



**Kräutler**  
Electric Motors

# Boat motor catalog

version V01.12

**The future  
needs new drive**

For the provide of boat pictures we would like to thank the following companies.



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**Kräutler**  
Electric Motors

**Introduction**

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**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 family 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.



Krätler 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 Krätler has an individual character. Everything is tailor-made, what requires a good deal of flexibility. The large amount of special constructions from Krätler 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 engineering 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:

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







**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

page 23



GPAV with grip  
for hand steering

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GPAV with pin for remote control

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GPRV with rudder gland

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GPE with straight stern

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ACA with pin for remote control

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SDK with  
folding propeller

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SDKH with  
fixed propeller

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SDKH-D with  
fixed propeller

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SDKH-ED with

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WAd 10,0 AC

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WAz 15,0 AC

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hybrid

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WA 370/100  
with fixed propeller

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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<br><br>Technology: DC motor with permanent magnets, continuous control<br>Advantages: small and light design<br>Power range: 0,5 – 2,2kW<br>Battery voltage: 24 – 36 Volt   |
| *GPRV                   | Submersible motor for mounting in a rudder gland (mechanical rotatable / Pod)<br><br>Technology: DC motor with permanent magnets, continuous control<br>Advantages: small and light design<br>Power range: 0,5 – 2,2kW<br>Battery voltage: 24 – 36 Volt  |
| *GPH                    | *GPR with rudder gland   |
| *GPAV                   | Submersible outboarder with stainless steel tube and outboarder-bracket<br><br>Technology: DC motor with permanent magnets, continuous control<br>Advantages: small and light design<br>Power range: 0,5 – 2,2kW<br>Battery voltage: 24 – 36 Volt  |
| *GPE                    | Submersible outboarder for fixed mounting on the straight stern<br><br>Technology: DC motor with permanent magnets, continuous control<br>Advantages: small and light design<br>Power range: 0,5 – 2,2kW<br>Battery voltage: 24 – 36 Volt  |
| <b>ATTENTION</b>        | <p><b>* 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.</b></p> <p><b>You have to change the anode, if you are driving in brackish or seawater.</b></p> |



| alternating current - models |   |
|------------------------------|---|
| AC - model                   | brief description   |
| ACV                          | Submersible flange motor for fixed mounting under the hull<br>Technology: brushless three phase asynchronous motor<br>Advantages: high performance and free of maintenance<br>Power range: 2,4 – 12,0kW<br>Battery voltage: 24 – 48 Volt                    |
| ACR                          | Submersible motor for mounting in a rudder gland (mechanical rotatable / Pod)<br>Technology: brushless three phase asynchronous motor<br>Advantages: high performance and free of maintenance<br>Power range: 2,4 – 12,0kW<br>Battery voltage: 24 – 48 Volt |
| ACH                          | ACR with rudder gland   |
| ACAV                         | Submersible outboarder with stainless steel tube and outboarder-bracket<br>Technology: brushless three phase asynchronous motor<br>Advantages: high performance and free of maintenance<br>Power range: 2,4 – 5,0kW<br>Battery voltage: 24 – 48 Volt        |
| ACE                          | Submersible outboarder for fixed mounting on the stern (stern drive)<br>Technology: brushless three phase asynchronous motor<br>Advantages: high performance and free of maintenance<br>Power range: 2,4 – 5,0kW<br>Battery voltage: 24 – 48 Volt           |
| ACA                          | Submersible outboarder with shaft-profile and outboarder-bracket<br>Technology: brushless three phase asynchronous motor<br>Advantages: high performance and free of maintenance<br>Power range: 2,4 – 11,7kW<br>Battery voltage: 24 – 48 Volt              |
| <b>ATTENTION</b>             | <b>You have to change the anode, if you are driving in brackish or seawater.</b>  |

# 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. Krätler 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. Krätler 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 |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|--|-----------|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|  |           | Consumption      | Output  |         |         |                  |        | 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 11,0 | 13,2 kW          | 11,0 kW | 48 V    | 275 A   | 83 %             | 61 kg  | 10,0 t            | -         |
| possible options   |           |                  |         |         |         |                  |        |                   |           |
| 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 |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|--|-----------|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|  |           | Consumption      | Output  |         |         |                  |        | Sailing boat      | 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 11,0 | 13,2 kW          | 11,0 kW | 48 V    | 275 A   | 83 %             | 61 kg  | 10,0 t            | -         |
| possible options   |           |                  |         |         |         |                  |        |                   |           |
| 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 Krätler 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, Krätler 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.

