

EvoRail™ 7PzV385



*VRLA GEL Battery Technology
for Rolling Stock Applications*



*High cycle
performance*

*Very good deep
discharge recovery*

Maintenance free

V-0 flame retardant



Keeping you on track

Electrical Data

Nominal voltage	2 V
Number of cells	1 (VRLA, tubular GEL Technology)
Rated capacity C ₁₀ to 1.80 Vpc at 20 °C	378 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	385 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	544.9 A / 894 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	387.7 A / 659 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	247.7 A / 435 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	105.5 A / 195 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	68.8 A / 130 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	47.3 A / 90 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	37.8 A / 73 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	18.4 A / 36 W
Conversion to capacity at 25 °C	102% of Current/Power at 20°C
Internal resistance to IEC/EN 60896-21	0.53 mΩ
Short circuit current to IEC/EN 60896-21	3.85 kA
Self discharge at 20 °C to IEC/EN 60896-21	max. 3% / Month
Heat loss during float service at 20°C	≈0.53 W

Mechanical Data

Weight	27.4 kg ±2%
Height of cell / over terminal cover	340 mm / 370 mm
Width	198 mm
Depth	137 mm
Number of terminals	1 + / 1 -
Dimension of terminal screw hole	M10 x 22 deep, female thread
Torque terminal screw	25 Nm ±2
Terminal insulation class according to IEC/EN 60529	IP 20
Diameter of diagnostic hole for voltage probe	2 mm
Maximum cable cross-section	95 mm 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 (according)	Category 1, Class B (IEC 61373:2011)

Environmental Data

Installation	vertically
Cell assembly distance	not required; for higher loads 5-10 mm recommended for cooling
Material of case/cover; Flame retardancy rating (according to)	PP - FR or PP (on request) V-0 (UL94); I2 / F1 (NF F 16-101) or HB (UL94)
Flame barriers at vents	Yes
Rail service life expected at 15 °C	6 years (max. 30% DOD / day)
Cycle Endurance (DB Test : 30% DOD/8h)	> 80% C after 1'300 cycles
Design life (Eurobat classification)	12+ Long Life
Shipping name	Batteries, wet, non spillable

Hawker® EvoRail™ 7PzV385

Operating specifications

Figure 1



Figure 2

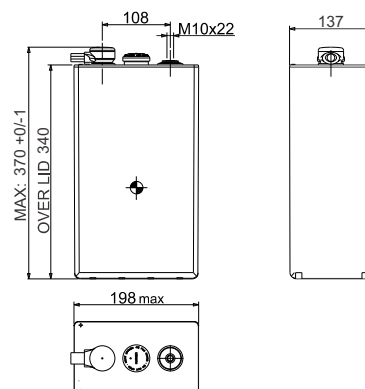
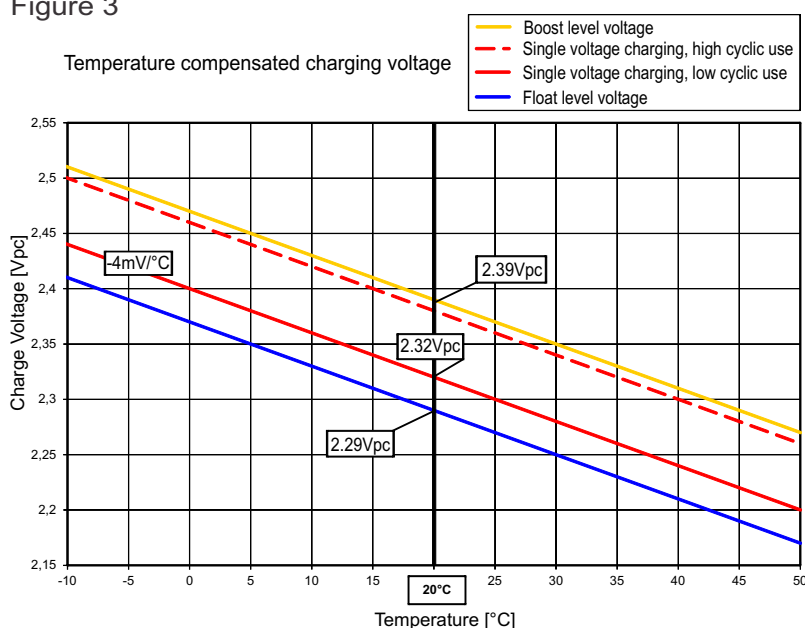


