Skyllermarks
Power demand quality

SUTARS SOCKETS

Who doesn't want to improve the charging capacity?

Common Busbars

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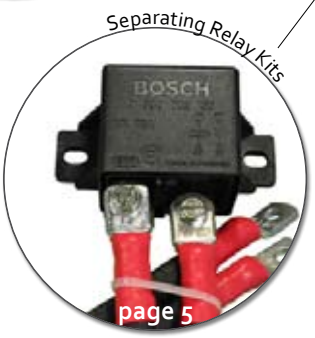
Separating Relay Kits



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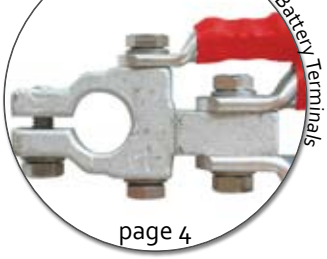

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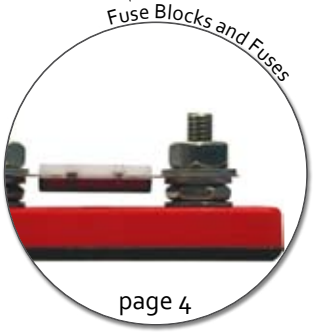
Fuse Blocks and Fuses



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Catalogue v1

www.skyllermarks.se

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GlobaLiTH is an all electrical vehicle built by students from Linköping Institute of Technology in cooperation with Skyllermarks. The vehicle employs the latest in lithium-technology and has electrical hub engines which run on 48 Volts. To make sure enough power reaches the engines all wiring is made with Skyllermarks range of products.

POWER DEMANDS QUALITY

Skyllermarks and Sutars construct, produce and market products for better electrical systems in boats, vehicles and small homes. Our range of products are made with the highest marine quality in mind.

Double the charging capacity

Upgrade your electrical system with Skyllermarks's products and optimize your charging. Most systems will double their charging capacity, some will increase it tenfold.

Marine Quality

We only sell high quality products with unprecedented service life, since we find it frustrating to redo the same work over and over again.

Technical development

We deliver systems for the modern boat owner. Technical development is monitored closely to ensure that new knowledge benefit our costumers as soon as possible.

Welcome to a better boat!

Stefan Skyllermark, CEO

Have you got both a cellphone and a plotter? Sockets! Sockets! Sockets! [Page 8]

An electrical makeover with Skyllermarks Power Kits [Page 3]

A Voltage Gauge gives you the status of your batteries [Page 8]

Separate your starter battery without loosing charge [Page 5]

SKYLLERMARKS POWER KITS

Poor electrical connections and thin cables causes many boats to get only a fraction of the potential charge. We know it can be hard to figure out what is needed to make sure that your electrical system works properly. That is why we have gathered the most important products to get you started in three power kits, designed for the size of your boat.

Skyllermarks Power Kits are easily assembled in your boat, after which the required cable lengths between connection points can be measured. Then cables can be ordered and attached to the connection points. The result is a high quality electrical system which yields at least double charge for most systems. The unparalleled service life is a bonus.

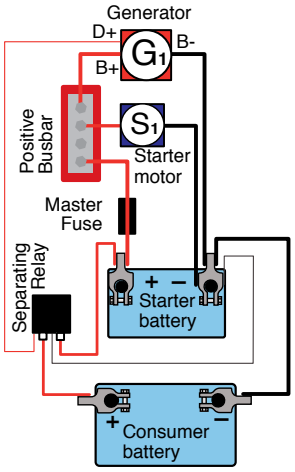
Who doesn't want to improve the charging?

Skyllermarks Power Kit No 1

Power Kit no 1 is suitable for one engine with one starter battery and one consumer battery (12 V).

Separating Relay Kit 75 A 12 V	1 pc
Battery Terminal (-) 50 mm²	2 pcs
Battery Terminal (+) 50 mm²	2 pcs
Common Busbar 4 x 50 mm² red	1 pc
Protective Cover S	1 pc
Fuse Block Secure XS	1 pc
Protective Cover XS	1 pc
Master Fuse with Cover 400 A	2 pcs
Assembly Instruction	1 pc

Part No.: E 2000

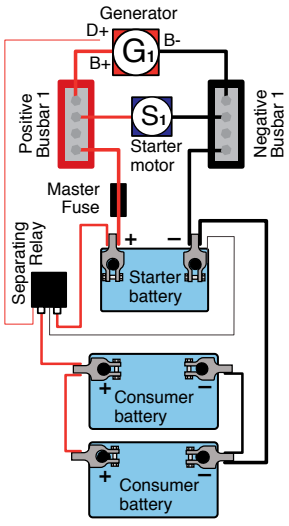


Skyllermarks Power Kit No 2

Power kit for one engine with one starter battery and two consumer batteries (12 V).

Separating Relay Kit 75 A 12 V	1 pc
Battery Terminal (-) 50 mm²	3 pcs
Battery Terminal (+) 50 mm²	3 pcs
Common Busbar 4 x 50 mm² red	1 pc
Common Busbar 4 x 50 mm² black	1 pc
Protective Cover S	1 pc
Fuse Block Secure XS	1 pc
Protective Cover XS	1 pc
Master Fuse with Cover 400 A	2 pcs
Assembly Instruction	1 pc

Part No.: E 2010

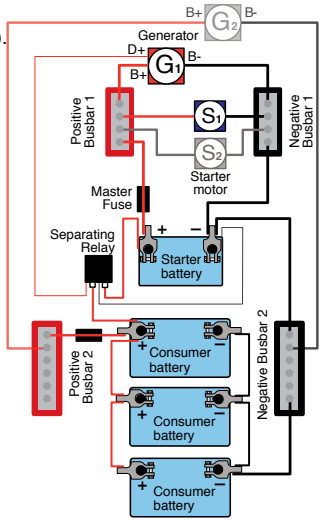


Skyllermarks Power Kit No 3

Power kit for one engine with one starter battery and three consumer batteries (12 V).