Krätler 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 |        | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|---|------------------|--------|---------|---------|------------------|--------|-------------------|-----------|
|                  |   | Consumption      | Output |         |         |                  |        | Sailing boat      | 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 options |   |                  |        |         |         |                  |        |                   |           |
|                  | 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 |        | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|---|-------------------------------|------------------|--------|---------|---------|------------------|--------|-------------------|-----------|
|   |                               | Consumption      | Output |         |         |                  |        | Sailing boat      | 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 options  |                               |                  |        |         |         |                  |        |                   |           |
| 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 |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|---|--|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|   |  | Consumption      | Output  |         |         |                  |        | Sailing boat      | Powerboat |
| 102817  | GPRV 0,5   | 0,5 kW           | 0,4 kW  | 24 V    | 21 A    | 85 %             | 15 kg  | 0,4 t             | 0,2 t     |
| 102180  | GPRV 0,8   | 0,8 kW           | 0,7 kW  | 24 V    | 34 A    | 85 %             | 16 kg  | 0,7 t             | 0,3 t     |
| 144475  | 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     |
| 143898  | 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 11,0  | 13,2 kW          | 11,0 kW | 48 V    | 275 A   | 83 %             | 62 kg  | 10,0 t            | 4,0 t     |
| 144371  | SCR 15,0   | 17,0 kW          | 15,0 kW | 48 V    | 355 A   | 88 %             | 79 kg  | 15,0 t            | 6,0 t     |
| possible options  |  |                  |         |         |         |                  |        |                   |           |
| 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: GPRV motors are 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 |        | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|---|------------------|--------|---------|---------|------------------|--------|-------------------|-----------|
|                  |   | Consumption      | Output |         |         |                  |        | Sailing boat      | 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 options |   |                  |        |         |         |                  |        |                   |           |
|                  | 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: GPE motors are only for short term use in seawater.**

# Outboarder with shaft-profile

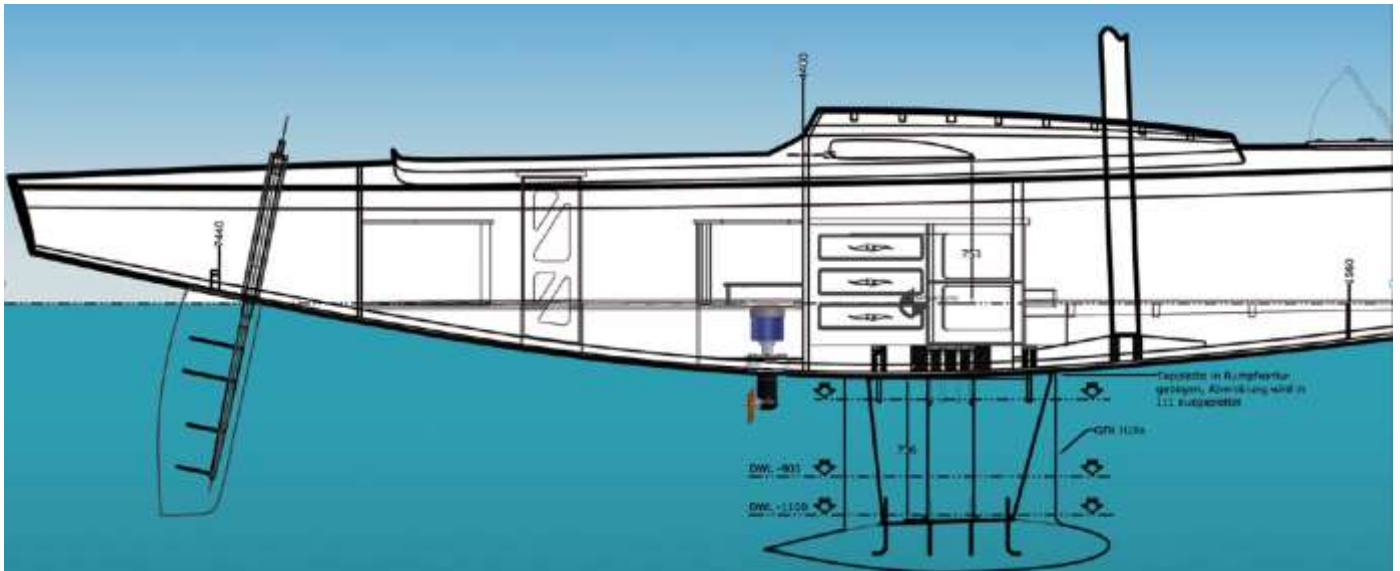


Figure: Outboarder with shaft-profile

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

Stern height: normal shaft up to 50cm – long shaft (L) up to 63cm –super long shaft (SL) up to 74cm

# Sail-Drive motors



Sail-Drive is called a special drive design for motor boat 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 | <p>Electric Drive with Sail-Drive gear, motor <b>without ventilator</b></p> <p>SDK compact: only freshwater<br/>           SDKS compact: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: small, compact design and free of maintenance<br/>           Power range: 2,5 – 4,7kW<br/>           Battery voltage: 24 – 48 Volt</p>                        |
| *SDK or SDKS                 | <p>Electric Drive with Sail-Drive gear</p> <p>SDK: only freshwater<br/>           SDKS: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: higher power than the compact version, free of maintenance<br/>           Power range: 3,1 – 7,1kW<br/>           Battery voltage: 24 – 48 Volt</p>  |
| *SDK-D or SDKS-D             | <p>Electric Drive with Sail-Drive gear, Sail-Drive <b>mechanical rotatable 2 x 45°</b></p> <p>SDK-D: only freshwater<br/>           SDKS-D: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: mechanical rotatable shuttle (active rudder), steered by Teleflex<br/>           Power range: 3,1 – 7,1kW<br/>           Battery voltage: 24 – 48 Volt</p> |
| <b>ATTENTION</b>             | <p><b>* 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.</b></p> <p><b>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.</b></p>   |

