# The New Standard of Manoeuvrability.

**Towing capacity up to 80 t (176.400 lbs)**

- Highly precise manoeuvrability
- Wireless controlled
- Can pass underneath the fuselage of any aircraft
- Extremely compact
- Usable for almost all aircraft and wheeled helicopter in seconds
- Emission-free and noise-free
- Ground-Power included

mototok® easy moving

Made in Germany

Not a vision, but reality. The revolution is here when it comes to maneuvering aircraft and helicopter. A big idea in a small format! Name: mototok. Distinguishing features: Revolutionary in its simplicity. Extremely compact. Uniquely flexible. And very high performance.

mototok has high-tech radio remote control with worldwide safety approval also for airports. mototok provides the optimum balance between minimal dimensions and maximum effect! mototok enables the movement of the aircraft to be controlled at every conceivable collision point around the aircraft. mototok can be used for almost all aircraft within seconds and without conversion.

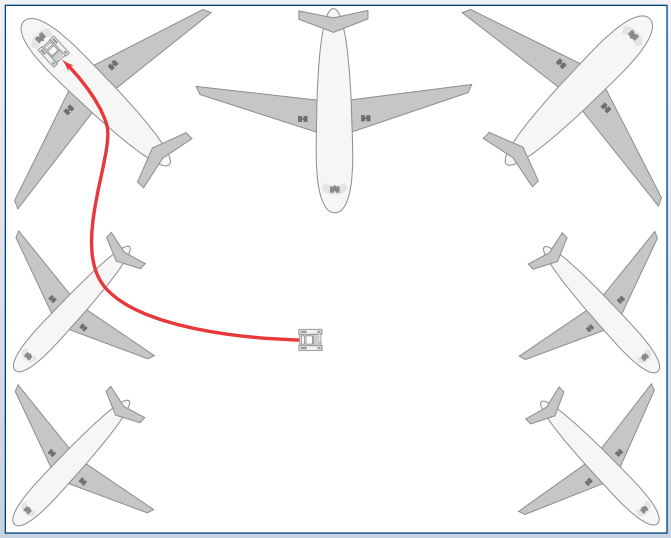
Extremely powerful electric motors driven by high-performance, maintenance-free GEL batteries with high cycling capability, regulated and controlled by two high-performance microprocessors provide enormous driving forces. Extremely high initial torque ensures smooth acceleration, particularly at the start. Storage capacity is sufficient for several days, depending on workload. Separate ground-power equipment is not necessary as mototok has 12 V or 24/28 V ground-power connection.

# mototok – The high-tech wireless remote controlled aircraft and helicopter positioning unit

# Only mototok generates more space in your hangar.

100 % visual control around the aircraft. No knocks. No collisions. Optimum use of limited space!

Only mototok appliances are capable of manoevering an aircraft's nose a few millimetres away from a hangar wall, and obove all, quickly and effieciently prepare all other aircraft in the hangar for their next duties. Furthermore, space for an addtional number of 1 to 3 aircraft can be created in the hangar.



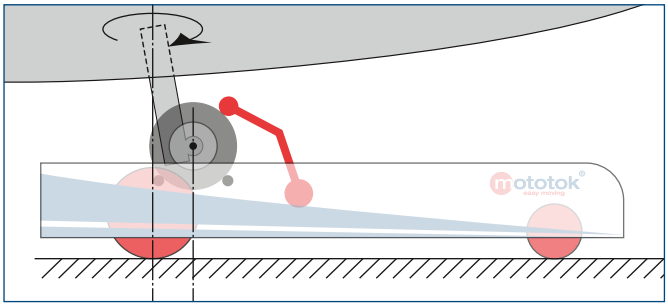
Whether in forward or reverse motion, mototok will always manage to create real space inside the hangar

Docking takes a matter of seconds from the rear or front of the nose wheel. Simply drive the mototok up to the nose wheel. The wheel is then hydraulically fixed firmly in position and raised – ready for take off! All this with no awkward strap, no inconvenient winch. No bolts or tools are required.

