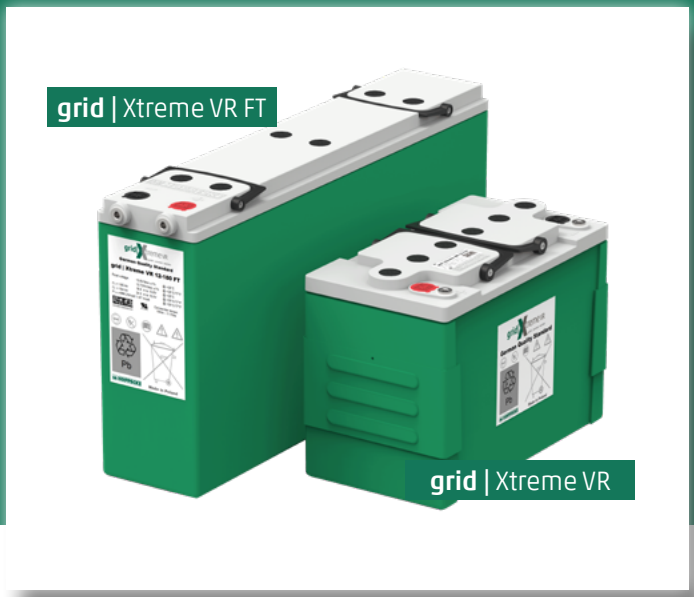
HOPPECKE
POWER FROM INNOVATION



DATA SHEET

grid | Xtreme VR

PURE series

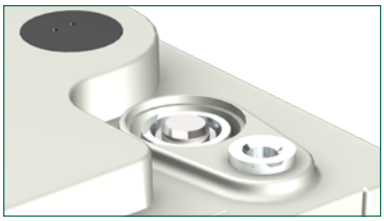
Application | Data Center

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.

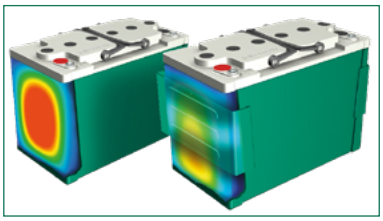


grid | XtremeStack – optimal use of space with a minimal footprint

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/m²) - 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		CONSTANT POWER RATINGS IN WATTS PER CELL @ 77°F (25°C)			DIMENSIONS [inches]			WEIGHT	
	VOLTAGE [V]	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	656.8	459.6	349.4	10	6.85	9.17	56.9	25.8
grid | Xtreme VR 12-110	12	880.5	617.1	469.5	12.6	6.85	9.17	71.4	32.4
grid | Xtreme VR 12-150	12	1073.2	811.4	647.5	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	718.2	528.4	415.0	15.91	4.33	10.39	66.6	30.2
grid | Xtreme VR 12-100 FT 23"	12	818.9	601.6	472.4	22.17	4.92	7.87	74.7	33.9
grid | Xtreme VR 12-150 FT	12	932.5	759.6	639.8	22.17	4.33	12.09	110.7	50.2
grid | Xtreme VR 12-180 FT	12	1046.9	866.2	725.5	22.17	4.92	12.09	126.5	57.4
grid | Xtreme VR 12-200 FT	12	1038.9	869.5	743.8	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	2153	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	3045	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	2118	Insert (M8)	133 in.-lbs (15 Nm)	B
grid | Xtreme VR 12-100 FT 23"	FRONT	1000	2262	Insert (M8)	133 in.-lbs (15 Nm)	B
grid | Xtreme VR 12-150 FT	FRONT	1000	2398	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	2879	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	699.7	699.7	699.7	645.0	598.4	443.3	346.4	286.5	214.1	156.1	123.2
1.70	834.1	834.1	761.7	696.3	638.7	456.2	349.4	287.6	214.3	156.1	123.3
1.67	868.0	868.0	791.0	719.8	656.8	459.6	349.4	287.6	214.3	156.1	123.3
1.65	887.9	887.9	802.0	729.2	667.4	460.6	349.4	287.6	214.3	156.1	123.3
1.60	941.4	941.4	843.6	758.9	686.9	460.6	349.4	287.6	214.3	156.1	123.3

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	1082.4	1082.4	1082.4	1020.6	965.4	759.7	622.4	523.5	398.5	297.1	238.5
1.70	1175.9	1175.9	1175.9	1102.8	1037.5	796.6	643.1	535.1	402.2	297.4	238.5
1.67	1314.8	1314.8	1224.9	1144.7	1073.2	811.4	647.5	535.9	402.3	297.4	238.5
1.65	1348.6	1348.6	1254.4	1170.0	1094.6	819.2	648.7	535.9	402.3	297.4	238.5
1.60	1421.8	1421.8	1318.5	1224.3	1139.5	832.5	648.8	535.9	402.3	297.4	238.5

