

## DATA SHEET

grid | Xtreme VR

PURE series

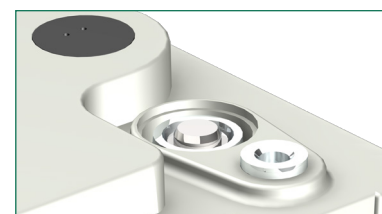
Application | Data Center

### The next generation of real pure lead batteries

By using high-purity lead (99.99%), HOPPECKE has deliberately opted for better corrosion resistance and thus an outstanding service life even in high-current applications and high ambient temperatures, such as in data center.

#### Unique dual-pole design - less service efforts

Dedicated pole contact points with touch protection allows for a precise impedance measurement making it quick and easy during installation and regular maintenance work.



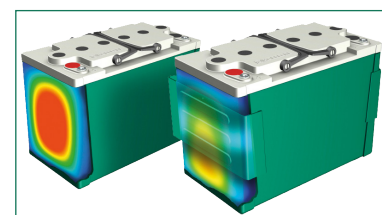
#### grid | XtremeStack – optimal use of space with a minimal footprint

The innovative stacking solution from HOPPECKE. Tailored for grid | Xtreme VR batteries in the top terminal variant to achieve maximum efficient use of space and power density (kW/m<sup>2</sup>) - with comparatively less installation effort and lower costs. grid | XtremeStack is both horizontally and vertically expandable and adapts flexibly to your needs. Suitable for seismic loads up to UBC Zone 1.



#### Patented, innovative safeguard-tec - lower operational costs

The innovative safeguard-tec for the top terminal types (optional) ensures dimensional stability throughout battery lifetime and at elevated ambient temperature. This allows installation in cabinets or on racks with limited demand for a continuous cost-intensive air-conditioning.



#### Proven ESS technology - reduced life cycle costs (TCO)

The result of Enhanced Stability Standard (ESS) technology is a proprietary improved resilience against thermal runaway, better charge acceptance and more even voltage behavior of the battery. This leads to a longer service life and reduced service costs: in summary optimized life cycle costs.





### Construction

- High Performance Pure Lead grid electrodes for maximum corrosion resistance also under **elevated operating temperature**
- Active mass is designed for **maximum discharge performance** with good cyclability
- High-quality and low resistance microporous glass fiber separators combined with **ESS technology** ensures optimum charge carrier exchange and improves a **long-term stability**
- Fully isolated HOPPECKE** connector system
- Innovative plastic-overmolded dual-pole design with an **access for impedance measurements**
- 100% tested self-regulating pressure relief valve per cell to prevent interaction between cells of a block with backfire inhibiting for increased **operational safety**
- UL94 V-0** rated flame retardant ABS-PC material (halogen-free) - high heat, shock and vibration resistant
- 15 years** design life and optimized aging behavior at high temperatures



### Installation & Operation

- Suitable for standby parallel operation as well as partial cyclic applications
- Vertical as well as horizontal installation** on racks, in battery cabinets or in the grid | XtremeStack due to the robust folding handles integrated in the lid for easy assembly
- FT: real front terminals** for an ease of installation and maintenance - no additional connectors needed
- TT: safeguard-tec** optional available - **improves the overall performance** significantly
- Recommended charge float voltage: 2.3 Vpc @ 68°F (20°C) / 2.288 Vpc @ 77°F (25°C)
- Operating temperature range extremely wide from **-40°F to +131°F (-40°C to +55°C)**
- Storage time** extended up to **2 years** for maximum project deployment flexibility
- Reduced maintenance: no refilling of distilled water is required



### Standards

- Designed to be compliant with international standard **IEC 60896-21/22**
- Usage in applications where longest life (15 years design life) and highest reliability are required. Therefore, classified as "Very Long Life" according to Eurobat Guide 2015
- UL recognized** component
- UL94 V-0 rated flame retardant ABS-PC material (halogen-free)
- Classified as non-spillable battery and approved as non-hazardous cargo for land, sea and air transportation in accordance with the requirements of **ADR / RID, IMDG and IATA**
- Exclusively manufactured in HOPPECKE certified production facilities in accordance with **ISO 9001, ISO 14001, ISO 50001 and ISO 45001**



