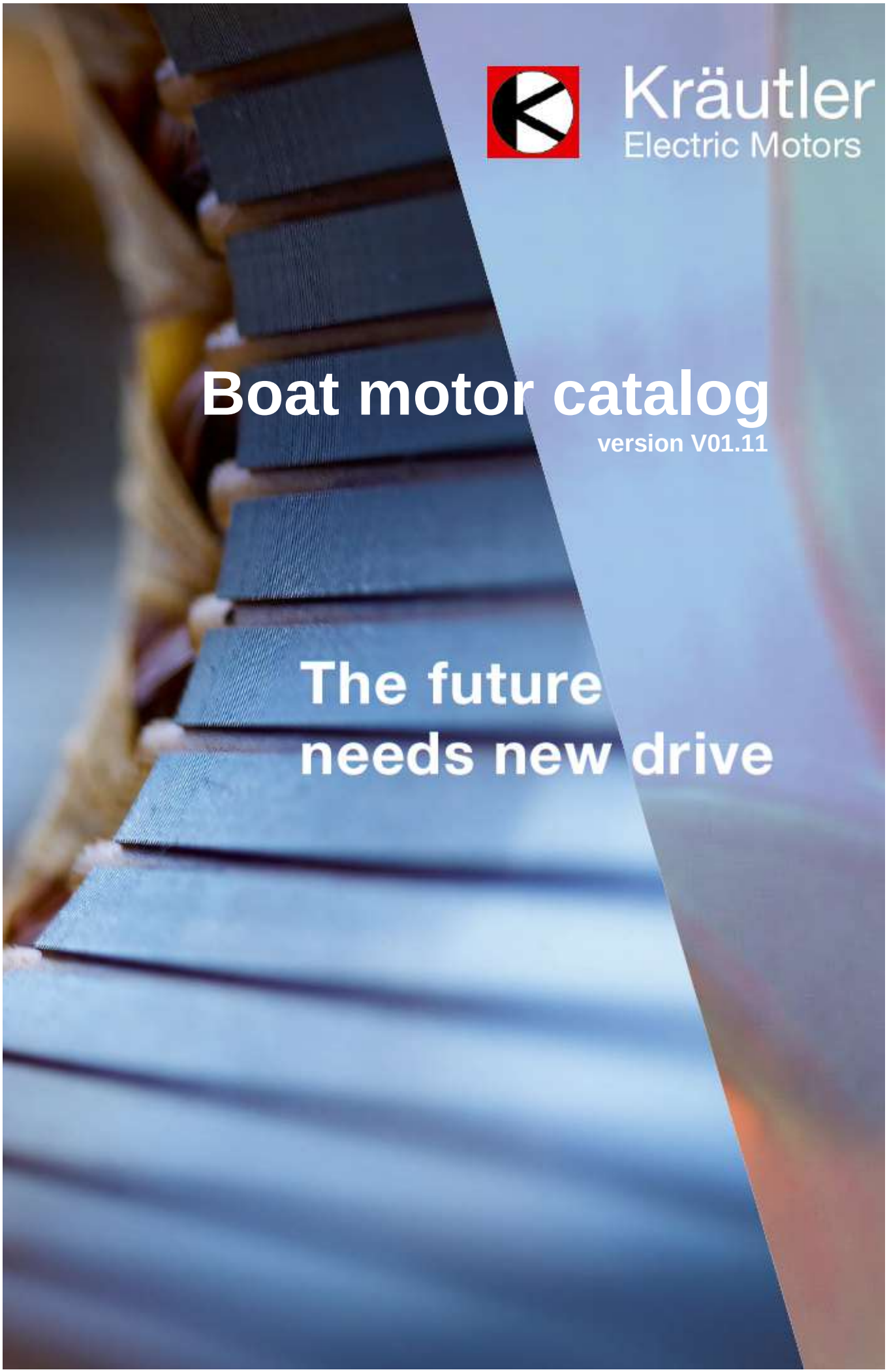
Kräutler
Electric Motors
Boat motor catalog
version V01.11
The future
needs new drive

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4662 Steyrermühl | Austria

wooden boats

Markus Glas GmbH
Bootwerft und Fachgeschäft für Bootszubehör und Wassersportbedarf
Seeweg 1-3
82343 Pöcking-Possenhofen

PEHN BOOTSBAU.AT

Pehn Bootsbau
Attergaustraße 8
A 4880 St. Georgen

form staal

Formstaal GmbH & Co. KG
An der Werft 17
D 18439 Stralsund

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Kräutler
Electric Motors
Introduction
The future
needs new drive

The company Kräutler

Every one of us needs his drive - his motivation!
For us the electric motor is the drive - it makes us every day more flexible for new challenges.
We are a competent partner for special customer solutions - our technicians realize in the shortest time new solutions - flexibility belongs to the daily tool.

Company portrait

Our familiar company was established in 1971 by Oswald Kräutler. In the meantime his sons Harald and Andreas Kräutler with about 20 employees are available for you. We complete electric drive units for motorboats and electric auxiliary drives for sailing boats, also special designs of asynchronous three-phase motors for the drive and machine-building industry. Every year, thousands of electric motors leave our factory in Lustenau, in the extreme West of Austria.

Industrial motors

In the division industrial motors, our company delivers the component electric motor to system providers in the drive industry. Besides, we also provide directly the machine-building industry or all companies that require demanding drive motor techniques. The Industrial Motor Division of us is skill in developing special mechanical and electrical solutions for the specific drive motor needs of the customer.

Boat motors

With a large amount of innovations, the division boat motors of our company has positioned as a complete provider with a wide, but individual standard range. Nowadays we deliver nearly exclusively drive units for motor and sailing boats ready for assembly. A solid distribution network takes charge of the sale.

Repair

Everything around the motor belongs to the action area of our company, and this does not end up with the repair and maintenance service. This also means to cover the specific customer needs with the suiting market products. Careless whether own or foreign motor, the optimum solution of the problem has first priority.

Division industrial motors

The division industrial motors include development, construction, production and sales of mainly asynchronous three-phase motors. Emphasis is not made on the manufacture of standard motors and mass production, we rather try to solve together with our customer his individual drive needs. We construct independently of quantities - we mainly build single units and small series, and this in shortest delivery times.

Kräutler supplies asynchronous motors as special mechanical and electrical solutions, water-cooled motors, synchronous reluctance motors, torque and coiling motors, motors for hoisting gears and electric drives for the car industry.

The motor production of Kräutler has an individual character. Everything is tailor-made, what requires a good deal of flexibility. The large amount of special constructions from Kräutler proves our force, to respond to customer-specific requests. This diversity of variants induces us to improve our products day by day and to optimise permanently our production flow. The key-point is nevertheless a good working global system - from the first contact with the customer over construction and production, right up to the commissioning of the drive unit.

Division boat motors

The construction of electric boat motors started in the 80‘s. First for own consumption and in reality only because no product on the market satisfied the high requirements of the company founder Oswald Kräutler. Nearly 40 years after the first boat motor from Kräutler, these motors gained in the meantime worldwide recognition. No wonder that sailing and motorboat fans link „Kräutler“ to commitment to quality and performance.

With our „groove“ in motor construction we show competence and quality. Especially in motors for boat drives, our range of electric motors for sailing and motorboats has practically no limit. This is our contribution to an environmental thinking focused on the future.

In the last years, the division Boat Motors, together with engineerings and constructors and the know-how of the motor manufacturer Kräutler, a sample and prototype for the car and vehicle industry has furthermore been developed.

Division repair

The division repair includes the areas of preventive repairs servicing, reporting and the classic repair.

The failure of an electric motor during use can lead to significant failure costs. In order to avoid this failure costs, we offer our customers the option of preventive maintenance work. In this work, wear and tear parts such as seals, bearings are replaced and the winding is tested.

Through years of experience in the field of electric motors production and assembly, it is possible for us to identify development or production errors also from other manufacturers and to demonstrate as part of a reporting.

In the classic motor repair, we are able to repair through our extensive range of machinery almost all defective parts or to replace them with new ones.

Our service scope includes:

- new winding
- exchange of the ball bearings
- repair or replace defective mechanical components
- replace wear and tear parts (brake, brush, etc.)


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001


Kräutler
Electric Motors
The drive
The future
needs new drive

For every application the right drive

ACV with
fixed propeller

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GPV with
folding propeller

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GPAV with grip
for hand steering

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GPAV with pin
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GPRV with
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GPE with
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ACA with pin
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SDK with
folding propeller

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SDKH with
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SDKH-ED with

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WAd 10,0 AC

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WA 370/100
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Submersible motors

In the last years there has been a significant improve and expand of diversity and power of electric propulsion submersible motors. Here you will find some explanations for a better distinguish of different motor variants and a description of the components which are included in the standard version.
For an application with low power requirements we recommend the GP engine. The GP motor is a permanently excited DC motor.
For a power requirement of more than 2,4kW we recommend the AC engine. The AC motor is a brushless three-phase asynchronous motor.