Separating Relay Kit 75 A 12 V	1 pc
Battery Terminal (-) 50 mm²	4 pcs
Battery Terminal (+) 50 mm²	4 pcs
Common Busbar 4 x 50 mm² red	1 pc
Common Busbar 4 x 50 mm² black	1 pc
Common Busbar 6 x 50 mm² red	1 pc
Common Busbar 6 x 50 mm² black	1 pc
Protective Cover S	1 pc
Protective Cover M	1 pc
Fuse Block Secure XS	1 pc
Fuse Block XS	1 pc
Protective Cover XS	2 pcs
Master Fuse with Cover 500 A	2 pcs
Master Fuse with Cover 100 A	2 pcs
Assembly Instruction	1 pc

Part No.: E 2020



Assembly instructions for your power kit

Buy a power kit of appropriate size for your needs.

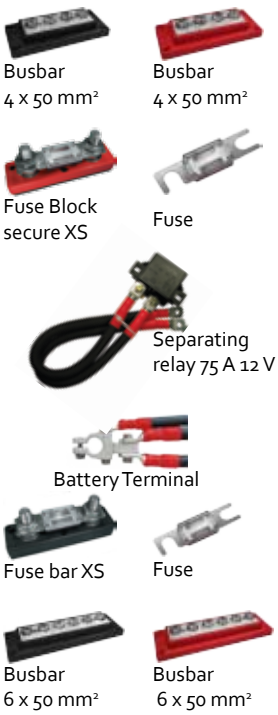
Mount the Common Busbars close to the generator and the starter motor. Mount a Protective Cover over the red Common Busbar.

Mount the red Fuse Block is mounted as close to the starter battery as possible. Mount the Protective Cover XS over the Fuse Block Secure.

The Separating Relay is mounted so that the supplied cables can be connected between the starter battery and the first consumer battery. If the batteries are placed to far apart preventing this, it is preferred only to extend one of the cables.

After that, connect the battery terminals to the plus and to the minus poles on your batteries.

If you've purchased Power Kit No 3; mount the black Fuse Block XS as close to the consumer batteries as possible. Attach the Protective Cover over the black Fuse Block. The 6 x 50 mm² Common Busbars should be placed in an appropriate place after the Fuse Block XS.



Now it is time to measure how long the cables in your new system should be. Measure the distance between the generator, Common Busbars, Fuse Blocks and Battery Terminals and write it down on the Order Form for Pre-pressed Cables that came with your Power Kit. Extra Order Forms can be printed from our web site.

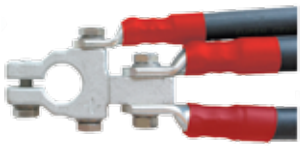
When you have measured, you can either order the cables from your local retailer or make them yourself with rented tools. Finally screw the cables firmly in place and you're done. Well done!

MULTIPLE CONNECTION BATTERY TERMINALS

To achieve the best possible function and durability in your electrical system, all cables should end in a cable lug. To enable lug connection with battery poles we have constructed the unique multiple connection battery terminal. Each terminal can house up to four thick cables.

All contact surfaces are milled flat and with the included head bolts you can achieve extreme connective force. The material in the battery terminals is tinned brass and all bolts are from stainless steel

Excellent connection with milled surfaces



Battery Terminal 50 mm²

Cable area: max 2 x 35 mm² & 2 x 50 mm²
Connection: 3 x M6 head bolt
Part No.: E 0100 (-)
Part No.: E 0140 (+)

Battery Terminal 70 mm²

Cable area: max 2 x 35 mm² & 2 x 70 mm²
Connection: 2 x M6 & 1 x M8 head bolt
Part No.: E 0110 (-)
Part No.: E 0150 (+)

Battery Terminal 95 mm²

Cable area: max 2 x 35 mm² & 2 x 95 mm²
Connection: 2 x M6 & 1 x M8 head bolt
Part No.: E 0120 (-)
Part No.: E 0160 (+)

PROTECTIVE COVERS

Protective covers from transparent high impact polycarbonate. We recommend using protective covers with all fuse blocks and all positive busbars.

Stainless steel mounting screws are included.

Protective Cover XS

For Fuse Blocks
Fits: E 0400, E 0402
Mounting screw: 2 x 4.2 x 16 mm
Part No.: E 0602

Protective Cover XXS

For Common Busbars
Fits: E 0331.
Mounting screw: 2 x 4.2 x 16 mm
Part No.: E 0603

Protective Cover S

For Common Busbars
Fits: E 0303, E 0313, E 0841.
Mounting screw: 2 x 4.2 x 16 mm
Part No.: E 0600

Protective Cover M

For Common Busbars
Fits: E 0301, E 0306, E 0316, E 0321, E 0831.
Mounting screw: 2 x 4.2 x 16 mm
Part No.: E 0610

FUSE BLOCKS

If something were to go wrong in your boat a fuse could very well be the thing saving your boat from disaster by quickly cutting the power.

In our homes we always have a main fuse and all new boats have a master fuse directly after the batteries. However, old boats often miss this feature.

Fuse Block Secure XS has special cut screws and washers to keep the master fuse from getting twisted when you tighten the nut.
Fuse Block XS is a simplified model recommended only for master fuses with max 250 A.

Specification

Size: XS
Materials: Stainless steel and glass fiber reinforced PP.
Measurements (L x B x H): 105 x 30 x 42 mm
Weight: 135 g

Fuse Block Secure XS

Amperage: max 750 A.
Cable area: max 120 mm².
Connection: 2 x M10
Part No.: E 0400

Fuse Block XS

Amperage: max 250 A.
Cable area: max 120 mm².
Connection: 2 x M10
Part No.: E 0402

How to mount a fuse in the fuse block

It is of great importance that the fuse, nut and washers are placed in the correct order, here illustrated on the left. The fuse has to bare against the cable lug.