Figure 3



Temperature in °C	Percent of the rated capacity (C ₅)
40	107.0
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 level or constant voltage setting at 20°C	2.32 ... 2.38 Vpc (low ... high cyclic use)
Charge current for IU or IU0U-charging (DIN 41773)	70 ... 105 A (minimum for cyclic use: 88 A)
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	As a VRLA battery according to EN 50272-2 : 2001 $Q = 0.05 * N_{cells} * I_{gas} * C_{AhC10} * 10^{-3} [m^3/h]$ $I_{gas} = 1$ (at 2.29 Vpc) ; $I_{gas} = 8$ (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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Discharge data per cell

Constant current performance [Ampere] to the defined end of discharge voltage

Voltage [Vpc]	Temp	Discharge time [h:min]																		
		0:01	0:05	0:10	0:15	0:20	0:25	0:30	0:40	0:50	1:00	1:30	2:00	3:00	4:00	5:00	8:00	10:00	12:00	24:00
1.90	20°C	276.7	260.4	240.5	221.6	206.1	193.3	181.2	162.7	147.6	135.5	109.2	92.1	71.1	58.2	49.6	35.0	29.4	25.4	15.4
	25°C	277.5	261.5	243.3	225.4	210.2	197.5	185.8	167.2	152.1	139.8	112.9	95.4	73.7	60.3	51.4	36.2	30.4	26.3	15.8
1.85	20°C	367.8	350.0	317.6	291.5	269.8	250.5	234.2	207.7	186.8	170.3	134.9	112.6	85.7	69.8	59.1	41.3	34.6	29.9	17.3
	25°C	368.6	352.4	322.3	297.0	275.7	257.0	240.9	214.6	193.4	176.6	140.1	117.2	89.1	72.6	61.4	42.7	35.8	30.9	17.8
1.80	20°C	462.7	434.0	389.5	354.7	325.4	300.8	280.2	245.4	218.6	197.7	154.6	127.7	95.8	77.4	65.3	45.2	37.8	32.6	18.4
	25°C	462.7	438.2	395.9	362.6	334.2	309.9	289.0	254.6	227.3	206.0	161.4	133.3	99.9	80.7	67.9	46.9	39.2	33.8	19.0
1.75	20°C	560.6	514.7	456.2	411.1	374.4	343.9	317.3	275.3	243.0	217.9	167.5	137.2	101.9	81.9	68.8	47.3	39.5	34.1	19.0
	25°C	560.6	520.9	465.1	421.4	385.6	355.3	329.1	286.7	253.8	228.0	175.5	143.7	106.6	85.5	71.7	49.2	41.0	35.3	19.6
1.70	20°C	658.5	591.1	517.9	462.1	416.5	378.7	347.1	297.5	260.4	231.7	175.9	143.0	105.5	84.4	70.6	48.1	40.0	34.4	19.0
	25°C	658.5	599.0	529.6	475.5	430.9	393.2	361.5	311.0	273.0	243.2	184.8	150.0	110.5	88.2	73.8	50.0	41.5	35.6	19.6
1.65	20°C	756.4	664.7	575.3	506.8	451.7	407.0	370.3	313.6	272.3	241.1	181.3	146.4	106.5	84.6	70.6	48.1	40.0	34.4	19.0
	25°C	756.4	674.9	589.6	523.5	469.3	424.6	387.4	329.3	286.5	253.8	190.8	154.1	111.7	88.5	73.8	50.0	41.5	35.6	19.6
1.60	20°C	854.2	735.1	627.1	544.9	480.9	429.3	387.7	325.3	281.0	247.7	182.6	146.4	106.5	84.6	70.6	48.1	40.0	34.4	19.0
	25°C	854.2	748.2	644.9	565.0	501.6	449.9	407.3	342.6	296.2	261.3	192.7	154.1	111.7	88.5	73.8	50.0	41.5	35.6	19.6