All electric drives with Submersible motors consist of

- Motor with appropriate bracket
- Electric regulation system mounted on an aluminium base plate with fuse and cut-off relay
- Single lever control (throttle) for panel mounting in standard version with key switch, status LED, black front panel, black aluminium lever and mounting screws
    - Special designs at additional cost (see page 52)
- Cable set: controller-battery 3m, controller-motor 1,5m, controller-single lever control 5m,
    - Optional cable lengths at additional cost
- Battery master switcher and battery fuse
- Battery monitor BMV 700 with shunt and 10m connecting cable
- Fixed propeller 3 blade aluminium or bronze (depending on model)
- Alternative with 2 blade folding propeller
- Anode for fresh water
- Alternative anode for salt water

Direct current - models	
DC - model	**brief description**
*GPV	Submersible flange motor for fixed mounting under the hull Technology: DC motor with permanent magnets, continuous control Advantages: small and light design Power range: 0,5 – 2,2kW Battery voltage: 24 – 36 Volt
*GPRV	Submersible motor for mounting in a rudder gland (mechanical rotatable / Pod) Technology: DC motor with permanent magnets, continuous control Advantages: small and light design Power range: 0,5 – 2,2kW Battery voltage: 24 – 36 Volt
*GPH	*GPR with rudder gland
*GPAV	Submersible outboarder with stainless steel tube and outboarder-bracket Technology: DC motor with permanent magnets, continuous control Advantages: small and light design Power range: 0,5 – 2,2kW Battery voltage: 24 – 36 Volt
*GPE	Submersible outboarder for fixed mounting on the straight stern Technology: DC motor with permanent magnets, continuous control Advantages: small and light design Power range: 0,5 – 2,2kW Battery voltage: 24 – 36 Volt
*	**ATTENTION:** The GP motors are only for short using in seawater – max. 4 weeks. After a maximum of four weeks at a time, you have to check the housing against corrosion. If necessary repair the painting.

Note: You have to change the anode, if you are driving in brackish or seawater.

alternating current - models	
AC - model	**brief description**
ACV	Submersible flange motor for fixed mounting under the hull Technology: brushless three phase asynchronous motor Advantages: high performance and free of maintenance Power range: 2,4 – 12,0kW Battery voltage: 24 – 48 Volt
ACR	Submersible motor for mounting in a rudder gland (mechanical rotatable / Pod) Technology: brushless three phase asynchronous motor Advantages: high performance and free of maintenance Power range: 2,4 – 12,0kW Battery voltage: 24 – 48 Volt
ACH	ACR with rudder gland
ACAV	Submersible outboarder with stainless steel tube and outboarder-bracket Technology: brushless three phase asynchronous motor Advantages: high performance and free of maintenance Power range: 2,4 – 5,0kW Battery voltage: 24 – 48 Volt
ACE	Submersible outboarder for fixed mounting on the stern (stern drive) Technology: brushless three phase asynchronous motor Advantages: high performance and free of maintenance Power range: 2,4 – 5,0kW Battery voltage: 24 – 48 Volt
ACA	Submersible outboarder with shaft-profile and outboarder-bracket Technology: brushless three phase asynchronous motor Advantages: high performance and free of maintenance Power range: 2,4 – 11,7kW Battery voltage: 24 – 48 Volt

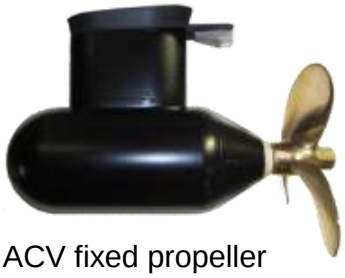
Note: You have to change the anode, if you are driving in brackish or seawater.

Delivery programme submersible flange motor

your wish
our solution

GPV folding propeller or

fixed propeller



ACV fixed propeller or

folding propeller

High performance

The efficiency of a ship propulsion system is dependent on the shaft speed and the proper selection of the propeller. By the superior torque curve of an electric motor to a gasoline engine two or three-blade propeller can be used at low shaft speed. Because of this principle, a very high thrust is developed even for small drives. Both, the AC and the GP engine are available with a fixed or folding propeller. Kräutler AC drives are also completely maintenance-free.

Low noise level

The luxury of being able to move almost silently is the most beautiful experience of navigating with an electrically powered vehicle. Whole chapter in the literature for shipbuilding are dedicated to noise reduction in powertrains. Kräutler submersible flange motors are slow rotating and therefore require no gearbox. The propeller is mounted directly on the motor shaft and runs very quietly and with low vibration.

Controllable

With the convenient single-lever-controller, an infinitely variable speed control in forward and reverse is possible. The high-quality electric controller operates almost without energy loss and protects your valuable battery pack against to deep discharge. The modern power electronics will help you to optimally adjust the drive to your ship.

Environmentally friendly

Electric motors are totally emission free. They are the future in maritime applications, since they apply to all environmental protection requirements, today and in future.

Submersible flange motor with fixed propeller

Figure: ACV - flange motor with fixed propeller

Article no.	Type	Continuous power Consumption	Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	Powerboat
101885	GPV 0,5	0,5 kW	0,4 kW	24 V	21 A	85 %	14 kg	0,4 t	--
141301	GPV 0,8	0,8 kW	0,7 kW	24 V	34 A	85 %	15 kg	0,7 t	-
101887	GPV 1,6	1,6 kW	1,4 kW	24 V	67 A	85 %	20 kg	1,4 t	-
101888	GPV 2,2	2,2 kW	1,9 kW	36 V	61 A	85 %	20 kg	1,9 t	-
137956	ACV 1,8	2,4 kW	1,8 kW	24 V	100 A	75 %	21 kg	1,8 t	-
143352	ACV 2,0	2,6 kW	2,0 kW	24 V	107 A	78 %	29 kg	2,0 t	-
138170	ACV 4,0	5,0 kW	4,0 kW	48 V	104 A	80 %	29 kg	4,0 t	-
140377	ACV 8,0	9,7 kW	8,0 kW	48 V	202 A	82 %	48 kg	8,0 t	-
143890	ACVS 10,0	12,0 kW	10,0 kW	48 V	250 A	83 %	61 kg	10,0 t	-
	possible option								
	GPV 0,5 and GPV 0,8 with two-stage switch for speed control								
	ACV and ACVS Boost function 30% performance increase for 2 minutes								

Attention: The GPV motor is only for short term use in seawater.

Submersible flange motor with folding propeller

Figure: GPV - flange motor with folding propeller

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
101901	GPV 0,5	0,5 kW	0,4 kW	24 V	21 A	85 %	14 kg	0,4 t	-
141302	GPV 0,8	0,8 kW	0,7 kW	24 V	34 A	85 %	15 kg	0,7 t	-
101903	GPV 1,6	1,6 kW	1,4 kW	24 V	67 A	85 %	20 kg	1,4 t	-
101904	GPV 2,2	2,2 kW	1,9 kW	36 V	61 A	85 %	20 kg	1,9 t	-
137953	ACV 1,8	2,4 kW	1,8 kW	24 V	100 A	75 %	21 kg	1,8 t	-
142398	ACV 2,0	2,6 kW	2,0 kW	24 V	107 A	78 %	29 kg	2,0 t	-
137782	ACV 4,0	5,0 kW	4,0 kW	48 V	104 A	80 %	29 kg	4,0 t	-
140378	ACV 8,0	9,7 kW	8,0 kW	48 V	202 A	82 %	48 kg	8,0 t	-
	ACVS 10,0	12,0 kW	10,0 kW	48 V	250 A	83 %	61 kg	10,0 t	-
	possible option								
	GPV 0,5 and GPV 0,8 with two-stage switch for speed control								
	ACV and ACVS Boost function 30% performance increase for 2 minutes								

Attention: The GPV motor is only for short term use in seawater.

Delivery programme submersible motor outboarder

High performance

The Kräutler submersible outboarders are powerful, quiet and reliable. But every boat is different! We have developed a wide range of mounts and mounting options for the requirements on the boat. Whether mounting on the straight stern, in the engine slot or under your rudder gland system, Kräutler certainly has the right drive. The leading e-boat manufacturers in Europe have confidence in our technology, your benefit from our decades of experience. Both, the AC and the GP engine are available with a fixed or folding propeller.

Low noise level

The luxury of being able to move almost silently is the most beautiful experience of navigating with an electrically powered vehicle. Whole chapter in the literature for shipbuilding are dedicated to noise reduction in powertrains.
Kräutler submersible flange motors are slow rotating and therefore require no gearbox. The propeller is mounted directly on the motor shaft and runs very quietly and with low vibration.

Controllable

With the convenient single-lever-controller, an infinitely variable speed control in forward and reverse is possible. The high-quality electric controller operates almost without energy loss and protects your valuable battery pack against to deep discharge. The modern power electronics will help you to optimally adjust the drive to your ship.

Environmentally friendly

Electric motors are totally emission free. They are the future in maritime applications, since they apply to all environmental protection requirements, today and in future.

Outboarder with grip (for hand steering)

Figure: Outboarder with grip (for hand steering)

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
	GPAV 0,5	0,5 kW	0,4 kW	24 V	21 A	85 %	18 kg	0,4 t	0,2 t
	GPAV 0,8	0,8 kW	0,7 kW	24 V	34 A	85 %	19 kg	0,7 t	0,3 t
102781	GPAV 1,6	1,6 kW	1,4 kW	24 V	67 A	85 %	24 kg	1,4 t	0,6 t
102780	GPAV 2,2	2,2 kW	1,9 kW	36 V	61 A	85 %	20 kg	1,9 t	0,8 t
138078	ACAV 1,8	2,4 kW	1,8 kW	24 V	100 A	75 %	25 kg	1,8 t	0,7 t
143790	ACAV 2,0	2,6 kW	2,0 kW	24 V	107 A	78 %	33 kg	2,0 t	0,8 t
138392	ACAV 4,0	5,0 kW	4,0 kW	48 V	104 A	80 %	33 kg	4,0 t	1,6 t
	possible option								
	GPAV 0,5 and GPAV 0,8 with two-stage switch for speed control								
104817	Rudder for GPAV								
138910	Rudder for ACAV								
105297	Special shaft length up to 1m								
	ACAV Boost function 30% performance increase for 2 minutes								

Length of standard shaft 850mm

Attention: The GPAV motor is only for short term use in seawater.

