40°C to +80°C

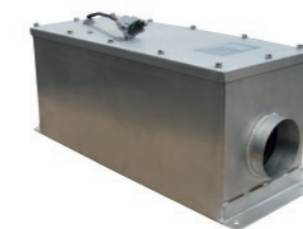


ARTEC – Boxer with two 9 kW coolant heaters



AM General – High Mobility Multi Wheeled Vehicle with one 9 kW coolant heater

Air heaters from 2 – 11 kW heating performance available.



### Air Top 2000 STC

Air heater for crew compartments

- Heating power up to 2 kW
- Fuel consumption: 0.24 l/h max.
- Dimensions L x W x H: 311 x 120 x 121 mm
- Dimensions boxed L x W x H: 450 x 195 x 194.25 mm

### Air Top Evo 40, Air Top Evo 55

Air heater for crew compartments

- Heating power up to 4.0 kW and 5.5 kW respectively
- Fuel consumption: 0.49 l/h max. and 0.67 l/h max. respectively
- Dimensions L x W x H: 423 x 148 x 162 mm
- Dimensions boxed L x W x H: 540 x 195 x 217.25 mm





## When you find cutting edge products that optimize your resources.

Global mission readiness also means being prepared to cover long distances.

To ensure you can make optimum use of limited resources, it is worthwhile to factor in the fuel consumption of your equipment!

The efficiency of your fleet is not only measured by the top performance that is available to you, but also by the number of resources you need to achieve it. Fuel is one of the most important supply items. Every liter of diesel is vital and comes at a high cost. A constant need for fuel supply convoys also increases the danger for all concerned.

Engines that have been preheated work more efficiently, no matter how cold the ambient temperature may be. An engine-off heater from Webasto with optimized fuel and power consumption saves unnecessary downtimes. Please review the sample calculation and the dimension of savings will be clear.

### Thermo 90 fuel study as an Afghanistan operation (sample calculation)

- Cost of one liter of diesel incl. transportation to the site of the operation: 5.01 euros
- Duration of the operation: 13 weeks
- Number of U.S. Army HMMWV vehicles: 633

#### Engine idling for heating

- Fuel consumption with idling engine: 742.71 l/h
- Fuel costs for heating: 3.7 million euros



#### Webasto Thermo 90

- Fuel consumption: 618.82 l/h
- Fuel costs for heating: 3.1 million euros



Fuel cost savings of min. 17%. Approx. 600,000 euros!

Source: Terry VanSky, Comparative Analyse on the Use of Webasto Thermo 90 in U.S. Army. Act 1, Ohio, 2011.





## When heat and humidity are conquered.

Keeping you cool at all times is not easy when you are exposed to extreme hot and humid weather conditions for an extended period. Air-conditioning systems from Webasto remedy the situation, ensuring mission readiness – for crew and equipment alike.

The keyword is “Tropicalization”. The appropriate air-conditioning system to make your equipment heat- and damp-proof. According to your wishes as uncomplicated retrofitting or individual system solution.

### Vehicle and Shelter Cooling Solutions

Webasto takes cooling to the next level with its reliable and robust range of vehicle and mobile shelter cooling products using field experience gained from all over the world. These units provide outstanding performance and high quality. A full line of split and compact air-conditioning systems are available so your solution is engineered to fit your needs.



VÝVOJ Martin – Shelter application with UKG 12



MAN – HX with customized air-conditioning system FSA, integrated into the roof

Webasto offers a wide range of standard air conditioners as well as customized systems. A common control unit for our fuel operated heaters and air conditioners make handling easy and save installation space.



### UKG 12

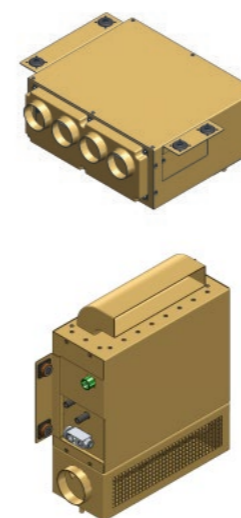
The UKG 12 air conditioner has been specifically designed for the defense market to cool and heat and ensure a constant temperature in movable and stationary military tactical shelters. The temperatures can be controlled automatically.

