VIDEOLINK

See HELIMO in action: bit.ly/mototok-helimo

Electrically powered

Radio remotely controlled

Extreme low height

Park your Heli using the last corner of your hangar and save space

Only 1 person required for operation

Loads and unloads the Helicopter in seconds

Engineered and Made in Germany with Passion.

SKIDDED HELICOPTER

HANGAR OPTIMIZATION

HELIMO

The safest and most effective way of moving Helicopter towbarless. Electrify your Ground Handling.

mototok
easy moving

5653 / 12-2020

Mototok HELIMO.
Make the impossible possible!

With Mototok HELIMO you makes the impossible possible: Give the helicopter wheels as long as it needs them – in a fast, safe and convenient way.

HELIMO is – like all Mototok Tugs – an electric driven, remotely controlled vehicle. With HELIMO you maneuver almost all skidded helicopter easily.

With its two 4 metre long forks HELIMO drives underneath the helicopter from the front or the rear – and from inside or outside of the helicopter's skids. The forks are lowered and lifted by means of a hydraulic system. With the aid of two hydraulic cylinders each fork is moveable separately sideways to reach the skids. WIth four skid clamps (two at each side) the skids are formerly fixed to the tug.

Since the skids are gripped from the inside or the outside and lifted, floats, antennae, floodlights, camera pods or other attachments on the skid landing gear or any equipment attached underneath the helicopter can remain in position.

Driving, lifting and lowering the forks are done with the radio remote control. You can move the lifted helicopter to all places, rotate it freely, even in the tightest environments without any problems. The eyes of the operator never leaves the helicopter.

Drives and braking system

HELIMO is driven by electric gear hub drives with a starting torque of up to 6000 Nm. Steering is provided by the two variable-speed electric motors. The drives are controlled by two microprocessor controllers. The software developed for this purpose ensures that all drive states are covered. The unit stops immediately if a fault occurs in the wiring, in the remote control or in one or both controllers.

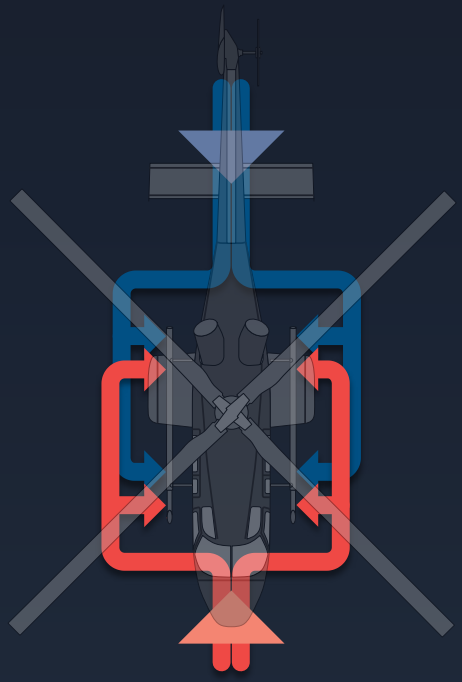
Batteries and ground power supply

The power supply for almost all Mototok vehicles is provided by maintenance-free, cycle-resistant lead-gel batteries that allow more than 700 full discharges when used properly. This means an approximate life span of 5 to 6 years in normal flight operation. A special high-frequency charger is responsible for charging, which allows 80% of the battery capacity to be available again after four hours of charging.

All Mototoks can be used as GPUs (Ground Power Units), i.e. they provide ground power for starting the propulsion units up to 1200 A 120 seconds at 25.6 V. This power supply can also be used for updates of the on-board electronics.