If you fail to follow these instructions and place a bolt or washer between the fuse and the cable lug, the fuse block run the risk of melting even before the fuse has blown.

MASTER FUSES

Skyllermarks's fuses have a cover from transparent high impact polycarbonate, which keeps you safe if the fuse blows. Unlike fuses with ceramic covers these fuses will not crack if dropped to the floor. M10 connections.

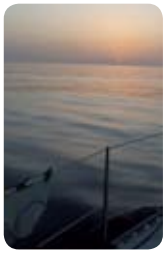
Size	Part No.:
35 A	E 0999
50 A	E 1000
80 A	E 1010
100 A	E 1020
125 A	E 1022
160 A	E 1025
200 A	E 1030
250 A	E 1035
300A	E 1040
400 A	E 1050
500 A	E 1060
750 A	E 1070

Fuse table from Nordic boating standard 1990

The white table shows maximal fuse size for specific cable sizes. But the size of the fuse is also dependent on the size of your battery pack. Therefore, in most cases we recommend slightly smaller fuse.

Cable area	Continuous amperage	Fuse against overcharging	Fuse against short circuit
1 mm²		6 A	
1.5 mm²	9 A	10 A	20 A
2.5 mm²	15 A	16 A	35 A
4 mm²	16 A	20 A	35 A
6 mm²	21 A	25 A	63 A
10 mm²	28 A	35 A	100 A
16 mm²	37 A	50 A	160 A
25 mm²	49 A	63 A	200 A
35 mm²	60 A	80 A	315 A
50 mm²	76 A	100 A	400 A

COMMON BUSBARS OF EXCELLENT MARINE QUALITY



Good Busbars supply great connective pressure and corrosion resistance. Here you find well dimensioned high quality Common Busbars which will eliminate all unnecessary voltage drop. For superior conductivity connect only one cable per head bolt.

All Skyllermarks Busbars are made from tinned brass, placed in casings from fiberglass reinforced polypropylene. All screws and bolts are stainless. Mounting template is included.

There are three sizes of casings: XXS, S and M.

Size	Length	With	Height	Weight
XXS	115 mm	28 mm	16 mm	125 g
S	126 mm	55 mm	20 mm	290 g
M	170 mm	55 mm	20 mm	425 g

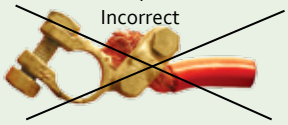
Why use Busbars and multiple connection Battery Terminals?

A crucial part of a healthy electric system in your boat is good connections. This is because a large part of the system's voltage drop can come from poor conductivity through the connections.

Oxygen is an ever present voltage thief. It causes corrosion which leads to substantial voltage drops in all infected connections. To prevent this make sure that the connection is tight enough not to enter. Otherwise a membrane of corroded, less conductive, material will separate the surfaces

Clamping Battery Terminals such as the one below will not produce enough pressure with poor connectivity as a result. The air will also in time corrode the strands one by one and further compromise the conductivity.

Incorrect



Correct

Common Busbar 7 x 6 mm²

Size: XXS
Connection: 1 x M6 & 7 x M5 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0330 (black)
Part No.: E 0331 (red)

Common Busbar 4 x 50 mm²

Size: S
Connection: 4 x M8 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0302 (black)
Part No.: E 0303 (red)

Common Busbar 3 x 95 mm²

Size: S
Connection: 3 x M8 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0312 (black)
Part No.: E 0313 (red)

Common Busbar 1 x 70 + 8 x 16 mm²

Size: S
Connection: 1 x M8 & 8 x M6 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0840 (black)
Part No.: E 0841 (red)

Common Busbar 6 x 50 mm²

Size: M
Connection: 6 x M8 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0300 (black)
Part No.: E 0301 (red)

Common Busbar 3 x 50 + 8 x 16 mm²

Size: M
Connection: 3 x M8 & 8 x M6 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0305 (black)
Part No.: E 0306 (red)

Common Busbar 5 x 95 mm²

Size: M
Connection: 5 x M8 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0315 (black)
Part No.: E 0316 (red)

Common Busbar 4 x 120 mm²

Size: M
Connection: 4 x M8 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0320 (black)
Part No.: E 0321 (red)

Common Busbar 1 x 70 +14 x 16 mm²

Size: M
Connection: 1 x M8 & 14 x M6 head bolt
Mounting screw: 4 x 4.8 x 25 mm
Part No.: E 0830 (black)
Part No.: E 0831 (red)

SEPARATING RELAY KITS

To ensure always having enough power in your starter battery you should separate it from the consumer batteries when the engine is off. The best way to do so is by installing an automatic separating relay. In contrast to separating diodes, the relay introduce virtually no voltage drop. Diodes on the other hand cut charging by half with their 0.7 V drop.

The kits include insulated terminals and stainless mounting screws.

Separating Relay Kit 12 V 75 A

Skyllermarks's 12 V 75 A separating relay kit with tinned marine quality cables has almost no drop in voltage. It separates starter and consumer batteries automatically.

Cable area: 25 mm²
Length on cables: 35 cm
Connection on cable: 2 x M6
Part No.: E 0800

Separating Relay Kit 24 V 50 A

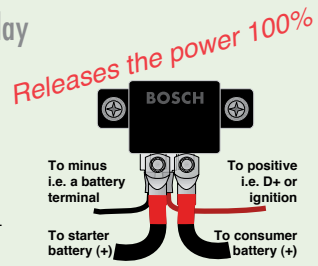
Skyllermarks's 24 V 50 A separating relay kit with tinned marine quality cables has almost no drop in voltage. It separates starter and consumer batteries automatically.

Cable area: 25 mm²
Length on cables: 35 cm
Connection on cable: 2 x M6
Part No.: E 0805

How to connect a separating relay

The thick cables are connected to the positive side of the starter battery and the positive side consumer battery respectively.

