ECHNICAL DATA DHV TESTREPORT LTF DHV TESTREPORT EN	DATASHEET PARTS LIST OPERATING INSTRUC	
STREPORT EN 926-2:2013+A1:2021		Bing
UP MANA 2 27		
Classification Winch towing Number of seats min / max Accelerator	DHV GS-01-2757-23 <u>UP International GmbH</u> <u>UP International GmbH</u> A Yes 1 / 1 Yes	
Trimmers Test pilots	BEHAVIOUR AT MIN WEIGHT IN FLIGHT (80KG)	BEHAVIOUR AT MAX WEIGHT IN FLIGHT (130KG)
Test pilots	Josef Bauer No release	Mario Eder No release
Inflation/take-off	A	
Rising behaviou	Smooth, easy and constant rising	Smooth, easy and constant rising
Special take off technique required	l No	No
Landing	A	A
Special landing technique required	l No	No
Speeds in straight flight	A	A
Trim speed more than 30 km/h	<u>.</u>	Yes
Speed range using the controls larger than 10	Yes	Yes
km/h Minimum speed	ı I Less than 25 km/h	Less than 25 km/h
Control movement	Α	Α
Symmetric control pressure	-	Increasing
Symmetric control trave		Greater than 65 cm
Pitch stability exiting accelerated flight	Α	A
Dive forward angle on exit		Dive forward less than 30°
Collapse occurs	s No	No
Pitch stability operating controls during		
accelerated flight	A	A
accelerated flight Collapse occurs	<u> </u>	A No
L	i No	No
Collapse occurs	L No A	No
Collapse occurs Roll stability and damping Oscillations	No Reducing	No A Reducing
Collapse occurs Roll stability and damping Oscillations Stability in gentle spirals	No A Reducing	No A Reducing
Collapse occurs Roll stability and damping Oscillations	No A Reducing	No A Reducing
Collapse occurs Roll stability and damping Oscillations Stability in gentle spirals	No A Reducing A Spontaneous exit	No A Reducing A Spontaneous exit
Collapse occurs Roll stability and damping Oscillations Stability in gentle spirals Tendency to return to straight flight Behaviour exiting a fully developed spiral dive Initial response of glider (first 180°)	No A Reducing A Spontaneous exit A Immediate reduction of rate of turn	No A Reducing A Spontaneous exit A Immediate reduction of rate of turn
Collapse occurs Roll stability and damping Oscillations Stability in gentle spirals Tendency to return to straight flight Behaviour exiting a fully developed spiral dive Initial response of glider (first 180°) Tendency to return to straight flight	No A Reducing A Spontaneous exit A Immediate reduction of rate of turn	No A Reducing A Spontaneous exit A

Symmetric front collapse	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course	Keeping course	Keeping course
Cascade occurs	No	No
Folding lines used	no	no
Unaccelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course	Keeping course	Keeping course
Cascade occurs	No	No
Folding lines used	no	no
Accelerated collapse (at least 50 % chord)	A	A
····· · · · · · · · · · · · · · · · ·	Rocking back less than 45°	Rocking back less than 45°
-	Spontaneous in less than 3 s	Spontaneous in less than 3 s
ر Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Keeping course
Cascade occurs		No
Folding lines used	no	no
Exiting deep stall (parachutal stall)	A	A
Deep stall achieved	<u>.</u>	Yes
-	Spontaneous in less than 3 s	Spontaneous in less than 3 s
-	•	Dive forward 0° to 30°
Dive forward angle on exit		
Change of course Cascade occurs	Changing course less than 45°	Changing course less than 45° No
High angle of attack recovery	A	A
Recovery Cascade occurs	Spontaneous in less than 3 s	Spontaneous in less than 3 s No
Recovery from a developed full stall	Α	Α
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Collapse	No collapse	No collapse
Cascade occurs (other than collapses)	No	No
Rocking back	Less than 45°	Less than 45°
Line tension	Most lines tight	Most lines tight
Small asymmetric collapse	A	A
Change of course until re-inflation	£	Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 0° to 15°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs		No
Folding lines used		no
	1.	1.
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
Re-inflation behaviour	Spontaneous re-inflation	Spontaneous re-inflation
	Loss than 2609	Less than 360°
Total change of course	No (or only a small number of collapsed	

