

Battery chargers

PLN-24CH12 / PRS-48CH12



en

Supplementary sheet

PRELIMINARY

Table of contents

| | | |
|---|--|-----------|
| 1 | General | 4 |
| 2 | Ri-monitoring | 5 |
| 3 | Wire gauge selection | 6 |
| 4 | Battery charging | 7 |
| 5 | Approved batteries and wire gauge | 8 |
| 6 | New batteries | 14 |

PRELIMINARY

1 **General**

This supplementary sheet to the manual of the PLN-24CH12 and PRS-48CH12 chargers contains important information for proper installation and operation of the devices.

PRELIMINARY

2

Ri-monitoring

The PLN-24CH12 and PRS-48CH12 battery chargers monitor the resistance of the battery circuit. This monitoring is important and mandatory for compliance to EN 54-4. The chargers monitor:

- The summed resistance of the wiring
- The fuse
- The electrical connections
- The internal resistance (R_i) of the battery.

The chargers warn when you must replace the battery. When the R_i of the battery reaches its maximum allowed value, the backup power system can still power the VACIE.

The resistance of the wiring and the connections is included in the measured total resistance. It is important for these resistances to be very low. Otherwise, even good batteries will generate a fault. A VACIE can take up to 150 A from the battery. Then, every 10 m Ω will cause a voltage drop of 1.5 V, limiting the maximum available output power from the VACIE.

PRELIMINARY

3 Wire gauge selection

Take into consideration all primary contributors to the total resistance:

- The R_i of the battery: typically 3 to 6 m Ω per battery, depending on size and make.
- The cables: very dependent on the length and the gauge.
- The battery fuse: typically 1 to 2 m Ω .
- The connections: typically 1 m Ω .

Check the real values with the battery supplier and the fuse supplier. Make sure to tighten all the screws of the interconnections terminals.

Keep some margin to avoid false positive faults. Stay at least 20 % under the selected resistance threshold, because there is some tolerance on the measurement accuracy.

PRELIMINARY

4 Battery charging

Normal operating mode: the battery charger (re)charges the batteries and maintains them when they are fully charged. The maximum current that can be provided to the main outputs and auxiliary outputs is $I_{max a}$.

Back-up operating mode: the total operating current is provided by the batteries and cannot exceed $I_{max b}$ without mains power.

| | |
|-----------------------------------|---|
| $I_{max a}$ | The maximum available current which can be drawn continuously while charging the battery: – $I_{max a} = 12 A - C/20$ (C = battery capacity in Ah) |
| $I_{max b}$ (with mains power) | The maximum available output current which can be drawn for a short period of time. During this period, the battery may not be charged if the external load takes the full $I_{max b}$. If the load is less than the $I_{max b}$, the battery will not be discharged and the remaining current is used to charge the battery: – $I_{max b} = 12 A$ |
| $I_{max b}$ (without mains power) | The maximum available current which can be drawn from the batteries when the mains supply is not available: – $I_{max b} = 150 A$, if the jumper is set to 75 – $I_{max b} = 100 A$, if the jumper is set to 50 |

If $I_{max b}$ (without mains power) is 100 A – 150 A:

1. Use batteries with a capacity of 86 Ah to 225 Ah.
2. Set the jumper on the daughter board to 75.

If $I_{max b}$ (without mains power) is < 100 A:

1. Use batteries with a capacity of 65 Ah to 225 Ah.
2. Set the jumper on the daughter board to 50.

PRELIMINARY

5 Approved batteries and wire gauge

To help you select the right cable gauge, two tables are provided with maximum cable lengths, per wire gauge for several battery types. Use this guideline to determine the needed gauge. The maximum wire length appears in centimeters. The maximum wire length represents the total wire length, from charger to battery, the wires between batteries, and the wire back to the charger. The red and the black wire lengths are represented together. With some smaller batteries, it might happen that the total resistance already exceeds the maximum value, even for zero length cables. This is not allowed and is indicated as n.a. (not allowed).