Outboarder with pin (for remote control)

Figure: Outboarder with pin (for remote control)

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
101939	GPAV 0,5 Pi	0,5 kW	0,4 kW	24 V	21 A	85 %	18 kg	0,4 t	0,2 t
141058	GPAV 0,8 Pi	0,8 kW	0,7 kW	24 V	34 A	85 %	19 kg	0,7 t	0,3 t
101941	GPAV 1,6 Pi	1,6 kW	1,4 kW	24 V	67 A	85 %	24 kg	1,4 t	0,6 t
101942	GPAV 2,2 Pi	2,2 kW	1,9 kW	36 V	61 A	85 %	20 kg	1,9 t	0,8 t
138348	ACAV 1,8 Pi	2,4 kW	1,8 kW	24 V	100 A	75 %	25 kg	1,8 t	0,7 t
	ACAV 2,0 Pi	2,6 kW	2,0 kW	24 V	107 A	78 %	33 kg	2,0 t	0,8 t
137760	ACAV 4,0 Pi	5,0 kW	4,0 kW	48 V	104 A	80 %	33 kg	4,0 t	1,6 t
	possible option								
	GPAV 0,5 Pi and GPAV 0,8 Pi with two-stage switch for speed control								
104817	Rudder for GPAV								
138910	Rudder for ACAV								
105297	Special shaft length up to 1m								
	ACAV Boost function 30% performance increase for 2 minutes								

Length of standard shaft 650mm

Attention: The GPAV motor is only for short term use in seawater.

Submersible pod motor for mounting in a rudder gland

Figure: Submersible pod motor for mounting in a rudder

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
102817	GPRV 0,5	0,5 kW	0,4 kW	24 V	21 A	85 %	15 kg	0,4 t	0,2 t
141303	GPRV 0,8	0,8 kW	0,7 kW	24 V	34 A	85 %	16 kg	0,7 t	0,3 t
102181	GPRV 1,6	1,6 kW	1,4 kW	24 V	67 A	85 %	21 kg	1,4 t	0,6 t
102182	GPRV 2,2	2,2 kW	1,9 kW	36 V	61 A	85 %	21 kg	1,9 t	0,8 t
138932	ACR 1,8	2,4 kW	1,8 kW	24 V	100 A	75 %	22 kg	1,8 t	0,7 t
	ACR 2,0	2,6 kW	2,0 kW	24 V	107 A	78 %	30 kg	2,0 t	1,0 t
139425	ACR 4,0	5,0 kW	4,0 kW	48 V	104 A	80 %	30 kg	4,0 t	1,6 t
140404	ACR 8,0	9,7 kW	8,0 kW	48 V	202 A	82 %	49 kg	8,0 t	3,2 t
143762	ACR 9,9	11,7 kW	9,9 kW	48 V	244 A	84 %	49 kg	-	-
141646	ACRS 10,0	12,0 kW	10,0 kW	48 V	250 A	83 %	62 kg	10,0 t	4,0 t
	possible option								
	GPRV 0,5 and GPRV 0,8 with two-stage switch for speed control								
104817	Rudder for GPRV								
138910	Rudder for ACR 1,8 und ACR 4,0								
105297	Special shaft length up to 1m to 5kW motor power								
140888	Special shaft length up to 1m for ACR 8,0								
101358	Rudder gland for GPRV, ACR 1,8 and ACR 4,0 - Ø30mm, length 175mm								
104066	Rudder gland for GPRV, ACR 1,8 and ACR 4,0 - Ø30mm, length 275mm								
140077	Rudder gland for ACR 8,0 and ACRS 10,0 - Ø40mm, length 205mm								
138905	Rudder gland for ACR 8,0 and ACRS 10,0 - Ø40mm, length 305mm								
	ACR and ACRS Boost function 30% performance increase for 2 minutes								

Length of standard shaft 450mm

Attention: The GPRV motor is only for short term use in seawater.

Outboarder for Electric boats (straight stern)

Figure: Outboarder for Electric boats (straight stern)

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
104148	GPE 0,5	0,5 kW	0,4 kW	24 V	21 A	85 %	17 kg	-	0,2 t
140965	GPE 0,8	0,8 kW	0,7 kW	24 V	34 A	85 %	18 kg	-	0,3 t
104144	GPE 1,6	1,6 kW	1,4 kW	24 V	67 A	85 %	23 kg	-	0,6 t
104142	GPE 2,2	2,2 kW	1,9 kW	36 V	61 A	85 %	21 kg	-	0,8 t
139017	ACE 1,8	2,4 kW	1,8 kW	24 V	100 A	75 %	28 kg	-	0,7 t
143924	ACE 2,0	2,6 kW	2,0 kW	24 V	107 A	78 %	33 kg	-	0,8 t
139019	ACE 4,0	5,0 kW	4,0 kW	48 V	104 A	80 %	33 kg	-	1,6 t
	possible option								
	GPE 0,5 and GPE 0,8 with two-stage switch for speed control								
104903	Rudder for GPE								
138910	Rudder for ACE								
	ACE Boost function 30% performance increase for 2 minutes								

Attention: The GPE motor is only for short term use in seawater.

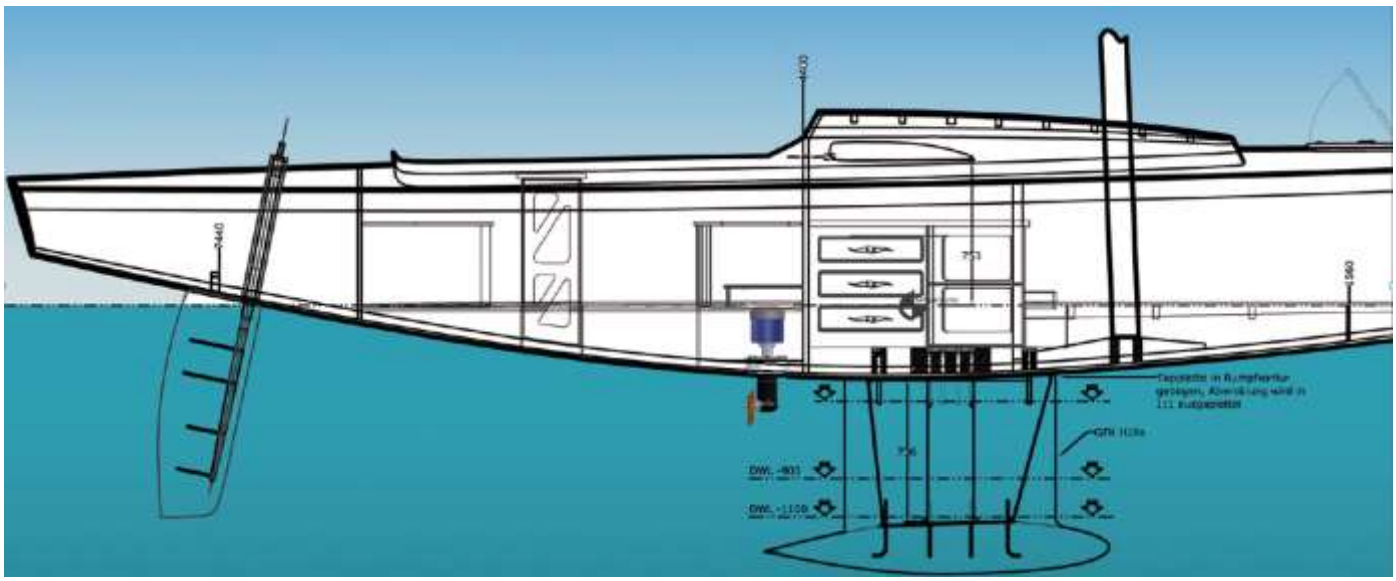
Outboarder with shaft-profile

Figure: Outboarder with shaft-profile

Article no.	Type	Continuous power Consumption	Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	Powerboat
140388 143800 140389	ACA 1,8 ACA 1,8 L ACA 1,8 SL	2,4 kW	1,8 kW	24 V	100 A	75 %	26 kg	1,8 t	0,7 t
143061 143540	ACA 2,0 ACA 2,0 L ACA 2,0 SL	2,6 kW	2,0 kW	24 V	107 A	78 %	34 kg	2,0 t	0,8 t
140121 143788 140370	ACA 4,0 ACA 4,0 L ACA 4,0 SL	5,0 kW	4,0 kW	48 V	104 A	80 %	34 kg	4,0 t	1,6 t
140976	ACA 8,0 ACA 8,0 L ACA 8,0 SL	9,7 kW	8,0 kW	48 V	202 A	82 %	49 kg	8,0 t	3,2 t
141689	ACA 9,9	11,7 kW	9,9 kW	48 V	244 A	84 %	49 kg	-	-
	possible option								
138910	Rudder for ACA 1,8 and ACA 4,0								
	Boost function 30% performance increase for 2 minutes								

3 variants: with short shaft-profile – with long shaft-profile (L) – with super long shaft-profile (SL)

Sail–Drive motors



Sail-Drive is called a special drive design for motor boad or sailing yachts. This is a readily installable compact system.
The company Kräutler is the only electric motor manufacturer, that builds there Sail-Drive gearbox as an in-house production. As a result, you gain a perfectly matched electric drive and gearbox. The design, mechanically and electrically rotatable, is a special development and often it replaces the conventional steering system.
Kräutler Made in Austria!

