



## DHV TESTREPORT EN926-2:2014

## UP MAKALU 4 M

**Type designation** UP Makalu 4 M  
**Type test reference no** DHV GS-01-2206-16  
**Holder of certification** [UP International GmbH](#)  
**Manufacturer** [UP International GmbH](#)  
**Classification** B  
**Winch towing** Yes  
**Number of seats min / max** 1 / 1  
**Accelerator** Yes  
**Trimmers** No



## BEHAVIOUR AT MIN WEIGHT IN FLIGHT (85KG)

## Test pilots



Beni Stocker

## BEHAVIOUR AT MAX WEIGHT IN FLIGHT (110KG)



Sebastian Mackrodt

Inflation/take-off

A

A

**Rising behaviour** Smooth, easy and constant rising  
**Special take off technique required** No

**Rising behaviour** Smooth, easy and constant rising  
**Special take off technique required** No

Landing

A

A

**Special landing technique required** No

No

Speeds in straight flight

A

A

**Trim speed more than 30 km/h** Yes  
**Speed range using the controls larger than 10 km/h** Yes  
**Minimum speed** Less than 25 km/h

**Trim speed more than 30 km/h** Yes  
**Speed range using the controls larger than 10 km/h** Yes  
**Minimum speed** Less than 25 km/h

Control movement

A

A

**Symmetric control pressure** Increasing  
**Symmetric control travel** Greater than 60 cm

**Symmetric control pressure** Increasing  
**Symmetric control travel** Greater than 65 cm

Pitch stability exiting accelerated flight

A

A

**Dive forward angle on exit** Dive forward less than 30°  
**Collapse occurs** No

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**Collapse occurs** No

Pitch stability operating controls during accelerated flight

A

A

**Collapse occurs** No

No

Roll stability and damping

A

A

**Oscillations** Reducing

Reducing

Stability in gentle spirals

A

A

**Tendency to return to straight flight** Spontaneous exit

Spontaneous exit

en : Verhalten beim Verlassen einer vollständigen Steilspirale

A

A

**en : Erstes Ansprechen des Gleitschirms (die ersten 180°)** Drehgeschwindigkeit

**en : unmittelbare Verringerung der Drehgeschwindigkeit**

**Tendency to return to straight flight** en : selbstständiges Ausleiten (G-Kraft abnehmend, Drehgeschwindigkeit abnehmend)

