

# ESW-2B

indicate operational readiness and which drum is active. There is only one power adjustment control – similar to a volume control on an amplifier – with a scale for the individual take-off phases and torques. Next to it there is a list with existing types of gliders.

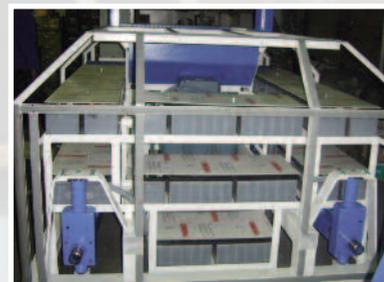
After tautening the rope with the adjustment control set to "Start reel-in", the adjustment control is quickly pushed to the setting of the glider type. After an initial rolling acceleration of up to 8 m/s<sup>2</sup>, the control of the tension force on the rope takes place automatically – independent of the effect of the wind. Only during the last part of the tow is the output power reduced and the towline is wound in again after it has been released. The winch does not require a brake. A reduction in output power causes braking of the drum.

## Components

The ESW-2B take-off winch consists of the following main components:

- Basic chassis with cover panels and driver's seat
- Two rope guide-arms with guide pulleys
- Two cable cutters - suitable without modification for steel as well as for Dyneema synthetic fibre cable
- Two cable drums Ø 500/770 mm x 280 mm
- One double drum axle with clutch device, cable reel-out brake and level wind mechanisms
- One 280 M4 90 kW/400 V, standard (asynchronous) drive motor
- One FU 475/130 – 400 ESW frequency converter with integrated 20kW mains battery charger
- One control console for the winch driver
- One starter battery set consisting of 50 12V vehicle starter batteries providing > 88Ah in series, maintenance-free as per DIN, low temperature testing current > 500 A as per DIN.

**With more than 20 winches in service and more than 150 000 starts, the concept of the mobile, electric powered take-off winch has more than proven its worth.**



The compact winch frame is outfitted with all required components

## Description/Technical Data

- Electrically operated double drum winch with lengthways pull, available as superstructure for lorry
- maximum towing weight: **850 kg**
- adjustable automatic tensioning device
- longest cable pay-out: **2500**, optionally **3000** metres (Dyneema 5mm)
- maximum cable reel-in speed: **125 kms/hr**
- maximum adjustable power output: **155 kW (210 HP)**
- (65km/hr cable reel-in, 850daN tension force)**
- maximum peak power output **205 kW (280 HP)**
- connected load **12kW / 15kW / 20kW**
- maximum **20 2-seater take-offs/hour**
- no torque converter**
- approx. **1.2 kWh** energy consumption per take-off

A great bargain when it comes to power consumption and depreciation.



The large cable guide rollers increase the service life of the cable noticeably.



## The Company

Ulbrich Industrial Electronics was founded in 1983 and transformed into a Limited Liability Company in 1987. Initially, only special machine- and process controllers based on microcontroller technology specific to customers requirements were built.

In 1992, a separate product line of speed controllers for three-phase electric motors (Frequency Drives) was added under the brand name 'drive-tron'. Today, this line represents the core business with approximately 3000 units per year in power range of 40-75kW.



Ulbrich-Industrieelektronik GmbH  
Mozartstraße 6  
D-35796 Weinbach Germany

Tel.: 0049 (0) 06471-41781 • Fax: 41946

e-mail: [info@startwinde.de](mailto:info@startwinde.de)  
web: [www.startwinde.de](http://www.startwinde.de)



## The mobile glider winch launch with electric drive

- Environmentally friendly, super-quiet, emission-free
- Up to 850 kg towing weight
- Automatic tensioning device
- Child's play to operate
- Low-maintenance, practically free of wear and tear
- No torque converter
- Very low running costs
- Manufactured exclusively with brand new components
- Industrially manufactured
- Economical outlay

*The entire design of the ESW-2B is sound and clean. ... Overall, a lot of attention to details was paid. The cable guide rollers are larger in diameter than customary which increases the service life of the cable. Furthermore, the cable guide is laid out in a way that the cable is bent only in one direction. The cable drums are covered by wide guides which prevent cable derailments or the formation of loops. The price of a ESW-2B shows that High-Tech can be more cost effective than traditional technology.*

Aerokurier 8/2002



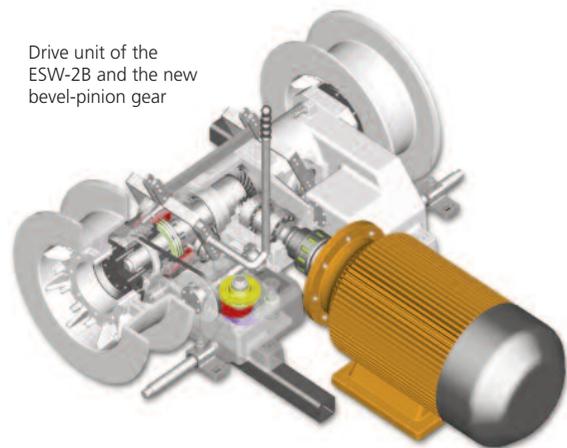
The sliding rheostat replaces the „accelerator“.

