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SWEDEN



## › Thule Upslope

Mammut Removable Airbag System 3.0 Information

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# AVALANCHE AIRBAGS

## KNOW HOW

### How avalanche airbags work

If you are caught in an avalanche, an avalanche airbag increases your chance of staying on the surface. However, an avalanche airbag does not provide any guarantee of survival, as its effectiveness in the avalanche depends to a great extent on the volume of snow, the density of the snow and, in particular, the nature of the terrain. Like a beacon, probe, shovel and first aid kit, an avalanche airbag should be part of every ski tourer's or freerider's standard safety equipment. Sound training in risk management and familiarization with your safety equipment are also essential requirements.



Avalanche Airbag



Probe



Shovel



Cellphone



Beacon



First Aid Kit



The avalanche airbag uses the physical law of inverse segregation (sorting effect). This means that in an equally moving mass of particles (e.g. snow), the smaller particles gravitate to the bottom while the larger ones rise to the surface. The avalanche airbag increases your volume and therefore significantly enhances this effect. Consequently, the avalanche airbag can actively help prevent burial or partial burial and, in an ideal situation, allow self-rescue or rapid location.

150L Airbag volume	3 seconds Inflation time	-30° to +50° C Range
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### Effectiveness of avalanche airbags

A scientific study by the Canadian avalanche researcher Pascal Haegeli has shown an avalanche airbag can reduce the probability of dying in an avalanche by around half.

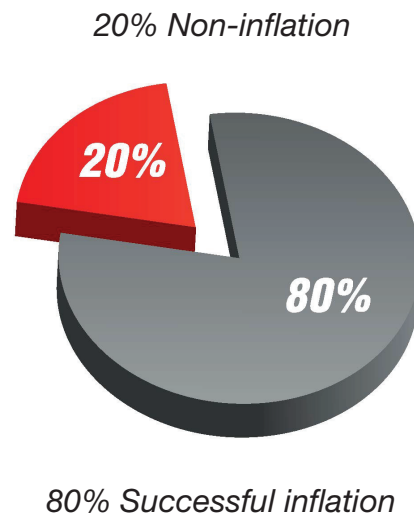
The study was based on reports on avalanche accidents from Canada, the USA, Switzerland, France, Norway and Slovakia. It considered only cases of serious involvement in an avalanche (i.e. being swept along with the flow), and where the individuals could actually have been buried by the avalanche (avalanches of magnitude 2 or higher). Furthermore, the investigation into effectiveness considered only situations where an airbag wearer and people without airbags had been involved in the same accident.

#### Effectiveness results

The results of the study show that an avalanche airbag reduces the probability of dying in an avalanche by around half.

#### Results of non-inflated airbags

Further investigations showed that around 20% of airbags used could not be inflated. In most cases, the airbag was not deployed at all as the wearer did not manage to pull the deployment handle. In contrast, the non-inflation rate was lower among professionals such as mountain guides. This demonstrates that training with an avalanche airbag can positively influence behavior in an avalanche situation. Familiarizing yourself with your avalanche airbag - including regular practice deployments - can therefore be vital.



# AVALANCHE AIRBAGS

## KNOW HOW

### Best choice for the worst case: WEIGHT

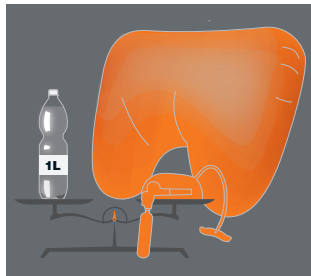
#### Safety has never been so light

With the Airbag System 3.0, Mammut has succeeded in developing an airbag system that is reliable, but at the same time so small and light that you will barely notice it on long ski tours or out freeriding. The compressed gas technology is, in our opinion, still the best solution, as the system is used continuously in mountain environments and needs to operate reliably regardless of temperature. It is possible to quickly and easily remove the airbag system when not needed or install it in different backpacks, offering you complete flexibility.