All electric drives with Sail-Drive gear consist of:

- Motor with appropriate Sail-Drive gear
- base plate for lamination at the SDK and SDKS
  - at SDKH available for extra charge
  - Alternative with mounting plate for available mount for extra charge
- Electric regulation system mounted on an aluminium base plate with fuse and cut-off relay
- Single lever control (throttle) for panel mounting in standard version with key switch, status LED, black front panel, black aluminium lever and mounting screws
  - Special designs at additional cost (see page 52)
- Cable set: controller-battery 3m, controller-motor 1m, controller-single lever control 5m
  - Optional cable lengths at additional cost
- Battery master switcher and battery fuse
- Battery monitor BMV 700 or BMV 700H with shunt and 10m connecting cable
- Fixed or folding propeller is not included in the main price – see on the price list propeller Alternative anode for salt water

Additionally for electric rotatable Sail-Drives

- Actuating drive with gearbox
- Electric regulation system for dynamic rotating actuating drive
- steering lever
  - Special design steering lever combination with EHS
- Kräutler Control Unit (KCU) incl. displaying the propeller position
  - Special design additional analog indication of the propeller position

Sail–Drive Model	
Model	**brief description**
*SDK compact or SDKS compact	Electric Drive with Sail-Drive gear, motor **without ventilaton** SDK compact: only freshwater SDKS compact: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: small, compact design and free of maintenance Power range: 2,5 – 4,7kW Battery voltage: 24 – 48 Volt
*SDK or SDKS	Electric Drive with Sail-Drive gear SDK: only freshwater SDKS: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: higher power than the compact version, free of maintenance Power range: 3,1 – 7,1kW Battery voltage: 24 – 48 Volt
*SDK-D or SDKS-D	Electric Drive with Sail-Drive gear, Sail-Drive **mechanical rotatable 2 x 45°** SDK-D: only freshwater SDKS-D: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: mechanical rotatable shuttle (active rudder), steered by Teleflex, and free of maintenance, Power range: 3,1 – 7,1kW Battery voltage: 24 – 48 Volt
*	**Attention:** The Drives for fresh water are only for short using in seawater. After a maximum of four weeks at a time, you have to check the housing against corrosion. If necessary repair the painting.

Note: You have to change the anode, if you are driving in brackish or seawater.
Water cooled drives are only useable in seawater with 2-circle water cooling.

Sail–Drive Models	
Model	**brief description**
*SDK-ED or SDKS-ED	Electric Drive with Sail-Drive gear, Sail-Drive **electric rotatable 2 x 90°** SDK-ED: only freshwater SDKS-ED: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: electric rotatable shuttle (active rudder), steered by switcher or joystick and free of maintenance, Power range: 3,1 – 7,1kW Battery voltage: 24 – 48 Volt
SDKH	Electric Drive with Sail-Drive gear, **heavy duty type**, **above 20kW water cooled** Field of application: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: Sail-Drive gear for high power, with big reduction free of maintenance Power range: 9,4 – 34,1kW Battery voltage: 48 – 144 Volt
SDKH-D	Electric Drive with Sail-Drive gear, **heavy duty type, mechanical rotatable 2 x 45°** **above 20kW water cooled** Field of application: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: mechanical rotatable shuttle (active rudder), steered by Teleflex, free of maintenance, Power range: 9,4 – 34,1kW Battery voltage: 48 – 144 Volt
SDKH-ED	Electric Drive with Sail-Drive gear, **heavy duty type, electric rotatable 2 x 90°** **above 20kW water cooled** Field of application: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: electric rotatable shuttle (active rudder), steered by switcher or joystick free of maintenance Power range: 9,4 – 34,1kW Battery voltage: 48 – 144 Volt
*	**Attention:** The Drives for fresh water are only for short using in seawater. After a maximum of four weeks at a time, you have to check the housing against corrosion. If necessary repair the painting.

Note: You have to change the anode, if you are driving in brackish or seawater.
Water cooled drives are only useable in seawater with 2-circle water cooling.

Delivery programme Sail-Drive

Variant

Depending on the version, the Sail–Drive is available as a fixed, electrical rotating or mechanical rotating drive. Details about each version can be found on the following pages.

Motor

The heart of the Sail–Drive is the electric motor. The Sail–Drive must work strong, reliable, quiet and maintenance-free. The Kräutler Sail–Drive motor is maintenance free AC-motor. This technology is characterized by a very long life and robustness against adverse environmental conditions.

Gearbox

The high standards of the company Kräutler haven´t allowed using a gearbox "off the shelf". The company builds all Sail–Drive - gearboxes itself!
Why? The gearboxes must be quietly, because only a faint transmission has the best efficiency. The gearboxes unit must have spiral serrated, polished and paired bevel gears. For the seawater the gearbox is made in bronze. That is also one special about a Kräutler Sail–Drive
Kräutler Sail–Drive, the best Sail–Drive for you boat.

Controllable

With the convenient single-lever-controller, an infinitely variable speed control in forward and reverse is possible. The high-quality electric controller operates almost without energy loss and protects your valuable battery pack against to deep discharge. The modern power electronics will help you to optimally adjust the drive to your ship.

Easy to install

The Sail–Drive (design SDK) is supplied with a fiberglass base plate. This fiberglass base plate can be laminated to the hull. Therefore the installation cost is very low. For existing base plates like “Volvo” or “Yanmar”, the Sail–Drive can be delivered with the right adapter plate. With the adapte plate, it´s possible to mount the Kräutler Sail–Drive on the existing base plate.

Sail–Drive compact

Figure: Sail–Drive compact

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
105954	SDK 2,0 AC	2,5 kW	2,0 kW	24 V	104 A	80 %	42 kg	2,0 t	-
105620	SDK 3,0 AC	3,6 kW	3,0 kW	36 V	100 A	83 %	42 kg	3,0 t	-
105622	SDK 4,0 AC	4,7 kW	4,0 kW	48 V	99 A	84 %	42 kg	4,0 t	-
	possible option								
	SDK unlimited for seawater = SDKS								
000279	Sail-Drive with recuperation								
139898	Control unit KCU 5.7 - 48V for passenger ships with the possibility to connect a camera								
	Boost function 30% performance increase for 2 minutes								

Attention: The SDK motor is only for short term use in seawater.

Sail–Drive fixed

Figure: Sail–Drive fixed

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
130094	SDK 2,5 AC	3,1 kW	2,5 kW	24 V	130 A	80 %	45 kg	2,5 t	1,0 t
130099	SDK 3,5 AC	4,1 kW	3,5 kW	36 V	115 A	85 %	45 kg	3,5 t	1,4 t
	SDK 4,0 AC	4,7 kW	4,0 kW	24 V	196 A	85 %	45 kg	4,0 t	1,6 t
105682	SDK 4,3 AC	5,0 kW	4,3 kW	48 V	104 A	85 %	45 kg	4,3 t	1,7 t
138050	SDK 5,0 AC	5,0 kW	6,0 kW	48 V	124 A	85 %	45 kg	5,0 t	2,0 t
141156	SDK 6,0 AC	7,1 kW	6,0 kW	48 V	148 A	85 %	45 kg	6,0 t	2,4 t
138981	SDKH 8,0 AC	9,4 kW	8,0 kW	48 V	196 A	85 %	80 kg	8,0 t	3,2 t
140393	SDKH 11,0 AC	13,0 kW	11,0 kW	48 V	270 A	85 %	91 kg	10,0 t	4,0 t
139192	SDKH 15,0 AC	17,0 kW	15,0 kW	96 V	178 A	88 %	91 kg	15,0 t	6,0 t
	SDKH 18,5 AC	21,0 kW	18,5 kW	96 V	219 A	88 %	91 kg	18,5 t	7,4 t
	water cooled								
143970	SDKH 15,0 AC	17,4 kW	15,0 kW	48 V	370 A	85 %	91 kg	15,0 t	6,0 t
	SDKH 20,0 AC	23,0 kW	20,0 kW	48 V	480 A	88 %	101 kg	20,0 t	8,0 t
140380	SDKH 25,0 AC	28,4 kW	25,0 kW	96 V	296 A	88 %	101 kg	25,0 t	10,0 t
	possible option								
	SDK unlimited for seawater = SDKS								
103420	GfK-base plate for for SDKH								
000279	Sail-Drive with recuperation								
139898	Control unit KCU 5.7 – 48V for passenger ships with the possibility to connect a camera								
139882	Control unit KCU 5.7 – 96V for passenger ships with the possibility to connect a camera								
141590	Camera for KCU 5.7								
142435	Heat exchanger for 2-circle water cooling								
	Boost function 30% performance increase for 2 minutes								

Attention: The SDK motor is only for short term use in seawater.
Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.

Sail–Drive
mechanical rotatable – 2x45°

Figure: Sail–Drive mechanical rotatable

Article no.	Type	Continuous power Consumption	Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	Powerboat
130249	SDK-D 2,5 AC	3,1 kW	2,5 kW	24 V	130 A	80 %	52 kg	-	1,0 t
	SDK-D 4,0 AC	4,7 kW	4,0 kW	24 V	196 A	85 %	52 kg	-	1,6 t
105944	SDK-D 4,3 AC	5,0 kW	4,3 kW	48 V	104 A	85 %	52 kg	-	1,7 t
139199	SDK-D 6,0 AC	7,1 kW	6,0 kW	48 V	148 A	85 %	52 kg	-	2,4 t
138982	SDKH-D 8,0 AC	9,4 kW	8,0 kW	48 V	196 A	85 %	83 kg	-	3,2 t
140394	SDKH-D 11,0 AC	13,0 kW	11,0 kW	48 V	270 A	85 %	94 kg	-	4,0 t
139624	SDKH-D 15,0 AC	17,1 kW	15,0 kW	96 V	178 A	88 %	94 kg	-	6,0 t
	water cooled								
	SDKH-D 15,0 AC	17,7 kW	15,0 kW	48 V	370 A	85 %	97 kg	-	6,0 t
	SDKH-D 20,0 AC	23,1 kW	20,0 kW	48 V	480 A	88 %	104 kg	-	8,0 t
140381	SDKH-D 25,0 AC	28,4 kW	25,0 kW	96 V	296 A	88 %	104 kg	-	10,0 t
	SDKH-D 30,0 AC	34,1 kW	30,0 kW	144 V	237 A	88 %	104 kg	-	12,0 t
	possible option								
	SDK-D unlimited for seawater = SDKS-D								
103420	GfK-base plate for for SDKH								
000279	Sail-Drive with recuperation								
	Control unit KCU 3.5 - 48V for passenger ships with the possibility to connect a camera								
	Control unit KCU 5.7 - 96V for passenger ships with the possibility to connect a camera								
102065	Fin for SDK-D								
141590	Camera for KCU 5.7								
142435	Heat exchanger for 2-circle water cooling								
	Boost function 30% performance increase for 2 minutes								

Attention: The SDK-D motor is only for short term use in seawater.
Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.