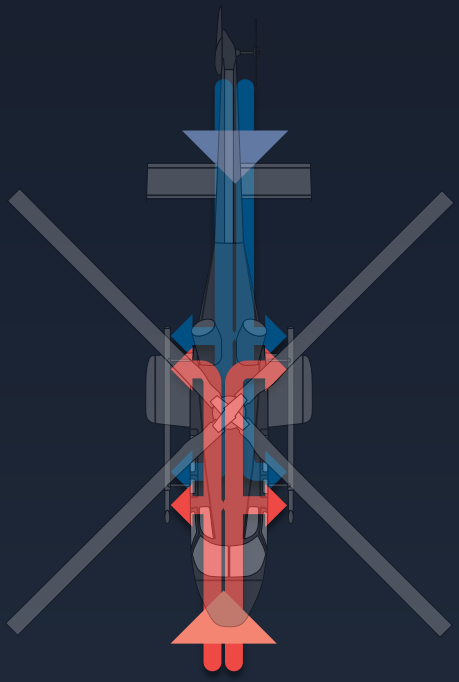
Maximum Flexibility: Eight principle ways of loading helicopter.

from outside / from the rear



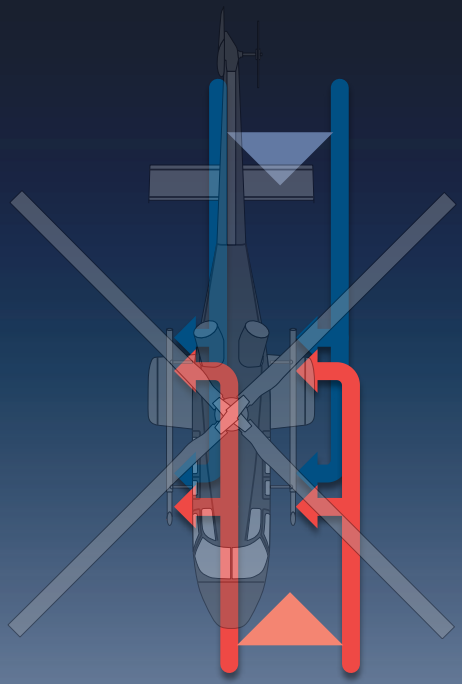
from outside / from the front

from inside / from the rear



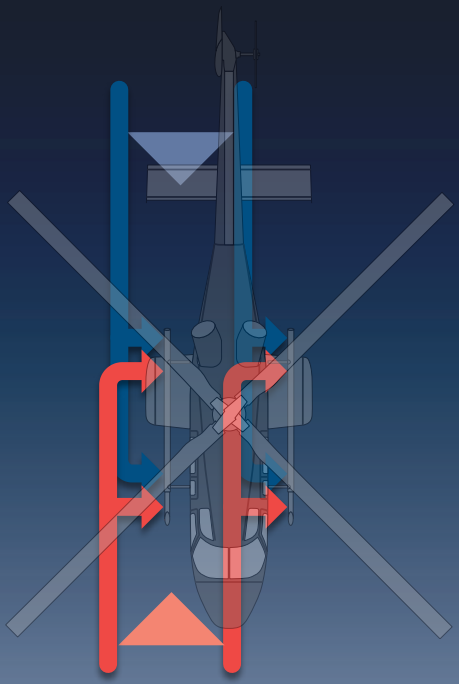
from inside / from the front

one skid fom outside, one from inside / from the rear



one skid fom outside, one from inside / from the front

the other skid fom outside, one from inside / the rear



the other skid fom outside, one from inside / from the front

Methods of loading a helicopter with skids

(depends on mounted systems below the helicopter)

	loading from INSIDE		loading from OUTSIDE	
	loading from the rear	loading from the front	loading from the rear	loading from the front
floats	X	X	X	X
landing lights inside	X		X	X
loudspeaker inside	X		X	X
winch inside / outside	X	X	X	X
downlink antenna			X	X
wire strike protection system	X	X	X	X
radar			X	X
weapons	X	X		
flir system			X	X
snow skis			X	X

The loading of a helicopter is extremely versatile. Depending on the additional equipment installed under the helicopter, the outriggers, which are positioned parallel to the skids, can be placed from the outside, inside or even mixed. In addition, you have the option of loading the helicopter from the front or from the rear.