| Sail-Drive Models        |  |
|--------------------------|--|
| Model                    | brief description  |
| *SDK-ED<br>or<br>SDKS-ED | <p>Electric Drive with Sail-Drive gear, Sail-Drive <b>electric rotatable 2 x 90°</b></p> <p>SDK-ED: only freshwater<br/>           SDKS-ED: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: electric rotatable shuttle (active rudder), steered by switcher or joystick and free of maintenance,<br/>           Power range: 3,1 – 7,1kW<br/>           Battery voltage: 24 – 48 Volt</p>  |
| SDKH                     | <p>Electric Drive with Sail-Drive gear, <b>heavy duty type, above 20kW water cooled</b></p> <p>Field of application: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: Sail-Drive gear for high power, with big reduction free of maintenance<br/>           Power range: 9,4 – 34,1kW<br/>           Battery voltage: 48 – 144 Volt</p>   |
| SDKH-D                   | <p>Electric Drive with Sail-Drive gear, <b>heavy duty type, mechanical rotatable 2 x 45° above 20kW water cooled</b></p> <p>Field of application: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: mechanical rotatable shuttle (active rudder), steered by Teleflex, free of maintenance,<br/>           Power range: 9,4 – 34,1kW<br/>           Battery voltage: 48 – 144 Volt</p>       |
| SDKH-ED                  | <p>Electric Drive with Sail-Drive gear, <b>heavy duty type, electric rotatable 2 x 90° above 20kW water cooled</b></p> <p>Field of application: fresh water and seawater<br/>           Technology: brushless three phase asynchronous motor, continuous control<br/>           Advantages: electric rotatable shuttle (active rudder), steered by switcher or joystick free of maintenance<br/>           Power range: 9,4 – 34,1kW<br/>           Battery voltage: 48 – 144 Volt</p> |
| <b>ATTENTION</b>         | <p><b>* 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.</b></p> <p><b>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.</b></p>   |



# 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 Krautler 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 Krautler 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 Krautler Sail-Drive

Krautler 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 Krautler Sail-Drive on the existing base plate.

# Sail-Drive compact



Figure: Sail-Drive compact

| Article no.                       | Type  | Continuous power |        | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|-----------------------------------|---|------------------|--------|---------|---------|------------------|--------|-------------------|-----------|
|                                   |   | Consumption      | Output |         |         |                  |        | Sailing boat      | 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 options                  |   |                  |        |         |         |                  |        |                   |           |
| 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: SDK motors are only for short term use in seawater.**

# Sail-Drive fixed



Figure: Sail-Drive fixed

| Article no.      | Type   | Continuous power |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|--|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|                  |  | Consumption      | Output  |         |         |                  |        | Sailing boat      | 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     |
| 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     |
|                  | 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 options |  |                  |         |         |         |                  |        |                   |           |
|                  | SDK unlimited for seawater = SDKS  |                  |         |         |         |                  |        |                   |           |
| 103420           | GfK-base plate for for SDKH  |                  |         |         |         |                  |        |                   |           |
| 000279           | Sail-Drive with recuperation   |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 3.5   |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 5.7 – 48 V and 96V for passenger ships with the possibility to connect a camera |                  |         |         |         |                  |        |                   |           |
| 141590           | Camera for KCU 5.7   |                  |         |         |         |                  |        |                   |           |
| 143350           | Heat exchanger for 2-circle water cooling  |                  |         |         |         |                  |        |                   |           |
|                  | Boost function 30% performance increase for 2 minutes  |                  |         |         |         |                  |        |                   |           |

**Attention: SDK motors are 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 |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|---|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|                  |   | Consumption      | Output  |         |         |                  |        | 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     |
| 137258           | SDK-D 3,5 AC  | 4,1 kW           | 3,5 kW  | 36 V    | 114 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     |
|                  | SDKH-D 18,5 AC  | 21,0 kW          | 18,5 kW | 96 V    | 219 A   | 88 %             | 94 kg  | -                 | 7,4 t     |
| water cooled     |   |                  |         |         |         |                  |        |                   |           |
| 143353           | 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    |
| possible options |   |                  |         |         |         |                  |        |                   |           |
|                  | SDK-D unlimited for seawater = SDKS-D   |                  |         |         |         |                  |        |                   |           |
| 103420           | GfK-base plate for for SDKH   |                  |         |         |         |                  |        |                   |           |
| 000279           | Sail-Drive with recuperation  |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 3.5 -  |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 5.7 – 48V and 96V for passenger ships with the possibility to connect a camera |                  |         |         |         |                  |        |                   |           |
| 141590           | Camera for KCU 5.7  |                  |         |         |         |                  |        |                   |           |
| 102065           | Fin for SDK-D   |                  |         |         |         |                  |        |                   |           |
| 143350           | Heat exchanger for 2-circle water cooling   |                  |         |         |         |                  |        |                   |           |
|                  | Boost function 30% performance increase for 2 minutes   |                  |         |         |         |                  |        |                   |           |