Sail–Drive electric rotatable – 2x90° or 360°

Figure: Sail–Drive electric rotatable

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
	SDK-ED 2,5 AC	3,1 kW	2,5 kW	24 V	130 A	80 %	58 kg	2,5 t	1,0 t
	SDK-ED 4,0 AC	4,7 kW	4,0 kW	24 V	196 A	85 %	58 kg	4,0 t	1,6 t
141612	SDK-ED 4,3 AC	5,0 kW	4,3 kW	48 V	104 A	85 %	58 kg	4,3 t	1,7 t
142540	SDK-ED 6,0 AC	7,1 kW	6,0 kW	48 V	148 A	85 %	58 kg	6,0 t	2,4 t
139646	SDKH-ED 8,0 AC	9,4 kW	8,0 kW	48 V	196 A	85 %	87 kg	8,0 t	3,2 t
141400	SDKH-ED 11,0 AC	13,0 kW	11,0 kW	48 V	270 A	85 %	98 kg	10,0 t	4,0 t
139647	SDKH-ED 15,0 AC	17,1 kW	15,0 kW	96 V	178 A	88 %	98 kg	15,0 t	6,0 t
	water cooled								
	SDKH-ED 15,0 AC	17,7 kW	15,0 kW	48 V	370 A	85 %	98 kg	15,0 t	6,0 t
	SDKH-ED 20,0 AC	23,1 kW	20,0 kW	48 V	480 A	88 %	108 kg	20,0 t	8,0 t
140382	SDKH-ED 25,0 AC	28,4 kW	25,0 kW	96 V	296 A	88 %%	108 kg	25,0 t	10,0 t
141470	SDKH-ED 30,0 AC	34,1 kW	30,0 kW	144 V	237 A	88 %	108 kg	30,0 t	12,0 t
	possible option								
	SDK-ED unlimited for seawater = SDKS-ED								
103420	Gfk-base plate for for SDKH								
000279	Sail-Drive with recuperation								
139898	Control unit KCU 5.7 - 48V for passenger ships with the possibility to connect a camera								
139882	Control unit KCU 5.7 - 96V for passenger ships with the possibility to connect a camera								
102065	Fin								
141590	Camera for KCU 5.7								
142435	Heat exchanger for 2-circle water cooling								
142072	Analog display for rudder position 360°								
	Boost function 30% performance increase for 2 minutes								

Attention: The SDK-ED motor is only for short term use in seawater.
Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.

Electric Drives for existing shafting

All electric drives for existing shafting (except for high speed) consist of:

- Motor with appropriate bracket or base plate with helical gear
- Clutch for shaft with Ø25mm
- Electric regulation system mounted on an aluminium base plate with fuse and cut-off relay
- Single lever control (throttle) for panel mounting in standard version with key switch, status LED, black front panel, black aluminium lever and mounting screws
    - Special designs at additional cost (see page 52)
- Cable set: controller-battery 3m, controller-motor 1m, controller-single lever control 5m
    - Optional cable lengths at additional cost
- Battery master switcher and battery fuse
- Battery monitor BMV 700 or BMV 700H with shunt and 10m connecting cable
- Fixed or folding propeller is not included in the main price – see price list propeller

Shaft drive	
Modell	**brief description**
WAd	Direct-Drives for existing shafting Field of application: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: small and light design, high total efficiency free of maintenance Power range: 2,5 – 11,9kW Battery voltage: 24 – 48 Volt
WAz	Drives for existing shafting with gearbox, **up to 20kW water cooled** Field of application: fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: the drive can be adapted to the desired speed, very quiet and highly efficient transmission, many reductions are possible, free of maintenance, Power range: 9,4 – 34,1kW Battery voltage: 48 – 144 Volt
WA 105/30 up to WA 525/100	High performance shaft drives engines Field of application: fresh water and seawater only with Heat exchanger for 2-circle water cooling Technology: brushless three phase SYNCHRONUS motor, continuous control Advantages: high power in a small size, very high total efficiency Power range: 34,9 – 107,5kW Battery voltage: 105 – 525 Volt
HyG-AC HyD-AC	Hybrid-Drives for existing petrol- or diesel motor on shaft drives Field of application: Fresh water and seawater Technology: brushless three phase asynchronous motor, continuous control Advantages: existing systems can be used, simple to switch between motor- and generator mode, free of maintenance Power range: 2,5 – 11,9kW Battery voltage: 24 – 48 Volt

Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.

Delivery programme shaft drives

Inspiration

Electrical shaft systems were the first electric drives with higher power on the market. A outdated system? Maybe for other suppliers. Kräutler pursue its own philosophy? For electric motors designed ships have in the rarest cases, a shaft system, since the drive trains require a lot of space and the installation of the shaft system is rather complicated. However, the remodeling of existing systems is always a challenge that can be implemented well with Kräutler motor shaft installations. Whether sail or motor boat or passenger ship the possibilities are diverse and the system requirements are high.

System

In a new building, the shaft system and propellers are dimensioned according to the electric drive, in this case Kräutler direct drives can be used (without additional gear).

For existing shaft systems and propellers, the drive must be adapted to the driveline of the old shaft system. If this is ignored, only a part of the performance is available, or worse, the drive is overloaded and overheats.

The proven modular system and the strict quality criteria of Kräutler shaft systems with spur gear allow the torque and gear ratios that are unmatched. Likewise, they can be excellently adapted to existing systems. The design of the gear box, you just leave us, your partner with over 30 - years of experience.

Low noise level

The efficiency and smoothness are crucial in the selection of gear. This results in innovative drive solutions, specific to fit to your requirements.

Environmentally friendly

Electric motors are totally emission free. They are the future in maritime applications, since they apply to all environmental protection requirements, today and in future.

Direct - drives for shaft drives

Figure: WAd 4,3 AC

Article no.	Type	Continuous power		Voltage	Current	Total efficiency	Weight	up to boat weight	
		Consumption	Output					Sailing boat	Powerboat
141011	WAd 2,0 AC	2,5 kW	2,0 kW	24 V	104 A	80 %	35 kg	2,0 t	0,8 t
	WAd 4,0 AC	4,8 kW	4,0 kW	24 V	201 A	83 %	35 kg	4,0 t	1,6 t
140447	WAd 4,3 AC	5,1 kW	4,3 kW	48 V	108 A	83 %	35 kg	4,3 t	1,7 t
143603	WAd 5,0 AC	6,0 kW	5,0 kW	48 V	124 A	83 %	35 kg	5,0 t	2,0 t
140490	WAd 6,0 AC	7,2 kW	6,0 kW	48 V	152 A	83 %	44 kg	6,0 t	2,4 t
140756	WAd 8,0 AC	9,4 kW	8,0 kW	48 V	193 A	86 %	69 kg	8,0 t	3,2 t
141281	WAd 11,0 AC	13,0 kW	11,0 kW	48 V	270 A	85 %	69 kg	11,0 t	4,0 t
	WAd 15,0 AC	17,0 kW	15,0 kW	96 V	178 A	88 %	69 kg	15,0 t	6,0 t
	WAd 18,5 AC	21,0 kW	18,5 kW	96 V	219 A	88 %	69 kg	18,5 t	7,4 t
	water cooled								
	WAd 15,0 AC	17,7 kW	15,0 kW	48 V	370 A	85 %	76 kg	15,0 t	6,0 t
	WAd 20,0 AC	23,1 kW	20,0 kW	48 V	480 A	88 %	87 kg	20,0 t	8,0 t
	WAz 25,0 AC	28,4 kW	25,0 kW	96 V	296 A	88 %	107 kg	25,0 t	10,0 t
	WAz 30,0 AC	34,1 kW	30,0 kW	144 V	237 A	88 %	168 kg	30,0 t	12,0 t
	possible option								
139538	Shaft Ø=25mm up to 1,4m with stern tube 0,5m and rubber packing								
104446	Option mechanical seal for shaft Ø=25mm								
105322	Special base plate								
103247	Stern bearing to be screwed from outside								
101938	Shaft buck with rubber bearing Ø=25mm								
102659	Shaft buck with bearing and flange plate								
	Control unit KCU 5.7 - for passenger ships with the possibility to connect a camera								
141590	Camera for KCU 5.7								
	Boost function 30% performance increase for 2 minutes								

Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.

Shaft drives with gearbox

Figure: WAz 15,0 AC

Article no.	Type	Continuous power Consumption	Continuous power Output	Voltage	Current	Total efficiency	Weight	up to boat weight Sailing boat	up to boat weight Powerboat
	WAz 8,0 AC	9,4 kW	8,0 kW	48 V	196 A	85 %	74 kg	8,0 t	3,2 t
	WAz 11,0 AC	13,0 kW	10,0 kW	48 V	249 A	84 %	74 kg	10,0 t	4,0 t
	WAz 15,0 AC	17,0 kW	15,0 kW	96 V	178 A	88 %	97 kg	15,0 t	6,0 t
	WAz 18,5 AC	21,0 kW	18,5 kW	96 V	219 A	88 %	97 kg	18,5 t	7,4 t
	water cooled								
	WAz 15,0 AC	17,7 kW	15,0 kW	48 V	370 A	85 %	97 kg	15,0 t	6,0 t
	WAz 20,0 AC	23,1 kW	20,0 kW	96 V	237 A	88 %	107 kg	20,0 t	8,0 t
	WAz 25,0 AC	28,4 kW	25,0 kW	96 V	296 A	88 %	107 kg	25,0 t	10,0 t
	WAz 30,0 AC	34,1 kW	30,0 kW	144 V	237 A	88 %	117 kg	30,0 t	12,0 t
	possible option								
139538	Shaft Ø=25mm up to 1,4m with stern tube 0,5m and rubber packing								
104446	Option mechanical seal for shaft Ø=25mm								
105322	Special base plate								
103247	Stern bearing to be screwed from outside								
101938	Shaft buck with rubber bearing Ø=25mm								
102659	Shaft buck with bearing and flange plate								
139898	Control unit KCU 5.7 - 48V for passenger ships with the possibility to connect a camera								
139882	Control unit KCU 5.7 - 96V for passenger ships with the possibility to connect a camera								
141590	Camera for KCU 5.7								
142435	Heat exchanger for 2-circle water cooling								
	Boost function 30% performance increase for 2 minutes								

Attention: Water cooled drives are only useable in seawater with 2-circle water cooling.
The article number (articel no.) depends on the reduction of the gearbox.