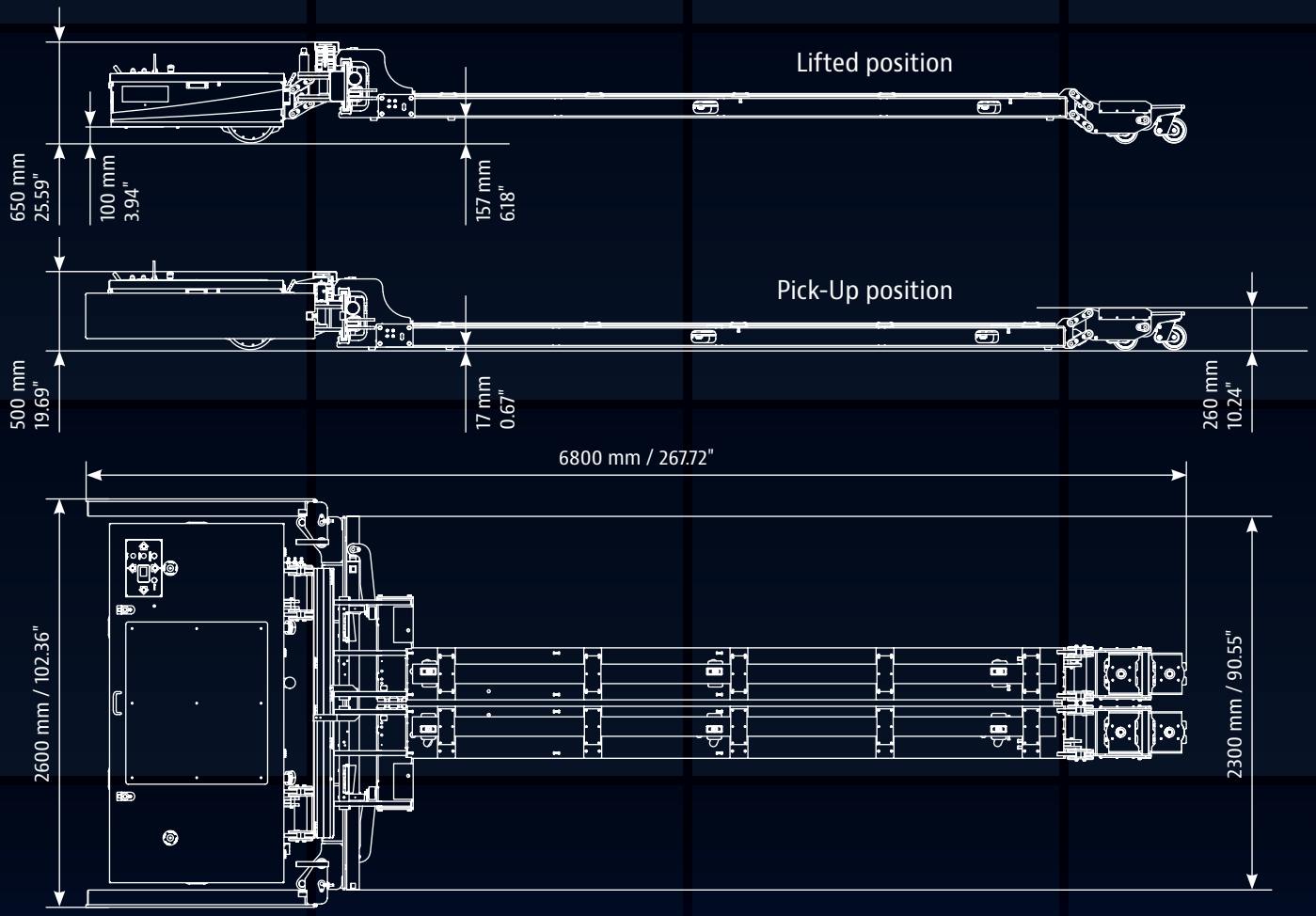
Technical Data

		helimo
Use for		skidded helicopter 
Lifting capacity		6 t 13228 lbs
Dimensions / overall max	length	6800 mm 267.72 inch
	width	5760 mm 226.77 inch
	height	650 mm 25.59 inch
Dimensions / overall min	length	6600 mm 259.84 inch
	width	2300 mm 90.55 inch
	height	250 mm 9.84 inch
Length of the extension arms		3960 mm 155.91 inch
Length of the extension arms		3960 mm 155.91 inch
Stroke of the extension arms		160 mm 6.30 inch
Cantilever arms	length	300 mm 11.81 inch
	width	150 mm 5.91 inch
Ground clearance		100 mm 3.94 inch
Unladen weight		2.7 t 5952 lbs
Voltage		48 V
Speed		6 km/h 1.67 m/s 3.73 mph
Tyres		Puncture-proof
Advanced radio remote control with safety features, waterproof, certification of conformity, worldwide safety approval including airports, TÜV certified		✓
24/28V Groundpower for engine start and updates		✓
Yellow flashlight		✓
Safety beeper		✓
Military spiral cable connection (15 m) between aggregate and control unit		available
Adaptations for special demands (i.e. military version / range of production)		available