## Fantastic towing performance

From the early days of winch technology, attempts were made time and again to be able to carry out winch take-offs with the torque and the smoothness of an electric motor and at the same time to launch even today's heavy synthetic two-seaters in calm conditions.

Now we have the ESW-2B, the first mobile electric winch. Without using a torque converter, it easily transmits its enormous power to the cable. For the drive it uses a maintenance and wear-free, three-phase, standard motor (brushless squirrel-cage motor). It is always ready to run and even under the highest loads is not subject to the wear and tear due to cold starts which is so damaging to diesel engines.

Drive unit of the ESW-2B and the new bevel-pinion gear

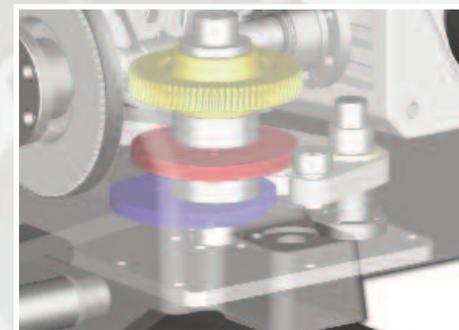


The ESW-2B is the result of long years of trials using electric drive systems for glider take-off winches. Now, for the first time, despite low-capacity power connections at winch sites (12-20 kW), it is possible to make available the necessary take-off power output (up to approx. 200kW). This has been made possible by means of an ingenious system involving the electric motor, frequency converter, back-up batteries and electronics in the charging device. As a result, up to 20 two-seater take-offs per hour are possible. For the back-up batteries we use 50 economical car starter batteries > 88Ah/ 12V with a service life of around 6 years (practically independent of the number of take-offs). If necessary, they can be dispensed with, but in this case a power supply connection of 3 x 400V AC / > 200kW has to be available at the take-off site which is not viable economically.

## A New Winch Concept

This being a new design starting from scratch, the constructors did not miss the opportunity to introduce further improvements and avoid the common disadvantages of conventional winches. The ESW-2B manages with a minimum of components. It suffers practically no wear and tear and is almost maintenance-free. The use of second-hand gearboxes, old rear axles from lorries and breakdown-prone coil winders was discarded right from the start. The ESW-2B is constructed as simply as possible and uses only brand-new components.

Cost Example:	1000	2000	4000
	Launches per year		
Energie consumption 1 Kw h (two seat glider to 400m)	€ 0,26	€ 0,26	€ 0,26
Cable wear (2000 launches/cable)	€ 0,20	€ 0,20	€ 0,20
Batteries (6 year write-off)	€ 0,76	€ 0,38	€ 0,19
Write-off winch (30 years)	€ 2,84	€ 1,42	€ 0,71
<b>Total cost per launch (incl. 19% VAT)</b>	<b>€ 4,06</b> <small>rates of 1.1.2009</small>	<b>€ 2,26</b>	<b>€ 1,36</b>



Cam drive gearbox for the level-wind mechanism, maintenance free and more robust than the cross groove spindle drive.



Frequency converter control board. It contains the entire brain of the adjustment control in the form of a microcontroller programme.

## A Compact Winch

The double drum winch with lengthways pull is housed in one compact block and can be mounted on a 7.5 tonne truck (usually supplied). As soon as the electricity supply is plugged in, it is ready for operation.

## Simple Operation

The driver's cabin comes with two comfortable, weather-proof seats (for the winch driver and marshaller). The drums are engaged by a mechanical clutch mechanism by means of the control levers installed in front of the seat. Only one drum can be engaged at any one time. Disengaging the clutch automatically activates the automatic unreeling brake at the same time. Unreeling the cable, once the lever has been moved to the unreeling position, requires no further attention on the part of the winch driver.

Large-size instruments provide information on the battery charge status, cable velocity and cable tension force. Control lamps

## Comparison between the ESW-2B and other winches typically by internal combustion engines

	Double drum winch powered by international combustion engine	Electric winch ESW-2B
Mechanical components of the drive train	Engine with accessories such as starter, alternator, electrics, radiator, carburetor/fuel injector, tank, truck axle, drums and brakes	Electric motor, bevel gears, drums without external brakes
Maintenance items of drive train	<ul style="list-style-type: none"> <li>- Engine</li> <li>- Torque converter</li> <li>- Level wind unit</li> <li>- Cooling system</li> <li>- Accessories</li> <li>- Drum brakes</li> <li>- Hydraulic</li> <li>- Pneumatic</li> </ul>	<ul style="list-style-type: none"> <li>- 8 grease nipples to be greased once a year</li> <li>- check on the acid level in the batteries once a year,</li> <li>- replace the batteries after approx. 6 years</li> </ul>
Wear during warm-up phase	unavoidable	not necessary
Efficiency	Approximately 25 %	Approximately 80 %
Pollution	Exhaust gas, noise	not necessary
Spare parts supply	May be questionable for old or US engines	guaranteed long-term by using German standard parts
Tools and hardware	US engines are used, imperial tools and hardware may be required	built using metric DIN standard parts throughout
Useful service life	Depending on operational conditions and climate, cold running wear, operation, maintenance and age of used components	minimum 300 000 launches
<b>Price:</b>		<b>73.600,00 not including VAT.</b> <small>Export price 1/2010</small>