**Attention: SDK-D motors are 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 |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|---|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|                  |   | Consumption      | Output  |         |         |                  |        | Sailing boat      | 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 3,5 AC   | 4,1 kW           | 3,5 kW  | 36 V    | 114 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     |
|                  | SDKH-ED 18,5 AC   | 21,0 kW          | 18,5 kW | 96 V    | 219 A   | 88 %             | 98 kg  | 18,5 t            | 7,4 t     |
| water cooled     |   |                  |         |         |         |                  |        |                   |           |
| 143672           | 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    |
| possible options |   |                  |         |         |         |                  |        |                   |           |
|                  | SDK-ED unlimited for seawater = SDKS-ED   |                  |         |         |         |                  |        |                   |           |
| 103420           | Gfk-base plate for for SDKH   |                  |         |         |         |                  |        |                   |           |
| 000279           | Sail-Drive with recuperation  |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 3.5  |                  |         |         |         |                  |        |                   |           |
|                  | Control unit KCU 5.7 - 96V for passenger ships with the possibility to connect a camera |                  |         |         |         |                  |        |                   |           |
| 141590           | Camera for KCU 5.7  |                  |         |         |         |                  |        |                   |           |
| 102065           | Fin for SDK-ED  |                  |         |         |         |                  |        |                   |           |
| 143350           | Heat exchanger for 2-circle water cooling   |                  |         |         |         |                  |        |                   |           |
| 142072           | Analog display for rudder position 360°   |                  |         |         |         |                  |        |                   |           |
|                  | Boost function 30% performance increase for 2 minutes                                   |                  |         |         |         |                  |        |                   |           |

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

# 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. Krätler 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 Krätler 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 Krätler 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 Krätler 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     |
| 140441           | WAd 3,0 AC  | 3,6 kW           | 3,0 kW  | 36 V    | 100 A   | 83 %             | 35 kg  | 3,0 t             | 1,2 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     |
| 144340           | 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 options |   |                  |         |         |         |                  |        |                   |           |
| 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



| Article no.      | Type  | Continuous power |         | Voltage | Current | Total efficiency | Weight | up to boat weight |           |
|------------------|---|------------------|---------|---------|---------|------------------|--------|-------------------|-----------|
|                  |   | Consumption      | Output  |         |         |                  |        | Sailing boat      | Powerboat |
| **               | WAz 6,0 AC  | 7,2 kW           | 6,0 kW  | 48 V    | 152 A   | 83 %             | 44 kg  | 6,0 t             | 2,4 t     |
| **               | 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 %             | 168 kg | 30,0 t            | 12,0 t    |
| **               | WAz 37,0 AC   | 42,0 kW          | 37,0 kW | 144 V   | 292 A   | 88 %             | 168 kg | 37,0 t            | 14,8 t    |
| possible options |   |                  |         |         |         |                  |        |                   |           |
| 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 - 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 |                  |         |         |         |                  |        |                   |           |
| 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 (artical 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 Krautler 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 350/50  | IPM 6.17.12   | 53,8 kW           | 50 kW        | 350 V   | 154 A   | 93 %             | 73 kg  |
|             | WA 350/60  | IPM 6.17.18   | 64,0 kW           | 60 kW        | 350 V   | 183 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 Krätler Hybrid drive.

## The possibilities

The in-house production and attention to details of each employee of the company Krätler, 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 Krätler hybrid drive is your existing drive concept.

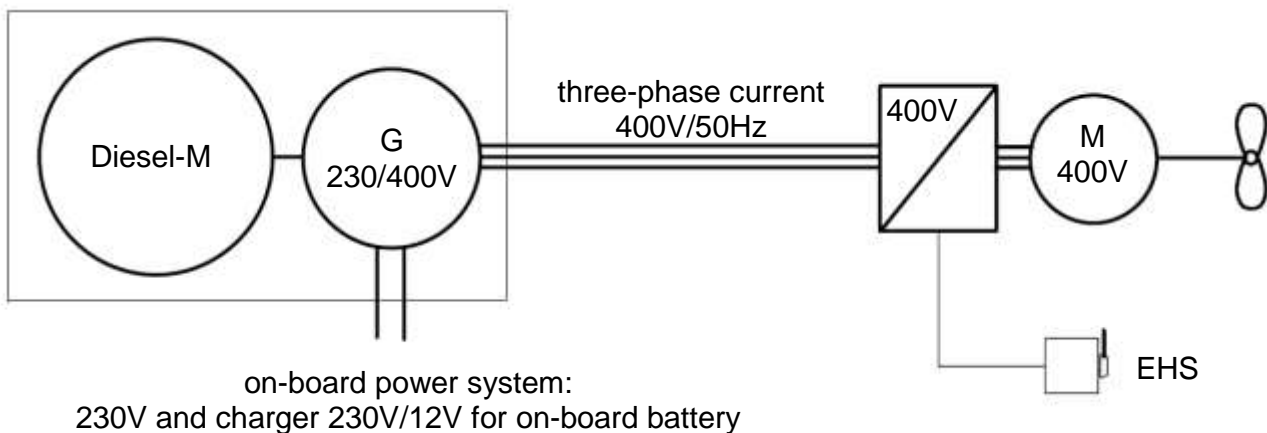
### ***Passenger ship:***

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



All Krautler 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 connect the Krautler 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 boat, 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.