Twist occurs	No	No
Cascade occurs	s No	No
Folding lines used	l no	no
Small asymmetric collapse accelerated	¦A	<u> </u> A
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle	Dive or roll angle 0° to 15°	Dive or roll angle 0° to 15°
Re-inflation behaviou	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course	Less than 360°	Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	s No	No
Folding lines used	l no	no
Large asymmetric collapse accelerated	Α	Α
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle	Dive or roll angle 15° to 45°	Dive or roll angle 0° to 15°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course	Less than 360°	Less than 360°
	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs		No
Cascade occurs		No
Folding lines used	l no	no
Directional control with a maintained asymmetric collapse	A	A
Able to keep course	Yes	Yes
180° turn away from the collapsed side	Yes	Yes
possible in 10 s Amount of control range between turn and stall or spin	l More than 50 % of the symmetric control travel	control travel
Amount of control range between turn and	l More than 50 % of the symmetric control	
Amount of control range between turn and stall or spin	More than 50 % of the symmetric control travel	control travel
Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs	More than 50 % of the symmetric control travel	control travel
Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency	More than 50 % of the symmetric control travel	control travel
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Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin	More than 50 % of the symmetric control travel A No A No A	control travel A No A No A
Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs	More than 50 % of the symmetric control travel A No A S No A S Stops spinning in less than 90°	control travel A No A No A Stops spinning in less than 90°
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release	More than 50 % of the symmetric control travel A No A S No A S Stops spinning in less than 90°	control travel A No A No A
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release	More than 50 % of the symmetric control travel A No A S No A S Stops spinning in less than 90°	control travel A No A No A Stops spinning in less than 90°
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A	control travel A No A No A Stops spinning in less than 90° No A
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45°	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45°
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs	More than 50 % of the symmetric control travel A No A S No A S Stops spinning in less than 90° S No A Changing course less than 45° Remains stable with straight span S Spontaneous in less than 3 s Dive forward 0° to 30° No A	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique
Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight
Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique
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Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery Dive forward angle on exit Behaviour during big ears Recovery Dive forward angle on exit	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s Dive forward 0° to 30° A	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s Dive forward 0° to 30° A Standard technique Standard technique
Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery Dive forward angle on exit Behaviour during big ears Recovery	More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s Dive forward 0° to 30° A	control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s Dive forward 0° to 30° A

Dive forward angle on exit Dive forward 0° to 30°	Dive forward 0° to 30°	
Behaviour immediately after releasing the Stable flight accelerator while maintaining big ears	Stable flight	
Alternative means of directional control	A	
180° turn achievable in 20 s Yes	Yes	
Stall or spin occurs No	No	
Any other flight procedure and/or configuration described in the user's manu	al	

TESTREPORT EN 926-2:2013+A1:2021

UP MANA 2 25

Type designation UP Mana 2 25 Type test reference no DHV GS-01-2756-23 Holder of certification UP International GmbH Manufacturer UP International GmbH **Classification** A Winch towing Yes Number of seats min / max 1/1Accelerator Yes Trimmers No





Sebastian Mackrodt

No release

FLIGHT (70KG) Test pilots



No release

	ino release	No release
Inflation/take-off	А	Α
Rising behav	viour Smooth, easy and constant rising	Smooth, easy and constant rising
Special take off technique requ	uired No	No
Landing	Α	A
Special landing technique requ	uired No	No
Speeds in straight flight	A	Α
Trim speed more than 30 k	xm/h Yes	Yes
Speed range using the controls larger that k	n 10 Yes m/h	Yes
Minimum s	peed Less than 25 km/h	Less than 25 km/h
Control movement	A	A
Symmetric control pres	sure Increasing	Increasing
Symmetric control to	ravel Greater than 55 cm	Greater than 65 cm
Pitch stability exiting accelerated flight	A	Α
Dive forward angle on	exit Dive forward less than 30°	Dive forward less than 30°
Collapse oc	ccurs No	No
Pitch stability operating controls during accelerated flight	A	A
Collapse oc	ccurs No	No
Roll stability and damping	A	A
Oscillat	tions Reducing	Reducing
Stability in gentle spirals	A	Α
Tendency to return to straight f	light Spontaneous exit	Spontaneous exit