The first table is for 24 V battery systems. The second table is for 48 V battery systems.

| 24 V | Wire gauge | | 16 mm ² | | 25 mm ² | | 35 mm ² | | 50 mm ² | |
|------|--------------------------|---------------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|
| | Jumper setting | | 50 | 75 | 50 | 75 | 50 | 75 | 50 | 75 |
| | Maximum load current (A) | | 100 | 150 | 100 | 150 | 100 | 150 | 100 | 150 |
| Ah | Brand | Type | | | | | | | | |
| 65 | SSB | SBL65-12i | 129 | n.a. | 201 | n.a. | 282 | n.a. | 403 | n.a. |
| 65 | Europower | EPS 65-12 | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 65 | Sun | SB12-65SV0 | 84 | n.a. | 132 | n.a. | 185 | n.a. | 264 | n.a. |
| 65 | Sun | SB12-65V0 | 111 | n.a. | 174 | n.a. | 243 | n.a. | 347 | n.a. |
| 66 | SSB | SBL66-12HR | 227 | n.a. | 354 | n.a. | 496 | n.a. | 708 | n.a. |
| 68 | Leoch | LPL12-65 | 84 | n.a. | 132 | n.a. | 185 | n.a. | 264 | n.a. |
| 68 | Effekta | BTL12-65L | 84 | n.a. | 132 | n.a. | 185 | n.a. | 264 | n.a. |
| 70 | Yuasa | NPL78-12IFR | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 75 | SSB | SBL75-12i(sh) | 147 | n.a. | 229 | n.a. | 321 | n.a. | 458 | n.a. |
| 75 | Sun | SB12-80 | 147 | n.a. | 229 | n.a. | 321 | n.a. | 458 | n.a. |
| 78 | Sun | SB12-75 | 147 | n.a. | 229 | n.a. | 321 | n.a. | 458 | n.a. |
| 80 | SSB | SBL80-12i | 156 | n.a. | 243 | n.a. | 340 | n.a. | 486 | n.a. |
| 80 | Leoch | LPF12-75 | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 80 | Effekta | BTL12-80 | 244 | n.a. | 382 | n.a. | 535 | n.a. | 764 | n.a. |
| 80 | Fiamm | FG28009 | 431 | n.a. | 674 | n.a. | 943 | n.a. | 1347 | n.a. |
| 80 | Long | 6FM80G/B | 200 | n.a. | 313 | n.a. | 438 | n.a. | 625 | n.a. |
| 85 | SSB | SBL85-12HR | 200 | n.a. | 313 | n.a. | 438 | n.a. | 625 | n.a. |
| 90 | Effekta | BTL12-90 | 271 | n.a. | 424 | n.a. | 593 | n.a. | 847 | n.a. |
| 90 | Energysys | 12VE90 | 329 | n.a. | 514 | 76 | 719 | 107 | 1028 | 153 |
| 90 | Europower | EPS 90-12 | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 95 | SSB | SBLFT90-12i | 67 | n.a. | 104 | n.a. | 146 | n.a. | 208 | n.a. |
| 95 | Effekta | BTL12-90LX | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |