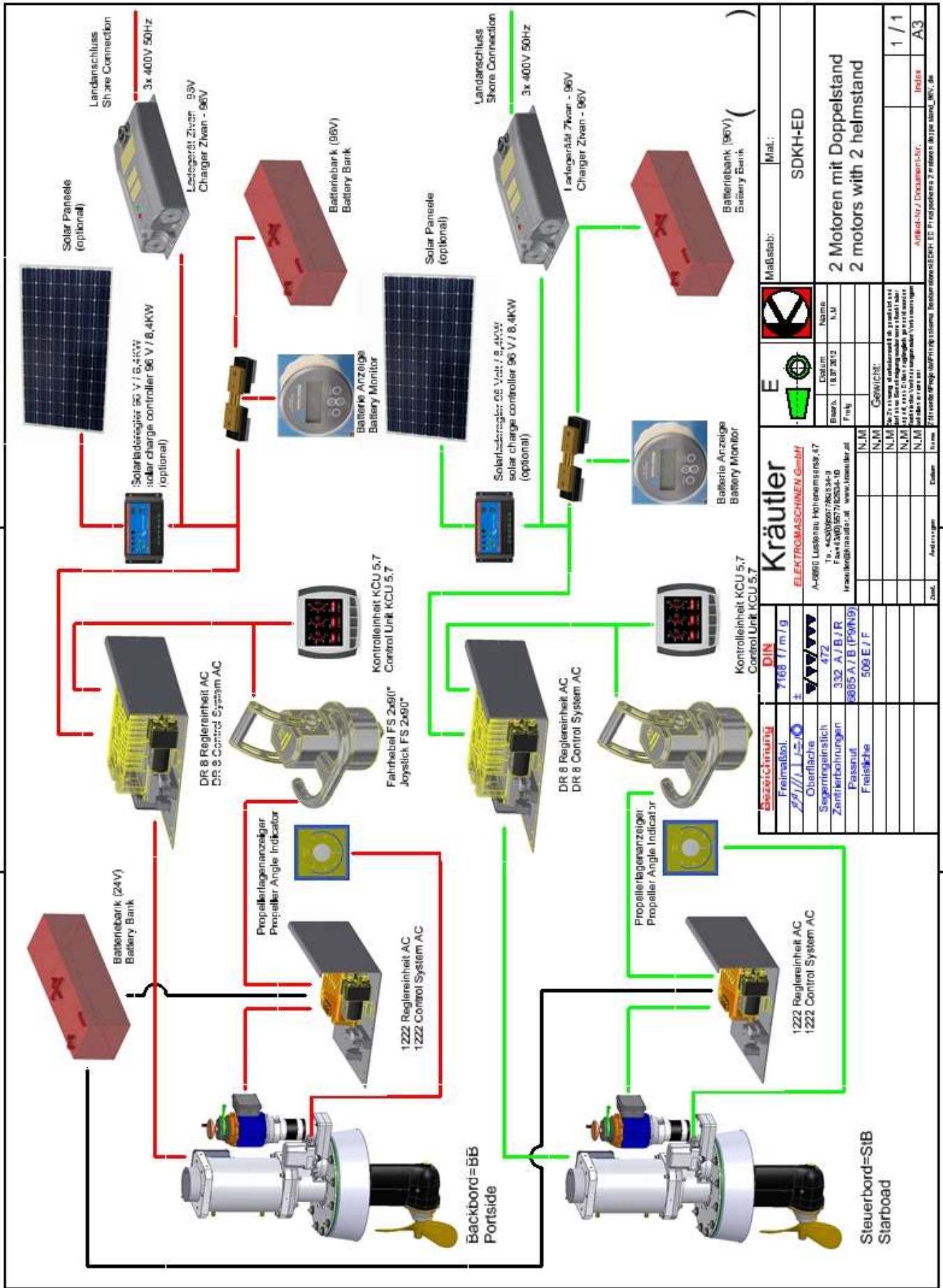


**Kräutler**  
Electric Motors

Controls / energy supply

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**The future  
needs new drive**