Behaviour exiting a fully developed spiral dive	L	Α
Initial response of glider (first 180°)	Immediate reduction of rate of turn	Immediate reduction of rate of tur
Tendency to return to straight flight	Spontaneous exit (g force decreasing, rate of turn decreasing)	Spontaneous exit (g force decreasing, rate of turn decreasing
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°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Keeping course
Cascade occurs		No
Folding lines used		no
Unaccelerated collapse (at least 50 % chord)	Α	A
Entry	Rocking back less than 45°	Rocking back less than 45°
	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Keeping course
Cascade occurs Folding lines used		No no
Folding mes used	10	10
Accelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course	Keeping course	Keeping course
Cascade occurs		No
Folding lines used	no	no
Exiting deep stall (parachutal stall)	Α	A
Deep stall achieved	Yes	Yes
	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course Cascade occurs	Changing course less than 45° No	Changing course less than 45° No
	A	A
Recovery Cascade occurs	Spontaneous in less than 3 s No	Spontaneous in less than 3 s No
		1
	A	A
Dive forward angle on exit		Dive forward 0° to 30°
Collapse Cascade occurs (other than collapses)	No collapse	No collapse No
Rocking back		Less than 45°
_	Most lines tight	Most lines tight
	-	1
······	A	A
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle Re-inflation behaviour		Dive or roll angle 15° to 45° Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs		No (or only a small number of collapsed cells with a spontaneous re inflation)
		· · · · /
Twist occurs	No	No
		No No
Twist occurs	No	

Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
Total change of course	Spontaneous re-inflation	Spontaneous re-inflation Less than 360°
-	No (or only a small number of collapsed	No (or only a small number of
	cells with a spontaneous re inflation)	collapsed cells with a spontaneous re inflation)
Twist occurs	s No	No
Cascade occurs	s No	No
Folding lines used	no	no
Small asymmetric collapse accelerated	ia.	A
··	<u> </u> A	<u>.</u>
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	s No	No
Cascade occurs	s No	No
Folding lines used	l no	no
Large asymmetric collapse accelerated	Α	A
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle	Dive or roll angle 15° to 45°	Dive or roll angle 15° to 45°
Re-inflation behaviour	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course	Less than 360°	Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs		No
Folding lines used	10	HO
Folding lines used	100	no
Folding lines used Directional control with a maintained asymmetric collapse	A	A
Directional control with a maintained	A	1
Directional control with a maintained asymmetric collapse	A Yes	A
Directional control with a maintained asymmetric collapse Able to keep course	A Yes Yes	Yes
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side	A Yes Yes More than 50 % of the symmetric control	A Yes Yes
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin	A Yes Yes More than 50 % of the symmetric control travel	A Yes Yes More than 50 % of the symmetric
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin	A Yes Yes More than 50 % of the symmetric control travel	A Yes Yes More than 50 % of the symmetric control travel
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin	A Yes Yes More than 50 % of the symmetric control travel	Yes Yes More than 50 % of the symmetric control travel
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin	A Yes Yes More than 50 % of the symmetric control travel A	A Yes Yes More than 50 % of the symmetric control travel A
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs	A Yes More than 50 % of the symmetric control travel A	A Yes Yes More than 50 % of the symmetric control travel A
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency	A Yes More than 50 % of the symmetric control travel A	A Yes Yes More than 50 % of the symmetric control travel A No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs	A Yes More than 50 % of the symmetric control travel A	A Yes Yes More than 50 % of the symmetric control travel A No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency	A Yes Yes More than 50 % of the symmetric control travel A No A	A Yes Yes More than 50 % of the symmetric control travel A No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90°	A Yes Yes More than 50 % of the symmetric control travel A No A
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90°	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90°
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45°	A Yes Yes More than 50 % of the symmetric control travel A No A No Stops spinning in less than 90° No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Recovery Dive forward angle on exit Cascade occurs	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No	A Yes Yes More than 50 % of the symmetric control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 90° No A Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique	A Yes Yes More than 50 % of the symmetric control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Dedicated controls
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears	A Yes Yes More than 50 % of the symmetric control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight	A Yes Yes More than 50 % of the symmetric control travel A No A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Dedicated controls Stable flight
Directional control with a maintained asymmetric collapse Able to keep course 180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears	A Yes Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 90° No A Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique	A Yes Yes More than 50 % of the symmetric control travel A No A No A Stops spinning in less than 90° No A Changing course less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A Dedicated controls