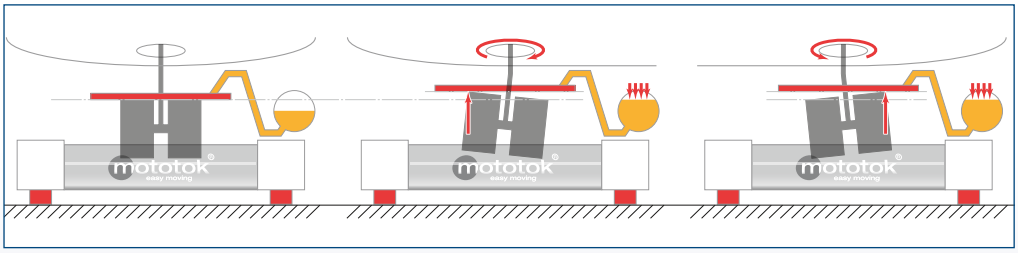
# Docking safely without any tools from behind or front of the nose wheel.

# mototok. Safety first.

When the nosewheel is raised in the TWIN and SPACER Models, it is secured by means of the hydropneumatically operated wheel securing system.

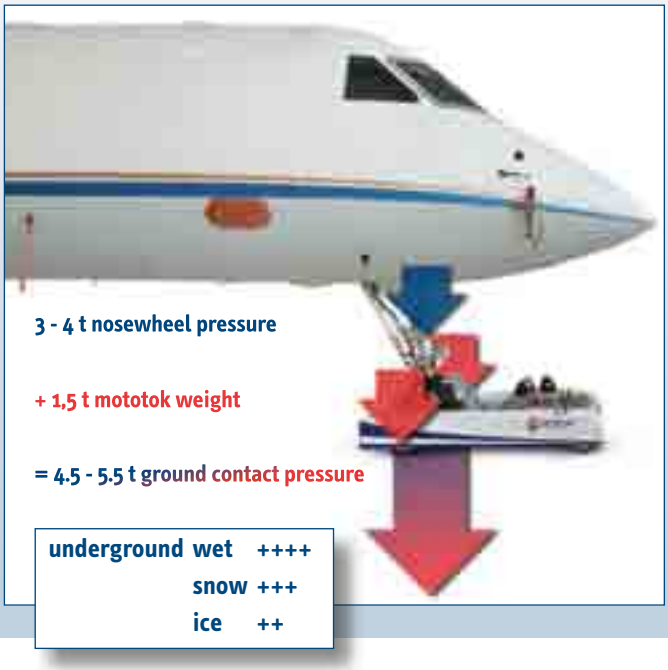


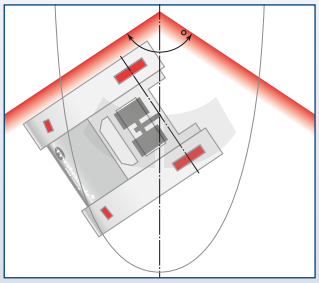
The nosewheels tilt on account of offset nosewheel gear mechanism and are also kept in a fixed tilted position under constant ground contact pressure provided by the hydropneumatic system.



The nose wheel pressure is positioned exactly between the two drive wheels of mototok. So the resulted ground contact pressure is very high.

A very high ground contact pressure ratio in relation to the total aircraft weight is attained due to the fact that the driving wheels are 100mm wide. Under these circumstances, mototok can be operated without any problems in rain, snow or on ice.