**en : selbstständiges Ausleiten (G-Kraft abnehmend, Drehgeschwindigkeit abnehmend)**

**Turn angle to recover normal flight** Less than 720°, spontaneous recovery

**Less than 720°, spontaneous recovery**

Symmetric front collapse

A

A

**Entry** Rocking back less than 45°  
**Recovery** Spontaneous in less than 3 s

**Entry** Rocking back less than 45°  
**Recovery** Spontaneous in less than 3 s

<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Change of course</b>	Keeping course	Keeping course
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>en : Symmetrischer Frontklapper mindestens 50% Flügeltiefe</b>		
<b>Entry</b>	Rocking back less than 45°	Rocking back less than 45°
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Change of course</b>	Entering a turn of less than 90°	Entering a turn of less than 90°
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>en : Symmetrischer Frontklapper im beschleunigten Flug</b>		
<b>Entry</b>	Rocking back less than 45°	Rocking back less than 45°
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Change of course</b>	Entering a turn of less than 90°	Entering a turn of less than 90°
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>Exiting deep stall (parachutal stall)</b>		
<b>Deep stall achieved</b>	Yes	Yes
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Change of course</b>	Changing course less than 45°	Changing course less than 45°
<b>Cascade occurs</b>	No	No
<b>High angle of attack recovery</b>		
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Cascade occurs</b>	No	No
<b>Recovery from a developed full stall</b>		
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Collapse</b>	No collapse	No collapse
<b>Cascade occurs (other than collapses)</b>	No	No
<b>Rocking back</b>	Less than 45°	Less than 45°
<b>Line tension</b>	Most lines tight	Most lines tight
<b>en : Kleiner einseitiger Klapper</b>		
<b>Change of course until re-inflation</b>	Less than 90°	Less than 90°
<b>Maximum dive forward or roll angle</b>	Dive or roll angle 0° to 15°	Dive or roll angle 15° to 45°
<b>Re-inflation behaviour</b>	Spontaneous re-inflation	Spontaneous re-inflation
<b>Total change of course</b>	Less than 360°	Less than 360°
<b>Collapse on the opposite side occurs</b>	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)
<b>Twist occurs</b>	No	No
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>en : Großer einseitiger Klapper</b>		
<b>Change of course until re-inflation</b>	Less than 90°	90° to 180°
<b>Maximum dive forward or roll angle</b>	Dive or roll angle 15° to 45°	Dive or roll angle 15° to 45°
<b>Re-inflation behaviour</b>	Spontaneous re-inflation	Spontaneous re-inflation
<b>Total change of course</b>	Less than 360°	Less than 360°
<b>Collapse on the opposite side occurs</b>	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)
<b>Twist occurs</b>	No	No
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>en : Kleiner einseitiger Klapper im beschleunigten Flug</b>		
<b>Change of course until re-inflation</b>	Less than 90°	Less than 90°
<b>Maximum dive forward or roll angle</b>	Dive or roll angle 15° to 45°	Dive or roll angle 15° to 45°
<b>Re-inflation behaviour</b>	Spontaneous re-inflation	Spontaneous re-inflation
<b>Total change of course</b>	Less than 360°	Less than 360°
<b>Collapse on the opposite side occurs</b>	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)
<b>Twist occurs</b>	No	No
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b>en : Großer einseitiger Klapper im beschleunigten Flug</b>		
<b>Change of course until re-inflation</b>	Less than 90°	90° to 180°
<b>Maximum dive forward or roll angle</b>	Dive or roll angle 15° to 45°	Dive or roll angle 15° to 45°
<b>Re-inflation behaviour</b>	Spontaneous re-inflation	Spontaneous re-inflation
<b>Total change of course</b>	Less than 360°	Less than 360°
<b>Collapse on the opposite side occurs</b>	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)	en : Nein (oder nur eine kleine Anzahl von eingeklappten Zellen mit selbstständiger Wiederöffnung)

	Wiederöffnung)	selbstständiger Wiederöffnung)
<b>Twist occurs</b>	No	No
<b>Cascade occurs</b>	No	No
<b>en : Faltleinen wurden benutzt</b>	no	no
<b><u>Directional control with a maintained asymmetric collapse</u></b>	<b>A</b>	<b>A</b>
<b>Able to keep course</b>	Yes	Yes
<b>180° turn away from the collapsed side possible in 10 s</b>	Yes	Yes
<b>Amount of control range between turn and stall or spin</b>	More than 50 % of the symmetric control travel	More than 50 % of the symmetric control travel
<b><u>Trim speed spin tendency</u></b>	<b>A</b>	<b>A</b>
<b>Spin occurs</b>	No	No
<b><u>Low speed spin tendency</u></b>	<b>A</b>	<b>A</b>
<b>Spin occurs</b>	No	No
<b><u>Recovery from a developed spin</u></b>	<b>A</b>	<b>A</b>
<b>Spin rotation angle after release</b>	Stops spinning in less than 90°	Stops spinning in less than 90°
<b>Cascade occurs</b>	No	No
<b><u>B-line stall</u></b>	<b>A</b>	<b>A</b>
<b>Change of course before release</b>	Changing course less than 45°	Changing course less than 45°
<b>Behaviour before release</b>	Remains stable with straight span	Remains stable with straight span
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Cascade occurs</b>	No	No
<b><u>Big ears</u></b>	<b>A</b>	<b>A</b>
<b>Entry procedure</b>	Dedicated controls	Dedicated controls
<b>Behaviour during big ears</b>	Stable flight	Stable flight
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b><u>Big ears in accelerated flight</u></b>	<b>A</b>	<b>A</b>
<b>Entry procedure</b>	Dedicated controls	Dedicated controls
<b>Behaviour during big ears</b>	Stable flight	Stable flight
<b>Recovery</b>	Spontaneous in less than 3 s	Spontaneous in less than 3 s
<b>Dive forward angle on exit</b>	Dive forward 0° to 30°	Dive forward 0° to 30°
<b>Behaviour immediately after releasing the accelerator while maintaining big ears</b>	Stable flight	Stable flight
<b><u>Alternative means of directional control</u></b>	<b>A</b>	<b>A</b>
<b>180° turn achievable in 20 s</b>	Yes	Yes
<b>Stall or spin occurs</b>	No	No
<b><u>Any other flight procedure and/or configuration described in the user's manual</u></b>		
No other flight procedure or configuration described in the user's manual		