Big ears in accelerated flight	A	A
Entry proced	lure Standard technique	Dedicated controls
Behaviour during big e	ears Stable flight	Stable flight
Recov	rery Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on o	exit Dive forward 0° to 30°	Dive forward 0° to 30°
Behaviour immediately after releasing accelerator while maintaining big e	5	Stable flight
Alternative means of directional control	Α	A
180° turn achievable in 2	20 s Yes	Yes
Stall or spin occ	curs No	No
Any other flight procedure and/or configura	ation described in the user's manual	

TESTREPORT EN 926-2:2013+A1:2021

UP MANA 2 23

Type designationUP Mana 2 23Type test reference noDHV GS-01-2755-23Holder of certificationUP International GmbHManufacturerUP International GmbHClassificationAWinch towingYesNumber of seats min / max1 / 1AcceleratorYesTrimmersNo



Spontaneous exit

Test pilots	BEHAVIOUR AT MIN WEIGHT IN FLIGHT (65KG)	BEHAVIOUR AT MAX WEIGHT IN FLIGHT (100KG)
Inflation/take-off	Α	Α
Rising behaviour	Smooth, easy and constant rising	Smooth, easy and constant rising
Special take off technique required	No	No
Landing	A	A
L	<u>.</u>	<u>.</u>
Special landing technique required	No	No
Speeds in straight flight	A	Α
Trim speed more than 30 km/h		Yes
Speed range using the controls larger than 10 km/h		Yes
	Less than 25 km/h	Less than 25 km/h
Control movement	A	A
Symmetric control pressure		Increasing
Symmetric control travel		Greater than 60 cm
Pitch stability exiting accelerated flight	A	A
L	i	<u>i</u>
Dive forward angle on exit Collapse occurs		Dive forward less than 30° No
conapse occurs		
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
Tandanas to action to start the first	Constant of the second state	Caracter and the

Tendency to return to straight flight Spontaneous exit

Behaviour exiting a fully developed spiral dive	4	<u> </u> A
Initial response of glider (first 180°) Tendency to return to straight flight	Spontaneous exit (g force decreasing,	Immediate reduction of rate of tur Spontaneous exit (g force
Turne angle to recover neurol flight	rate of turn decreasing)	decreasing, rate of turn decreasing
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°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Keeping course
Cascade occurs		No
Folding lines used	no	no
Jnaccelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
_	Entering a turn of less than 90°	Keeping course
Cascade occurs Folding lines used		No no
rotating thes used	110	110
Accelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
	Entering a turn of less than 90°	Keeping course
Cascade occurs		No
Folding lines used	no	no
Exiting deep stall (parachutal stall)	Α	A
Deep stall achieved	Yes	Yes
	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course Cascade occurs	Changing course less than 45° No	Changing course less than 45° No
· · · · · · · · · · · · · · · · · · ·	Α	A
Recovery Cascade occurs	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Cascade occurs	NO	No
Recovery from a developed full stall	Α	A
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Collapse	No collapse	No collapse
Cascade occurs (other than collapses)		No
Rocking back		Less than 45°
Line tension	Most lines tight	Most lines tight
Small asymmetric collapse	A	A
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs		No
	no	no
Folding lines used		