The UKG 12 is a self-contained „monoblock“ type air conditioner designed to be mounted on the exterior wall of the shelter. Optionally the unit can be equipped with a sliding mechanism.

- Cooling power up to 12 kW
- Heating power up to 7 kW
- Dimensions L x W x H:  
1,739 x 548 x 573 mm
- Weight 213 kg
- Operation -30°C to + 50°C

### Modular and Flexible Air Conditioning

The unique and high-performance air conditioner concept is specifically designed for defense vehicles. Its flexible, modular design provides a range of cooling capacities along with various mounting orientations and versatile connection options. Systems are configured from a basis of common components that are both robust and EMC protected. The casing design is scalable to match the performance and all the interfaces can be tailored to suit the customer's requirements.



- Cooling power up to 10 kW
- Heating power up to 7 kW (electr. or water)
- Dimensions scaleable
- Weight depending on dimensions
- Operation -30°C to + 50°C



# When the customer needs and our engineers form a tight community. That's Feel the Drive.



Your requirements are what drives us! As a profitable company for more than 110 years, Webasto is a reliable partner when it comes to system development for heating and air-conditioning components for vehicles. We offer you optimum support, from the commencement of a project to the site of the operation – anywhere in the world!

## Webasto "Feel the Drive"

Feel the Drive is synonymous with reliability in the field, with flexibility in installation, and with simple service. We have been able to establish new standards with these very special products by performing numerous tests, with our intensive development work, and through constant coordination with our customers.

## Practice-oriented service

As a professional partner, we also support you after you have purchased the product. We accompany you throughout the implementation phase and assist you with operation and maintenance as well. That is our promise. And you can rely on it.

## Webasto worldwide

As an international company, we manufacture our products throughout the world. In the Webasto network we have specialized production sites for defense heating and air-conditioning products. Having adjusted to the conditions of the market, we are specialized in the production of small series. All processes are, of course, certified according to ISO 9001!



**Station 1: Defining the customer requirements**  
In the first step we define your specific requirements and determine together with you which solution is the right one for you.



**Station 3: Design**  
Once the solution has been decided upon, we develop both the mechanical and the thermodynamic design.



**Station 5: Documentation**  
Important documents, such as the maintenance manual and the operation manual, are produced.



**Station 7: In service**  
Now things are starting to get really serious for the climate control system. We will continue to take care of you with personal service and maintenance at your customer's site.



**Station 2: Concept development and simulation**  
Various simulations help us to deliver forecasts, for instance about laying air ducts or regarding the temperature distribution in the vehicle.



**Station 4: Analyses and tests**  
From the RAMS analysis to EMV tests, all the way to shock and vibration tests: we subject the system to very thorough checks. And our products must demonstrate their fitness again and again in Webasto's climatic chambers.



**Station 6: Installation**  
After all instructions have been written, the climate control system can be put to practice. Our experts will assist you with the installation as well as commissioning.



## When the business utility of all types of commercial vehicles can be enhanced thanks to innovative climate systems, that's Feel the Drive.

Vehicles change the world. And Webasto is changing vehicles and their world. Our solutions help trucks reach their destinations more economically. Buses and trains are more comfortable. Special and commercial vehicles are more efficient. Whether they are original parts or parts for retrofitting, our products provide sustainable solutions – that benefit the environment as well as companies.

Our dedicated people support you all around the world. Wherever commercial vehicles are planned, produced, redesigned or repaired, we are there for you. Professional, committed and helpful, we see to it that you, our customers, reach your destinations comfortably and efficiently. This is what drives us as a company and inspires our work.

And that is what we call Feel the Drive.