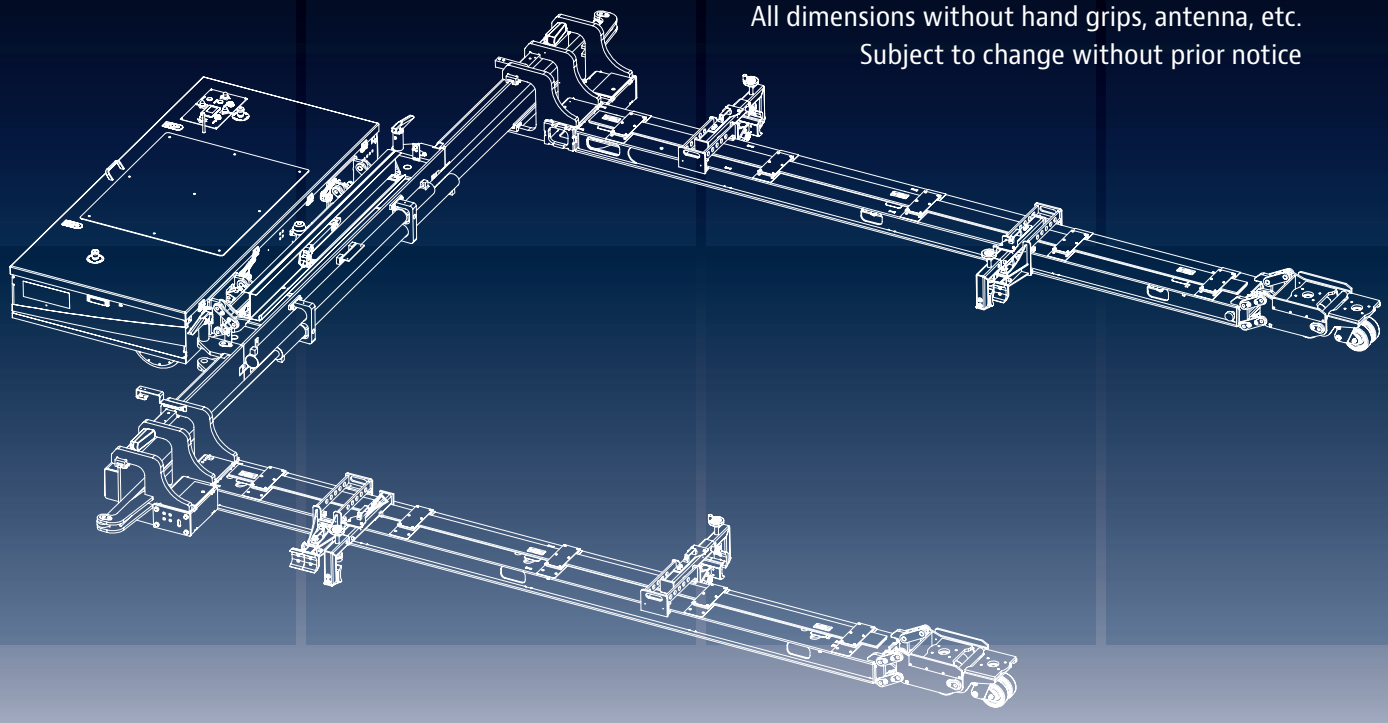
Mistakes and technical alterations reserved

Date 12.2020

Dimensions



All dimensions without hand grips, antenna, etc.
Subject to change without prior notice