| | | | | | | | | | | |
|-----|------------|----------------|-----|------|-----|------|------|------|------|------|
| 100 | SSB | SBL100-12HR | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 100 | SSB | SBL100-12i(sh) | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 100 | Europower | EPS 100-12 | 333 | 53 | 521 | 83 | 729 | 117 | 1042 | 167 |
| 100 | Effekta | BTL12-100 | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 100 | Fiamm | FG2A007 | 458 | 178 | 715 | 278 | 1001 | 389 | 1431 | 556 |
| 100 | PowerSonic | PS121000GB | 298 | n.a. | 465 | n.a. | 651 | n.a. | 931 | 56 |
| 100 | Yuasa | NPL100-12 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 105 | Sun | SB12-110AFT | 244 | n.a. | 382 | n.a. | 535 | n.a. | 764 | n.a. |
| 105 | Leoch | LPF12-100 | 333 | 53 | 521 | 83 | 729 | 117 | 1042 | 167 |
| 105 | Long | 6FM100G/B | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 107 | Sun | SB12-100 | 298 | n.a. | 465 | n.a. | 651 | n.a. | 931 | 56 |
| 110 | Sun | SB12-100HFT | 351 | 71 | 549 | 111 | 768 | 156 | 1097 | 222 |
| 115 | Long | 6FM115G/B | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 116 | SSB | SBLFT110-12i | 307 | n.a. | 479 | n.a. | 671 | 58 | 958 | 83 |
| 120 | SSB | SBL120-12i(sh) | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 120 | Europower | EPS 120-12 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 120 | Effekta | BTL12-120 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 120 | Fiamm | FG2C007 | 502 | 222 | 785 | 347 | 1099 | 486 | 1569 | 694 |
| 120 | Long | 6FM120G/B | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 125 | Sun | SB12-120 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 125 | SSB | SBL125-12HR | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 125 | Sun | SB12-125FT | 449 | 169 | 701 | 264 | 982 | 369 | 1403 | 528 |
| 130 | Yuasa | NPL130-6IFR | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 131 | Leoch | LPF12-125 | 351 | 71 | 549 | 111 | 768 | 156 | 1097 | 222 |
| 132 | Leoch | LPF12-120 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 134 | SSB | SBL134R-12i | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 135 | SSB | SBL135-12HR | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 140 | Energys | 6VE140 | 476 | 199 | 749 | 311 | 1048 | 436 | 1497 | 622 |
| 140 | PBQ | FA140-12 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 150 | Effekta | BTL12-150 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 150 | Fiamm | FG2F009 | 547 | 267 | 854 | 417 | 1196 | 583 | 1708 | 833 |
| 150 | SSB | SBL150-12i | 422 | 142 | 660 | 222 | 924 | 311 | 1319 | 444 |
| 151 | SSB | SBL151-12HR | 333 | 53 | 521 | 83 | 729 | 117 | 1042 | 167 |
| 155 | Cell Power | CPF155-12 | 467 | 187 | 729 | 292 | 1021 | 408 | 1458 | 583 |

PRELIMINARY

PRELIMINARY

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|-----|-----------|--------------|-----|------|-----|------|------|------|------|------|
| 156 | Sun | SB12-150 | 422 | 142 | 660 | 222 | 924 | 311 | 1319 | 444 |
| 157 | Leoch | LPF12-150 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 159 | Sun | SB12-150AFT | 369 | 89 | 576 | 139 | 807 | 194 | 1153 | 278 |
| 159 | SSB | SBLFT150-12i | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 160 | Haze | HZB12-160 | 555 | 275 | 868 | 430 | 1215 | 603 | 1736 | 861 |
| 160 | Effekta | BTL12-150L | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 170 | SSB | SBL170-12HR | 396 | 116 | 618 | 181 | 865 | 253 | 1236 | 361 |
| 180 | Energys | 6VE180 | 518 | 238 | 810 | 372 | 1134 | 521 | 1619 | 744 |
| 180 | Leoch | LPF12-180 | 422 | 142 | 660 | 222 | 924 | 311 | 1319 | 444 |
| 200 | SSB | SBL200-12i | 484 | 204 | 757 | 319 | 1060 | 447 | 1514 | 639 |
| 200 | Europower | EPS 200-12 | 511 | 231 | 799 | 361 | 1118 | 506 | 1597 | 722 |
| 200 | Effekta | BTL12-200 | 378 | 98 | 590 | 153 | 826 | 214 | 1181 | 306 |
| 200 | Fiamm | FG2M009 | 591 | 311 | 924 | 486 | 1293 | 681 | 1847 | 972 |
| 200 | Yuasa | NPL200-6 | 502 | 222 | 785 | 347 | 1099 | 486 | 1569 | 694 |
| 210 | Leoch | LPF12-200 | 467 | 187 | 729 | 292 | 1021 | 408 | 1458 | 583 |
| 210 | Long | 6FM200G/B | 467 | 187 | 729 | 292 | 1021 | 408 | 1458 | 583 |
| 214 | Sun | SB12-200 | 493 | 213 | 771 | 333 | 1079 | 467 | 1542 | 667 |
| 225 | Energys | 2VE225 | 525 | 245 | 821 | 383 | 1149 | 537 | 1642 | 767 |
| 225 | SSB | SBL225-12HR | 413 | 133 | 646 | 208 | 904 | 292 | 1292 | 417 |
| 228 | Leoch | PLH210FT | 493 | 213 | 771 | 333 | 1079 | 467 | 1542 | 667 |
| 230 | Europower | EPS 230-12 | 511 | 231 | 799 | 361 | 1118 | 506 | 1597 | 722 |