Change of course until re-inflation Maximum dive forward or roll angle		Less than 90° Dive or roll angle 15° to 45°
	· Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
-	No (or only a small number of collapsed	No (or only a small number of
conapse on the opposite side occurs	cells with a spontaneous re inflation)	collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	l no	no
Small asymmetric collapse accelerated	i.	A
······		<u>.</u>
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	l no	no
Large asymmetric collapse accelerated	Α	A
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle	Dive or roll angle 15° to 45°	Dive or roll angle 15° to 45°
	· Spontaneous re-inflation	Spontaneous re-inflation
Total change of course	Less than 360°	Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed	No (or only a small number of
	cells with a spontaneous re inflation)	collapsed cells with a spontaneous re inflation)
Twist occurs	s No	No
Cascade occurs	s No	No
Folding lines used	no	no
Directional control with a maintained asymmetric collapse	A	A
L	<u>.</u>	Yes
Able to keep course	Yes	
Able to keep course 180° turn away from the collansed side		
Able to keep course 180° turn away from the collapsed side possible in 10 s	Yes	Yes
180° turn away from the collapsed side	Yes More than 50 % of the symmetric control	Yes
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir	Yes I More than 50 % of the symmetric control travel	Yes More than 50 % of the symmetric
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency	Yes More than 50 % of the symmetric control travel	Yes More than 50 % of the symmetric control travel
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir	Yes More than 50 % of the symmetric control travel	Yes More than 50 % of the symmetric control travel
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Spin occurs	Yes More than 50 % of the symmetric control travel	Yes More than 50 % of the symmetric control travel
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Spin occurs	Yes More than 50 % of the symmetric control travel No	Yes More than 50 % of the symmetric control travel
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Spin occurs Low speed spin tendency	Yes More than 50 % of the symmetric control travel No	Yes More than 50 % of the symmetric control travel A No
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs	Yes More than 50 % of the symmetric control travel No	Yes More than 50 % of the symmetric control travel A No A
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Spin occurs Low speed spin tendency	Yes More than 50 % of the symmetric control travel No No A	Yes More than 50 % of the symmetric control travel A No A
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin	A A S No A S No A S S S S S S S S S S S S S	Yes More than 50 % of the symmetric control travel A No A
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release	A A S No A S No A S S S S S S S S S S S S S	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release	A A S No A S No A S S S S S S S S S S S S S	Yes More than 50 % of the symmetric control travel A No A No Stops spinning in less than 90°
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release	A Stops spinning in less than 90° No A Changing course less than 45°	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release	A Stops spinning in less than 90° A	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	A Solution Solution Solu	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release	A Solution Solution Solu	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	A Solution Solution Solution	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spir Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs	A Solution State	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit	A Solution Solution Solution	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears	A Solution Stable with straight span Solution Stable S	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No
180° turn away from the collapsed side possible in 10 s Amount of control range between turn and stall or spin Trim speed spin tendency Spin occurs Low speed spin tendency Spin occurs Recovery from a developed spin Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears Entry procedure Behaviour during big ears	A A A No A S No A S Stops spinning in less than 90° S No A Changing course less than 45° Remains stable with straight span S Spontaneous in less than 3 s Dive forward 0° to 30° No A Dedicated controls	Yes More than 50 % of the symmetric control travel A No A Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No A

Dive forward 0° to 30°

Big ears in accelerated flight	A	A
Entr	y procedure Dedicated controls	Dedicated controls
Behaviour dur	ing big ears Stable flight	Stable flight
	Recovery Spontaneous in 3 s to 5 s	Spontaneous in less than 3 s
Dive forward a	ngle on exit Dive forward 0° to 30°	Dive forward 0° to 30°
Behaviour immediately after re accelerator while maintain		Stable flight
Alternative means of directional co	ntrol	A
180° turn achiev	able in 20 s Yes	Yes

Any other flight procedure and/or configuration described in the user's manual



Landing	Α	A
Special landing techniq	ue required No	No
Speeds in straight flight	A	A
Trim speed more th	an 30 km/h Yes	Yes
Speed range using the controls lar	ger than 10 Yes km/h	Yes
Mini	mum speed Less than 25 km/h	Less than 25 km/h
Control movement	A	A
Symmetric cont	r ol pressure Increasing	Increasing
Symmetric co	ontrol travel Greater than 55 cm	Greater than 60 cm
Pitch stability exiting accelerated f	light A	A
Dive forward a	ngle on exit Dive forward less than 30°	Dive forward less than 30°
Coll	apse occurs No	No
Pitch stability operating controls du accelerated flight	uring A	A
Coll	apse occurs No	No
Roll stability and damping	A	A
	Oscillations Reducing	Reducing
Stability in gentle spirals	A	A
Tendency to return to st	raight flight Spontaneous exit	Spontaneous exit
Behaviour exiting a fully developed	spiral dive A	В
Initial response of glider	(first 180°) Immediate reduction of rate of turn	en : keine unmittelbare Reaktion
Tendency to return to st	raight flight Spontaneous exit (g force decreasing rate of turn decreasing)	 Spontaneous exit (g force decreasing, rate of turn decreasing)

