




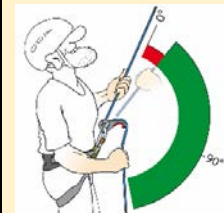


Data	Device	GRIGRI 2	MATIK	CLICK UP	ERGO	MEGA JUL	JUL ²	SMART
	Manufacturer	Petzl	Camp	Climbing Technology	Salewa	Edelrid	Edelrid	Mammut
Rope diameter	8.9 – 11 mm; optimum 9.4 – 10.3 mm	8.6 – 10.2 mm; optimum 8.6 – 9.6 mm	8.6 – 10.5 mm	8.6 – 11 mm; optimum 9.0 – 10.5 mm	8.9 – 10.5 mm (single rope)	8.9 – 11 mm	8.7 – 10.5 mm	
Weight	170 g	276 g	115 g	70g	65 g	100 g	82 g	
MSRP price	€ 69.95	€ 99.95	€ 64.95 (including carabiner)	€ 65,- (including carabiner)	€ 34.95	€ 30,-	Euro 30,-	
Characteristic	Dependency on the Carabiner	No Carabiner serves for connection to the harness only	No Carabiner serves for connection to the harness only	Strong Use original carabiner! (Only available as part of a set)	Strong Use original carabiner! (Only available as part of a set)	Average Handling and brake force depend on the cross section of the carabiner Device ought to be able to rotate freely (Belay-Master and Fifty-Fifty unsuitable) Manufacturer specification: HMS Bruce Steel FG or HMS Strike		Minor Handling and brake force depend on the cross section of the carabiner Manufacturer specification: symmetrical HMS carabiner, e.g. Element Smart HMS
	Static brake force	8.9 mm: 2.8 kN	8.9 mm: 2.1 kN	8.9 mm: 1.4 kN	8.9 mm: 1.9 kN	8.9 mm: 0.5 kN	8.9 mm: 0.5 kN	8.9 mm: 0.6 kN
Handling	Movement pattern when giving out rope	average thin ropes: tube handling (Fig. 1) thick ropes and paying out rope quickly: „New technique“ (Fig. 2)	simple to complex thin ropes: tube handling (Fig. 1) thick ropes and giving out rope quickly: problematic (special method „pistol grip“)	simple to complex simple tube handling releasing the blocking function after unintended response using the guide hand is difficult (brake hand has to hold the rope!)	simple handling similar to tube handling involving lifting the device (Fig. 3)	simple handling similar to tube handling except for it involves lifting the device (Fig. 3)	simple handling similar to tube handling except for it involves lifting the device (Fig. 3)	simple handling similar to tube handling except for it involves lifting the device (Fig. 3)
	Lowering	average Initially well controllable by a lever Eventually you reach a point of resistance beyond which lowering speed suddenly substantially increases. This point is reached faster with thin ropes.	good Panic function positive (only operate with two fingers! With the whole hand holding the lever same may not be pulled to the point where the panic function takes effect) If much friction is involved the „pistol grip“ has to be used for lowering (no panic function)	average Initially, a relatively high resistance has to be overcome (negative, as it then switches to „full throttle“) Well controllable during further lowering	good After a slight initial resistance is overcome, comfortable to control	average Slight initial resistance to be overcome, all in all not quite as comfortable to control as the new „Jul ² “ Attention: little braking effect with thin ropes and/or heavy climbers!	average Initial resistance is low, controllability high Attention: little braking effect with thin ropes and/or heavy climbers!	average Initial resistance is low, controllability high Attention: little braking effect with thin ropes and/or heavy climbers!
Safety reserve	Influence of the brake hand position on the assisted braking function	Not given 	Not given 	Strong (yellow: depends on "jerk") 	Little 	Little 	Little 	Little 
	Fall when giving out rope and correct handling	Little problematic with tube handling Also using the „new technique“ it is almost impossible to keep the device open	Little problematic with tube handling When giving out rope quickly using the „pistol grip“ the device may be kept open!	If the brake hand is positioned above the device, a reaction of the belayer is required: close hand and down! Little problematic if the brake hand is positioned below the device	Attention: reaction of the belayer required: close hand and down!	Attention: reaction of the belayer required: close hand and down!	Attention: reaction of the belayer required: close hand and down!	Attention: reaction of the belayer required: close hand and down!
	Safety buffer when violating the brake hand principle	large Only with extremely soft falls a failure of the assisted braking function is possible. Hard falls are no problem.	average With soft falls (without a jerk) failure is possible. Hard falls are no problem.	average With soft falls (without a jerk) the assisted braking function does not function reliably. Hard falls are no problem.	large The assisted braking function responds already in case of very soft falls and blocks reliably in case of hard falls	small The assisted braking function responds already in case of very soft falls, in case of hard falls the device alone may not stop the fall!	small The assisted braking function responds already in case of very soft falls, in case of hard falls the device alone may not stop the fall!	small The assisted braking function responds already in case of very soft falls, in case of hard falls the device alone may not stop the fall!
	Typical handling mistakes and accident causes (Climbing gym study 2012 and accident statistics)	25% of Grigri belayers block the cam when giving out rope and at the same time remove their hand from the brake end of the rope (Fig. 5). Lose control over lowering speed and reflexively pull the lever towards the body (Fig. 4)	Unknown, as the device is not yet common Possible: Blocking the cam when giving out rope („pistol grip“) and at the same time remove one's hand from the brake end of the rope	The brake hand remains above or too close to the device for too long. Violating the brake hand principle (in particular when releasing the braking function) When the brake hand is held to the side of the device: no braking function, only tube function Lowering accidents	Unknown, as the device is not yet common Similar handling errors possible as in comparison with the Smart	Few accidents known, as the device is not yet very common Known: Violation of the „brake hand principle“ Similar handling errors possible as in comparison with the Smart	Unknown, as the device is not yet common Similar handling errors possible as in comparison with the Smart	Violation of the „brake hand principle“ The brake hand holds the „trunk“ upwards for too long or does not correctly enclose the brake end of the rope Lowering accidents (letting go of the rope when lowering and/or pulling up the trunk)
	Handling errors - inserting rope the wrong way round or attaching the device incorrectly to the harness (brake side of the rope towards the body)	Incorrectly inserted rope is very critical, as no blocking function and very little brake force. Incorrectly attached device is unproblematic (blocks)	Incorrectly inserted rope is very critical, as no blocking function and very little brake force. Incorrectly attached device is unproblematic (blocks)	Regarding both handling errors: no assisted braking, tube function still given. If device attached incorrectly to the harness: tube function with high brake force	Regarding both handling errors: no assisted braking, only tube function with little brake force	Regarding both handling errors: no assisted braking, only tube function with little brake force	Regarding both handling errors: no assisted braking, only tube function with little brake force	Regarding both handling errors: no assisted braking, only tube function with little brake force