A thinner cable (e.g. 2.5 mm²) goes from one of the 6.3 mm push-on male terminal to either the ignition or the D+ (or 61, or STA) on the generator. This cable is used to maneuver the relay. The other push-on terminal goes to negative (ground).



Neither the thin cables nor the thicker ones are dependent of polarity. Hence, there is no risk of connecting the relay "backwards".

TINNED CABLE WITH RUBBER ISOLATION

Skyllermarks's tinned rubber cable is flexible and easy to install.

The rubber isolation is durable and can withstand oil and wear better than isolation made of PVC. Furthermore, each strand in the cables is covered in a layer of tin to withstand the marine environment for many years to come

Copper deformation hardens and becomes brittle when exposed to vibrations. This will break the strands one by one. To minimize this effect our cables have an unusually high strand count.

Durable and flexible

Technical Specification

Size:	16 - 120 mm²
Color:	Black
Isolation:	Rubber
Wire:	Tinned copper
Wire thickness:	0,21 mm
Lowest temperature:	-25 °C
Highest temperature:	80 °C

Area	Outer diam.	Weight	Part No.:
16 mm²	Ø 9.5 mm	200 g/m	FK 0290
25 mm²	Ø 11 mm	300 g/m	FK 0310
35 mm²	Ø 12 mm	400 g/m	FK 0330
50 mm²	Ø 14 mm	560 g/m	FK 0350
70 mm²	Ø 16.5 mm	780 g/m	FK 0370
95 mm²	Ø 18.5 mm	1010 g/m	FK 0390
120 mm²	Ø 20 mm	1250 g/m	FK 0410

The cable is delivered in lengths of 25, 50 & 100 m
Part No.: FK XXX1 25 m
Part No.: FK XXX2 50 m
Part No.: FK XXX3 100 m

HEXAGONALLY CRIMPED TINNED CABLES

Hexagonally Crimped Tinned Cables with doubly annealed Tubular Copper Cable Lugs which lets the current flow better

Flexible and easy-to-install cable with high vibration toughness due to high strand count. Air tight Tubular Copper Cable Lugs and supporting Heat Shrink Tubing in each end. The rubber isolation is much more resistant then to wear and thicker than other isolators.

The idea is not having to change cables ever again.

Area	Length on cable	Cable connection	Color	Part No.:
25 mm²	20 cm	2 x M6	Red	KS 1001
25 mm²	20 cm	2 x M6	Black	KS 1002
25 mm²	35 cm	2 x M6	Red	KS 1040
25 mm²	35 cm	2 x M6	Black	KS 1050
25 mm²	50 cm	2 x M6	Red	KS 1060
25 mm²	50 cm	2 x M6	Black	KS 1070
35 mm²	70 cm	2 x M6	Red	KS 1095
35 mm²	70 cm	2 x M6	Black	KS 1096
35 mm²	90 cm	1 pc M6 + 1 pc M8	Red	KS 1110
35 mm²	90 cm	1 pc M6 + 1 pc M8	Black	KS 1120
35 mm²	115 cm	1 pc M6 + 1 pc M8	Red	KS 1130
35 mm²	115 cm	1 pc M6 + 1 pc M8	Black	KS 1140
50 mm²	140 cm	1 pc M6 + 1 pc M8	Red	KS 1170
50 mm²	140 cm	1 pc M6 + 1 pc M8	Black	KS 1180

Great contact and outstanding service life

TOOLS TO GET THE JOB DONE

Proper crimping of the Tubular Copper Cable Lugs onto the cable is essential, especially if you want to avoid having to redo the work after a few years. Skyllermarks products include Crimping Tools for cables with diameter ranging from 0.5 to 120 mm².

The larger Crimping Tools (6 - 50 mm², 16 - 95 mm² & 10 - 120 mm²) have a system with rotating hexagon shaped dies in different sizes, no loose parts that can be lost. The Crimping Tools are designed to give an extra high crimping force and ensure proper air tight crimping of the Cable Lugs. The 6 - 50 mm² Crimping Tool is especially suitable for work in confined spaces, due to its compact size.

Cutting and stripping tool
Cable area interval: 0.25 - 120 mm²
Part No.: V 0120

Crimping tool for insulated terminals
Cable area interval: 0.5 - 6 mm²
Part No.: V 0290

Crimping tool for tubular copper cable lugs
Cable area interval: 0.25 - 10 mm²
Part No.: V 0300

Crimping tool with hexagon dies for tubular copper cable lugs
Cable area interval: 6 - 50 mm²
Part No.: V 0320

Crimping tool with hexagon dies for tubular copper cable lugs
Cable area interval: 16 - 95 mm²
Part No.: V 0330

Crimping tool with hexagon dies for tubular copper cable lugs
Cable area interval: 10 - 120 mm²
Part No.: V 0340

Why use tinned products and hexagon crimping?

When copper comes into contact with oxygen, the copper is oxidized forming verdigris. The copper oxide is greenish in color and work as an isolator. This prevents the current from flowing freely and is a catastrophe when charging your batteries.
A thin layer of tin around the copper will protect it from oxygen, preventing oxidation of the copper. This is why we market a wide selection of tinned products.

To protect the cable, the crimping is critical. Crimping tools, cable lugs and cable all have to fit together. With hexagon crimping, it is possible to prevent oxygen from reaching the copper in the cable.

We have a quality selection of products of crimping your cables and improving your electrical system once and for all.

To achieve the proper result we use our self constructed pressing equipment for all pre-crimped cables.

TUBULAR CABLE LUGS

Skyllermarks's Tubular Cable Lugs are annealed twice and tinned. The material is copper and the lugs give the cable a great corrosion resistance for many years to come.

After crimping, the cable is conical inside the lug and no air enters the cable. The annealing keeps the lugs from springing back after crimping.