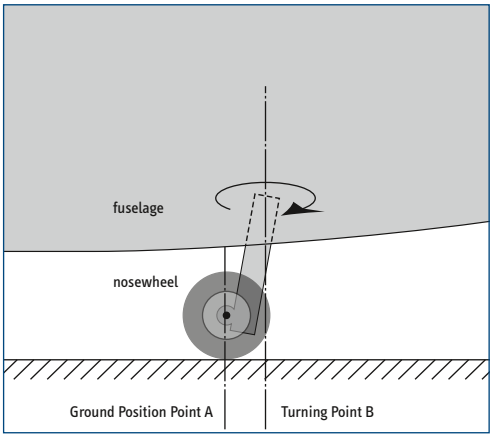


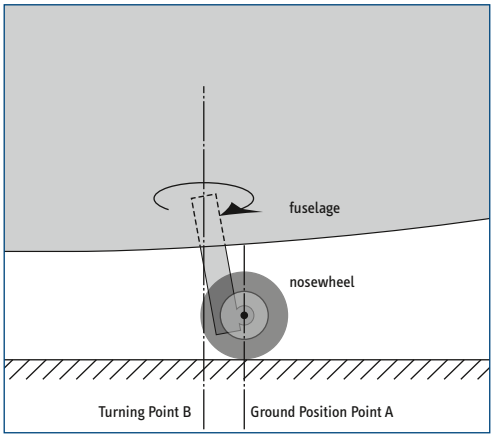



With mototok, a shearing off of the nose wheel stop whilst turned around its axis is impossible because the adjusteable electronic torque control effectively prevents this.

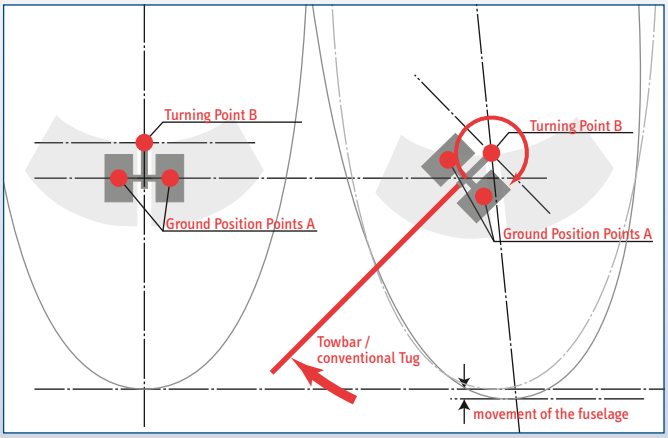
mototok® easy moving

# Problems of moving aircraft the conventional way.



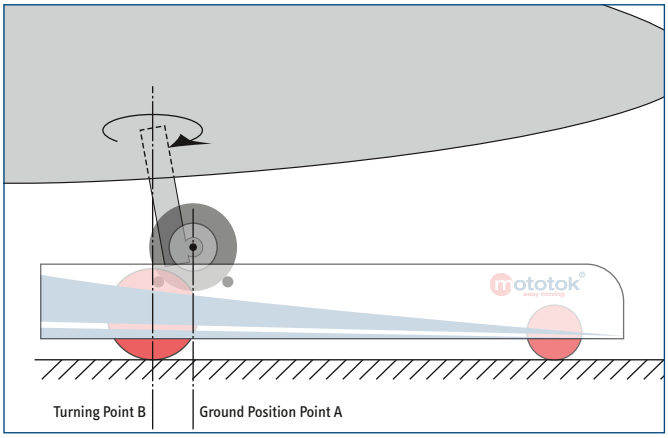




A nosewheel is basically offset in order to remain safely on track during take-off and landing. Due to this, ground position point A is not identical with construction related axis B on the landing gear.



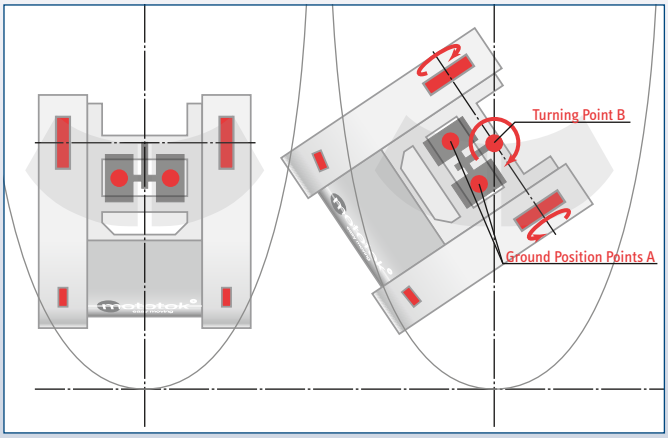

Lever action is imposed on the landing gear whilst turning the nosewheel around point A. This in turn leads to considerable movement of the entire aircraft when using conventional tractors and tow-bars – especially movement of wing tips and elevators. Upon turning the nosewheel, these can protrude outwards by approximately up to half a metre. Therefore, collisions with other aircraft or hangar walls cannot be ruled out. Furthermore, transverse forces are inflicted on undercarriage bearings which are not construction related and hence damage can be incurred.

