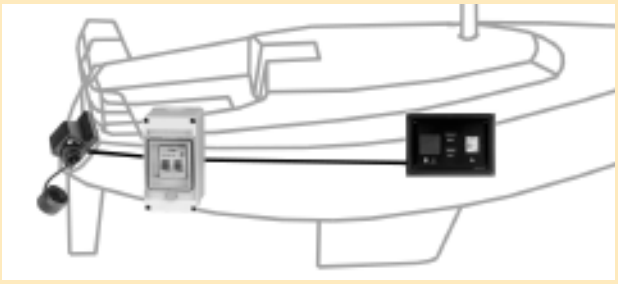
SHORE POWER CONNECTION UNIT

Shore power connections are installed on-board to ensure a safe and problem-free power supply in accordance with GL - Germanischer Lloyd safety regulations and the European Standards EN ISO 13297 for AC power supply.
The main element is a double pole RCBO leakage protector, which separates the on-board AC- system from the shore power supply in case of a fault. In order to facilitate the installation we use double pole RCBO leakage protectors. They combine a leakage protector, which interrupts the power by means of a 30 mA and a line protector in case of a short. Important is the use of a double pole switch, because on board of yachts the life (L) and the neutral (N) are not well defined. At some power supply connectors the life (L) and neutral (N) could be interchanged.
Please pay attention to use watertight or -protected power connectors. If they are installed outside and exposed to rain, protection class should be IP 55, if the shore power connector could be flooded or underwater for a short time, the protection should be IP 56.



When mounting a shore power connection unit more than three meters far from the source, a double pole circuit breaker is necessary near the shore power connection on board to protect against electrical accidents. Cables for AC 230 V installation have to be installed well protected, best in cable ducts.
Please take care that the AC 230V and the DC 12/24V wiring is installed in separate channels.

FEATURES OF THE PHILIPPI SHORE POWER CONNECTION UNITS

Our shore power units are built according to EN ISO 13297 using best components available.
Included in the delivery is a manual and a CE - certification in case of need of an acceptance certification .The self-extinguishing plastic housing protects against inadvertent contact with terminals. The controls are fitted on annodized aluminium faced plates with plastic coating.

The new shore power indication light shows the correct connection to the shore power supply. A green light means: all correct. A red light means: L and N are changed.
If the red light is flashing means that there is a heavy fault like a non connected protective earth conductor and the system isn't operational.

Encased terminals ensure protection against accidental contacts.
A simple and sure connection via through lead clamps outside of the housing. This means a shure appliance connection without problems.

LAE 100 Order-No.: **0 1000 1003**

Shore power connection unit for 230 V/50 Hz cycles supply. Connection on rear side of unit for 230 V via through lead clamps.

RCBO leakage protector	RCBO 16A/0,03A 2-pole
Dimensions	W 150 x H 185 x D 100 mm
Cut-out measurements	W 125 x H 160 mm

LAE 101 Order-No.: **0 1000 1010**

Shore power connection unit for 230 V/50 Hz cycles supply and Schuko-Socket. Shore power indication light. Connection at rear side of unit for 230 V via through lead clamps.

RCBO leakage protector	RCBO 16A/0,03A 2-pole
Dimensions	W 185 x H 150 x D 100 mm
Cut-out measurements	W 160 x H 125 mm

SHORE POWER CONNECTION UNIT

LAE 110 Order-No.: **0 1000 1100**

Shore power connection unit for 230 V/50 Hz cycles supply and Schuko-Socket. Shore power indication light and 2 circuit breakers 10 amps for charger and heater. Connection at rear side of unit for 230 V via through lead clamps.

RCBO Leakage protector	RCBO 16A/0,03A 2-pole
Dimensions	W 260 x H 185 x D 100 mm
Cut-out measurements	W 235 x H 160 mm

LAE 220 Order-No.: **0 1000 2201**

Shore power connection unit for 230 V/50 Hz supply. Circuits are connected inside to the clamps of the 2-pole automatic RCBO leakage protector. Cable lead with grommets. Watertight full plastic housing with flap cover. Protective system IP 65.

RCBO Leakage protector	RCBO 16A/0,03A 2-pole
Dimensions	W 80 x H 150 x D 97 mm

LAE 205 Order-No.: **0 1000 2050**

Double pole circuit breakers switch to protect wiring from the shore power connection and the unit with 3m or more.

Circuit breaker	MCB 16 A 2-pole
Dimensions	W 80 x H 150 x D 97 mm

BOW STERN SWITCH OVER

If there is a shore power connection for each bow and stern a double pole switch must be used for separation of the two provided inputs.
The switch keeps the unused connectors free of potential. If no switch is used, dangerous voltage occurs because the pins at the flange plug are at AC main power voltage.