Give your cables great corrosion resistance

Consumer pack

Area	Hole Ø	Quantity	Part No.:
6 mm²	Ø 6 mm	4-pack	RK 1001
6 mm²	Ø 8 mm	4-pack	RK 1002
6 mm²	Ø 10 mm	4-pack	RK 1003
10 mm²	Ø 6 mm	4-pack	RK 1021
10 mm²	Ø 8 mm	4-pack	RK 1022
10 mm²	Ø 10 mm	4-pack	RK 1023
16 mm²	Ø 6 mm	4-pack	RK 1030
16 mm²	Ø 8 mm	4-pack	RK 1040
16 mm²	Ø 10 mm	4-pack	RK 1050
25 mm²	Ø 6 mm	4-pack	RK 1060
25 mm²	Ø 8 mm	4-pack	RK 1070
25 mm²	Ø 10 mm	4-pack	RK 1080
35 mm²	Ø 6 mm	4-pack	RK 1090
35 mm²	Ø 8 mm	4-pack	RK 1100
35 mm²	Ø 10 mm	4-pack	RK 1110
50 mm²	Ø 6 mm	4-pack	RK 1120
50 mm²	Ø 8 mm	4-pack	RK 1130
50 mm²	Ø 10 mm	4-pack	RK 1140
70 mm²	Ø 6 mm	2-pack	RK 1150
70 mm²	Ø 8 mm	2-pack	RK 1160
70 mm²	Ø 10 mm	2-pack	RK 1170
95 mm²	Ø 8 mm	2-pack	RK 1180
95 mm²	Ø 10 mm	2-pack	RK 1190
95 mm²	Ø 12 mm	2-pack	RK 1200

The Tubular Cable Lugs are available in size from 1.5 - 120 mm² with drill hole diameter Ø 5 - 12 depending on size.

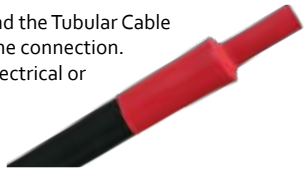
The Tubular Cable Lugs can be bought in Bulk packages containing 25, 50 or 100 pcs with their own part numbers.

In addition Angled Cable Lugs are available in 45° and 90° variants with sizes ranging from 16 - 95 mm² with drill hole diameter Ø 6 - 12 mm depending on size. Also available are Tin-plated copper tubular splices from 1.5 - 95 mm².

HEAT SHRINK TUBING

Our Heat Shrink Tubing 2:1 is made of cadmium free polyolefin. It is used to give extra support and isolation to the cable ends.

The Heat Shrink Tubing is placed around the Tubular Cable Lugs and Cable to act as isolation for the connection. Heat the Heat Shrink Tubing with an electrical or gas powered heat gun.



Consumer pack

Size	Length	Part No.:	Color
1.5 - 4 mm²	2 x 30 cm	TK 0590	red and black
6 - 10 mm²	2 x 30 cm	TK 0595	red and black
16 - 25 mm²	2 x 30 cm	TK 0600	red and black
35 - 95 mm²	2 x 30 cm	TK 0610	red and black
70 - 120 mm²	2 x 30 cm	TK 0620	red and black

Bulk

Increases durability

Size	Color	Part No.:
1.5 - 4 mm²	red	TK 0420
1.5 - 4 mm²	black	TK 0430
6 - 10 mm²	red	TK 0400
6 - 10 mm²	black	TK 0410
16 - 25 mm²	red	TK 0440
16 - 25 mm²	black	TK 0450
35 - 95 mm²	red	TK 0460
35 - 95 mm²	black	TK 0470
70 - 120 mm²	red	TK 0480
70 - 120 mm²	black	TK 0490

Gas Powered Heat Gun

Skyllermarks's Gas powered Heat Gun with piezoelectric ignition. Compact and easy to bring on board. Supplies enough heat for the Heat Shrink Tubing to wrap tightly around the cable.

Gas powered Heat Gun
Part No.: TK 1000

Gas refill
Part No.: TK 1010

CABLE CLAMP KIT

Small sized screws on e.g. the generator may break from heavy cables. Therefore, Skyllermarks recommend you to use cable clamps and cable ties to lift the weight off the screws. Stainless mounting screws are included.

Cable ties:	12 x 4.8 x 200 mm
Mounting screw:	8 x 4.2 x 16 mm
Cable clamps:	8 pcs
Part No.:	TK 0930

BATTERY HOLDER

A high quality battery holder in stainless steel and a strap in woven polyester with a stainless buckle to fixate one battery in your boat. Stainless mounting screws are included.

Strap:	25 mm x 1.6 m
Mounting screw:	4 x 6.3 x 25 mm
Part No.:	E 0810

TINNED CABLE WITH PVC ISOLATION

For dimensions up to 10 mm² Skyllermarks have a wide variety of tinned, PVC isolated cables. It is perfect for installation of electrical equipment in your boat or caravan.

For more power consuming installations, such as charging or starter motor, we refer to our rubber coated cables on page 6.

For more colors see www.skyllermarks.se

Specifications

Type	RK (230 V)	RKUB (80 V)
Size:	1,5 - 10 mm²	2 x 0,75 - 2 x 6 mm²
Isolation:	PVC	PVC
Conductor material:	Tinned copper	Tinned copper
Strand thickness:	0,25 mm	0,25 mm
Highest service temp.:	70 °C	70 °C

Area	Length	Color	Part No.
0,75 mm²	25 m	Red	FK 0980
0,75 mm²	25 m	Black	FK 0990
1,5 mm²	18 m	Red	FK 1000
1,5 mm²	18 m	Black	FK 1010
2,5 mm²	14 m	Red	FK 1020
2,5 mm²	14 m	Black	FK 1030
4 mm²	10 m	Red	FK 1040
4 mm²	10 m	Black	FK 1050
6 mm²	8 m	Red	FK 1060
6 mm²	8 m	Black	FK 1070
10 mm²	5 m	Red	FK 1080
10 mm²	5 m	Black	FK 1090
2 x 0,75 mm²	12 m	Red/Black	FK 1099
2 x 1,5 mm²	10 m	Red/Black	FK 1100
2 x 1,5 mm²	10 m	Brown/Brown	FK 1103
2 x 2,5 mm²	8 m	Red/Black	FK 1120
2 x 2,5 mm²	8 m	Brown/Brown	FK 1123
2 x 4 mm²	6 m	Red/Black	FK 1130
2 x 6 mm²	5 m	Red/Black	FK 1140
2 x 2.5 mm²	35 m	Red/Black	FK 1150

PVC cable in bulk

The range includes the colors yellow, blue, green and brown. All colors also come in lengths of 25, 50 & 100 m.