#### Mammut's lightest airbag system weighs less than 1 liter of water

Weighing around 1 kg (2.2 lbs), the new Removable Airbag System 3.0 with carbon cartridge (Europe only) is the lightest airbag system Mammut has ever developed. With the refillable aluminum cartridge (North America only), the total system weighs in at only 1.4 kg (3.0 lbs).



### Best choice for the worst case: FLEXIBILITY



#### Complete flexibility

Thule Upslope R.A.S. ready backpacks give you the option of removing the airbag system from the backpack and installing it in another Mammut Airbag System 3.0 compatible backpack. Full removal allows you to use the backpack in the offseason or to lighten the bag when you're using it to ride at the ski area. The system can be installed and removed in a matter of minutes.



### Best choice for the worst case: RELIABILITY



#### Always ready in case of an emergency regardless of conditions

The avalanche airbag is a piece of safety equipment that needs to work with 100% certainty and reliability in an emergency – irrespective of weather, temperature and external pressure. Only pressure cartridges offer the reliability of a dependable energy store over a period of years. This technology also guarantees a very high initial pressure to unfold the airbag reliably even in situations of external loading.

300 bar Initial pressure	3 seconds Inflation time	150L Airbag volume	-30° to +50° C Range
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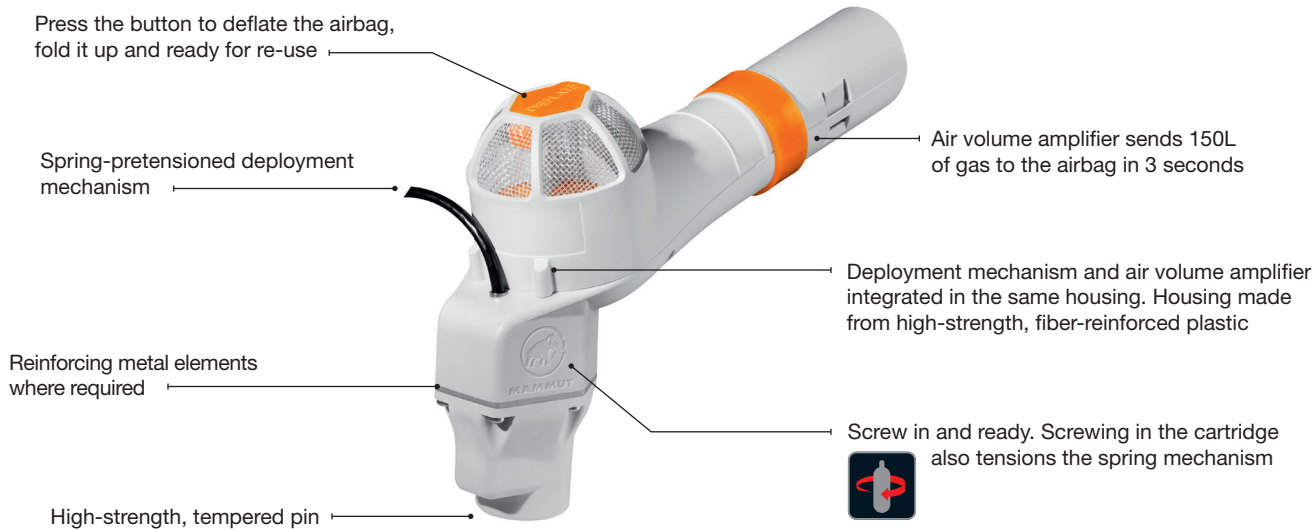