CAG 20 BH

LAE 241

CAG 20 BH Order-No.: **6 4120 2111**

Switch over to select two feed lines (bow / stern), **manual**, max. 25 A

Dimensions	W 82 x H 92 x D 92 mm

LAE 241 Order-No.: **0 1000 2410**

Switch over to select two feed lines, **automatic**, max. 16 A

Dimensions	W 94 x H 94 x D 81 mm

LAE 210 Order-No.: **0 1000 2101**

Shore power connection unit for 230V/50Hz supply with additional socket. Power connection internally connected to clamps of the automatic double pole RCBO leakage protector. Cable lead with grommets. Water tight full plastic housing with flap cover. Protective system IP X4.

RCBO Leakage protector	RCBO 16A/0,03A 2-pole
Dimensions	W 80 x H 170 x D 92 mm

LAE 230 Order-No.: **0 1000 2300**

Shore power connection unit for 230V/50Hz supply with 4 additional circuit breakers switches, type MCB 10. Power connection internally connected to clamps of the automatic double pole RCBO leakage protector. Cable lead with grommets. Water tight full plastic housing with flap cover. Protective system IPX4.

RCBO Leakage protector	RCBO 16A/0,03A 2-pole
Circuit breaker	2 x MCB 10 (10 A) 2-polig
Dimensions	W 160 x H 200 x D 115 mm

SWITCH OVER UNIT

Connection of gensets and inverters according to EN/ISO 13297

For additional AC power sources on board, as a genset and/or inverter, all poles must be separated by switching device. This will prevent a simultaneous connection of multiple sources in the on-board system. Additionally, the switch over unit must have a voltmeter. Control lights show the availability of power sources. During the use of an inverter the operating of a charger must be excluded because the charger would use the power from the inverter and the batteries would be discharged unintentionally without any use.

LAE 111 Order-No.: **0 1000 1110**

Combined shore/genset or shore/inverter power unit for AC-power 230 V/50 Hz. with double pole switch over, current rating max. 25A, power-indicationlight shows correct power connection, voltmeter 250 V. 4 double pole thermal circuit breakers 10A. Connection via through lead clamps on the rear of the unit

RCBO Leakage Protector	RCBO 25A/0,03A 2-pole
Dimensions	W 260 x H 185 x D 100 mm
Cut-out measurements	W 235 x H 160 mm

CAG 20 LG

Leer CA

CAG 20 LG Order-No.: **6 4120 2110**

Manual switch over to select two feed lines (shore/genset), max. 25 A

Dimensions	W 82 x H 92 x D 92 mm

Blank CA Order-No.: **0 2900 2060**

Blank plate for easy mounting of a rotary selector switch of the series CH 16 for example in a wooden wall. Delivery without rotary selector switch.

Dimensions	W 70 x H 70 x D 3 mm

ROTARY SELECTOR SWITCH

For assembly on front plates with a max. thikkness of 5 mm. Bigger thickness please use blank panel CA.

Switch	Main switch 0-1	Shore generator switch over 1-0-2	Shore Inverter switch over 1-0-2	Shore generator inverter switch over 1-0-2-3	Shore generator inverter switch over 1-0-2-3, with limit on use of charger while inverter
Type	**CH 16 A 291**	**CH 16 A 211 LG**	**CH 16 A 211 LW**	**CH 16 A 251**	**CH 16 D 926**
Order-No.:	**6 4020 2910**	**6 4020 2110**	**6 4020 2111**	**6 4020 2510**	**6 4020 7980**
Max. load	25 A	25 A	25 A	25 A	25 A
Front/Mounting depth	48 x 48/44 mm	48 x 48/58 mm	48 x 48/58 mm	48 x 48/86 mm	48 x 48/86 mm
Type	**CA 63 A 291**	**CA 63 A 211 LG**	**CA 63 A 211 LW**	**CA 63 A 251**	**CA 63 D 926**
Order-No.:	**6 4042 2910**	**6 4042 2110**	**6 4042 2111**	**6 4042 2510**	**6 4042 7980**
Max. load	63 A	63 A	63 A	63 A	63 A
Front/Mounting depth	64 x 64/43 mm	64 x 64/56 mm	64 x 64/56 mm	64 x 64/81 mm	64 x 64/81 mm

Switch over of several power sources

If a genset and/or inverter will be connected additionally to the shore power connection into an existing on-board AC-system it is necessary to use switch over units. They separate and switch over safely all power sources. The switch over units have a delay time when switching among different sources. So the risk of a short circuit, caused by phase-shift in the sources and inductive load currents is prevented.
When installing a switch over unit you have to ensure that the outputs are connected to a RCBO leakage protector.