ISOLATED TERMINALS

Find the cable lug or connector suiting your need or choose our mix pack of assorted connectors and lugs.

Ring terminal Ø 5 mm
Quantity: 10-pack
Part No.: IK 1001 (Red, 0,5 - 1 mm²)
Part No.: IK 1002 (Blue, 1,5 - 2,5 mm²)

Ring terminal Ø 6 mm
Quantity: 10-pack
Part No.: IK 1000 (Red, 0,5 - 1 mm²)
Part No.: IK 1010 (Blue, 1,5 - 2,5 mm²)
Part No.: IK 1020 (Yellow, 4 - 6 mm²)

Fork terminal Ø 6 mm
Quantity: 10-pack
Part No.: IK 1030 (Red, 0,5 - 1 mm²)
Part No.: IK 1040 (Blue, 1,5 - 2,5 mm²)
Part No.: IK 1050 (Yellow, 4 - 6 mm²)

Pin terminal Ø 1.9 mm
Quantity: 10-pack
Part No.: IK 1060 (Red, 0,5 - 1 mm²)
Part No.: IK 1070 (Blue, 1,5 - 2,5 mm²)
Part No.: IK 1080 (Yellow, 4 - 6 mm²)

Through Connector - Fully insulated
Quantity: 10-pack
Part No.: IK 1150 (Red, 0,5 - 1 mm²)
Part No.: IK 1160 (Blue, 1,5 - 2,5 mm²)
Part No.: IK 1170 (Yellow, 4 - 6 mm²)

Push-On Female Terminal - Fully insulated. Ø 6.3 x 0.8 mm
Quantity: 10-pack
Part No.: IK 1090 (Red, 0,5 - 1 mm²)
Part No.: IK 1100 (Blue, 1,5 - 2,5 mm²)

Push-On Male Terminal. Ø 6.3 x 0.8 mm
Quantity: 10-pack
Part No.: IK 1110 (Red, 0,5 - 1 mm²)
Part No.: IK 1120 (Blue, 1,5 - 2,5 mm²)

Closed End Terminal - Fully insulated
Quantity: 10-pack
Part No.: IK 1130 (Blue, 1,5 - 2,5 mm²)
Part No.: IK 1140 (Yellow, 4 - 6 mm²)

Push-On Piggy Back Terminal. Ø 6.3 x 0.8 mm
Quantity: 10-pack
Part No.: IK 1180 (Red, 0,5 - 1 mm²)
Part No.: IK 1190 (Blue, 1,5 - 2,5 mm²)

Assortment of insulated terminals. 1.5 - 6 mm²
Contains Ring Terminals. Through Connectors Push-On Male Terminals and Push-On Piggy Back Terminals.
Quantity: 80-pack
Part No.: RK 0990

MEASURING INSTRUMENTS

How much power is lef in my batteries? Are my cables and connectors okey? Would an morning bath be apropriate? All are questions easily answered with good measuring instruments.

Would you drive around without a fuel gauge?

Voltage Gauge

One of the most important instruments onboard your boat is the Voltage Gauge. From it you read the voltage over your consumer battery package and consequently how much energy is left.

The Skyllermarks surface mounted Voltage Gauge is compact and easy to mount. With it you take charge of your energy reserve.

Mounting template is included.

Measurements (L x B x D):
60 x 36 x 27 mm
Part No.: V 2100
Price: 685 kr

Measurements (L x B x D):
60 x 36 x 27 mm
Part No.: V 2300
Price: 765 kr

Water Thermometer

It measures the water temperature under the boat. The included stainless feed through lets the sensor pass through the hull.

Current Clamp

The Current Clamp can be used to measure the charging current or leak currents. Just clamp the meter around any cable and get the magnitude of the current flowing through. The front panel is water resistant.

It can also measure resistance and voltage using the included probes.

Part No.: V 2000
Price: 1 695 kr

SOCKETS

The sockets are all built to last long in a harsh marine environment. The metal parts are all made out of nickel plated brass with high corrosion resistance. A sealing lid and UV stabilization vouch for long service life.

The inside rim keeps the accessory plugs securely fastened and the plus pole is countersunk to maximise connection. Connections are push-on 6.3 mm blade terminals. There are both 12 V and 24 V versions and all products can handle at least 16 A of current.

SOCKETS 12 V

Socket - Flush mounting, rectangular flange

Mount in a Ø 27 mm hole and fixate with two screws. Distance between the screw holes center to center is 40 mm.

Color: Black
Weight: 23 g
Part No.: 1206

Sutars sockets since 1980

Sutars has made Swedish high quality cigar lighter size sockets and accessory plugs since 1980. As of 2008 it is a part of the Skyllermarks group.

Add more sockets to your car, boat or caravan, and enjoy your electrical equipment easier. There is always a socket to fit your need.

Socket - Surface mounting

Socket housed in a plastic casing . Easy to mount with only two small screw holes. Distance between the screw holes center to center is 44 mm.

Color: Black
Weight: 43 g
Part No.: 1212

Socket - Flush mounting, round flange

Mount in a Ø 27 mm hole and fixate with three screws. Distance between the screw holes center to center is 32 mm.

Front: Ø 41 mm

Color: Black
Weight: 22.5 g
Part No.: 1216

Socket - Flush mounting, round flange

Mount socket with the included ring nut on the back side of the panel. The hole for the flush mounting should be Ø 30 - 32 mm.