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	744.5	744,5	744,5	693.3	649.0	492.7	397.7	335.1	255.8	189.4	151.7
1.70	856.6	856.6	797.5	744.1	695.9	519.0	410.6	342.8	259.0	190.6	152.1
1.67	902.0	902.0	832.7	771.8	718.2	528.4	451.0	344.7	259.2	190.6	152.1
1.65	924.3	924.3	852.0	788.1	731.9	533.9	416.8	345.2	259.2	190.6	152.1
1.60	977.5	977.5	893.9	821.2	758.2	542.4	418.8	345.2	259.2	190.6	152.1

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	848.6	848.6	848.6	793.3	744.2	564.6	452.9	378.7	287.1	211.7	168.0
1.70	985.2	985.2	914.5	851.4	795.1	591.2	467.4	386.9	290.1	212.4	168.4
1.67	1027.5	1027.5	949.3	880.1	818.9	601.6	472.4	388.9	290.2	212.4	168.4
1.65	1053.9	1053.9	970.4	897.1	832.7	606.6	474.2	389.3	290.2	212.4	168.4
1.60	1110.3	1110.3	1014.4	931.4	859.5	613.9	475.0	389.3	290.2	212.4	168.4

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	827.5	827.5	827.5	827.5	827.5	691.2	592.0	516.3	409.2	311.0	250.4
1.70	935.4	935.4	935.4	935.4	896.4	738.1	626.0	540.5	422.3	316.7	252.8
1.67	1019.7	1019.7	1019.7	974.7	932.5	759.6	639.8	549.2	425.9	317.3	252.8
1.65	1026.1	1026.1	1026.1	981.1	938.5	761.9	639.8	549.2	425.9	317.3	252.8
1.60	1165.6	1165.6	1105.4	1050.0	999.0	797.9	656.8	555.5	427.0	317.3	252.8

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	929.3	929.3	929.3	929.3	929.3	783.2	667.2	582.7	464.8	351.8	282.6
1.70	1086.0	1086.0	1086.0	1045.3	1006.4	839.5	709.3	609.4	477.8	357.2	284.8
1.67	1133.0	1133.0	1133.0	1089.0	1046.9	866.2	725.5	620.3	481.9	357.7	284.8
1.65	1164.5	1164.5	1164.5	1116.2	1070.6	880.7	734.2	626.0	483.9	357.7	284.8
1.60	1271.5	1271.5	1222.2	1172.7	1124.1	911.1	748.1	631.8	483.9	357.7	284.8

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	918.3	918.3	918.3	918.3	918.3	784.0	684.1	600.4	482.2	369.5	298.8
1.70	1036.7	1036.7	1036.7	1036.7	997.1	841.5	724.6	631.5	497.3	374.9	300.5
1.67	1130.1	1130.1	1130.1	1082.3	1038.9	869.5	743.8	645.0	501.2	375.6	300.8
1.65	1158.9	1158.9	1158.9	1108.1	1062.3	886.3	754.4	651.8	504.8	376.7	300.8
1.60	1279.3	1279.3	1220.1	1166.1	1116.6	921.4	775.4	663.1	505.8	376.7	300.8

Fig. A

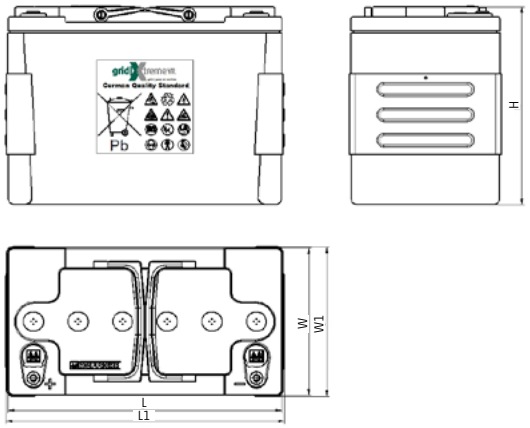
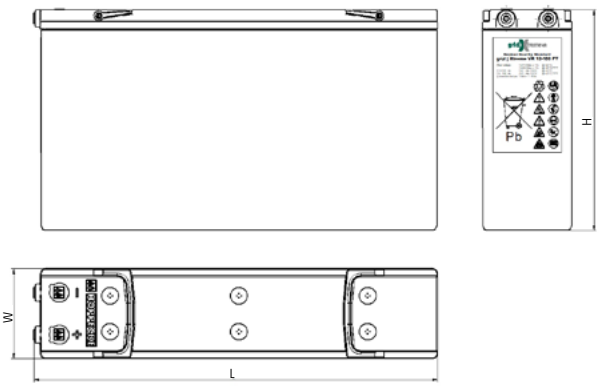


Fig. B



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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