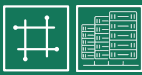
### Type overview grid | Xtreme VR

#### Capacity, dimensions and weights

| MODEL                          | VOLTAGE [V] | CONSTANT POWER RATINGS IN WATTS PER CELL @ 77°F (25°C) |                 |                 | DIMENSIONS [inches] |       |        | WEIGHT |      |
|--------------------------------|-------------|--|-----------------|-----------------|---------------------|-------|--------|--------|------|
|                                |             | 1.67 VPC 5 MIN   | 1.67 VPC 10 MIN | 1.67 VPC 15 MIN | LENGTH              | WIDTH | HEIGHT | LBS    | KG   |
| grid   Xtreme VR 12-80         | 12          | 641.5  | 465.9           | 363.5           | 10.00               | 6.85  | 9.17   | 56.9   | 25.8 |
| grid   Xtreme VR 12-110        | 12          | 880.5  | 617.1           | 469.5           | 12.60               | 6.85  | 9.17   | 71.4   | 32.4 |
| grid   Xtreme VR 12-150        | 12          | 1017.7   | 763.6           | 606.9           | 14.13               | 6.85  | 11.14  | 102.1  | 46.3 |
| grid   Xtreme VR 12-170        | 12          | 1266.4   | 940.1           | 743.3           | 19.61               | 6.85  | 9.17   | 113.3  | 51.4 |
| grid   Xtreme VR 12-100 FT 19" | 12          | 548.9  | 452.1           | 377.4           | 15.91               | 4.33  | 10.39  | 66.6   | 30.2 |
| grid   Xtreme VR 12-100 FT 23" | 12          | 590.2  | 486.5           | 406.4           | 22.17               | 4.92  | 7.87   | 74.7   | 33.9 |
| grid   Xtreme VR 12-150 FT     | 12          | 809.0  | 677.4           | 578.1           | 22.17               | 4.33  | 12.09  | 110.7  | 50.2 |
| grid   Xtreme VR 12-180 FT     | 12          | 1044.4   | 864.5           | 724.4           | 22.17               | 4.92  | 12.09  | 126.5  | 57.4 |
| grid   Xtreme VR 12-200 FT     | 12          | 1028.7   | 862.5           | 736.8           | 22.17               | 4.92  | 12.68  | 134.9  | 61.2 |

| MODEL                          | TERMINAL | MAXIMUM DISCHARGE CURRENT [A] | SHORT CIRCUIT CURRENT (acc. IEC 60896-21) [A] | TERMINAL TYPE | TERMINAL TORQUE     | FIG. |
|--------------------------------|----------|-------------------------------|---|---------------|---------------------|------|
| grid   Xtreme VR 12-80         | TOP      | 1100                          | 1439  | Insert (M8)   | 133 in.-lbs (15 Nm) | A    |
| grid   Xtreme VR 12-110        | TOP      | 1100                          | 2771  | Insert (M8)   | 133 in.-lbs (15 Nm) | A    |
| grid   Xtreme VR 12-150        | TOP      | 1100                          | 2766  | Insert (M8)   | 133 in.-lbs (15 Nm) | A    |
| grid   Xtreme VR 12-170        | TOP      | 1100                          | 3896  | Insert (M8)   | 133 in.-lbs (15 Nm) | A    |
| grid   Xtreme VR 12-100 FT 19" | FRONT    | 1000                          | 1545  | Insert (M8)   | 133 in.-lbs (15 Nm) | B    |
| grid   Xtreme VR 12-100 FT 23" | FRONT    | 1000                          | 1657  | Insert (M8)   | 133 in.-lbs (15 Nm) | B    |
| grid   Xtreme VR 12-150 FT     | FRONT    | 1000                          | 2372  | Insert (M8)   | 133 in.-lbs (15 Nm) | B    |
| grid   Xtreme VR 12-180 FT     | FRONT    | 1000                          | 3013  | Insert (M8)   | 133 in.-lbs (15 Nm) | B    |
| grid   Xtreme VR 12-200 FT     | FRONT    | 1000                          | 3078  | Insert (M8)   | 133 in.-lbs (15 Nm) | B    |

\*) Top terminal batteries: +0.12 inch in length and +0.2 inch in width using optional safeguard-tec



