

# EvoRail™ 8PzV560



*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*

# Hawker® EvoRail™ 8PzV560

## Technical specifications

Part number: 1882508V0CP

### Electrical Data

Nominal voltage	2 V
Number of cells	1 (VRLA, tubular GEL Technology)
Rated capacity C <sub>10</sub> to 1.80 Vpc at 20 °C	550 Ah
Rated capacity C <sub>5</sub> to 1.70 Vpc at 30 °C	560 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	792.6 A / 1300 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	564.0 A / 958 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	360.3 A / 633 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	153.5 A / 284 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	100.1 A / 189 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	68.9 A / 131 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	55.0 A / 106 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	26.8 A / 52 W
Conversion to capacity at 25 °C	102% of Current/Power at 20°C
Internal resistance to IEC/EN 60896-21	0.30 mΩ
Short circuit current to IEC/EN 60896-21	6.70 kA
Self discharge at 20 °C to IEC/EN 60896-21	max. 3% / Month
Heat loss during float service at 20°C	≈ 0.76 W

### Mechanical Data

Weight	36.9 kg ±2%
Height of cell / over terminal cover	405 mm / 435 mm
Width	198 mm
Depth	155 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 <sup>2</sup>
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 <sub>nom</sub> after 1'300 cycles
Design life (Eurobat classification)	12+ Long Life
Shipping name	Batteries, wet, non spillable

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## Operating specifications

Figure 1



Figure 2

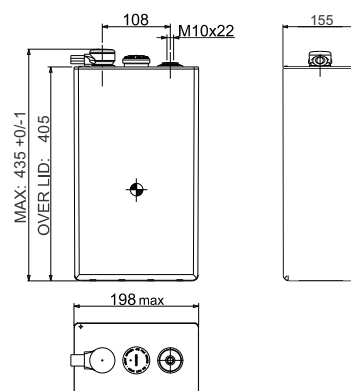
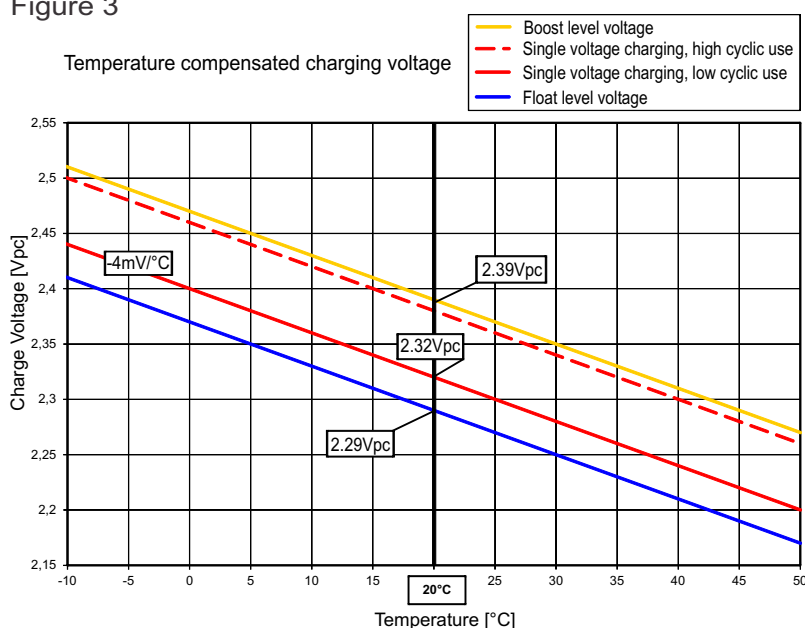