# Our solution:
# The mototok principle.




mototok is intelligent. Both of the processor-controlled release motors recognise rotational resistance and carry out a precise turning manoevre around axis B on landing gear.

The result: mototok revolves around Axis B. In other words it turns precisely around the same axis at rotational point B on the landing gear. The aircraft remains almost immovable from its location. Therefore, accidents through collisions are practically out of the question. Additionally, transverse forces are not inflicted upon the nosewheel and landing gear hence no damgage will be caused to the bearings and other landing gear related components.



mototok®
easy moving

# Maximum Flexibility.

Towing capacity up to 5 t (11.000 lbs)

helimo®

Made in Germany

## The electrical and precise mover for all helicopters with landing skids

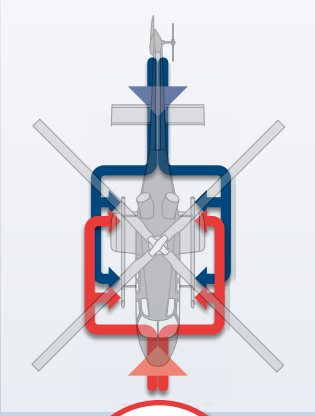
- Highly precise manoeuvrability
- Wireless controlled
- Extremely compact
- Usable for all skidded helicopter in seconds
- No problems with mounted cameras, radar, lights etc.
- Up to a week of operating time
- Ground-Power included

These arms can be mounted at any possible position in seconds and fixes the skid hydraulically.

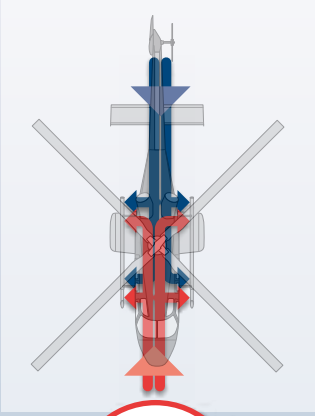
The HELIMO can move every type of helicopter with skids regardless of obstacles such as cameras, radar, floats, winds and weapons mounted on the belly or skids of the helicopter. The HELIMO is universal and easily adjustable to meet the specifications of the helicopter.

With HELIMO, you can pick up your helicopter by several different methods. You have the option of connecting to the skids from the outside or inside of its tubing with the HELIMO remaining outside your Helicopter either from the front or rear position. You also have the option of entering your helicopter under its belly from in front or from the rear and attaching to the skids from its inside tubing. It is possible to combine outside and inside attaching.

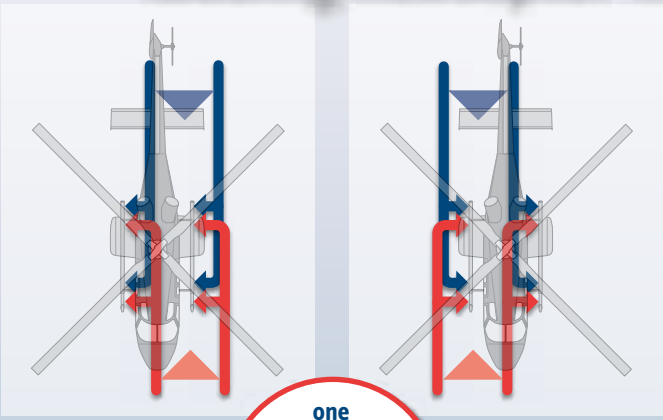
## Maximum Flexibility: Eight principle ways of loading helicopter ...