Webasto has developed innovative heating and air-conditioning solutions for the following markets:



### Trucks

Efficient heating and compact air-conditioning systems maintain exactly the right temperature in the cabin interior, the engine compartment and the cargo area.



### Light-duty vehicles

We provide heating and air-conditioning systems to match your individual requirements.



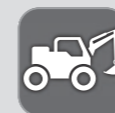
### Buses

Our air-conditioning systems make driving more pleasant and safer.



### Rail

Air-conditioning systems for passenger compartments and drivers' cabins, boosting efficiency and comfort the moment the vehicle enters operation.



### Off-highway

We supply sturdy and efficient heating and air-conditioning systems for a pleasant working environment, whatever the weather.



### Defense

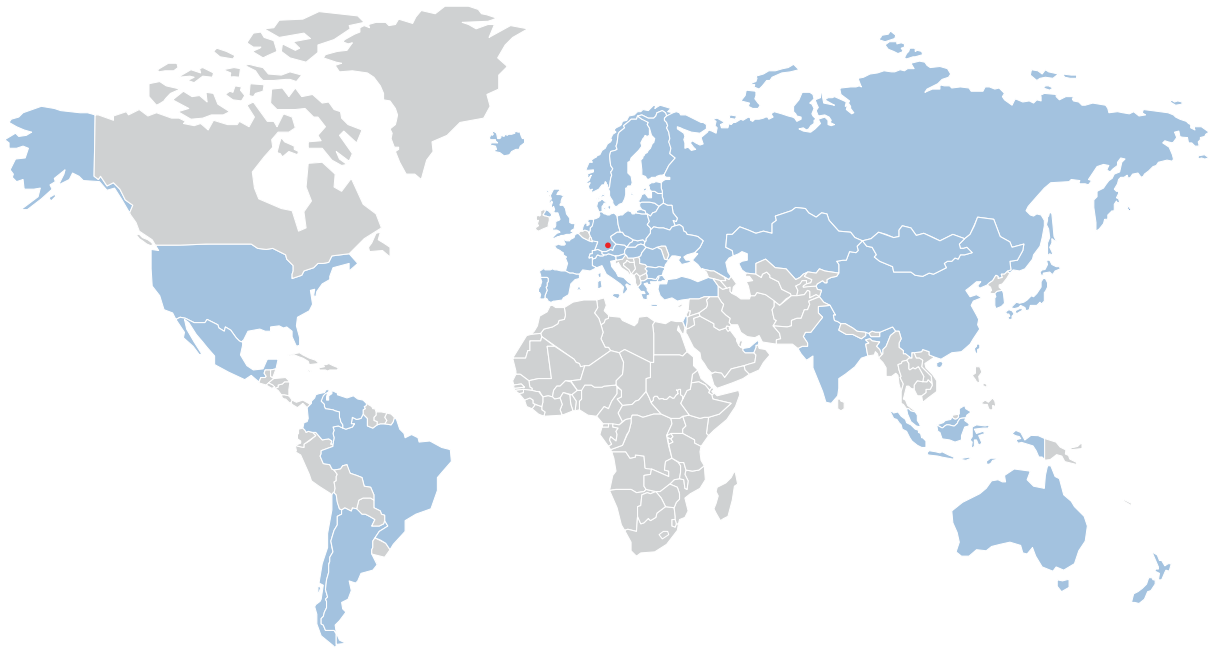
We provide special heating and air-conditioning systems to ensure vehicles are always ready for action.



### Special vehicles

Our solutions make your job more comfortable, safer and more profitable.





For more than 75 years, the Webasto group has continued to set new technological standards – in both the original equipment sector and the aftermarket. As one of the 100 biggest suppliers in the automotive industry worldwide, we develop and produce roof, convertible as well as heating, cooling and ventilation systems. Our products help provide a better atmosphere on the road, more comfort and security, as well as increased efficiency for cars, commercial and special vehicles, motor homes and boats. An outstanding network of production facilities and dealers guarantees high-quality products, installation standards and services worldwide.