Constant power performance [Watt per cell] to the defined end of discharge voltage

Voltage [Vpc]	Temp	Discharge time [h:min]																		
		0:01	0:05	0:10	0:15	0:20	0:25	0:30	0:40	0:50	1:00	1:30	2:00	3:00	4:00	5:00	8:00	10:00	12:00	24:00
1.90	20°C	525.9	495.6	457.0	422.3	392.9	368.3	346.1	311.1	283.4	260.6	210.8	178.8	138.3	114.2	97.4	68.7	57.9	50.0	30.3
	25°C	526.7	496.4	462.5	429.3	400.3	376.5	354.8	319.2	291.7	268.9	217.6	185.0	143.1	118.2	100.8	70.9	59.7	51.6	31.0
1.85	20°C	679.5	647.3	587.9	540.9	502.1	466.9	437.3	389.0	351.1	320.1	256.1	214.1	164.3	134.2	114.5	79.7	67.2	58.2	33.6
	25°C	681.3	652.5	596.4	551.5	513.5	479.0	449.5	401.7	363.0	331.7	266.0	222.7	170.8	139.3	118.8	82.6	69.5	60.2	34.5
1.80	20°C	832.8	781.3	702.7	641.7	590.8	547.6	511.0	450.6	403.2	365.2	287.7	239.5	181.4	146.9	124.7	86.7	72.6	62.8	35.6
	25°C	832.8	789.0	714.4	655.5	605.9	563.1	526.6	466.6	418.7	380.4	300.0	249.8	189.0	153.2	129.6	90.0	75.1	65.0	36.6
1.75	20°C	972.2	897.5	802.3	725.3	663.5	611.2	567.0	495.3	440.5	397.1	308.2	254.4	190.7	154.1	129.9	90.2	75.1	65.0	36.5
	25°C	972.3	907.2	817.6	742.9	682.4	631.5	587.1	515.0	459.1	414.6	322.4	266.0	199.0	160.8	135.1	93.7	77.9	67.3	37.7
1.70	20°C	1110.7	1000.4	883.9	795.1	721.6	659.9	608.3	526.5	464.5	416.7	320.0	262.3	195.4	157.7	132.4	91.4	75.8	65.5	36.6
	25°C	1110.8	1013.1	901.6	816.5	744.5	683.8	632.2	549.4	485.9	436.3	335.5	274.5	204.4	164.8	138.2	95.1	78.8	67.8	37.7
1.65	20°C	1246.8	1095.4	954.4	850.2	765.8	696.4	638.1	547.2	479.9	428.4	326.6	266.5	197.0	158.2	132.4	91.4	75.8	65.5	36.6
	25°C	1246.8	1112.1	976.5	875.8	792.8	724.0	665.5	572.7	503.5	449.5	343.2	279.9	206.5	165.5	138.4	95.1	78.8	67.8	37.7
1.60	20°C	1360.2	1182.2	1015.3	893.6	799.0	721.7	658.5	560.2	489.6	435.4	328.7	266.7	197.0	158.2	132.4	91.4	75.8	65.5	36.6
	25°C	1360.2	1201.5	1042.0	923.5	830.1	753.1	688.8	588.4	514.4	458.0	346.6	280.6	206.5	165.5	138.4	95.1	78.8	67.8	37.7

Constant discharge values without voltage loss in connectors and cables!
Our technical support offers to calculate the discharge curve for a specific load profile.



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