# AVALANCHE AIRBAGS

## KNOW HOW

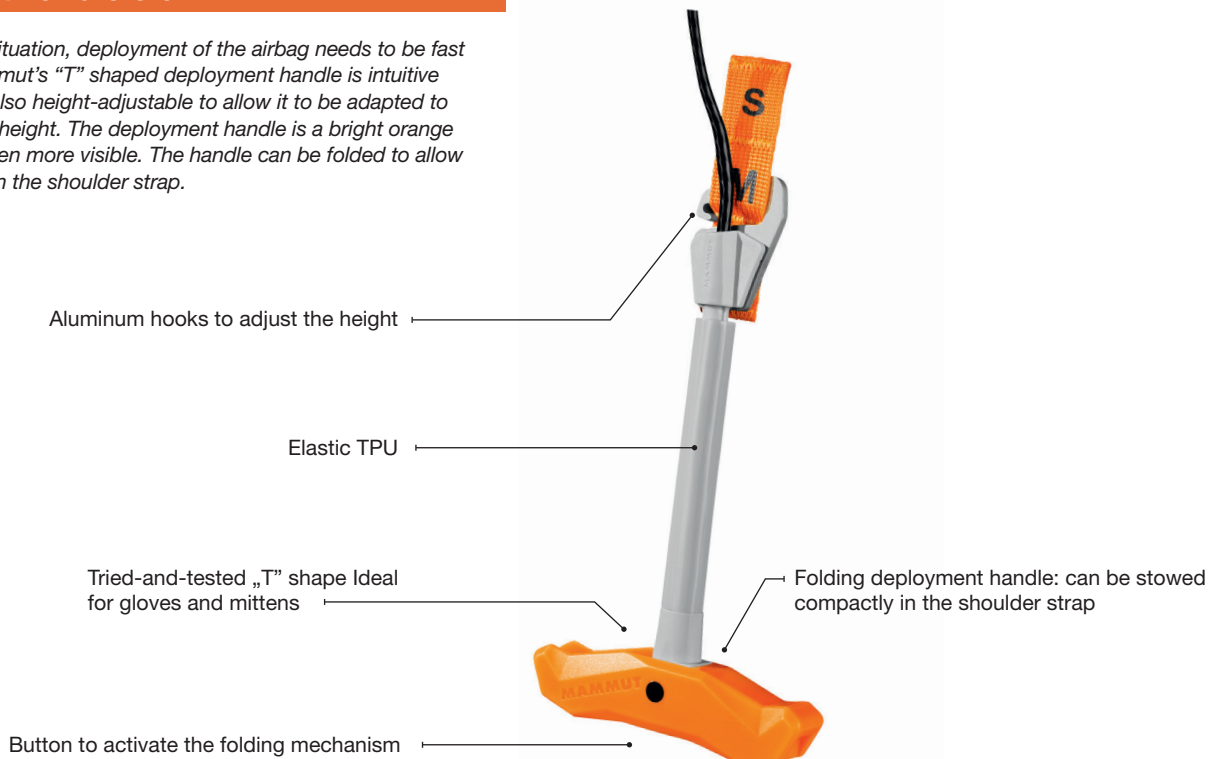
### Inflation system 3.0

The Inflation System 3.0 describes the component used to deploy the airbag. The system activates the deployment mechanism which opens the pressure cartridge with a pin and fills the airbag. The integrated air volume amplifier also sends ambient air to the airbag in addition to the gas stored in the pressure cartridge. The air volume amplifier and deployment mechanism are brought together in a single housing in order to save space and weight. The inflation system is reliable, low-maintenance and extremely user-friendly: just screw the cartridge in and you're ready to go!



### Deployment handle 3.0

In an emergency situation, deployment of the airbag needs to be fast and intuitive. Mammut's "T" shaped deployment handle is intuitive to operate and is also height-adjustable to allow it to be adapted to the wearer's body height. The deployment handle is a bright orange color to make it even more visible. The handle can be folded to allow compact storage in the shoulder strap.