Front: Ø 37 mm

Color: Black
Weight: 26.5 g
Part No.: 1218

Socket - Surface mounting

Socket housed in a plastic casing . Easy to mount with only two small screw holes. Distance between the screw holes center to center is 44 mm.

For superior life span do not mount in direct sunlight!

Color: White
Weight: 43 g
Part No.: 1213

Socket - Flush mounting, round flange

Mount socket with the included ring nut on the back side of the panel. The hole for the flush mounting should be Ø 30 - 32 mm.

For superior life span do not no not mount in direct sunlight!

Front: Ø 37 mm

Color: White
Weight: 26.5 g
Part No.: 1219

SOCKETS 24 VOLT

Socket - Flush mounting, rectangular flange

Mount in a Ø 27 mm hole and fixate with two screws. Distance between the screw holes center to center is 40 mm.

Color: Black
Weight: 23 g
Part No.: 2406

Socket - Surface mounting

Socket housed in a plastic casing . Easy to mount with only two small screw holes. Distance between the screw holes center to center is 44 mm.

Color: Black
Weight: 43 g
Part No.: 2412

Socket - Flush mounting, round flange

Mount in a Ø 27 mm hole and fixate with three screws. Distance between the screw holes center to center is 32 mm.

Front: Ø 41 mm

Color: Black
Weight: 22.5 g
Part No.: 2416

Socket - Flush mounting, round flange

Mount socket with the included ring nut on the back side of the panel. The hole for the flush mounting should be Ø 30 - 32 mm.

Front: Ø 37 mm

Color: Black
Weight: 26.5 g
Part No.: 2418

ACCESSORY PLUGS 12/24 V

The accessory plugs have wide spring loaded contact tips. The metal parts are from nickel plated brass and bronze. All models are equipped with cable strain relief and solder less screw terminals, which means simple installation. All plastic parts are UV-stabilized.

Accessory Plug - 16 A

Fits Sutars' sockets and reYellowar car sockets. Braze free connection with screws. With cable restraint. Corrosion resistant. Wiring instructions contained inside. 12/24 V.

Color: Black
Weight: 23,5 g
Part No.: 1230

Accessory Plug - 20 A

Screw terminal connectors. The three minus poles keep the plug standing straight up for better conductivity. With cable restraint. Extra high current rating at 20 A. 12/24 V.

Color: Black
Weight: 40 g
Part No.: 1240

EXTENSION CORDS 12 VOLT

Extension Socket - 16 A

Build your own extension or adapter with this socket. With cable restraint.

Color: Black
Weight: 35 g
Part No.: 1245

Accessory Adapter - 16 A

Including a female (1245) . For use with Bosch/ Hella Ø 12 mm type. Corrosion resistant, Ø 12 mm Plug with tinned wire.

Color: Black
Area: 2 x 2.5 mm²
Length: 0.3 m
Weight: 70 g
Part No.: 4531

Accessory Adapter - 16 A

Including a female (1245) and a pair of clips with 0.3 m tinned wire in between.

Note that the adapter does not have a fuse.

Area: 2 x 2.5 mm²
Length: 0.3 m
Weight: 92 g
Part No.: 5230

Extension Cord - 8 A

Including a male (1240) and a female (1245) with 3 metre tinned wire in between.

Color: Black
Area: 2 x 2.5 mm²
Length: 3 m
Weight: 230 g
Part No.: 1248

TECHNICAL FAQ

How discharged are my batteries?

The table below is not exactly but if you check your batteries from time to time you will learn the small differences that exist. This applies to batteries in rest, not during charging. If there is an active load drawing current add approximately 0,2 V to the value you read off the instrument.

The values are valid only for consumer batteries with low current loads, not starter batteries.

Batteries that get fully discharged quickly looses capacity. So best treatment for your batteries is to never discharge the battery pack more than 50 % before recharging it again.

Battery energy content

12.9 V	Full
12.6 V	75%
12.3 V	50%
12.0 V	25%
11.7 V	Empty

Keep track on your batteries by installing a Voltage Gauge [Page 8]

How do I improve my charging on a tight budget

It is not that hard to improve an old electrical system. Especially if you change the cables between the generator and the batteries. Often it is not necessary to change all the cables in the system to reach better charging of the batteries.

Start with the minus cable from the generator to the starter battery. With around € 20 you reach a good improvement. Furthermore, an extra consumer battery does not cost more then around € 80 and improves the charging a lot.

Poorly joined cast iron parts give a horrible voltage drop. Therefore, the cables should go directly the battery to the generator both on the positive and negative side of the system.

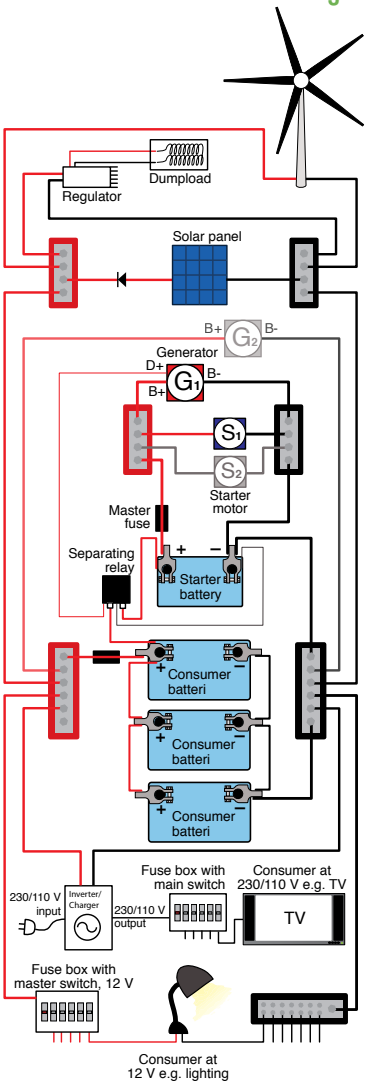
Quick reference guide on cable dimensioning