 Turn angle to recover normal flight Less than 720°, spontaneous recovery
 720° to 1 080°, spontaneous recovery

Symmetric front collapse	A	Α
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course	Keeping course	Keeping course
Cascade occurs	s No	No
Folding lines used	l no	no
Unaccelerated collapse (at least 50 % chord)	A	Α
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course	e Keeping course	Keeping course
Cascade occurs	s No	No
Folding lines used	l no	no
Accelerated collapse (at least 50 % chord)	A	В
Entry	Rocking back less than 45°	Rocking back less than 45°
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 30° to 60°
Change of course	Keeping course	Keeping course
Cascade occurs	s No	No
Folding lines used	l no	no
Exiting deep stall (parachutal stall)	A	В
Deep stall achieved	l Yes	Yes
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 30° to 60°
Change of course	Changing course less than 45°	Changing course less than 45°
Cascade occurs	s No	No
High angle of attack recovery	A	Α
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Cascade occurs	s No	No
		1
Recovery from a developed full stall	Α	B
Recovery from a developed full stall Dive forward angle on exit	<u>.</u>	B Dive forward 30° to 60°
Dive forward angle on exit	<u>.</u>	÷
Dive forward angle on exit	: Dive forward 0° to 30° No collapse	Dive forward 30° to 60°
Dive forward angle on exit Collapse Cascade occurs (other than collapses)	: Dive forward 0° to 30° No collapse	Dive forward 30° to 60° No collapse
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back	: Dive forward 0° to 30° No collapse No	Dive forward 30° to 60° No collapse No
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension	: Dive forward 0° to 30° No collapse No Less than 45°	Dive forward 30° to 60° No collapse No Less than 45°
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension	Dive forward 0° to 30° No collapse No Less than 45° Most lines tight	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse	Dive forward 0° to 30° No collapse No Less than 45° Most lines tight Less than 90°	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle	Dive forward 0° to 30° No collapse No Less than 45° Most lines tight Less than 90°	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90°
Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45°
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneou
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneou re inflation)
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs Collapse on the opposite side occurs Cascade occurs Folding lines used	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneou re inflation) No No
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs Collapse on the opposite side occurs Cascade occurs Folding lines used	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No Ino 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneou re inflation) No No
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs Collapse on the opposite side occurs Twist occurs Cascade occurs Folding lines used	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No Ino Less than 90° 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneou re inflation) No No No 90° to 180°
Dive forward angle on exit Collapse Cascade occurs (other than collapses) Rocking back Line tension Small asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs Collapse on the opposite side occurs Twist occurs Cascade occurs Folding lines used Large asymmetric collapse Change of course until re-inflation Maximum dive forward or roll angle	 Dive forward 0° to 30° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No Ino Less than 90° 	Dive forward 30° to 60° No collapse No Less than 45° Most lines tight A Less than 90° Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation) No No No No

Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	no	no
Small asymmetric collance accelerated		В
Small asymmetric collapse accelerated	4	±
Change of course until re-inflation		90° to 180°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	no	no
Large asymmetric collapse accelerated	A	A
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course		Less than 360°
5		
conapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	no	no
Directional control with a maintained asymmetric collapse	A	A
Able to keep course		Yes
180° turn away from the collapsed side		Yes
possible in 10 s		
Amount of control range between turn and stall or spin		More than 50 % of the symmetric control travel
Trim speed spin tendency		A
·	<u>1</u> A	·
Spin occurs	No	No
Low speed spin tendency	A	A
Spin occurs	No	No
Recovery from a developed spin	Α	Α
Spin rotation angle after release	Stops spinning in less than 90°	Stops spinning in less than 90°
Cascade occurs		No
B-line stall	A	A
Change of course before release	Changing course loss than 45%	Changing course less than 45°
_	Changing Course less than 45	
	Remains stable with straight span	
	Remains stable with straight span	Remains stable with straight span
Dive femuland angle an anit	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Spontaneous in less than 3 s Dive forward 0° to 30°	Spontaneous in less than 3 s Dive forward 0° to 30°
Dive forward angle on exit Cascade occurs	Spontaneous in less than 3 s Dive forward 0° to 30°	Spontaneous in less than 3 s
_	Spontaneous in less than 3 s Dive forward 0° to 30°	Spontaneous in less than 3 s Dive forward 0° to 30°
Cascade occurs Big ears	Spontaneous in less than 3 s Dive forward 0° to 30° No	Spontaneous in less than 3 s Dive forward 0° to 30° No
Cascade occurs Big ears Entry procedure	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique	Spontaneous in less than 3 s Dive forward 0° to 30° No Standard technique
Cascade occurs Big ears Entry procedure Behaviour during big ears	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight
Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s
Cascade occurs Big ears Entry procedure Behaviour during big ears	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight
Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery Dive forward angle on exit	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s Dive forward 0° to 30°
Cascade occurs Big ears Entry procedure Behaviour during big ears Recovery Dive forward angle on exit Big ears in accelerated flight	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s	Spontaneous in less than 3 s Dive forward 0° to 30° No A Standard technique Stable flight Spontaneous in less than 3 s