from outward



from inward



one skid from outward and one from inward

respectively → from the front or → from the back

# Technical Data

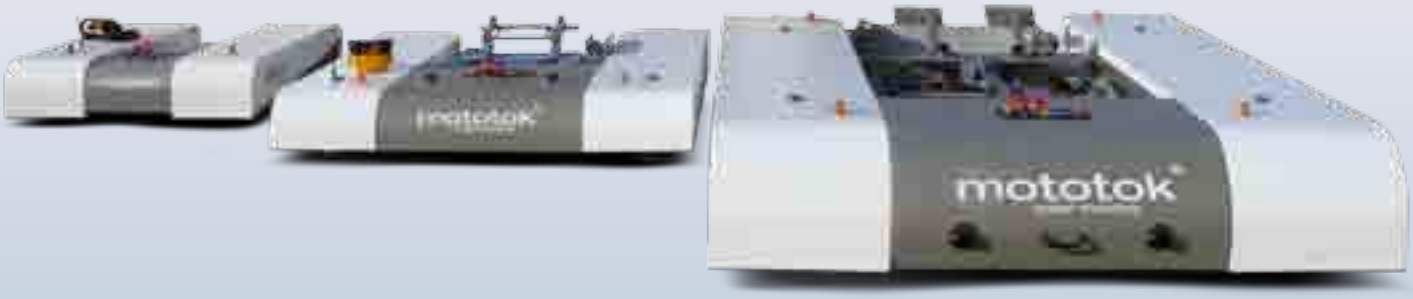
| mototok | M 520 | TWIN 6000 | TWIN 6500 SP | SPACER 8500 |
|---|---|---|---|---|
| **Use for** | **single & double nosewheel, wheeled helicopter** | **single & double nosewheel, wheeled helicopter** | **single & double nosewheel, wheeled helicopter** | **double nosewheel** |
| **Maximum towing capacity** [1] | **44800 lbs / 20 t** | **88100 lbs / 40 t** | **110200 lbs / 50 t** | **176300 lbs / 80 t** |
| **Maximum nosewheel weight capacity** | **4480 lbs / 2000 kg** | **11000 lbs / 5000 kg** | **13200 lbs / 6000 kg** | **15400 lbs / 7000 kg** |
| Time to load/fix aircraft | 10 sec | 10 sec | 10 sec | 20 sec |
| Hydraulic wheel opening doors | ✓ | ✓ | ✓ | incl. |
| Batteries (maintenance-free, deep cycle gel batteries) | 4 batteries x 12 V / 60 Ah | 4 batteries x 12 V / 140 Ah | 4 batteries x 12 V / 200 Ah | 80 Volt Armour Plate 300 Ah |
| Range (depending on the workload) | 2 days | 3-4 days | 3-4 days | 3-4 days |
| Possible terrain | Concrete, stone, asphalt | | | |
| Dimensions | w x l x h: 71.2 x 70.9 x **14.2 inch**<br>1808 x 1802 x **360 mm** | w x l x h: 74.6 x 93 x **14.2 inch**<br>1894 x 2363 x **360 mm** | w x l x h: 74.6 x 93 x **14.2 inch**<br>1894 x 2363 x **360 mm** | w x l x h: 97.6 x 130 x 21.6 inch<br>2480 x 3300 x 550 mm |
| Unladen weight | approx. lbs / 1000 kg | 3090 lbs / 1400 kg | 3200 lbs / 1450 kg | 7700 lbs / 3500 kg |
| Ground clearance | 3.94 inch / 100 mm | 3.94 inch / 100 mm | 3.94 inch / 100 mm | 2.95 inch / 75 mm |
| Width of the wheel opening | **20.4 inch / 520 mm** | **23.6 inch / 600 mm** | **25.6 inch / 650 mm** | **33.5 inch / 850 mm** |
| Depth of the wheel opening | 18.9 inch / 480 mm | 19.7 inch / 500 mm | 25.6 inch / 650 mm | 47 inch / 1200 mm |
| Tyres | Puncture-proof tyres | | | |
| | Radio remote control | Radio remote control (with safety features, waterproof, certification of conformity), worldwide safety approval, including airports, TÜV certified ) | | |
| **Optional accessories** | | | | |
| Demountable seat (can be mounted in few seconds) | - | ✓ | ✓ | - |
| Hydraulic nosewheel securing [2] | ✓ | incl. | incl. | incl. |
| Ground power cable for gound power connection 13,4V / 25,6 V (short time up to 1300 A) [3] | ✓ | ✓ | ✓ | - |
| Charger 24 V / 65 A (for additional ground-power buffer) [4] | - | ✓ | ✓ | 80 V / 80 A mit Elektrolytumwälzung |
| Driving light (LED, 10,000 hour operating life, very high beam range) | ✓ | incl. | incl. | incl. |
| Yellow flashlight | ✓ | incl. | incl. | incl. |
| Safety beeper | ✓ | incl. | incl. | incl. |
| Trailer coupling adaptor for multi-functional extensions | ✓ | ✓ | ✓ | - |
| Military spiral cable connection (15 m) between aggregate and control unit | ✓ | ✓ | ✓ | ✓ |
| Automatic controls by ground markings (AGV functionality) | ✓ | ✓ | ✓ | ✓ |
| Adaptations for special demands (i.e. military version / range of production) | ✓ | ✓ | ✓ | ✓ |
| Illuminated direction of travel indicator | ✓ | ✓ | ✓ | ✓ |