**grid | Xtreme VR 12-80**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |       |       |       |       |       |       |       |       |       |       |
|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |       |       |       |       |       |       |       |       |       |       |
|               | 1   | 2     | 3     | 4     | 5     | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 546.3   | 546.3 | 546.3 | 546.3 | 546.3 | 441.1 | 351.6 | 293.8 | 222.1 | 163.4 | 129.5 |
| 1.70          | 664.9   | 664.9 | 664.9 | 664.9 | 623.1 | 459.9 | 361.3 | 298.1 | 223.2 | 163.6 | 129.5 |
| 1.67          | 686.9   | 686.9 | 686.9 | 686.9 | 641.5 | 465.9 | 363.5 | 298.9 | 223.2 | 163.6 | 129.5 |
| 1.65          | 738.6   | 738.6 | 738.6 | 698.6 | 651.7 | 468.6 | 364.0 | 298.9 | 223.2 | 163.6 | 129.5 |
| 1.60          | 833.7   | 833.7 | 775.9 | 720.0 | 668.2 | 471.6 | 364.0 | 298.9 | 223.2 | 163.6 | 129.5 |

**grid | Xtreme VR 12-110**

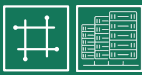
| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |        |        |        |       |       |       |       |       |       |       |
|---------------|---|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |        |        |        |       |       |       |       |       |       |       |
|               | 1   | 2      | 3      | 4      | 5     | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 937.9   | 937.9  | 937.9  | 864.9  | 802.7 | 595.3 | 465.5 | 385.1 | 287.9 | 210.0 | 165.8 |
| 1.70          | 1116.7  | 1116.7 | 1020.4 | 933.3  | 856.4 | 612.6 | 469.5 | 386.5 | 288.1 | 210.0 | 165.9 |
| 1.67          | 1161.5  | 1161.5 | 1059.2 | 964.5  | 880.5 | 617.1 | 469.5 | 386.5 | 288.1 | 210.0 | 165.9 |
| 1.65          | 1187.8  | 1187.8 | 1073.8 | 977.0  | 894.7 | 618.4 | 469.5 | 386.5 | 288.1 | 210.0 | 165.9 |
| 1.60          | 1258.4  | 1258.4 | 1128.9 | 1016.4 | 920.5 | 618.4 | 469.5 | 386.5 | 288.1 | 210.0 | 165.9 |

**grid | Xtreme VR 12-150**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |        |        |        |        |       |       |       |       |       |       |
|---------------|---|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |        |        |        |        |       |       |       |       |       |       |
|               | 1   | 2      | 3      | 4      | 5      | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 975.0   | 975.0  | 975.0  | 975.0  | 915.2  | 708.6 | 584.2 | 495.7 | 383.9 | 289.5 | 234.3 |
| 1.70          | 1125.1  | 1125.1 | 1125.1 | 1052.2 | 980.0  | 747.0 | 602.6 | 506.9 | 385.3 | 290.2 | 234.6 |
| 1.67          | 1169.9  | 1169.9 | 1169.9 | 1091.5 | 1017.7 | 763.6 | 606.9 | 508.6 | 385.3 | 290.2 | 234.6 |
| 1.65          | 1273.5  | 1273.5 | 1190.5 | 1108.2 | 1032.1 | 768.5 | 609.1 | 508.8 | 385.3 | 290.2 | 234.6 |
| 1.60          | 1339.9  | 1339.9 | 1235.2 | 1144.3 | 1062.8 | 777.0 | 610.0 | 508.8 | 385.3 | 290.2 | 234.6 |

**grid | Xtreme VR 12-170**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |        |        |        |        |       |       |       |       |       |       |
|---------------|---|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |        |        |        |        |       |       |       |       |       |       |
|               | 1   | 2      | 3      | 4      | 5      | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 1304.8  | 1304.8 | 1304.8 | 1223.9 | 1152.0 | 888.3 | 720.8 | 600.6 | 455.5 | 337.3 | 269.9 |
| 1.70          | 1514.5  | 1514.5 | 1411.1 | 1318.1 | 1234.8 | 928.5 | 738.7 | 610.8 | 458.2 | 337.6 | 269.9 |
| 1.67          | 1579.2  | 1579.2 | 1461.4 | 1357.8 | 1266.4 | 940.1 | 743.3 | 611.7 | 459.4 | 337.6 | 269.9 |
| 1.65          | 1617.7  | 1617.7 | 1495.5 | 1387.0 | 1290.9 | 948.4 | 744.2 | 611.9 | 459.4 | 337.6 | 269.9 |
| 1.60          | 1700.6  | 1700.6 | 1568.0 | 1448.1 | 1341.1 | 962.6 | 745.6 | 611.9 | 459.4 | 337.6 | 269.9 |