Automatic switch over units are useful for comfortable switching over between shore-/ onboard-genset- and/or inverters. The new switch over units of the series LAU are measuring the input voltage of each source and connect them to the on-board system if the voltage is high enough for the intended need (voltage & timewindow adjustable). Because of this, an AC-genset isn't connected before it is ramped up correctly and reached its voltage.

The switch over units LAU are prepared for the connection to the philippi PBUS. In connection with the system monitor PSM such factors as switch over delay time and voltage threshold are adjustable to each power supply source.
An additional power output circuit enables an exclusion for example of the charger during the use of an inverter; because then the batteries would be discharged unintentionally without use.

The switch over units can be used either as only switch over units for existing AC-systems or with integrated RCBO leakage protector. In addition there is space to integrate optional components such as an AC-transducer ACW (see page 32) or double pole circuit breakers MCB. While integrating an AC-transducer ACW the performance data of the AC-system could be displayed on the system monitor PSM.
Optional the shore power units can be designed and built to your special needs regarding the amount and power output of the sources and consumers. The units shown are a small example of the varieties possible. Please don't hesitate to ask for more information.

LAU 216 Order-No.: **0 1100 2160**

Automatic switch over unit **for 2 inputs such as shore power / genset.**
Current rating max. 16 A (3,6 kW), IP X4.

Dimensions W 160 x H 200 x D 115 mm

LAU 216 F Order-No.: **0 1100 2161**

Automatic switch over unit **for 2 inputs such as shore power / genset including a RCBO leakage protector** 16 A/30 mV. Housing prepared for installation of an AC-transducer ACW. Current rating max. 16 A (3,6 kW), IP X4.

Dimensions W 266 x H 200 x D 115 mm

LAU 325 Order-No.: **0 1100 3250**

Automatic switch over unit **for 3 inputs**.
Current rating: shore + inverter max. 16 A, genset max. 25 A (6 kW).

Dimensions W 195 x H 200 x D 115 mm

LAU 340 Order-No.: **0 1100 3400**

Automatic switch over unit **for 3 inputs**.
Current rating: shore + inverter max. 16 A, genset max. 40 A (9 kW).

Dimensions W266 x H 200 x D 115 mm

LAU 325 F Order-No.: **0 1100 3251**

Automatic switch over unit **for 3 inputs** with integrated **RCBO leakage protector** 25 A/30 mV. Current rating: shore + inverter max. 16 A, genset max. 25 A (6 kW). Space for installation of an AC-transducer ACW.

Dimensions W 448 x H 280 x D 160 mm

LAU 340 F Order-No.: **0 1100 3401**

Automatic switch over unit **for 3 inputs** with integrated **RCBO leakage protector** 25 A/30 mV. Current rating: shore + inverter max. 16 A, genset max. 40 A (9 kW). Space for installation of an AC-transducer ACW.

Dimensions W 448 x H 280 x D 160 mm

SHORE POWER CONNECTOR

The new MP16 shore power system has been designed to hook up your boat quickly and easily.
Based on the world standard CEE connectors this system offers a reliable and approved shore power connection.
The corrosion resistance stainless steel power inlet adds to the finishing touch of every boat. Easy locking waterproof cap (IP 56) .
Attention: normal CEE-coupling plugs cannot be used in connection with the MP16-10!

Integrated LED power indicator

Electric marine cord sets with moulded connectors to PUR cable offer the best watertight, rugged and reliable construction.

- **MPC 2,5-15, 3x2,5 mm², 15m,** for MP16/10 — Order-No.: **7 0050 2821**
- **MPC 2,5-25, 3x2,5 mm², 25m** for MP16/10 — Order-No.: **7 0050 2822**
- **MPC 4-25, 3x4 mm², 25m** for MP 32/16 — Order-No.: **7 0050 2832**

Finished manufactured cable with moulded CEE coupling plug and socket with protecting cap. Yellow weatherproof PUR cable type HO7BQ-F.

- **MP 16-10** — Order-No.: **7 0050 1610**

Flange plug with stainless steel housing 16A
Outer-ø 87 mm, hole-ø 48 mm, -depth 52 mm.

- **MP 32-16** — Order-No.: **7 0050 3216**

Flange plug with stainless steel housing 16A
Outer-ø 107 mm, hole-ø 75 mm, -depth 100 mm.

- **MPS 16-10** — Order-No.: **7 0050 1611**

Coupling plug for self mounting connecting cable.(without indication-LED) 16A.

- **MPS 32-16** — Order-No.: **7 0050 3217**

Coupling plug for self mounting connecting cable.(without indication-LED) 32A.