✓available

Mistakes and technical alterations reserved / Date 03.2011

1) The stated towing capacity is valid for towing on normal ground conditions without an incline of more than 2 %.
2) This prevents the nosewheel from rising and slipping out of position. The securing device is hydraulically lowered onto the nosewheel and securely locked at the push of a button. Standard: mechanical securing system.
3) In most aircraft, the generator voltage is 28.4 V. The 25.6 V on-board batteries are charged with this voltage. With the mototok ground power supply, the on-board voltage can be maintained and used to start the turbines.
4) To avoid the on-board electronics switching off during lengthy data update procedures (more than 30 minutes) in the case of aircraft with separate avionic cooling systems, we recommend a 28V buffer connection via a larger battery charger.

| **helimo** | | |
|---|---|---|
| **Use for** | **skidded helicopter** | |
| **lifting capacity** | **5 t / 11,000 lbs** | |
| dimensions | overall max | L: 5850 mm (230″) H: 536 mm (21″) W: 5128 mm (201″) |
| | overall min | L: 5850 mm (230″) H: 250 mm (10″) W: 2554 mm (100″) |
| | load area | 3960 mm (156″) |
| | cantilever arms | L: 300 mm (12“) W: 150 mm (6″) |
| | ground clearence | 100 mm (4″) |
| voltage | 48 V | |
| unladen weight | 2.2 t / 5000 lbs | |
| Tyres | Puncture-proof tyres | |
| Skids mounting and fixing system worldwide patent-registered | | |
| Radio remote control (with safety features, waterproof, certification of conformity), worldwide safety approval, including airports (TÜV certified) | | |
| 24/28V Groundpower available for engine start and updates | | |
| Yellow flashlight available | | |




mototok®
easy moving

# mototok.

## Big advance. Compact design.

+ **Extremly compact.**
  **Docking from the rear or front of the nosewheel.**
  Optimum use of limited space in the hangar.

+ **Independent of aircraft type**
  M-Series: Suitable for use with all aircraft types up to 25 t / 55,100 lbs with single nosewheel.
  TWIN: Suitable for use with all aircraft types up to 50t 110,200 lbs with single or double nosewheel.
  SPACER: Suitable for use with all aircraft types up to 80t 176,300 lbs with single or double nosewheel.
  helimo: Suitable for use with all skidded helicopter up to 5 t / 11,000 lbs.

  No adaptation necessary. Ready for immediate use!

+ **Radio remote controlled**
  No more damage due to inability to see wings and fuselage. 100 % visual control over the aircraft or helicopter. Only mototok enables the movement of the aircraft or helicopter to be controlled at every conceivable collision point around the aircraft.

+ **100 % control of the movement**
  Only mototok turns the nose wheel on the spot, without the aircraft fuselage and wing tips moving one millimetre. The aircraft only moves when the mototok sets off – and exactly along the course that you, as the operator, specify.

+ **Highly manoeuverable!**
  As the operator, you decide the route.

+ **Independent of weather**
  Moisture, cold, heat – no problem.

+ **Ground power included**
  Separate ground-power equipment is not necessary as mototok has approx. 12 V or 24/28 V ground-power connection.

+ **Worldwide usability**
  The remote control has a worldwide safety approval.

+ **Emission and noise-free**

+ **Made in Germany**
  Its powder-coated, hot dip galvanized steel body and the quality of all components and materials used ensure high reliability and low maintenance requirements. Manufactured ISO DIN 9001.

mototok®
easy moving

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