

Dear Customer and Skydiver Friend

For a long time now there has been no significant development in the field of ram air parachute technology since the introduction of Bill Coes cross brace and Brian Germain's Air Lock.
UNTIL NOW.

The revolutionary Ram Air Guiding System R.A.G.E. celebrates its debut.

Idea, Research and Development

In 1999, Paratec engineers started to examine the air inside a ram air cell to study its behavior regarding pressure, potential pressure changes and general airflow using a wind tunnel.

The study unveiled interesting interrelations.

The most important one was that the air, once having filled the cell completely, forms a static column. This fact led straight to the conclusion, that air locked canopies will not generate an increase in general flight performance, since their valves will logically not close in a static column of air. Their performance potential results if at all, from their basic design and aerodynamics.

The Airlock though still has its benefit. In case of a turbulence, the canopy gets deformed, which will shift the air column and force the valve to close. This will result in a rigid wing, but only for the duration of the deformation. What started the development of the R.A.G.E. system was the discovery of air exchange on the air intake of the cell. During flight, air gets pushed into the front part of the cell and naturally will displace other air, which spills out. Just like a full bucket of water which is permanently topped. What's too much, will overflow and spill. This overflow of air will spill uncontrolled over top and bottom of the cell respectively the complete nose openings.

In conclusion : Due to the air spill, caused by overflowing cells, we are facing a disturbance of the laminar airflow, especially over the top of the wing. This spill is to be controlled to maximize the lift potential of the individual design.

Taking a close look at the current nose designs on the market, you will discover that almost every manufacturer is trying to give it a solid clean nose. In all cases the intention is visible, but due to the fact, that the problem is tried to be solved by bluntly sewing panels down the leading edge, the effect comes out to be exactly the opposite as desired : The air just pushes the nose back and increases the nose drag by simply distorting it.

That's where the RAGE system sets in. The top skin panels extend into each half cell in direction of the relative airflow. This serves two purposes. First of all the distortion of the nose is eliminated and secondly the air spill

on the nose is controlled by the air being actively disposed over the bottom of the wing, where it is not as harmful.

With the development of such a system you don't have a parachute yet. To demonstrate the superior performance of the RAGE concept we decided to introduce it in the field of high performance canopies. The core of this new wing is a thin and fast airfoil.

Normally thin airfoils have a lower lift coefficient especially at low speeds. Using the R.A.G.E. technology we were able to generate enough lift to support the weight of the jumper, especially at very low airspeeds near the stall speed. (The stall speed is where you normally have to set your feet down)

Design features of the canopy

The RAGE canopy is a double trapezoidal wing with an aspect ratio of 1 : 2.8 (projected)

It is a traditional 9 cell design with 2 half cells per cell made from Blue Brand parachute fabric of Perserveance Mills, England.

The lines are our own Vectran design with a tensile strength of 660 lbs and a diameter of 1.6 mm. We use a special coating on our lines which prohibit them to become gray and ugly. Even after hundreds of jumps they will still look good.

The Slider has a unique reefing system which allows to collapse it over its complete span to reduce drag.

It is probably the only production slider that has a square hole in its centre. (tells you already a bit about the RAGE openings)

Opening – Flight – and Landing Performance

The opening characteristics of the RAGE are second to none.

Once out of the bag, it will gently pull you into a vertical orientation. The inflation of the canopy is naturally also controlled by the R.A.G.E. system and therefore very smooth and symmetrical.

This fact leads to an almost 100 % on-heading opening characteristic of the wing.

Once inflated, you will experience the high airspeed of the R.A.G.E., generated by its thin airfoil. The optimized nose with its reduced drag will give you the hard, steep dive you are looking for in a canopy of this class. The most significant feature of the R.A.G.E. though is its riser pressure ! Our engineers have done extensive research to be able to create a load distribution never seen before in this category of ram air wings.

The result is a riser pressure which is light to start with combined with no tendency of pressure increase, no matter how long you keep it pulled.

This gives you a steering tool, which enables you to literally fly the canopy during a dive. You can alter the dive angle at any time to optimize your speed, proximity to the target, turn radius and diving arc.

Speaking of putting the RAGE in a dive.

During our intensive flight testing we have discovered a very helpful correlation between turn angle and altitude : They should be about the same. For example :

A 180 degree turn for landing should be executed in 180 meters above ground. (is true for ideal and max wing loads).

During all turns, whether initiated through toggle input or front riser, the canopy will very dynamically increase its speed and keep you in its centre of gravity. We have created the term cork screw to describe this type of spiralling behaviour. This enhances the overall ability of the RAGE to dive at enormous speeds combined with a ideal parabel which converts into a long swoop.

Long swoops are won on the slow end of your distance. And right there is where the R.A.G.E. technology sets another benchmark.

The stallspeed is significantly lower than on all other designs out there at this time.

Packing the RAGE is probably the easiest job out there. No flaking, just shaking is the best description. Clear your stabilizers, watch your steering lines, bring up the centre cell, roll it 3 times , thats it !

If you need more information, just give us a call or contact your nearest Paratec dealer

R.A.G.E.Ram Air is not enough !

Technical Data Sheet

Size	RAGE 86		RAGE 97		RAGE 107
Aspect ratio	1 : 2.8 (projected)				
Span	5040 mm		5220 mm		5580 mm
Avg chord	1638 mm		1730 mm		1822 mm
Fabric	Blue PN 4				
Lines	Vectran				
Min WL	139 lbs		156 lbs		172 lbs
Ideal WL	172 lbs		193 lbs		213 lbs
Max WL	189 lbs		213 lbs		235 lbs
Packvolume	260 cui		290 cui		320 cui
Experience	300 jumps with a wing load factor of 1.6				