Batteries

Number of Batteries	4
Nominal Voltage	12 V
Nominal Capacity C_{20} | 1,75V/C | 20°C	220 Ah
Discharge current I_{20}	10,000 A
Max. load with suitable matching contacts	approx. 770 A
Lenght	518 mm
Width	274 mm
Height up to top cover	216 mm
Height over terminals	242 mm
Weight	approx 70 kg
Internal resistance acc. to IEC 896-2	3.5 Ohm
Short circuit current acc. to IEC 896-2	3606 A
Terminal	A-Terminal

Constant current discharge

1,85 V/C Discharge in A at 20°C		1,80 V/C Discharge in A at 20°C		1,75 V/C Discharge in A at 20°C		1,70 V/C Discharge in A at 20°C		1,65 V/C Discharge in A at 20°C		1,60 V/C Discharge in A at 20°C	
5'	329.0	5'	381.0	5'	437.0	5'	486.0	5'	531.0	5'	581.0
10'	274.0	10'	313.0	10'	349.0	10'	380.0	10'	395.0	10'	411.0
20'	196.0	20'	222.0	20'	237.0	20'	251.0	20'	262.0	20'	269.0
30'	160.0	30'	176.0	30'	183.0	30'	191.0	30'	198.0	30'	202.0
1h	104.0	1h	110.0	1h	115.0	1h	117.0	1h	120.0	1h	121.0
3h	46.5	3h	48.5	3h	49.7	3h	50.6	3h	51.0	3h	51.11
5h	31.0	5h	32.0	5h	32.3	5h	32.8	5h	30.6	5h	30.6
8h	20.4	8h	21.1	8h	21.5	8h	21.8	8h	19.1	8h	19.1
10h	16.7	10h	17.7	10h	17.7	10h	17.7	10h	15.3	10h	15.3

Constant power discharge

1,85 V/C Discharge in W/bloc at 20°C		1,80 V/C Discharge in W/bloc at 20°C		1,75 V/C Discharge in W/bloc at 20°C		1,70 V/C Discharge in W/bloc at 20°C		1,65 V/C Discharge in W/bloc at 20°C		1,60 V/C Discharge in W/bloc at 20°C	
3'	4690	3'	5268	3'	5932	3'	6350	3'	6786	3'	7189
5'	4102	5'	4695	5'	5092	5'	5446	5'	5736	5'	5957
10'	3449	10'	3815	10'	3941	10'	4034	10'	4142	10'	4218
15'	2843	15'	3040	15'	3201	15'	3302	15'	3369	15'	3413
20'	2375	20'	2580	20'	2700	20'	2774	20'	2825	20'	2860
30'	1800	30'	1928	30'	2002	30'	2048	30'	2081	30'	2104
45'	1408	45'	1449	45'	1484	45'	1512	45'	1533	45'	1548
60'	1135	60'	1191	60'	1223	60'	1245	60'	1264	60'	1279
90'	875	90'	912	90'	933	90'	948	90'	959	90'	969

Motor

Type of Motor	2 x 5000 W AC
Power	40 Nm, 5 Kw
S2 60Min	14.9 Nm
Voltage	3 x 31 V
Protection IP	66
Gearbox design	Planetary
Gear ratio	31. Jan
Parking brake	10 Nm

Braking System

Mototok has three braking systems:
→ Regenerative braking system
→ Deceleration by reversing direction
→ Electromagnetic disc-brake System

The regenerative braking system is the main braking system. When decelerating, the drive motor is used as generator. The current produced is stored back into the batteries (additional load).

If the regenerative braking is not sufficient to bring the vehicle to a stop within the pre-set delay, a deceleration can be executed by reversing direction. The drive motors are hereby polarized by the controllers in the opposite direction and supplied with the necessary power.

At the moment when the electromotor comes to a stop, the electromagnetic disc brake is put into operation to block the drive. The switch-on delay is adjustable in the controllers by tenths of seconds.

The brake values are adjusted by a programming device which is plugged into the controller. This insertion may be done only by authorised persons..