| 48 V | Wire gauge | | 16 mm ² | | 25 mm ² | | 35 mm ² | | 50 mm ² | |
|------|--------------------------|------------|--------------------|------|--------------------|------|--------------------|------|--------------------|------|
| | Jumper setting | | 50 | 75 | 50 | 75 | 50 | 75 | 50 | 75 |
| | Maximum load current (A) | | 100 | 150 | 100 | 150 | 100 | 150 | 100 | 150 |
| Ah | Brand | Type | | | | | | | | |
| 65 | ABT | TM12-310W | 460 | n.a. | 718 | n.a. | 1005 | n.a. | 1436 | n.a. |
| 65 | Effekta | BTL12-65 | 467 | n.a. | 729 | n.a. | 1021 | n.a. | 1458 | n.a. |
| 65 | Fiamm | FG26505 | 911 | n.a. | 1424 | n.a. | 1993 | n.a. | 2847 | n.a. |
| 65 | Fiamm | FG26507 | 911 | n.a. | 1424 | n.a. | 1993 | n.a. | 2847 | n.a. |
| 65 | PowerSonic | PS12650GB | 236 | n.a. | 368 | n.a. | 515 | n.a. | 736 | n.a. |
| 65 | Yuasa | NP65-12 | 556 | n.a. | 868 | n.a. | 1215 | n.a. | 1736 | n.a. |
| 65 | SSB | SBL65-12i | 324 | n.a. | 507 | n.a. | 710 | n.a. | 1014 | n.a. |
| 65 | Sun | SB12-65SV0 | 236 | n.a. | 368 | n.a. | 515 | n.a. | 736 | n.a. |

| | | | | | | | | | | |
|-----|------------|----------------|-----|------|------|------|------|------|------|------|
| 65 | Sun | SB12-65V0 | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 65 | Europower | EPS 65-12 | 644 | n.a. | 1007 | n.a. | 1410 | n.a. | 2014 | n.a. |
| 66 | SSB | SBL66-12HR | 520 | n.a. | 813 | n.a. | 1138 | n.a. | 1625 | n.a. |
| 68 | Long | 6FM65G/B | 289 | n.a. | 451 | n.a. | 632 | n.a. | 903 | n.a. |
| 68 | Leoch | LPL12-65 | 236 | n.a. | 368 | n.a. | 515 | n.a. | 736 | n.a. |
| 68 | Effekta | BTL-12-65L | 236 | n.a. | 368 | n.a. | 515 | n.a. | 736 | n.a. |
| 70 | ABT | TM12-320W | 748 | n.a. | 1168 | n.a. | 1635 | n.a. | 2336 | n.a. |
| 70 | Fiamm | FG27004 | 627 | n.a. | 979 | n.a. | 1371 | n.a. | 1958 | n.a. |
| 70 | Fiamm | FG27007 | 893 | n.a. | 1396 | n.a. | 1954 | n.a. | 2792 | n.a. |
| 73 | Long | 6FM70G/B | 467 | n.a. | 729 | n.a. | 1021 | n.a. | 1458 | n.a. |
| 75 | ABT | TM12-350W | 760 | n.a. | 1188 | n.a. | 1663 | n.a. | 2375 | n.a. |
| 75 | Effekta | BTL12-75 | 520 | n.a. | 813 | n.a. | 1138 | n.a. | 1625 | n.a. |
| 75 | Energysys | 12VE75 | 632 | n.a. | 988 | n.a. | 1383 | n.a. | 1975 | n.a. |
| 75 | SSB | SBL75-12i(sh) | 360 | n.a. | 563 | n.a. | 788 | n.a. | 1125 | n.a. |
| 75 | Sun | SB12-80 | 360 | n.a. | 563 | n.a. | 788 | n.a. | 1125 | n.a. |
| 75 | PowerSonic | PS12750GB | 360 | n.a. | 563 | n.a. | 788 | n.a. | 1125 | n.a. |
| 78 | Yuasa | NPL78-12IFR | 644 | n.a. | 1007 | n.a. | 1410 | n.a. | 2014 | n.a. |
| 78 | Sun | SB12-75 | 360 | n.a. | 563 | n.a. | 788 | n.a. | 1125 | n.a. |
| 80 | Leoch | LPF12-100/A | 644 | n.a. | 1007 | n.a. | 1410 | n.a. | 2014 | n.a. |
| 80 | Effekta | BTL12-80 | 556 | n.a. | 868 | n.a. | 1215 | n.a. | 1736 | n.a. |
| 80 | SSB | SBL80-12i | 378 | n.a. | 590 | n.a. | 826 | n.a. | 1181 | n.a. |
| 80 | Fiamm | FG28009 | 929 | n.a. | 1451 | n.a. | 2032 | n.a. | 2903 | n.a. |
| 84 | Long | 6FM80G/B | 467 | n.a. | 729 | n.a. | 1021 | n.a. | 1458 | n.a. |
| 85 | SSB | SBL85-12HR | 467 | n.a. | 729 | n.a. | 1021 | n.a. | 1458 | n.a. |
| 90 | Effekta | BTL12-90 | 609 | 49 | 951 | 76 | 1332 | 107 | 1903 | 153 |
| 90 | Energysys | 12VE90 | 724 | 164 | 1132 | 257 | 1585 | 360 | 2264 | 514 |
| 90 | Europower | EPS 90-12 | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 95 | SSB | SBLFT90-12i | 200 | n.a. | 313 | n.a. | 438 | n.a. | 625 | n.a. |
| 95 | Effekta | BTL12-90LX | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 100 | SSB | SBL100-12HR | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 100 | SSB | SBL100-12i(sh) | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 100 | Effekta | BTL12-100 | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 100 | Fiamm | FG2A007 | 982 | 422 | 1535 | 660 | 2149 | 924 | 3069 | 1319 |
| 100 | PowerSonic | PS121000GB | 662 | 102 | 1035 | 160 | 1449 | 224 | 2069 | 319 |