Behaviour during big ears Stable flight	Stable flight
Recovery Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit Dive forward 0° to 30°	Dive forward 0° to 30°
Behaviour immediately after releasing the Stable flight accelerator while maintaining big ears	Stable flight
Alternative means of directional control A	A
180° turn achievable in 20 s Yes	Yes
Stall or spin occurs No	No
Any other flight procedure and/or configuration described in the user's manual	

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UP MANA 2 21

Type designation UP Mana 2 21 Type test reference no DHV GS-01-2754-23 Holder of certification UP International GmbH Manufacturer UP International GmbH **Classification** A Winch towing Yes Number of seats min / max 1 / 1 Accelerator Yes Trimmers No



BEHAVIOUR AT MIN WEIGHT IN BEHAVIOUR AT MAX FLIGHT (55KG)

Test pilots



Expert Harald Buntz



Harald Buntz

	No release	No release
Inflation/take-off	Α	Α
Rising behaviour	Smooth, easy and constant rising	Smooth, easy and constant rising
Special take off technique required	No	No
Landing	A	A
Special landing technique required		No
Speeds in straight flight	A	A
Trim speed more than 30 km/h	Yes	Yes
Speed range using the controls larger than 10 km/h		Yes
Minimum speed	Less than 25 km/h	Less than 25 km/h
Control movement	A	A
Symmetric control pressure	Increasing	Increasing
Symmetric control travel	Greater than 55 cm	Greater than 60 cm
Pitch stability exiting accelerated flight	A	A
Dive forward angle on exit	Dive forward less than 30°	Dive forward less than 30°
Collapse occurs	No	No
Pitch stability operating controls during accelerated flight	1	A
Collapse occurs		No
Roll stability and damping	A	A
Oscillations		Reducing
Stability in gentle spirals	A	A



Tendency to return to straight flight Spontaneous exit

Spontaneous exit

Behaviour exiting a fully developed spiral dive	4	<u> </u> A
Initial response of glider (first 180°)		Immediate reduction of rate of tur
Tendency to return to straight flight	Spontaneous exit (g force decreasing, rate of turn decreasing)	Spontaneous exit (g force decreasing, rate of turn decreasing
Turn angle to recover normal flight	57	Less than 720°, spontaneous recovery
Symmetric front collapse	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Keeping course
Cascade occurs Folding lines used		No no
rolang mes used		10
Unaccelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
-	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Change of course		Entering a turn of less than 90°
Cascade occurs		No
Folding lines used	no	no
Accelerated collapse (at least 50 % chord)	A	A
Entry	Rocking back less than 45°	Rocking back less than 45°
-	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Dive forward angle on exit		Dive forward 0° to 30°
Change of course		Entering a turn of less than 90°
Cascade occurs		No
Folding lines used	no	no
Exiting deep stall (parachutal stall)	A	A
Deep stall achieved		Yes
Recovery Dive forward angle on exit	Spontaneous in less than 3 s	Spontaneous in less than 3 s Dive forward 0° to 30°
_	Changing course less than 45°	Changing course less than 45°
Cascade occurs		No
High angle of attack recovery	A	A
Recovery	Spontaneous in less than 3 s	Spontaneous in less than 3 s
Cascade occurs	No	No
Recovery from a developed full stall	A	A
Dive forward angle on exit	Dive forward 0° to 30°	Dive forward 0° to 30°
Collapse	No collapse	No collapse
Cascade occurs (other than collapses)		No
Rocking back		Less than 45°
Line tension	Most lines tight	Most lines tight
Small asymmetric collapse	Α	Α
L	Laca than 000	Less than 90°
Change of course until re-inflation		
Change of course until re-inflation Maximum dive forward or roll angle	Dive or roll angle 15° to 45°	Dive or roll angle 0° to 15°
Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour	Dive or roll angle 15° to 45° Spontaneous re-inflation	Spontaneous re-inflation
Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course	Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360°	Spontaneous re-inflation Less than 360°
Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour	Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360°	Spontaneous re-inflation Less than 360° No (or only a small number of
Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course	Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation)	Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous
Change of course until re-inflation Maximum dive forward or roll angle Re-inflation behaviour Total change of course Collapse on the opposite side occurs	Dive or roll angle 15° to 45° Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation)	Spontaneous re-inflation Less than 360° No (or only a small number of collapsed cells with a spontaneous re inflation)