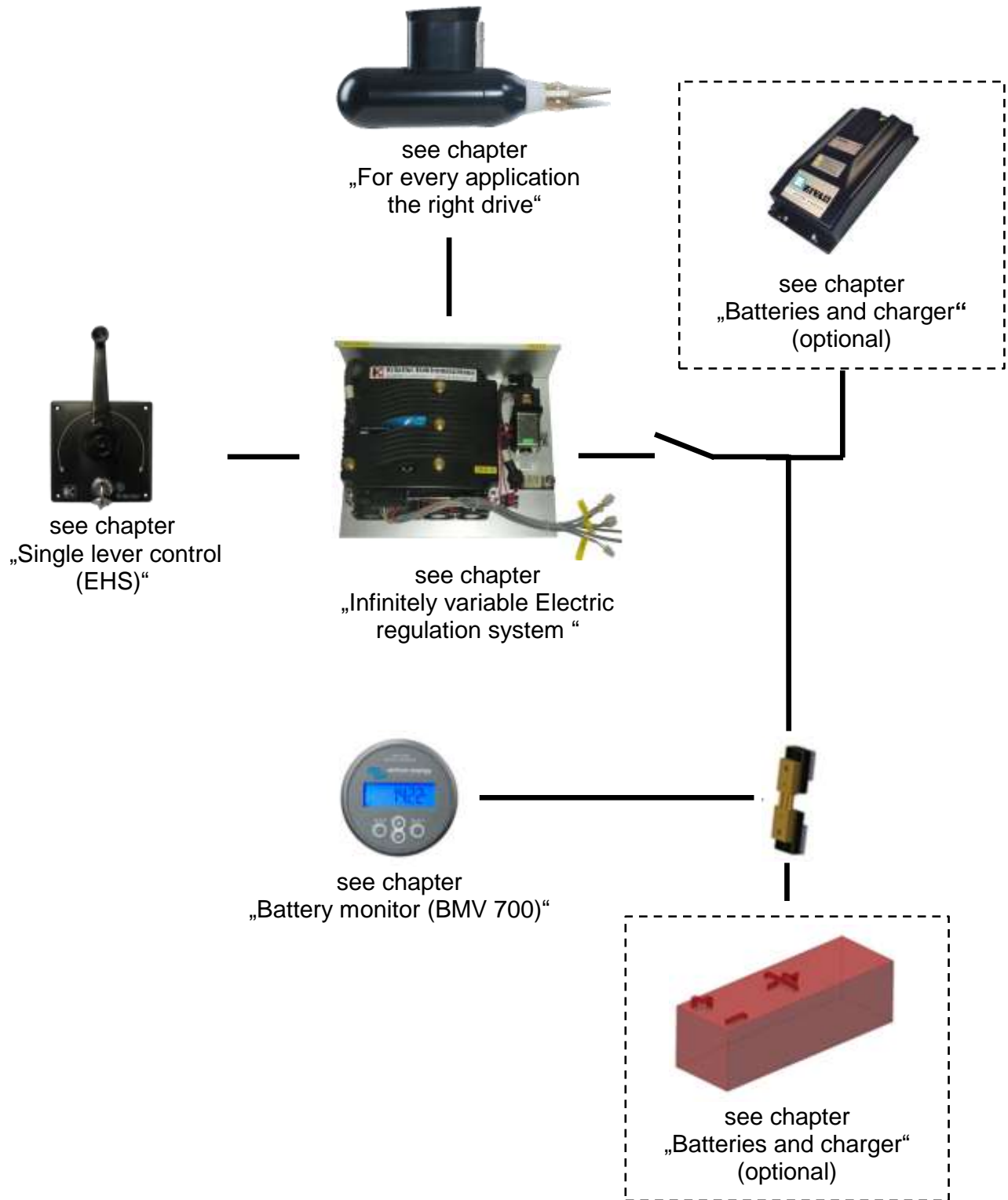


|   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
|---|------------|---------------------|-------|-------|------------|------------|-----|--------|--|----------|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|--|--|
| <b>Kräutler</b><br>ELEKTROMASCHINEN GmbH<br>A-6800 Ludersau, Helweggasse 47<br>T +43 310 657 7853-0<br>kraeutler@rednet.at www.kraeutler.at   |            | Maßstab:<br>SDKH-ED | Mat.: |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| <table border="1"> <tr><td>Name</td><td></td></tr> <tr><td>Datum</td><td>18.07.2013</td></tr> <tr><td>Elektr.</td><td>N.M</td></tr> <tr><td>Freig.</td><td></td></tr> <tr><td colspan="2">GEWICHT:</td></tr> <tr><td>N.M</td><td></td></tr> <tr><td>N.M</td><td></td></tr> <tr><td>N.M</td><td></td></tr> <tr><td>N.M</td><td></td></tr> <tr><td>N.M</td><td></td></tr> <tr><td>N.M</td><td></td></tr> </table> |            | Name                |       | Datum | 18.07.2013 | Elektr.    | N.M | Freig. |  | GEWICHT: |  | N.M |  | N.M |  | N.M |  | N.M |  | N.M |  | N.M |  | 2 Motoren mit Doppelstand<br>2 motors with 2 helmstand |  |
| Name  |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| Datum   | 18.07.2013 |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| Elektr.   | N.M        |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| Freig.  |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| GEWICHT:  |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| N.M   |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| <table border="1"> <tr><td>Zust.</td><td></td><td>Datum</td><td></td></tr> <tr><td>Änderungen</td><td></td><td></td><td></td></tr> </table>   |            | Zust.               |       | Datum |            | Änderungen |     |        |  | 1 / 1    |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| Zust.   |            | Datum               |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
| Änderungen  |            |                     |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
|   |            | Index               |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
|   |            | Index               |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |
|   |            | Index               |       |       |            |            |     |        |  |          |  |     |  |     |  |     |  |     |  |     |  |     |  |  |  |



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






# 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   |
|---|--|
|  | <p><b>Control unit GP 05/08</b></p> <p>Power range: 0,5kW to 0,8kW<br/>           Voltage: 24V<br/>           Cooling: air cooling</p>           |
|  | <p><b>Control unit GP 1,6/2,2</b></p> <p>Power range: 1,6kW to 2,2kW<br/>           Voltage: 24V bis 36V<br/>           Cooling: air cooling</p> |
|  | <p><b>Control unit 24V/AC</b></p> <p>Power range: 1,8kW to 2,0kW<br/>           Voltage: 24V<br/>           Cooling: air cooling</p>             |