PRELIMINARY

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|-----|-----------|----------------|------|------|------|------|------|------|------|------|
| 100 | Yuasa | NPL100-12 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 100 | Europower | EPS 100-12 | 733 | 173 | 1146 | 271 | 1604 | 379 | 2292 | 542 |
| 105 | Sun | SB12-110AFT | 556 | n.a. | 868 | n.a. | 1215 | n.a. | 1736 | n.a. |
| 105 | Long | 6FM100G/B | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 105 | Leoch | LPF12-100/A | 733 | 173 | 1146 | 271 | 1604 | 379 | 2292 | 542 |
| 107 | Sun | SB12-100 | 662 | 102 | 1035 | 160 | 1449 | 224 | 2069 | 319 |
| 110 | Sun | SB12-100HFT | 769 | 209 | 1201 | 326 | 1682 | 457 | 2403 | 653 |
| 110 | Sun | SB12-100HFT | 769 | 209 | 1201 | 326 | 1682 | 457 | 2403 | 653 |
| 116 | SSB | SBLFT110-12i | 680 | 120 | 1063 | 188 | 1488 | 263 | 2125 | 375 |
| 120 | Effekta | BTL12-120 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 120 | Fiamm | FG2C007 | 1071 | 511 | 1674 | 799 | 2343 | 1118 | 3347 | 1597 |
| 120 | SSB | SBL120-12i(sh) | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 120 | Europower | EPS 120-12 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 121 | Long | 6FM115G/B | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 125 | SSB | SBL125-12HR | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 125 | Sun | SB12-120 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 126 | Long | 6FM120G/B | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 130 | Yuasa | NPL130-6IFR | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 131 | Leoch | LPF12-125 | 769 | 209 | 1201 | 326 | 1682 | 457 | 2403 | 653 |
| 132 | Leoch | LPF12-120 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 134 | SSB | SBL134R-12i | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 135 | SSB | SBL135-12HR | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 140 | Energys | 6VE140 | 1025 | 465 | 1601 | 726 | 2242 | 1017 | 3203 | 1453 |
| 150 | Effekta | BTL12-150 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 150 | Fiamm | FG2F009 | 1160 | 600 | 1813 | 938 | 2538 | 1313 | 3625 | 1875 |
| 150 | SSB | SBL150-12i | 911 | 351 | 1424 | 549 | 1993 | 768 | 2847 | 1097 |
| 151 | SSB | SBL151-12HR | 733 | 173 | 1146 | 271 | 1604 | 379 | 2292 | 542 |
| 156 | Sun | SB12-150 | 911 | 351 | 1424 | 549 | 1993 | 768 | 2847 | 1097 |
| 157 | Leoch | LPF12-150 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 159 | SSB | SBLFT150-12i | 644 | 84 | 1007 | 132 | 1410 | 185 | 2014 | 264 |
| 159 | Sun | SB12-150AFT | 804 | 244 | 1257 | 382 | 1760 | 535 | 2514 | 764 |
| 160 | Effekta | BTL12-150L | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 170 | SSB | SBL170-12HR | 858 | 298 | 1340 | 465 | 1876 | 651 | 2681 | 931 |
| 180 | Energys | 6VE180 | 1103 | 543 | 1724 | 849 | 2413 | 1188 | 3447 | 1697 |