20-25 feet long boats (6 - 7.5 m)
From generator to battery (approx. 1.5 m): 35 mm²
Between batteries (approx. 0.50 m): 25 mm²
From start motor to battery: 35 mm²
From distribution box to battery: 16 mm²

25-30 feet long boats (7.5 - 9 m)
From generator to battery (approx. 2.5 m): 50 mm²
Between batteries (approx. 0.35 m): 25 mm²
From start motor to battery: 50 mm²
From distribution box to battery: 25 mm²
From windlass to battery: 25 mm²
From bow thruster to battery: 95 mm²
From 230 /110 V-inverter to battery: 35 mm²

30-35 feet long boats (9 - 11 m)
From generator to battery (approx. 3.5 m): 70 mm²
Between batteries (approx. 0.35 m): 25 mm²
From start motor to battery: 70 mm²
From distribution box to battery: 35 mm²
From windlass to battery: 35 mm²
From bow thruster to battery: 120 mm²
From 230/110 V-inverter to battery: 50 mm²

Circuit diagram for boats with one or two engines



Comments on the diagram

It is common to use separate circuits when you have two engines. This behavior is fueled by the misconception that one starter battery can not start both engines. However, the voltage in your starter battery drops after starting the first engine due to the strain, and therefore its reception to the charging current is exceptional. In just a short moment the battery will be ready to start engine number two.

Instead of having two starter batteries use the free space for an extra consumer battery.

The energy consumption when starting engines is negligible, always less than 1 Ah, even though the current is large. Hence, no extra charging is necessary for the starter battery.

A diesel engine with 200 hp draws about 600 A of current, and a standard 75 Ah marine battery can give 640 A. If 640 A is not enough there are batteries with extra high maximum current release.

There is no B- on my generator, what do I do?

Not all generators have both plus and minus poles. Attach the minus cable directly on to the generator casing.

How do I connect my batteries?

The charging should go diagonally through the battery pack to even out the charging. As the circuit diagram above shows, you should connect the plus side to the first consumer battery and the minus to the last.

The generator connections explained

B+ can be called BAT and goes to battery positive.
B- can be called D-, Earth or GRD and goes to ground/battery negative.
D+ can be called 61 or STA is magnetisation for the generator and goes to ignition key switch.

If discharged, will not the consumer batteries steal the current in the start moment?

No. The voltage in the starter battery will immediately drop to a level on par with or below the consumer batteries. This happens since the starter motor draws such a large current. If the starter battery is in poor condition the consumer batteries will even help starting the engine, even if they are partly discharged.

Out with the diodes, in with the relays

In our war against voltage drop in boat electric systems, one enemy is very common. It is the separating diode shown here to the right in some of its shapes.

All common diodes produce an voltage drop of approximately 0.7V. In real life testing we have shown that this seemingly small voltage drop reduces the charging current by half.

To deal with this Skyllermarks in the mid 90's launched the separating relay which replaces the voltage stealing diode.

If you have a separating diode on your boat, and suspect that your charging is suffering, we strongly recommend you to remove the separating diode and replace it with our separating relay.

Read more about the Separating Relay Kits on page 5

A few samples of separating diodes on the market

How do I remove my separating diode?

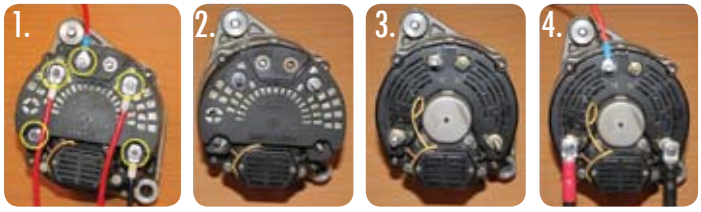


Figure 1 shows a generator with separating diode and the original cables.

The upper red cable is connected to D+ and goes to the ignition switch. The lower left red cable goes to the starter battery and the red cable to the right goes to a consumer battery. Finally, you have the black cable which goes to negative (ground). This is sometimes omitted and the generator is instead grounded through its metal casing.

First step is to remove the nuts marked by yellow circles and the cables thereon. When done you are at figure 2.

After that you remove the separating diode by pulling straight out and reveal the generator as in figure 3.

Now you have four connections left, where three are for charging and one is for RPM gauge (W). The W is seldom in use.

To finish the job you connect the thicker wires according to figure 4. The thick red cable from B+ goes directly to the positive pole of the starter battery and the thick black cable goes from B- to the negative side of the starter battery. The thin red cable still goes from D+ to the ignition switch.

With this simple operation you have improved your charging capacity with 100 %. If the original cables were poor the result is probably even better.

How discharged are my batteries?

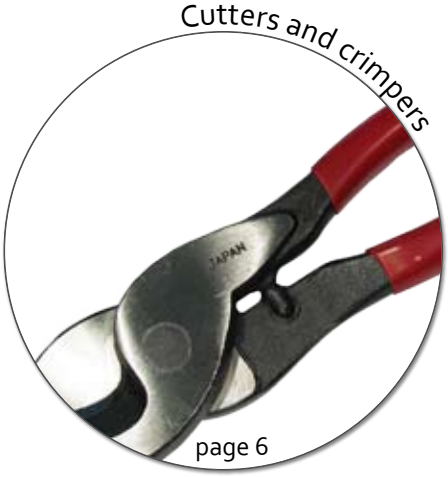
12.9 V	Full
12.6 V	75%
12.3 V	50%
12.0 V	25%
11.7 V	Empty

This applies to batteries in rest, not during charging. If there is an active load drawing current add approximately 0,2 V to the value you read off the instrument.

The values are valid only for consumer batteries with low current loads, not starter batteries.

Skyllermarks
Power demands high quality

SUTARS SOCKETS



Anläggarvägen 34 S - 136 44 HANDEN Phone: +46 (0) 8-716 00 10 Fax: + 46 (0) 8-741 33 09 **www.skyllermarks.se**
Sales goes thru our retailers. Our production is placed in Haninge, Sweden.