Example of possible brake unit settings:

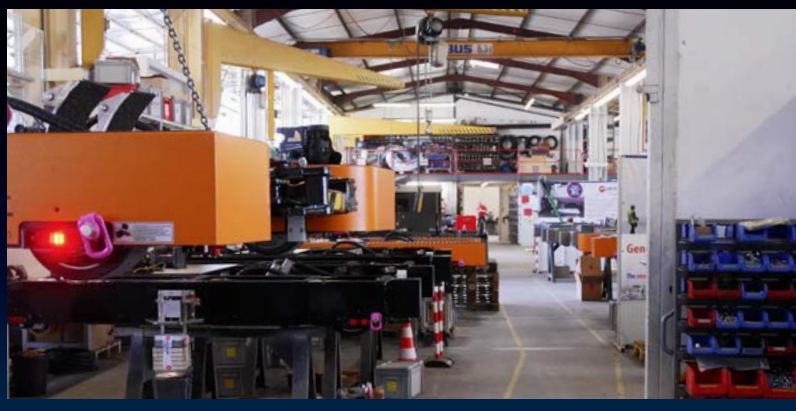
9	Dbrake	250 A
10	Nbrake	250 A
11	Fbrake	250 A
12	DBrkRamp	0.5 Sec
13	DBrkEnd	0.1 Sec
14	NBrkRamp	0.2 Sec
15	NBrkEnd	0.5 Sec

Working with fire and steel: German art of engineering.

Our innovative built to last aircraft tractors are best equipped for daily heavy use as they consist of high-grade material, hand-picked components according to the finest engineering designs. Our products are capable of withstanding the toughest conditions when exposed to wind and salt water. Thanks to a selection of the finest materials, only limited maintenance is necessary.

Our production process corresponds and applies to all necessary demands and conditions required in the engineering industry.

2006/42/EC	Machinery Directive (MD)
2014/35/EU	Low Voltage Directive (LVD)
2014/30/EU	Electromagnetic Compatibility Directive (EMC)
2014/53/EU	Radio Equipment Directive (RED)
EN 1915-1	Aircraft ground support equipment – General requirements – Part 1: Basic safety requirements
EN 1915-2	Aircraft ground support equipment – General requirements – Part 2: Stability and strength requirements, calculation and test methods
EN 12312-7	Aircraft ground support equipment – Part 7: Aircraft movement equipment
EN ISO 12100	Safety of machinery – General principles for design – Riskassessment and risk reduction
EN 1175-1	Safety of industrial trucks – Electrical requirements – Part 1: General requirements for battery powered trucks
EN ISO 4413	Hydraulic fluid power – General rules and safety requirements for systems and their components
EN ISO 13849-1	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements



Satisfaction guaranteed – our customers

(extract)

Airports

Bern	Switzerland	Airport	Several Aircraft
Birmingham	USA	Shuttlesworth International Airport	Several Aircraft
Burbank	USA	Bob Hope Airport	Several Aircraft
Cannes	France	Mandelieu Airport	Several Aircraft and Helicopter
Chicago	USA	Chicago Executive Airport	Several Aircraft
Dallas	USA	Dallas Love Field	Several Aircraft
Denison	USA	North Texas Regional Airport	Several Aircraft
Dresden	Germany	Airport	General Aviation
Dublin	Ireland	International Airport	Several Aircraft
Glasgow	UK	International Airport	Several Aircraft
Indianapolis	USA	International Airport	Several Aircraft
Kuala Lumpur	Malaysia	Sultan Abdul Aziz Shah International Airport	Several Aircraft
London	UK	Luton Airport	Several Aircraft
Lugano	Switzerland	Airport	Several Aircraft Helicopter Agusta and others
Lyon	France	Saint Exupery Airport	Several Aircraft and Helicopter
Malaga	Spain	Airport Costa del Sol	Several Aircraft and Helicopter
McKinney	USA	National Airport	Several Aircraft
Minneapolis	USA	Saint Paul International Airport	Several Aircraft
Moskow	Russia	Domodedovo Airport	Several Aircraft and Helicopter
Orlando	USA	Sanford International Airport	Several Aircraft
Panama	Panama	Albrook „Marcos A. Gelabert" International Airport	Several Aircraft
Philadelpia	USA	International Airport	Several Aircraft
Provo	USA	Municipal Airport	Several Aircraft
Santiago de Chile	Chile	Arturo Merino Benítez International Airport	Several Aircraft
Seattle	USA	Tacoma International Airport	Several Aircraft
Seattle	USA	King County International Airport	Several Aircraft
Sion	Switzerland	International Airport	Several Aircraft
Truckee	USA	Tahoe Airport	Several Aircraft
Tulsa	USA	International Airport	Several Aircraft
Waukegan	USA	Regional Airport	Several Aircraft
Zürich	Switzerland	International Airport	Several Aircraft and Helicopter