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

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<br>black aluminium lever<br>key switch (standard) |  | front panel silver<br>black aluminium lever<br>key switch      |
|  | black front panel<br>stainless steel lever<br>with key switch       |  | front panel silver<br>stainless steel lever<br>with key switch |
|  | steering lever  |  |  |

| picture   | description  | picture  | description  |
|---|--|--|--|
|    | black front panel<br>black aluminium lever<br>push button                              |    | front panel silver<br>black aluminium lever<br>push button |
|    | black front panel<br>stainless steel lever<br>push button                              |    | front panel silver<br>stainless steel lever<br>push button |
|   | Top mounting - single  |   | Top mounting - dual  |
|  | Top mounting – single<br>(vandal safety)   |  | Top mounting – dual<br>(vandal safety)                     |
|  | Throttle for steering<br>the motor speed and<br>steering the turning of<br>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 Kräutler 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.

**Krätler recommends batteries of the company Hoppecke and Aentron.**

The company Hoppecke with headquarter in Germany, is a leader in the manufacture of traction batteries and a longtime business partner of Krätler.

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 Aentron with headquarters and production in Germany purchase Krätler 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 board. Based on your needs, we will create a suitable battery system for you.





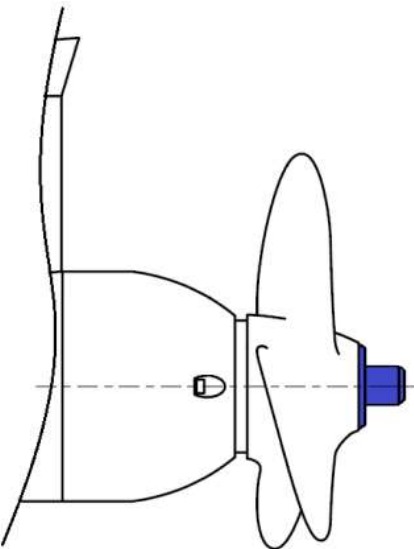




**Kräutler**  
Electric Motors

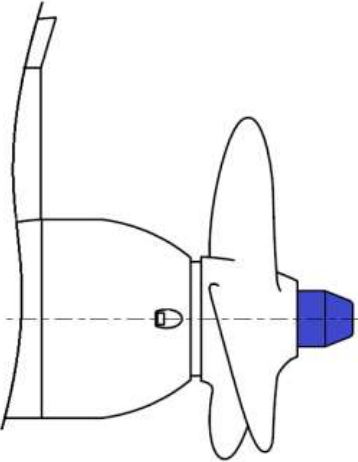


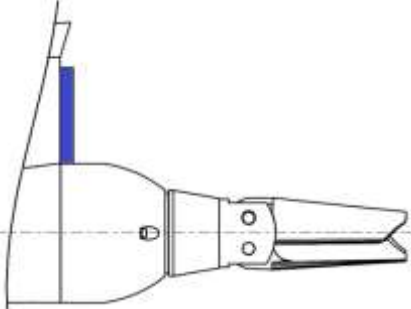


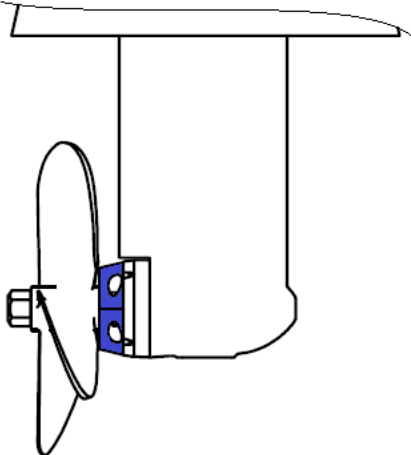


Spare - / Wear parts

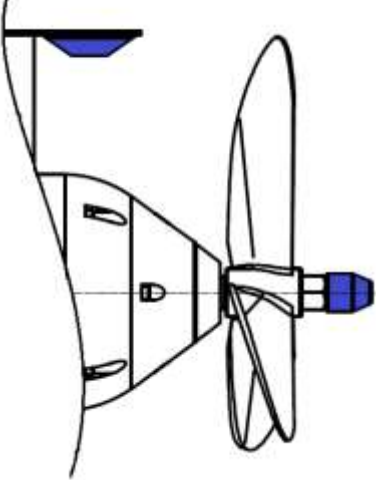




**The future  
needs new drive**

# Sacrificial anodes



| installation position   | picture   | Article no. | description   |
|---|---|-------------|---|
|  |   | 101362      | sacrificial anode for GP 3fl. sailboat propellers <b>freshwater</b> |
|   |  | 101363      | sacrificial anode for GP 3fl. sailboat propellers <b>salt water</b> |
|   |  | 101660      | sacrificial anode for GP 3fl. sailboat propellers <b>freshwater</b> |
|   |  | 101661      | sacrificial anode for GP 3fl. sailboat propellers <b>salt water</b> |