Drive system for high speed

Figure: WA 157/40 with fix propeller

Powerful, quiet, reliable and environmentally friendly

These are the guidelines in the development and manufacture of Kräutler drive systems.

The drive systems for high speeds are optimized for leisureboats. To guarantee this, every system is optimally adapted to the boat's hull during commissioning.

Everything but not standard!

For a number of years, other manufacturers have been trying to convince the industry of "standard boat propulsion".
We have been building electric drives for 45 years and boat and ship drives for more than 30 years. From our experience and your wishes comes your drive system. These are small series and individual pieces for customers with high demands.

The battery system

There are many different lithium batteries for various applications and usage profiles. The weight is an important point when selecting the battery. However, not every application requires the high-tech execution, but a solution suitable for the owner. Please do not hesitate to contact us.

The efficiency

The overall efficiency is optimized by a generous dimensioning of the motor control. The values given in the data sheet correspond to the practice and are not laboratory values.
As a system supplier, we attach great importance to the entire drive train. The power adjustment via the propeller is one of the most important tasks during project planning.
No special drive propellers are used for our drives. We work together with well-known propeller suppliers, whose products have been used all over the world and have been used and developed over decades.

Article no.	Type	Motor type	Power consumption	Power output	Voltage	Current	Total efficiency	Weight
	WA 100/30	112M 30,0 4 W	34,9 kW	30 kW	105 V	349 A	86 %	76 kg
	WA 150/40	132M 40,0 4 W	45,5 kW	40 kW	150 V	303 A	88 %	87 kg
	WA 300/50	IPM 6.17.12	53,8 kW	50 kW	300 V	179 A	93 %	73 kg
	WA 300/60	IPM 6.17.18	64,0 kW	60 kW	300 V	213 A	93 %	102 kg
	WA 500/80	IPM 6.17.25	85,5 kW	80 kW	500 V	171 A	93 %	124 kg
	WA 500/100	IPM 6.17.25	107,5 kW	100 kW	500 V	215 A	93 %	124 kg

Hybrid Drives

The philosophy

In the last years the interest for hybrid drives is steadily increased. The combination of the huge range of a diesel engine and the possibility to move soundlessly and emission-free is very attractive for many shipowners The benefit to combine both engines and get a higher benefit is one of the strengths of a Kräutler Hybrid drive.

The possibilities

The in-house production and attention to details of each employee of the company Kräutler, makes it possible to offer a hybrid solution for almost every drive. New construction or retrofit, house boat, sport boat or passenger ship, every owner has his personal idea and we support you with the implementation.

Some examples

House boat:

On a house boat the way is the goal. With these boats, it's not about to drive fast, but to enjoying the nature. Noiseless cruising through canals and lakes, without disturbing the nature and during driving with the diesel engine, the batteries will be recharged to supply the energy needs of an apartment on the water.

Sport boat:

In many sea or rivers, there are driving restrictions in certain areas or at certain seasons for conventional drives. In order to use your boat anyway, added a Kräutler hybrid drive is your existing drive concept.

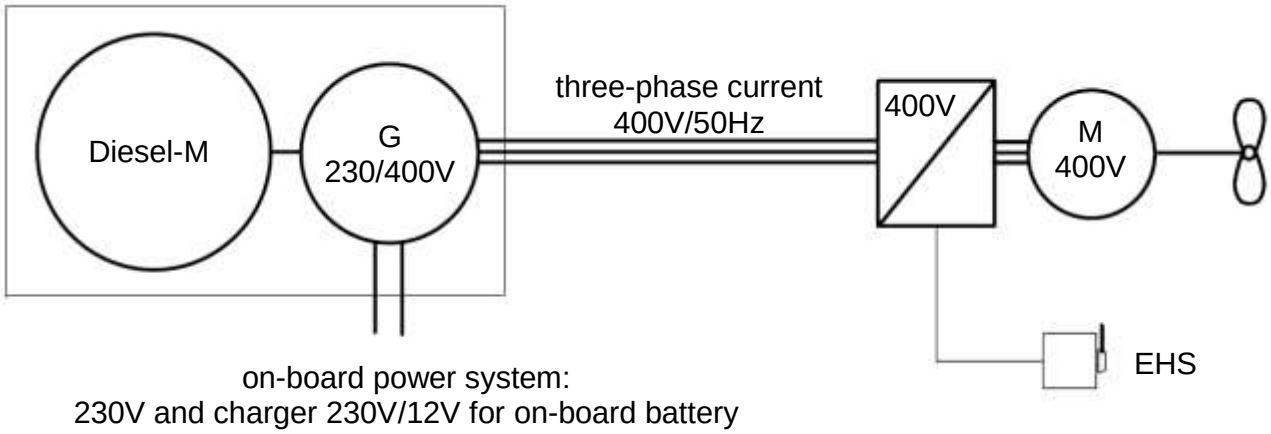
Passenger ship:

Many shipping companies use their passenger ships in the evening hours for events. Conventional drives with their noise and vibration often disturbing. For lectures, readings and theater performances on board convinced the quiet, electric motor and generator for driving under diesel engine.

For a quote, ask for our specification template.

Diesel-Electric Drives

Diesel-electric drive with three-phase AC motor and generator



on-board power system:
230V and charger 230V/12V for on-board battery

All Kräutler motors based on low voltage have one thing in common; they need to feature a battery pack. Even with the additional supply of solar, wind, or diesel generators, you always need a battery pack.

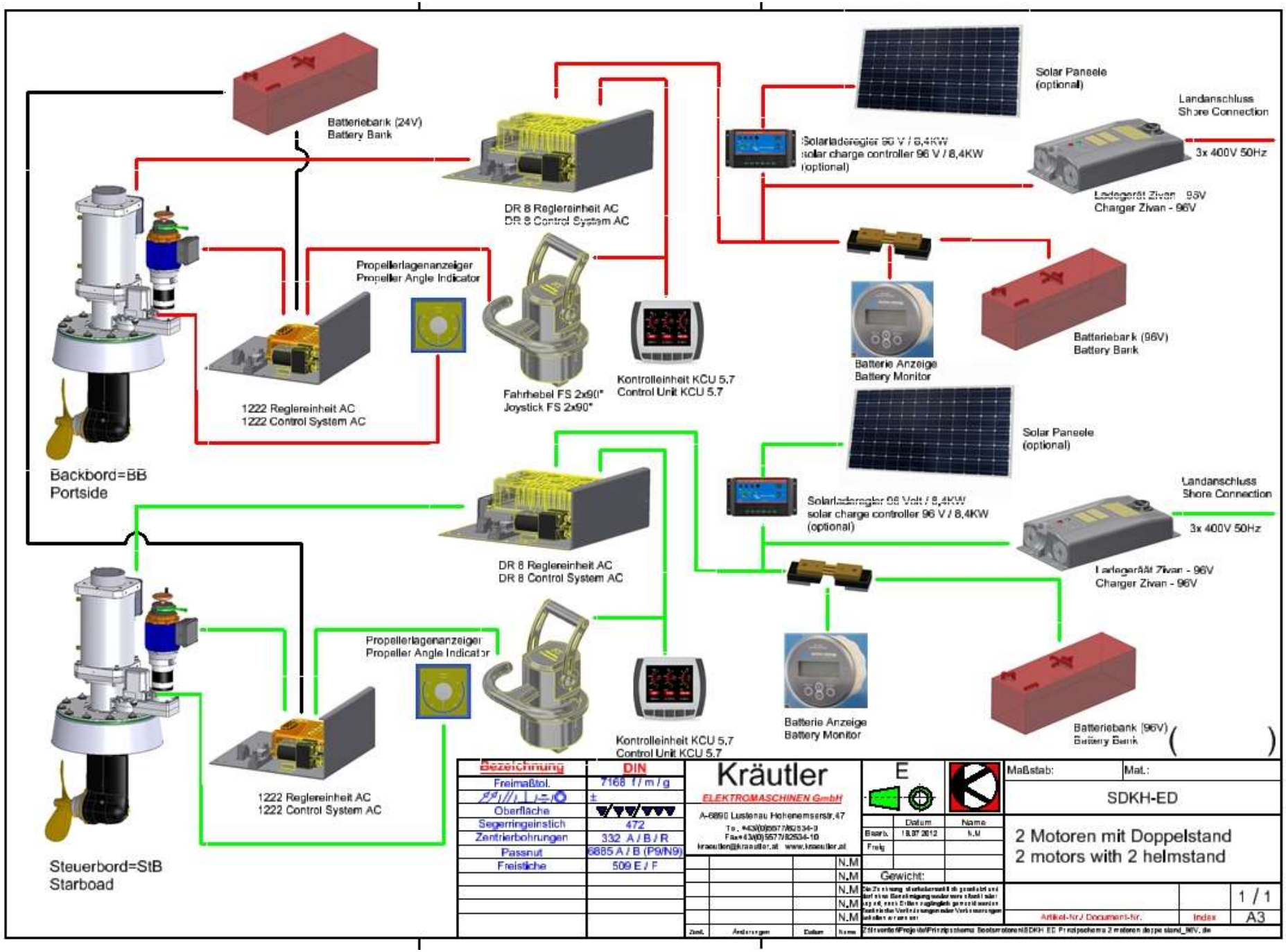
But there is also the possibility to conect the Kräutler three-phase asynchronous motor with a power control (frequency converter) directly on a 400 volt generator. In this case the expensive and heavy battery pack is completely eliminated. The advantages are that the relatively light electric motor can be installed at the optimum position in the hull of the boot, the generator, however, completely independent of the center of gravity. Also the supply from the electrical system is supplied by the generator.