FBO / MRO

ACC Columbia, Hannover & Cologne	Germany	Global & others
ACI Jet Center	USA	Several Aircraft
AERO Dienst, Nuremberg	Germany	FBO
Air Service Basel	Switzerland	G5, Global Express, Boeing 737
AirMec	Angola	MRO / Military Aircraft
Alpark SA	Switzerland	Several Aircraft
Cannes	France	Several Aircraft and Helicopter
Centeravia		Several Aircraft
DUNCAN Aviation	USA	Several Aircraft
Flying Group, Antwerpen	Belgium	Several Aircraft
Glasgow	UK	Several Aircraft
Hawker Pacific Asia Pte Ltd	Singapore	Several Aircraft
Jet Alliance Vienna	Austria	Several Aircraft
Jet Legacy Center, Tulsa	USA	Several Aircraft
JetAviation, Geneva	Switzerland	Several Aircraft
London	UK	Several Aircraft
Lyon	France	Several Aircraft and Helicopter
Panaviatic Ltd	Estonia	Several Aircraft
Perth	Australia	FBO
Santiago de Chile	Chile	Several Aircraft
Sapura Aero	Malaysia	Several Aircraft
Silk Way Airlines, Baku	Azerbaijan	Several Aircraft
Starport Aviation	USA	Several Aircraft
Synergy Flight Center	USA	Several Aircraft
Tarkim Air	Turkey	General Aviation
XJEt	UK	Several Aircraft
FAI Nürnberg	Germany	Several Aircraft
Executiv Jet Service	Switzerland	Several Aircraft
Alpin Sky Jets	Switzerland	Several Aircraft
Aeroground Berlind GmbH	Germany	Several Aircraft
DC Aviation GmbH	Germany	Several Aircraft
Dedeman	Rumänien	Several Aircraft
Execujet New Zealand	Neuseeland	Several Aircraft
Falcon Aviation Services	UAE	Several Aircraft
JetEx	UAE	Several Aircraft
Flying Service	Belgien	Several Aircraft
GCH Aviation	Neuseeland	Several Aircraft
Hawker Pacific Asia Pte Ltd	Australien	Several Aircraft
Jet Flight Air Services	Neuseeland	Several Aircraft
Japat AG	Switzerland	Several Aircraft
Luxembourg Air Rescue	Luxembourg	Several Aircraft
Volkswagen AG	Germany	Several Aircraft
ADAC Luftrettung	Germany	Skidded Helicopter

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Aircraft Manufacturers

Airbus S.A.S., Hamburg	Germany	Spacer
BOEING	USA	Plant in Philadelphia AGV
BOMBARDIER, Montreal	Canada	Global Express Delivery Center
Dassault Aviation	France	Twin
EMBRAER S.A.S. José dos Campos	Brasil	Embraer 195, 190, 175, 170, KC 390
Pilatus Aircraft Ltd	Switzerland	PC 12 Maintenance & Delivery
Rosvertol PLC	Russia	Helicopter Production MI-series
Sikorsky	USA	
Suchoi	Russia	
Turkish Aerospace Industries, Inc. (TAI)	Turkey	F 16 Fighter Maintenance Facility, Tiger Maintenance Facility
Xi'an Aircraft Company	China	Y 20