| installation position   | picture   | Article no. | description  |
|---|---|-------------|--|
|    |    | 101360      | sacrificial anode for GP fixed propeller <b>freshwater</b>         |
|   |    | 101361      | sacrificial anode for GP fixed propeller <b>salt water</b>         |
|   |    | 101364      | sacrificial anode for GPV 2fl. folding propeller <b>freshwater</b> |
|   |   | 101365      | sacrificial anode for GPV 2fl. folding propeller <b>salt water</b> |
|  |  | 101398      | sacrificial anode for Sail-Drive <b>freshwater</b>                 |
|   |  | 101399      | sacrificial anode for Sail-Drive <b>salt water</b>                 |

| installation position   | picture   | Article no. | description                                  |
|---|---|-------------|--|
|  |    | 144362      | sacrificial anode for AC-U <b>freshwater</b> |
|   |    | 137873      | sacrificial anode for AC-U <b>salt water</b> |
|   |    | 141289      | sacrificial anode for ACA <b>freshwater</b>  |
|   |  | 140235      | sacrificial anode for ACA <b>salt water</b>  |

# Repair kits

There is also a repair kit available for the GP series.

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.

You will find the contact address of contractual partners on our homepage [www.kraeutler.at](http://www.kraeutler.at) or you call us +43 5577 82534 0.

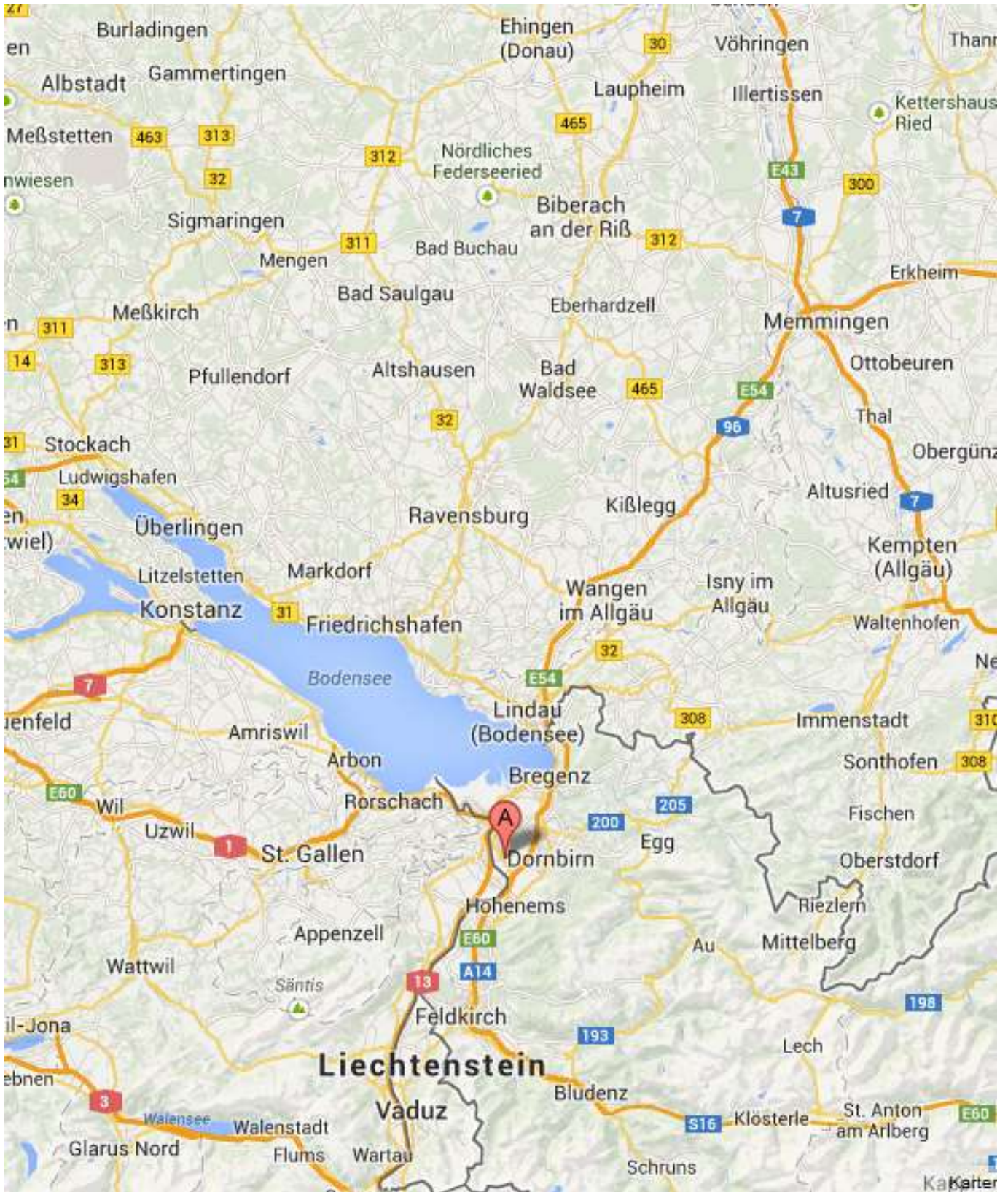
Depending on engine size, there are three different repair kits:

- 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







Kräutler  
Elektromotoren



Service rund um den Motor



Elektromotoren für Segelboote



Elektromotoren für Motorboote



Industriemotoren



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