**grid | Xtreme VR 12-100 FT 19"**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |       |       |       |       |       |       |       |       |       |       |
|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |       |       |       |       |       |       |       |       |       |       |
|               | 1   | 2     | 3     | 4     | 5     | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 485.4   | 485.4 | 485.4 | 485.4 | 485.4 | 407.7 | 346.4 | 302.0 | 240.4 | 181.6 | 145.7 |
| 1.70          | 569.7   | 569.7 | 569.7 | 547.8 | 526.9 | 437.8 | 368.8 | 316.2 | 247.2 | 184.4 | 146.8 |
| 1.67          | 595.4   | 595.4 | 595.4 | 571.6 | 548.9 | 452.1 | 377.4 | 322.0 | 249.4 | 184.7 | 146.8 |
| 1.65          | 612.7   | 612.7 | 612.7 | 586.5 | 561.8 | 459.9 | 382.1 | 325.0 | 250.5 | 184.7 | 146.8 |
| 1.60          | 671.8   | 671.8 | 644.8 | 617.8 | 591.3 | 476.5 | 389.7 | 328.2 | 250.5 | 184.7 | 146.8 |

**grid | Xtreme VR 12-100 FT 23"**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |       |       |       |       |       |       |       |       |       |       |
|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |       |       |       |       |       |       |       |       |       |       |
|               | 1   | 2     | 3     | 4     | 5     | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 522.3   | 522.3 | 522.3 | 522.3 | 522.3 | 439.0 | 373.1 | 325.4 | 259.1 | 195.8 | 157.1 |
| 1.70          | 612.6   | 612.6 | 612.6 | 589.1 | 566.7 | 471.2 | 397.1 | 340.6 | 266.5 | 198.8 | 158.4 |
| 1.67          | 640.0   | 640.0 | 640.0 | 614.6 | 590.2 | 486.5 | 406.4 | 346.8 | 268.8 | 199.1 | 158.4 |
| 1.65          | 658.5   | 658.5 | 658.5 | 630.4 | 604.0 | 494.9 | 411.4 | 350.1 | 270.0 | 199.1 | 158.4 |
| 1.60          | 721.5   | 721.5 | 692.6 | 663.7 | 635.5 | 512.6 | 419.5 | 353.5 | 270.0 | 199.1 | 158.4 |

**grid | Xtreme VR 12-150 FT**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |       |       |       |       |       |       |       |       |       |       |
|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |       |       |       |       |       |       |       |       |       |       |
|               | 1   | 2     | 3     | 4     | 5     | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 678.6   | 678.6 | 678.6 | 678.6 | 678.6 | 612.7 | 535.8 | 470.8 | 377.2 | 290.4 | 236.9 |
| 1.70          | 797.8   | 797.8 | 797.8 | 797.8 | 772.9 | 659.3 | 565.9 | 493.0 | 388.9 | 296.0 | 240.0 |
| 1.67          | 841.8   | 841.8 | 841.8 | 841.8 | 809.0 | 677.4 | 578.1 | 500.9 | 391.8 | 297.0 | 240.3 |
| 1.65          | 892.7   | 892.7 | 892.7 | 854.8 | 819.9 | 679.3 | 578.1 | 500.9 | 391.8 | 297.0 | 240.3 |
| 1.60          | 989.0   | 989.0 | 953.2 | 916.4 | 879.8 | 715.4 | 591.0 | 505.0 | 392.3 | 297.0 | 240.3 |