Corporations

Abbvie	USA	
ABP Food Group	Ireland	
Access Aviation	UK	
ACM	Chile	
ACSI Corporation	USA	
Alpine Sky Jets	Switzerland	
American Colors International	USA	
Anglo American	South Africa	Agusta AW139, G5
C & P Aviation	USA	
Caribbean Investor Group	USA	
CNH Industrial	The Netherlands	
Columbia Pacific Management	USA	
Comcast	USA	Several Aircraft
Cook Canyon Ranch	USA	
Disney	USA	
Gazprom Avia, Moscow	Russia	Falcon Jets
Harbert Aviation	USA	
Home Depot	USA	Several Aircraft
Indianapolis Colts	USA	
L-3	USA	Several Aircraft
Novartis AG (JAPAT AG), Basel	Switzerland	Global Express, EC 135
OAO Gazprom	Russia	Several Helicopter & Aircraft
Regions Financial Group	USA	
State Farm	USA	Several Aircraft
Taxxas	USA	
The Boler Company	USA	
The CocaCola Company	USA	Several Aircraft
The Duchossois Group	USA	
TLS Aviation	USA	

Government

Sultanat of Oman	Oman	Eurocopter Super Puma Fleet

Military

Brazil Navy	Brasilien	Onboard Helicopter
CASSIDIAN Manching (EADS)	Germany	Tornado & Eurofighter
China Military	China	All kind of Aircraft, Helicopters
Columbian Air Force	Columbia	
Danish Army	Denmark	Challenger, Agusta EH 101, F 16
French Navy / Air Force	France	Rafale Fighter, SuperPuma, NH 90, EC 155, Panther
Israel Airforce	Israel	Alenia Aermacchi M-346 Master
Pakistan Military	Pakistan	HELIMO for Helicopters with skids
Peru Navy	Peru	Helicopter on the BAP Pisco
South Korea Costguard	South Korea	Onboard Helicopter
Thailand Army	Thailand	
U.S. Army National Guard	USA	M 528
US Airfroce (in England)	UK	F 15
Venezuela Military	Venezuela	Helicopters with skids & with wheels

Special Forces

Federal Police	Germany	Helicopter Super Puma, EC 155
Guardia di Finanza Rome	Italy	ATR

Airlines

Aegean Airlines	Greece	
Air Nostrum, Líneas Aéreas del Mediterráneo S.A	Spain	
Alaska Airways, Seattle	USA	BOEING 737 Family
British Airways	UK	AIRBUS 320 Series
HOP!	Frankreich	
Iberia, Líneas Aéreas de España S.A.	Spain	Spacer for BOEING and Airbus
Thomson/TUI, Luton	UK	BOEING 737 Family

Pushback

Allegiant Air	USA	
ANA – All Nippon Airways	Japan	
British Airways	UK	28 Machines at Heathrow T5
Changsha Huanga Airport	China	
DNATA	UAE	Demo
Figari-Sud Corse Airport	Frankreich	
FRAport	Deutschland	Demo
JetBlue	USA	Demo
Rovaniemi Airport	Finnland	Demo
TCR	UK	

BOMBARDIER the evolution of mobility

DASSAULT AVIATION

EMBRAER

JET AVIATION

DUNCAN AVIATION

IBERIA

PILATUS

TUI Travel PLC

Mototok.

REVOLUTIONARY – FINDING INNOVATIVE SOLUTIONS OUT OF NECESSITY

Mototok was founded in 2003 by Kersten Eckert, avid aviator and creator of the Mototok, and his friend and partner Thilo Wiers-Keiser.

FUELLED BY PASSION

The invention of our aircraft tugs is a deeply personal story that began with Kersten Eckert's first solo flight at 18. His growing aggravation about a process efficient-minded Eckert considered far from ideal: Maneuvering the aircraft while on the ground. You know the rigmarole: Waiting for the machine being laboriously transported out of the hangar, depending on having two or even three people available to watch his wings and fuselage, needing a pilot to sit inside the aircraft ready to brake if needed ...Eckert became determined on finding not only a better, but the perfect way in terms of space, speed, and effort.

CREATING THE PERFECT PRODUCT

5 years of detail-oriented developing time later, the first Mototoks hit the market: Battery-powered industrial tugs providing an all-round view around the aircraft by high technology remote control, operated by a single person.

By now, there are Mototoks available for all aircrafts up to 250 tons. They are in use by international FBOs, MROs, aircraft manufacturers, special forces, airports, airlines, navy, military, industrial companies, businessmen and individuals with their own fleet.

Learn more about Mototok at www.mototok.com.

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MENZIES AVIATION
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easy moving

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