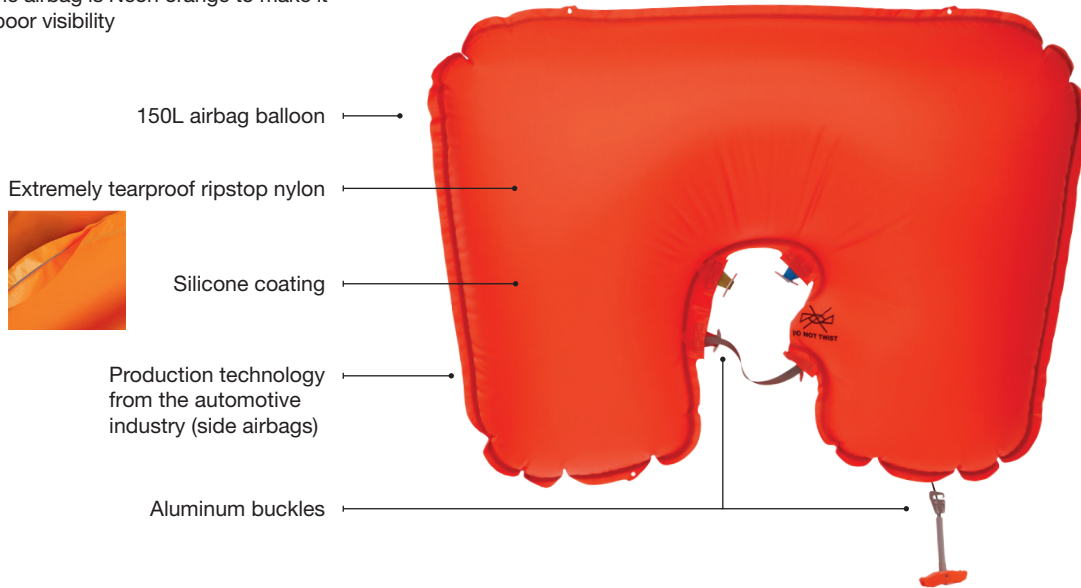


# AVALANCHE AIRBAGS

## KNOW HOW

### Airbag Balloon 3.0

The airbag balloon is the buoyancy device of the avalanche airbag and its volume can help reduce the burial depth or prevent complete burial. Since the balloon is exposed to the full force of the avalanche, as well as collisions with trees, shrubs or rocks in some cases, it needs to be extremely robust. At the same time, however, it also needs to be small and light enough to ensure it takes up as little space as possible in the backpack. Mammut's Airbag Balloon 3.0 has been completely revised to use production technologies from the automotive industry. As the airbag is also a significant aid when searching for people who have been partially buried, the airbag is Neon orange to make it easier to spot even in poor visibility



### Compatibility of airbag systems



Thule's Upslope R.A.S. ready backpacks are compatible with Mammut's Removeable Airbag System (R.A.S.) 3.0 and NOT compatible with previous R.A.S. generations 1.0 and 2.0 or any generations of Mammut's Protection Airbag System. However, the 2.0 cartridges remain unchanged and can be used with both the new 3.0 system and the older system.

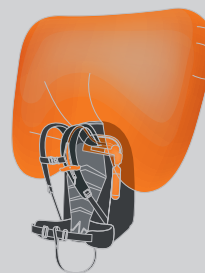


\*NOT compatible with the Thule Upslope 20L

# AVALANCHE AIRBAGS

## KNOW HOW

### Removable airbag system 3.0 / pressure cartridge comparison



Removable Airbag 3.0

	Increased chance of survival	✓
	Fast location on the avalanche debris	✓
	Weight (without cartridge)	700 g / 1.5 lbs
	Complete Flexibility - Removable and Transferable	✓
	Reliability in all conditions	✓
	„T“-shaped height-adjustable deployment handle (folding)	✓
	Screw-in ready	✓

*\*Pressure cartridges are not supplied with the airbag systems and must always be ordered separately.*



Carbon Cartridge  
300 Bar Non-Refillable  
2010-00870



Cartridge Refillable  
207 Bar Alu  
2610-00840 (full)  
2610-00850 (empty)

Compatible with the new Airbag 3.0 systems (Removable Airbag System 3.0 & Protection Airbag System 3.0) from W16-17	✓	✓
Compatible with the Inflation System 2.0 (Removable Airbag System / Protection Airbag System / Snowpulse Lifebag System) W11/12 - W15-16)	✓	✓
Compatible with Inflation System 1.0 Snowpulse W 2007/2008 – W 2010/2011	No	No
Weight full	310 g / 0.68 lbs	700 g / 1.5 lbs
Weight empty	235 g / 0.51 lbs	625 g / 1.37 lbs
Cartridge material	Carbon fiber	Aluminum
Filling	Nitrogen	Compressed air
Pressure	4350 psi	3000 psi
Sale	EU	US/CA (EU)
Can be refilled by the user	No	✓

# AVALANCHE AIRBAGS

## KNOW HOW

### Removable airbag system 3.0 / Pressure cartridges



**Removable Airbag System 3.0**  
2610-01230

**NEW**

The Removable Airbag System 3.0 is an avalanche airbag system is a brightly colored 150L airbag that deploys behind the wearer's head within seconds. The system is safe and easy to use, lighter and smaller than previous generations and can be attached to all Removable 3.0-compatible backpacks.