The allocation of tasks is as follows, the electric motor takes over the speed control of the ship the rotational speed of the diesel generator is in this case completely independent of the boat speed and the diesel engine is always operated in its optimal working range. There is no reverse gear required; the clockwise/counterclockwise rotation is electrically controlled.

It is correct that in the conversion from diesel generator into electricity and then into drive energy losses, but the efficiency advantages of this system are much higher than a conventional diesel engine.

Please do not mix a diesel-electric drive with a hybrid drive, a hybrid drive always has two sources of energy.


Kräutler
Electric Motors
Controls / energy supply
The future
needs new drive


Batteriebank (24V)
Battery Bank
DR 8 Reglereinheit AC
DR 8 Control System AC
Solar Paneele
(optional)
Landanschluss
Shore Connection
Solarladeregler 96 V / 8,4KW
solar charge controller 96 V / 8,4KW
(optional)
3x 400V 50Hz
Ladegerät Zivan - 96V
Charger Zivan - 96V
Propellerlagenanzeiger
Propeller Angle Indicator
Fahrhebel FS 2x90°
Joystick FS 2x90°
Kontrolleinheit KCU 5.7
Control Unit KCU 5.7
Batterie Anzeige
Battery Monitor
Batteriebank (96V)
Battery Bank
1222 Reglereinheit AC
1222 Control System AC
Backbord=BB
Portside
Steuerbord=StB
Starboad
Kräutler
ELEKTROMASCHINEN GmbH
A-6890 Lustenau Hohenemserstr.47
Maßstab:
Mat.:
SDKH-ED
2 Motoren mit Doppelstand
2 motors with 2 helmstand
Gewicht:
1 / 1
A3

With each underwater boat drive you get in addition to the motor:

- a infinitely variable Electric regulation system
- a Single lever control (throttle)
- a Battery monitor BMV 700 or BMV 700H
- a Anode for fresh water
- a Cable set
- a Battery master switcher and battery fuse
- a fixed or folding propeller depending on the ordered

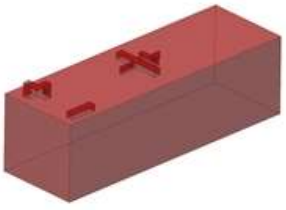
see chapter
„For every application
the right drive“

see chapter
„Batteries and charger“
(optional)

see chapter
„Single lever control
(EHS)“

see chapter
„Infinitely variable Electric
regulation system “

see chapter
„Battery monitor (BMV 700)“



see chapter
„Batteries and charger“
(optional)

Infinitely variable Electric regulation system

Depending on the required motor power, different control units are used. When we select the controller, we take ensure that the power output is possible at the optimum efficiency point of the controller. Only by this systematic implementation of energy efficiency, it is possible the overall efficiency of the system in all load points as high as possible and to keep the heat emission as low as possible.

The controller fulfills with its rugged, sealed housing and its connector, IP65 protection for use in harsh environments.

picture	technical data
	**Control unit GP 05/08** Power range: 0,5kW to 0,8kW Voltage: 24V Cooling: air cooling
	**Control unit GP 1,6/2,2** Power range: 1,6kW to 2,2kW Voltage: 24V bis 36V Cooling: air cooling
	**Control unit 24V/AC** Power range: 1,8kW to 2,0kW Voltage: 24V Cooling: air cooling

picture	technical data
	**Control unit 48V/AC** Power range: 4,0kW to 11,0kW Voltage: 48V Cooling: air cooling
	**Control unit 96V/AC15** Power range: 15,0kW to 18,5kW Voltage: 96V Cooling: air cooling
	**Control unit 96V/AC20** Power range: 15,0kW to 25,0kW Voltage: 48V and 96V Cooling: water cooling
	**Control unit 144V/AC30W** Power range: 30,0kW to 40,0kW Voltage: 100V and 144V Cooling: water cooling

Control unit for voltage from 96V to 144V must be installed contact safe.
Optionally the control unit can be supplied with housing at extra cost.

Single lever control (EHS)

picture	description	picture	description
	black front panel black aluminium lever key switch (standard)		front panel silver black aluminium lever key switch
	black front panel stainless steel lever with key switch		front panel silver stainless steel lever with key switch
	steering lever		

picture	description	picture	description
	black front panel black aluminium lever push button		front panel silver black aluminium lever push button
	black front panel stainless steel lever push button		front panel silver stainless steel lever push button
	Top mounting - single		Top mounting - dual
	Top mounting – single (vandal safety)		Top mounting – dual (vandal safety)
	Throttle for steering the motor speed and steering the turning of the SDKH-ED		Joystick

Battery monitor (BMV 700)

The BMV 700 is a precision battery monitors. The main function of a battery monitor is to determine the charge state of the batteries and display ampere-hours consum. Also the BMV 700 provides precise information about the current state of charge in percent and remaining driving time in hours and minutes.

Standard information and alarms:

- Battery voltage (V).
- Battery charge / discharge current (A).
- Consumption in ampere-hours (Ah).
- Consumption in Watt (W)
- State of charge (%).
- Remaining time for momentary consumption.
- Optical and audible alarm: over and under voltage, and/or flat batteries.
- Alarm or generator-start relay programmable.

Kräutler Control Unit (KCU 3.5 and 5.7)

The Käutler Control Unit (KCU) is more than just a battery monitor.
The large 5.7" color / LCD monitor shows motor-specific data such as the engine temperature and the engine speed.
Two standard integrated interfaces provide connecting two external cameras with plug and play.

With the KCU the requirements of the "Central Office Vessel Inspection Commission / ship Eichamt (ZSUK)" will be met and is therefore essential for the commercial shipping.

Specifications:

- 3,5 or 5,7“ color- / LCD- Display
- Two video inputs
- Waterproof IP67 (front)
- Operating temperature -40 to +70°C

Display - main page

- Power in kW
- Speed
- Battery capacity
- Battery current
- Battery voltage
- Operating hours
- Date and time
- Remaining travel time
- Travel direction
- Output of error messages of the control

Display – second page

Important data of the single lever control, the control electronics and the motor

Display – third page

Thrust direction indicator of the electric rotatable Sail-Drives

Batteries and charger

To ensure safe function of your electrical drive, you need a high-quality battery system.

Kräutler recommends batteries of the company Hoppecke, Super B and Aentron.

The company Hoppecke with headquarter in Germany, is a leader in the manufacture of traction batteries and a longtime business partner of Kräutler.
The batteries of Hoppecke are characterized in particular by:

- Long lifetime and high load cycle stability
- Maintenance free
- High operational reliability
- Simple assembly and installation

From the company Super B with headquarters and production in Holland purchase Kraeutler the Lithium Ion Phosphate batteries.
The batteries of the company Super B are characterized in particular by:

- 80% weight reduction with comparable performance to a standard lead acid battery.
- faster loading times
- much less or a multiple of the capacity of the same size as a standard lead-acid batteries
- longer lifetime and low self-discharge rate

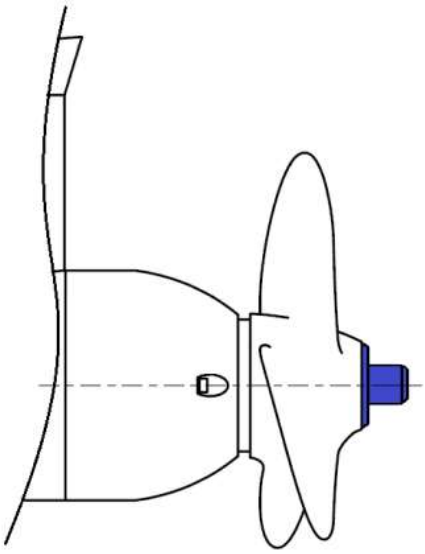
From the company Aentron with headquarters and production in Germany purchase Krautler Lithium Ion batteries (Li-NMC).
The batteries of the company Aentron are characterized in particular by:

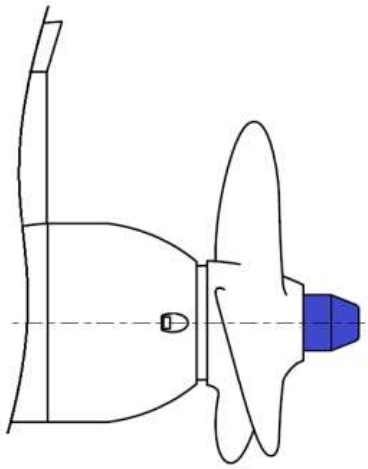
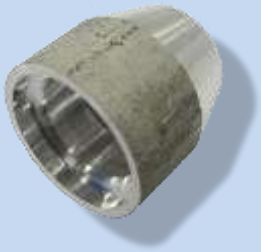
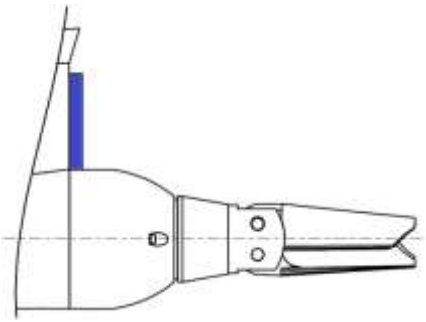
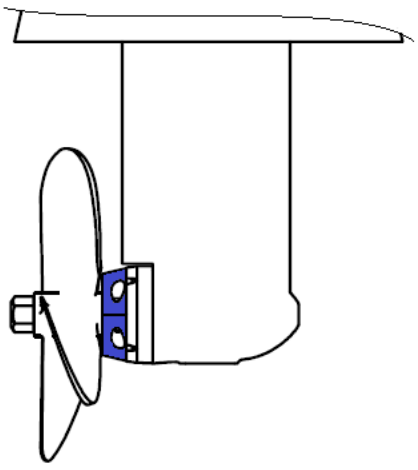
- 125% weight reduction with comparable performance to a standard lead acid battery.
- Faster loading times
- much less or a multiple of the capacity of the same size as a standard lead-acid batteries
- longer lifetime and low self-discharge rate
- build in an alu-housing – protection IP 66

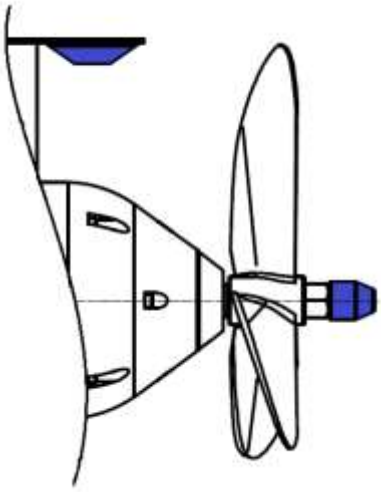
According to your requirement, we provide you a suitable battery system. A battery pack is just as good as its charging technology, so we gladly provide you the right charger for your batteries. Through a well-coordinated drive system you can enjoy the beautiful carefree hours on your boad.