PRELIMINARY

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|-----|-----------|-------------|------|-----|------|------|------|------|------|------|
| 180 | Leoch | LPF12-180 | 911 | 351 | 1424 | 549 | 1993 | 768 | 2847 | 1097 |
| 200 | Effekta | BTL12-200 | 822 | 262 | 1285 | 410 | 1799 | 574 | 2569 | 819 |
| 200 | SSB | SBL200-12i | 1036 | 476 | 1618 | 743 | 2265 | 1040 | 3236 | 1486 |
| 200 | Fiamm | FG2M009 | 1249 | 689 | 1951 | 1076 | 2732 | 1507 | 3903 | 2153 |
| 200 | Yuasa | NPL200-6 | 1071 | 511 | 1674 | 799 | 2343 | 1118 | 3347 | 1597 |
| 200 | Europower | EPS 200-12 | 1089 | 529 | 1701 | 826 | 2382 | 1157 | 3403 | 1653 |
| 210 | Leoch | LPF12-200 | 1000 | 440 | 1563 | 688 | 2188 | 963 | 3125 | 1375 |
| 210 | Long | 6FM200G/B | 1000 | 440 | 1563 | 688 | 2188 | 963 | 3125 | 1375 |
| 214 | Sun | SB12-200 | 1053 | 493 | 1646 | 771 | 2304 | 1079 | 3292 | 1542 |
| 225 | SSB | SBL225-12HR | 893 | 333 | 1396 | 521 | 1954 | 729 | 2792 | 1042 |
| 225 | Enersys | 2VE225 | 1117 | 557 | 1746 | 871 | 2444 | 1219 | 3492 | 1742 |
| 228 | Leoch | PLH210FT | 1053 | 493 | 1646 | 771 | 2304 | 1079 | 3292 | 1542 |
| 230 | Europower | EPS 230-12 | 1089 | 529 | 1701 | 826 | 2382 | 1157 | 3403 | 1653 |

PRELIMINARY

6 New batteries

Capacity

Often, new batteries do not give their rated capacity when received from the manufacturer. This happens due to the methods of making the plates. The plates are made by applying oxides of lead, mixed with a liquid, which is generally diluted sulfuric acid, to the grids. To produce the spongy lead and the lead peroxide, these oxides are subjected to a charging current. After the charge, the oxides are discharged, and then charged again. This cycle is necessary because not all the oxides are changed to active material on one charge. Repeated charges and discharges are required to produce the maximum amount of active materials. Some manufacturers do not charge and discharge a battery enough times before sending it out. These manufacturers expect that, after a battery is put into use, its capacity will eventually increase to the specified value, because more active material is produced during each charge. Backup batteries, however, might never get enough discharge and charge cycles to reach that capacity.

Internal resistance

Due to this reduction of active material, new batteries and batteries that have been stored for longer periods of time show a relatively high internal resistance. This degradation does not recover completely by recharging the battery once. The internal resistance is affected by the number of charging and discharging cycles. Initially, the internal resistance will decrease with every cycle. Eventually, the aging of the battery will increase the internal resistance.

Therefore, if you install one of these batteries and it shows a fault on the charger, this fault will not just go away by charging. The charger is not at fault, but the battery.

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