- Mammut's lightest airbag system: Complete with the carbon cartridge, the system weighs just 1010 g
- Very small packing volume: Fully integrated with the backpack. Does not get in the way of internal organization
- Complete flexibility: The whole system can be removed from the backpack and attached to other backpacks. The backpack can be used for other activities.
- Dependable: Compressed gas energy storage is not affected by the weather or the temperature
- Height-adjustable and easily stowable T-shaped deployment handle
- Victims faster to locate due to the bright color
- Screw-in ready: Screw in the cartridge and the system is ready to use straight away
- Safety leg loop
- Airbag volume: 150 liters
- Airbag inflation: approx. 3 seconds
- Range of application -30 °C to +40 °C



**Cartridge Refillable 207 Bar Aluminum**  
2610-00840/2610-00850  
(North America Only)

The cartridge is an essential component of the avalanche airbag system and must be ordered separately. It is intended for sale in the USA and Canada and can be refilled by the user after any deployment using a compressor or diving cylinder. The filling pressure of the cartridge can be checked quickly and safely using a pressure gauge. The Cartridge Refill Kit and a compressed air source are required for refilling.

- Aluminum cartridge filled with compressed air
- Simple, independent refilling possible
- One Refill kit (pack of 3) supplied with the product
- Filling pressure can be controlled via an integrated pressure gauge
- Available filled ex factory or empty

FULL (2610-00840)	EMPTY (2610-00850)
<b>Weight</b> 700 g / 1.5 lbs	<b>Weight</b> 625 g / 1.37 lbs
<b>Filling</b> Compressed air	<b>Filling</b> Compressed air
<b>Pressure</b> 270 bar/3000 psi	<b>Pressure</b> 270 bar/3000 psi



**Carbon Cartridge 300 Bar Non-Refillable**  
2610-00870  
(Europe Only)

An extremely light cartridge wrapped in carbon fiber for the most demanding requirements. When filled, this cartridge weighs around 310 grams and therefore about 50% less than a steel or aluminum cartridge. The cartridge is an essential component of the avalanche airbag system and must be ordered separately. It is intended for sale in Europe and must be refilled by the manufacturer after any deployment

- Extremely lightweight at 310 grams
- Carbon cartridge filled with nitrogen
- Filling pressure controlled by weight

FULL
<b>Weight</b> 310 g / 0.68 lbs
<b>Filling</b> Nitrogen
<b>Pressure</b> 300 bar/4350 psi

### Accessories



#### **Cartridge Refill Kit (Pack of 20)** 2610-00070/2610-00030

*The refill kit allows to refill the „Cartridge Refillable 207 Bar Alu / empty“, by using a compressed air source. A gasket and cover plate are required for each refill operation. Depending on the version, 3 or 20 refills are possible.*



#### **Adapter Scuba Tank to Cartridge** 2610-01070

*The adapter creates the connection between the diving cylinder and the „Cartridge Refillable 207 Bar Alu / empty“. This connection allows the cartridge to be refilled. Refer to the information on refilling in the airbag manual. There is a version for the European and the American divers bottle connector available.*



#### **Airbag 3.0 Trigger Test Tool** 2610-01560

*In case of dangerous situations, an avalanche airbag must be deployed quickly and reliably. You can use the Airbag 3.0 Trigger Test Tool to deploy your airbag without using up a cartridge. The tool lets you familiarize yourself with the airbag system and practice deployment. Simply screw the tool all the way into the deployment mechanism, put on the backpack, and pull the deployment handle. A clear „snapping“ sound indicates successful deployment.*



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