**grid | Xtreme VR 12-180 FT**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |        |        |        |        |       |       |       |       |       |       |
|---------------|---|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |        |        |        |        |       |       |       |       |       |       |
|               | 1   | 2      | 3      | 4      | 5      | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 927.5   | 927.5  | 927.5  | 927.5  | 927.5  | 782.0 | 666.3 | 582.0 | 464.4 | 351.6 | 282.5 |
| 1.70          | 1083.3  | 1083.3 | 1083.3 | 1042.9 | 1004.2 | 838.0 | 708.2 | 608.6 | 477.4 | 357.0 | 284.7 |
| 1.67          | 1130.0  | 1130.0 | 1130.0 | 1086.3 | 1044.4 | 864.5 | 724.4 | 619.5 | 481.4 | 357.4 | 284.7 |
| 1.65          | 1161.3  | 1161.3 | 1161.3 | 1113.3 | 1067.9 | 879.0 | 733.0 | 625.2 | 483.5 | 357.4 | 284.7 |
| 1.60          | 1267.4  | 1267.4 | 1218.5 | 1169.4 | 1121.0 | 909.2 | 746.9 | 631.0 | 483.5 | 357.4 | 284.7 |

**grid | Xtreme VR 12-200 FT**

| END POINT VPC | CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ *77°F (+25°C) |        |        |        |        |       |       |       |       |       |       |
|---------------|---|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
|               | OPERATING TIME TO END POINT VOLTAGE (IN MINUTES)                  |        |        |        |        |       |       |       |       |       |       |
|               | 1   | 2      | 3      | 4      | 5      | 10    | 15    | 20    | 30    | 45    | 60    |
| 1.75          | 852.5   | 852.5  | 852.5  | 852.5  | 852.5  | 780.8 | 683.2 | 600.7 | 481.6 | 371.0 | 302.8 |
| 1.70          | 1014.7  | 1014.7 | 1014.7 | 1014.7 | 983.3  | 839.7 | 721.3 | 628.8 | 496.4 | 378.1 | 306.6 |
| 1.67          | 1070.0  | 1070.0 | 1070.0 | 1070.0 | 1028.7 | 862.5 | 736.8 | 638.8 | 500.1 | 379.4 | 307.1 |
| 1.65          | 1151.3  | 1151.3 | 1151.3 | 1102.9 | 1058.1 | 877.7 | 743.9 | 642.5 | 500.9 | 379.5 | 307.1 |
| 1.60          | 1254.4  | 1254.4 | 1209.6 | 1163.5 | 1117.4 | 910.3 | 753.0 | 643.9 | 500.9 | 379.5 | 307.1 |

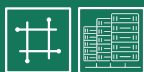


Fig. A

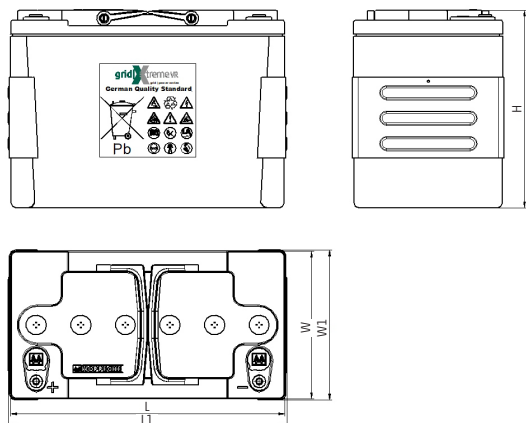
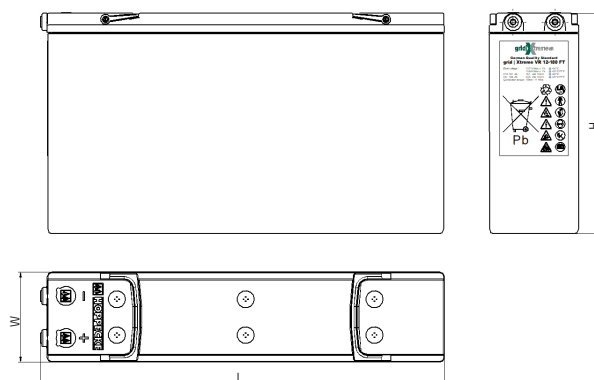


Fig. B



Tightening torque of terminal screw: 15 Nm - 133 lbf in

grid | Xtreme VR is versatile and may be used in other DC or AC industrial applications.

**All of our cells and batteries should be installed, commissioned and operated in accordance with:**

- HOPPECKE Operational Manual / Recommendations / Instructions
- International Standard IEC 62485-2 Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries
- Regional / National / Local Standards for the Environment

**Optimal environmental compatibility - closed material cycle in certified recycling system**

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