Large asymmetric collapse	A	A
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle	Dive or roll angle 0° to 15°	Dive or roll angle 15° to 45°
Re-inflation behaviour	Spontaneous re-inflation	Spontaneous re-inflation
Total change of course	Less than 360°	Less than 360°
Collapse on the opposite side occurs	No (or only a small number of collapsed cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	no	no
Small asymmetric collapse accelerated	A	A
	<u>.</u>	<u></u>
Change of course until re-inflation		Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
Re-inflation behaviour	1	Spontaneous re-inflation
Total change of course		Less than 360°
	cells with a spontaneous re inflation)	No (or only a small number of collapsed cells with a spontaneous re inflation)
Twist occurs		No
Cascade occurs		No
Folding lines used	no	no
Large asymmetric collapse accelerated	A	Α
Change of course until re-inflation	Less than 90°	Less than 90°
Maximum dive forward or roll angle		Dive or roll angle 15° to 45°
Re-inflation behaviour		Spontaneous re-inflation
Total change of course		Less than 360°
-		No (or only a small number of
Collapse on the opposite side occurs	cells with a spontaneous re inflation)	collapsed cells with a spontaneous re inflation)
Twist occurs	No	No
Cascade occurs	No	No
Folding lines used	no	no
Directional control with a maintained asymmetric collapse	A	A
Able to keep course	Yes	Yes
180° turn away from the collapsed side	Yes	Yes
possible in 10 s		
Amount of control range between turn and stall or spin		More than 50 % of the symmetric control travel
Trim speed spin tendency	A	A
Spin occurs	No	No
	1-	1.
	A	¦A
Spin occurs	INO	No
Recovery from a developed spin	A	A
Recovery from a developed spin Spin rotation angle after release	£	A Stops spinning in less than 90°
	Stops spinning in less than 90°	<u>.</u>
Spin rotation angle after release Cascade occurs	Stops spinning in less than 90°	Stops spinning in less than 90°
Spin rotation angle after release Cascade occurs B-line stall	Stops spinning in less than 90° No	Stops spinning in less than 90° No
Spin rotation angle after release Cascade occurs B-line stall Change of course before release	Stops spinning in less than 90° No A Changing course less than 45°	Stops spinning in less than 90° No A Changing course less than 45°
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight spar Spontaneous in less than 3 s
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30°
Spin rotation angle after release Cascade occurs B-line stall Change of course before release Behaviour before release Recovery Dive forward angle on exit Cascade occurs Big ears	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No	Stops spinning in less than 90° No A Changing course less than 45° Remains stable with straight span Spontaneous in less than 3 s Dive forward 0° to 30° No

Recovery Spontaneous in less than 3 s **Dive forward angle on exit** Dive forward 0° to 30°

Spontaneous in less than 3 s Dive forward 0° to 30°

Big ears in accelerated flight	A	A
Entry p	rocedure Standard technique	Dedicated controls
Behaviour during	J big ears Stable flight	Stable flight
	Recovery Spontaneous in less than 3 s	Spontaneous in 3 s to 5 s
Dive forward ang	le on exit Dive forward 0° to 30°	Dive forward 0° to 30°
Behaviour immediately after rele accelerator while maintaining		Stable flight
Alternative means of directional contr	ol	A
180° turn achievab	le in 20 s Yes	Yes