- **MPB** — Order-No.: **7 0050 7021**

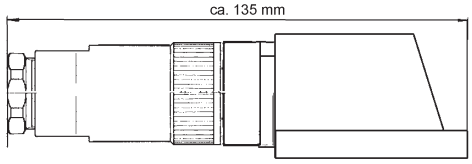
Shore power organizer bag

- **HO7BQ-F,3x2,5mm²** — Order-No.: **7 0050 2530**
- **HO7BQ-F, 3x4 mm²** — Order-No.: **7 0051 4030**
- **HO7BQ-F, 3x6 mm²** — Order-No.: **7 0051 6030**

Yellow watertight PUR - cable HO7BQ-F

WATERTIGHT CONNECTOR FOR SHORE POWER 230V/50HZ

Complete plug connection for shore power connection 230V/50Hz - 16A "RS 692 Land". Includes: coupling socket and flange plug (2 pole + ground), two protective caps and angular housing with compact dimensions.
Ideal for space saving on board. Protective system - IP 67.
To protect against inadvertently damaging of the coupling plug you can use the stainless steel protective clamp.



- **570** — Order-No.: **0 0570 0000**

Stainless steel protective clamp to prevent damage of angular mounted round plug of the 692 series.

- **RS 692 Land GL/DK** — Order-No.: **4 0692 3002**

Complete plug connector for shore power supply 230 V/50 Hz -16 A (2+PE).
Includes coupling socket, flange plug, two protection caps and angularhousing.

- **RS 692 Land GL** — Order-No.: **4 0692 3003**

Identical to RS 692-Land GL/DK, but without angular housing (no picture).

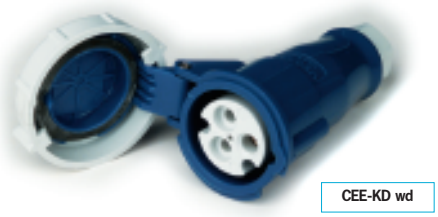
Matching connecting cable (see page 88)

- **H07RN-F 3 x 2,5 mm** — Order-No.: **5 0730 2530**
- **H07RN-F 3 x 2,5 mm - 25 m** — Order-No.: **5 2730 2530**

CEE-Connection with protective system IPX7

CEE shore power waterproof built on plug 2+PE, 230V/50Hz - 16A is designed to be mounted on deck or at the stern of yachts. The angular build on housing of the plug allows easy handling.

CEE-GS wd



CEE-KD wd

CEE-GS wd Order-No.: **6 0602 3569**

Waterproof CEE built-on plug 2+PE, 230V/50Hz - 16A with threaded terminal end, Protective system IPX7.

Dimensions L 150 x W 75 x H 90 mm

CEE-KD-wd Order-No.: **6 0600 0540**

Waterproof CEE-coupling socket 2+PE, 230V/50Hz - 16A with screw hold, IPX7.

Dimensions L 160 x ⌀ 79 mm

CEE-KS Order-No.: **6 0003 6504**

CEE coupling plug 2+PE, 230V/50Hz - 16A. Threaded terminal end.
Protective system IP X4/Splash proof

Dimensions L 150 x W 75 x H 90 mm

CEE-KD Order-No.: **6 0003 6502**

CEE coupling socket 2+PE, 230V/50Hz - 16A.
Threaded terminal end

Dimensions L 133 x W 52 x H 72 mm

CEE-GSR Order-No.: **6 0003 8160**

CEE built-in unit plug with cover, 2+PE, 230V/50Hz - 16A.
Protective system IP 66 - splash proof

Dimensions W 83 x H 75 x D 103 mm

CEE-WKD Order-No.: **6 0003 6524**

CEE Angular socket 2+PE, 230V/50Hz - 16A Threaded terminal end. Protective system IP X4 - splash proof

Dimensions L 90 x W 100 x H 55 mm

CEE-GSS Order-No.: **6 0003 6513**

CEE built-in unit plug with sliding cover, 2+PE, 230V/50Hz - 16A. Protective system IP X4 - Splash proof

Dimensions W 100 x H 122 x D 130 mm

CEE-GSK Order-No.: **6 0003 6511**

CEE built-in unit plug with flap cover, 2+PE, 230V/50Hz - 16A. Protective system IP X4 - splash proof

Dimensions W 103 x H 163 x D 80 mm

Watertight CEE connector for installation in external protected area.

CEE-KS

CEE-KD

CEE-WKD

CEE-GSK

CEE-GSS

CEE-GSR

US Shore power connection like NEMA standard

MGS wd Order-No.: **7 0007 0303**

Waterproof stainless built in plug, 3 pole, 230V/50Hz - 16A with screw hold,. Incl. rubber gasket. Built-in depth 77 mm

Dimensions W 105 x H 82 mm

MKD wd Order-No.: **7 0007 0304**

Waterproof coupling socket 3 pole, 230V/50Hz - 16A with protecting cap. Matching to MGS wd.

Dimensions D 80 x L 120 mm

MGS wd

MKD wd