



EvoRail™ Batteries: Technical Data

VRLA GEL BATTERY TECHNOLOGY FOR ROLLING STOCK APPLICATIONS

EvoRail™ batteries are Valve-Regulated Lead-Acid (VRLA) gas recombination batteries with a gelled electrolyte that eliminates the risk of environmentally damaging leaks and the need for watering.

Produced in accordance with the DIN standard and approved for use in railway vehicles, EvoRail™ batteries are suitable for rail auxiliary backup systems.

- **Robust Cell Construction:** Engineered with a strong and durable design, ensuring long-lasting reliability in all conditions.
- **Low Maintenance:** Designed for efficiency with no water topping required, providing worry-free operations and reduced upkeep costs.
- **Shock and Vibration Resistant:** Built to withstand the toughest rail environments, offering superior durability and peace of mind on every journey.
- **High Performance:** Delivers exceptional longevity with consistent power and long-term value.

 **HAWKER**
EvoRail™
BATTERIES

KEEPING YOU ON TRACK



Cell Range

Cell type	Nominal cell voltage	Nominal capacity 1.7 Vpc @30°C	Cell length	Total cell height		Cell width	Cell weight ±2%	Charge current IU or IUOU	Internal resistance	Short circuit current	Heat loss during float service at 20°C
				Height of cell	Over terminal cover						
#	Vdc	C _g Ah	mm	mm	mm	mm	kg	Wh	Wh	kA	W
2PzV110	2	110	47	340	370	198	8.9	20-30	1.85	1.1	0.15
2PzV140	2	140	47	405	435	198	10.5	25-38	1.21	1.68	0.19
3PzV165	2	165	65	340	370	198	12.8	30-45	1.23	1.65	0.23
3PzV210	2	210	65	405	435	198	14.9	38-57	0.81	2.51	0.29
4PzV220	2	220	83	340	370	198	16.3	40-60	0.92	2.2	0.3
5PzV275	2	275	101	340	370	198	20	50-75	0.74	2.75	0.38
4PzV280	2	280	83	405	435	198	19.3	51-76	0.61	3.35	0.38
6PzV330	2	330	119	340	370	198	23.7	60-90	0.62	3.3	0.45
5PzV350	2	350	101	405	435	198	23.7	64-95	0.48	4.19	0.48
7PzV385	2	385	137	340	370	198	27.4	70-105	0.53	3.85	0.53
6PzV420	2	420	119	405	435	198	28.1	76-115	0.4	5.03	0.57
8PzV440	2	440	155	340	370	198	31.1	80-120	0.46	4.4	0.6
7PzV490	2	490	137	405	435	198	32.5	89-134	0.35	5.87	0.67
8PzV560	2	560	155	405	435	198	36.9	102-153	0.3	6.7	0.76

Electrical Data

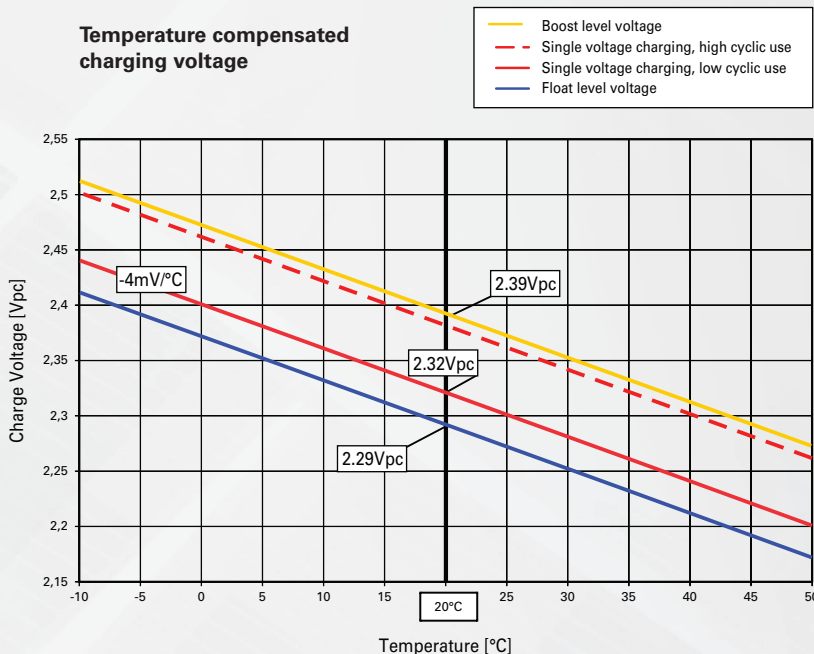
Conversion to capacity at 25°C	102% of Current/ Power at 20°C
Self discharge at 20°C	Max 3% / month

Mechanical Data

Number of terminals	1 + / 1-
Dimension of terminal screw hole	M10 x 22 deep, female thread
Torque terminal screw	25Nm ±2
Terminal insulation class according to IEC/EN 60529	IP 20
Diameter of diagnostic hole for voltage probe	2 mm
Maximum cable cross section	95mm ²
Connector and terminal connection	Use flexible EVO or PerfectPlus – connectors
Connector (copper, tin-coated and insulated)	For Rolling stock flexible connectors are recommended
Shock & Vibration rating	Category 1, Class B (IEC 61373)

Environmental Data

Installation	Vertical	
Cell assembly distance	Not required; for higher loads 5-10mm recommended for cooling	
Material of case/ cover	PP-FR	PP (on request)
Flame retardancy rating	EN45545-2 I2 / F1 (NF F 16-101)	HB (UL94)
Flame barrier at vents	Yes	
Rail service life expected at 15°C	6 years (max 30% DoD / day)	
Cycle Endurance (DB Test : 30% DoD/8h)	>80% Cnom after 1300 cycles	
Design life	12+ Long life, according Eurobat classification	
Shipping name	Batteries, wet, non spillable	



Temperature compensated charging voltage	
Temperature in °C	Percentage of the rated capacity (C _g)
40	107
35	105.8
30	104.0
25	102.0
20	100.0
15	97.8
10	94.5
5	91.0
0	86.0
-5	80.0
-10	72.5
-15	64.0
-20	47.0
-25	31.0
-30	14.0

*Estimated Values
Should be verified with actual load profile*

Battery Installation and Operation

Recommended charging for rolling stock applications (standby parallel operation)	IU0U- charging : 2 level charging (acc. DIN 41773) with current limitation and temperature compensation
Boost level voltage setting at 20°C	2.39 Vpc (Volt per cell)
Lower or single level voltage setting at 20°C	2.32 ... 2.38 Vpc (low ... high cyclic use)
Charge current for IU or IU0U-charging (DIN 41773)	See specific cell type
Voltage compensation in function of temperature	- 4 mV/K per cell
Float level voltage setting at 20°C (± 1%)	2.29 Vpc (valid for long term trickle charging at workshop and storage)
Air exchange	According to EN IEC 62485-2 $Q = 0.05 * N_{cells} * I_{gas} * C_{AhC10} * 10^{-3} [m^3/h]$ $I_{gas} = 5$ (at 2.29 Vpc) ; $I_{gas} = 20$ (at 2.39 Vpc)
Preferred operating temperature range	Between 15°C- 25°C
Maximum long term operating temperature	+40°C with ventilation assured (reduced service life)
Maximum short term operating temperature (< 3h)	+50°C with ventilation assured (reduced service life)
Minimum operating and storage temperature	- 40°C (in charged condition)



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