Kräutler
Electric Motors
Spare - / Wear parts
The future
needs new drive

Sacrificial anodes

installation position	picture	Article no.	description
		101362	sacrificial anode for GP 3fl. sailboat propellers **freshwater**
		101363	sacrificial anode for GP 3fl. sailboat propellers **salt water**
		101660	sacrificial anode for GP 3fl. sailboat propellers **freshwater**
		101661	sacrificial anode for GP 3fl. sailboat propellers **salt water**

installation position	picture	Article no.	description
		101360	sacrificial anode for GP fixed propeller **freshwater**
		101361	sacrificial anode for GP fixed propeller **salt water**
		101364	sacrificial anode for GPV 2fl. folding propeller **freshwater**
		101365	sacrificial anode for GPV 2fl. folding propeller **salt water**
		101398	sacrificial anode for Sail–Drive **freshwater**
		101399	sacrificial anode for Sail–Drive **salt water**

installation position	picture	Article no.	description
		137872	sacrificial anode for AC-U **freshwater**
		137873	sacrificial anode for AC-U **salt water**
		141289	sacrificial anode for ACA **freshwater**
		140235	sacrificial anode for ACA **salt water**

Repair kits

For the GP series is also a repair kit available.

Between 500 and 1,000 hours or 10 years, or irregularities during operation, we recommend sending the drive for a reversion to Kräutler directly or to a business partner of the company Kräutler.
Failure to properly repair irreparable damage or consequential damage to the engine or the boat may arise.

The contact address of contractual partners in your area may be requested under
0043 5577 82534 0

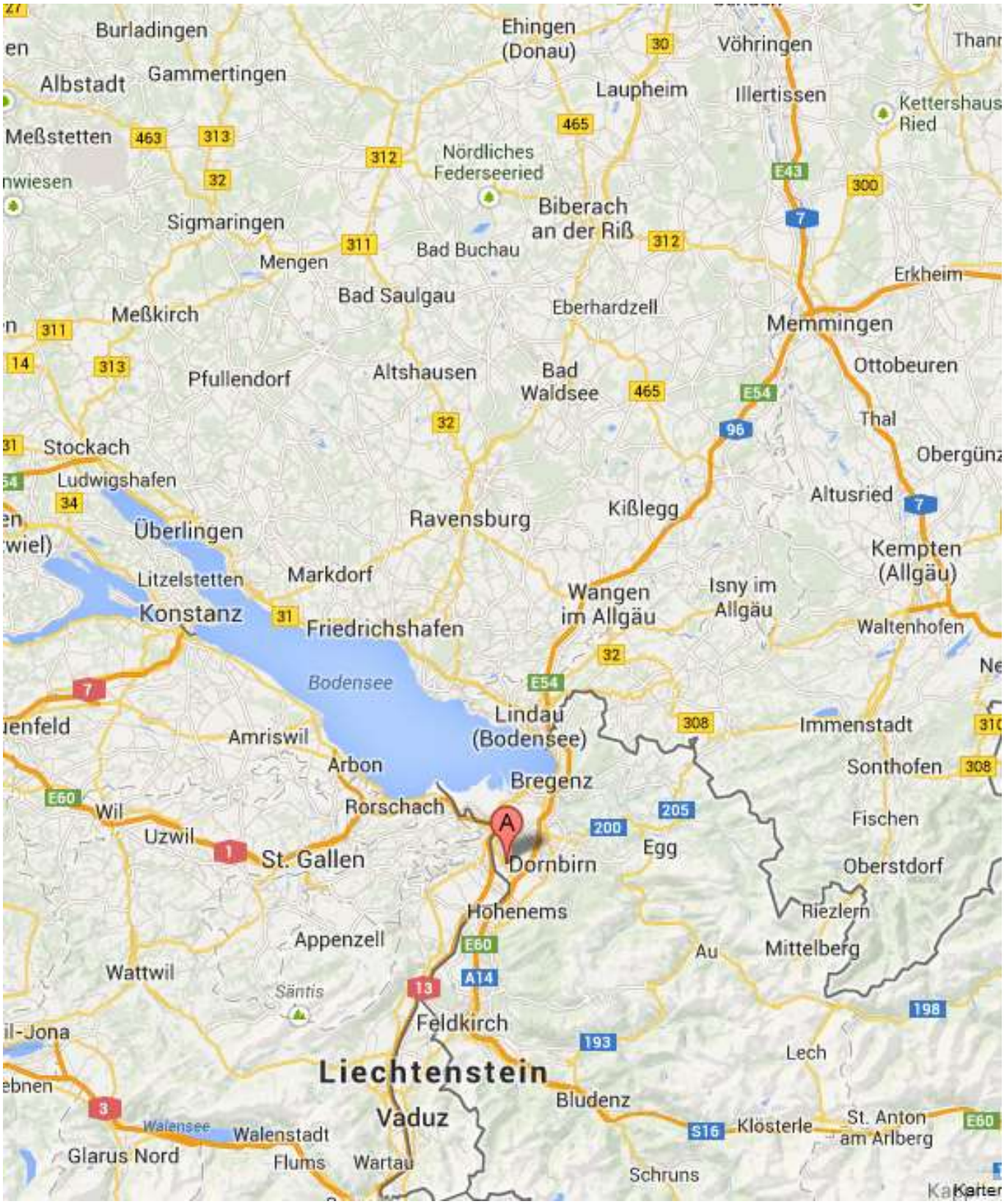
Depending on engine size, there are three different repair kits:

- Repair kits for GP 0,5
- Repair kits for GP 0,8/1,6
- Repair kits for GP 2,2/2,8

A repair kit consists of:

- Deep groove ball bearings
- Radial shaft seals
- O-rings
- Brush
- div. small parts
- Installation instructions


Schwansmoor
und Kranichmoor
Kiel
Rostock
Lübeck
Stade
Hamburg
Bremerhaven
Bremen
Pasewalk
Police
Szczecin
Koszalin
Piła
Gorzów
Wielkopolski
Hannover
Steglitz-Zehlendorf
Berlin
Amsterdam
Nederland
(Netherlands)
Bielefeld
Braunschweig
Magdeburg
Halle (Saale)
Duisburg
Essen
Leipzig
Düsseldorf
Deutschland
(Germany)
Dresden
Köln
Chemnitz
Zentrum
Zwickau
Frankfurt
am Main
Praha
Lëtzebuerg
(Luxembourg)
Plzeň
Česká republika
(Czech Republic)
Nürnberg
Saarbrücken
Donauauen
bei Stadldorf
Brno
Karlsruhe
Stuttgart
Nancy
Strasbourg
Landau
Passau
Tübingen
Augsburg
Linz
Wien
Freiburg im
Breisgau
Pocking
Gründlenried
- Rotseemoos
Wels
München
Basel
Krels 11
Österreich
(Austria)
Dijon
Wilten
Schweiz
Suisse
Svizzera
(Switzerland)
Liechtenstein
Graz
Villach-Innere
Stadt
Maribor
Lausanne
Genève
Slovenija
(Slovenia)
Zagreb
Milano
Brescia
Padova
Trieste
Karlovac
Sisak
Grenoble
Torino
Verona
Hrvatska


Burladingen
Albstadt
Gammertingen
Meßstetten
Ehingen (Donau)
Vöhringen
Laupheim
Illertissen
Kettershaus Ried
Nördliches Federseeried
Biberach an der Riß
Sigmaringen
Bad Buchau
Mengen
Bad Saulgau
Meßkirch
Eberhardzell
Memmingen
Erkheim
Pfullendorf
Altshausen
Bad Waldsee
Ottobeuren
Thal
Stockach
Ludwigshafen
Überlingen
Ravensburg
Kißlegg
Altusried
Kempten (Allgäu)
Litzelstetten
Markdorf
Konstanz
Friedrichshafen
Wangen im Allgäu
Isny im Allgäu
Waltenhofen
Bodensee
Lindau (Bodensee)
Immenstadt
Amriswil
Arbon
Bregenz
Sonthofen
Wil
Rorschach
Fischen
Uzwil
St. Gallen
Dornbirn
Egg
Oberstdorf
Hohenems
Riezlern
Appenzell
Au
Mittelberg
Wattwil
Säntis
Feldkirch
Liechtenstein
Lech
Vaduz
Bludenz
Walensee
Walenstadt
Glarus Nord
Flums
Wartau
Klösterle
St. Anton am Arlberg
Schruns