Figure 3



Temperature in °C	Percent of the rated capacity (C <sub>5</sub> )
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)	102 ... 153 A (minimum for cyclic use: 127 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	402.5	378.8	349.8	322.3	299.8	281.2	263.6	236.7	214.7	197.1	158.8	134.0	103.4	84.7	72.2	50.9	42.8	37.0	22.4
	25°C	403.7	380.3	353.9	327.9	305.7	287.2	270.2	243.2	221.3	203.3	164.2	138.7	107.2	87.7	74.7	52.6	44.2	38.2	23.0
1.85	20°C	535.0	509.1	462.0	424.0	392.5	364.4	340.6	302.2	271.7	247.7	196.2	163.8	124.7	101.5	86.0	60.0	50.4	43.5	25.1
	25°C	536.2	512.6	468.8	432.0	401.0	373.9	350.5	312.1	281.3	256.8	203.8	170.4	129.6	105.5	89.3	62.2	52.1	45.0	25.9
1.80	20°C	673.1	631.3	566.5	515.9	473.3	437.5	407.5	356.9	317.9	287.6	224.9	185.8	139.3	112.7	94.9	65.8	55.0	47.5	26.8
	25°C	673.1	637.3	575.9	527.4	486.0	450.8	420.4	370.4	330.7	299.7	234.7	193.9	145.4	117.4	98.8	68.2	57.0	49.1	27.6
1.75	20°C	815.5	748.6	663.6	598.0	544.6	500.3	461.5	400.5	353.4	316.9	243.7	199.6	148.3	119.1	100.1	68.9	57.5	49.5	27.6
	25°C	815.4	757.6	676.6	612.9	560.9	516.8	478.7	417.1	369.2	331.6	255.2	209.0	155.0	124.3	104.3	71.5	59.7	51.3	28.5
1.70	20°C	957.8	859.7	753.3	672.2	605.8	550.9	504.9	432.7	378.7	337.1	255.8	208.0	153.5	122.8	102.7	69.9	58.2	50.0	27.6
	25°C	957.8	871.3	770.4	691.6	626.8	571.9	525.9	452.4	397.1	353.8	268.7	218.2	160.7	128.3	107.3	72.7	60.4	51.8	28.5
1.65	20°C	1100.2	966.9	836.7	737.2	657.0	592.0	538.6	456.1	396.1	350.7	263.8	212.9	154.9	123.1	102.7	69.9	58.2	50.0	27.6
	25°C	1100.2	981.7	857.6	761.4	682.6	617.6	563.6	479.0	416.7	369.2	277.5	224.1	162.5	128.8	107.3	72.7	60.4	51.8	28.5
1.60	20°C	1242.5	1069.2	912.1	792.6	699.5	624.5	564.0	473.1	408.7	360.3	265.6	212.9	154.9	123.1	102.7	69.9	58.2	50.0	27.6
	25°C	1242.5	1088.2	938.1	821.9	729.5	654.5	592.5	498.4	430.8	380.1	280.3	224.1	162.5	128.8	107.3	72.7	60.4	51.8	28.5

### 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	764.9	720.9	664.7	614.3	571.4	535.7	503.5	452.6	412.2	379.1	306.6	260.1	201.1	166.1	141.6	99.9	84.2	72.8	44.0
	25°C	766.1	722.0	672.7	624.5	582.3	547.6	516.0	464.3	424.3	391.1	316.5	269.1	208.2	172.0	146.6	103.2	86.9	75.1	45.1
1.85	20°C	988.3	941.6	855.2	786.8	730.3	679.1	636.0	565.8	510.6	465.7	372.5	311.5	239.0	195.2	166.5	115.9	97.8	84.7	48.9
	25°C	991.0	949.0	867.5	802.2	746.9	696.7	653.9	584.3	528.1	482.5	386.9	323.9	248.4	202.6	172.8	120.2	101.1	87.5	50.2
1.80	20°C	1211.3	1136.4	1022.0	933.3	859.4	796.6	743.2	655.4	586.4	531.3	418.5	348.4	263.8	213.7	181.4	126.1	105.5	91.4	51.8
	25°C	1211.3	1147.7	1039.1	953.4	881.3	819.1	765.9	678.8	609.0	553.3	436.4	363.4	274.9	222.8	188.5	131.0	109.3	94.6	53.3
1.75	20°C	1414.1	1305.5	1167.0	1055.0	965.1	889.1	824.7	720.4	640.8	577.7	448.3	370.0	277.5	224.1	188.9	131.2	109.2	94.6	53.1
	25°C	1414.2	1319.6	1189.2	1080.6	992.6	918.6	854.0	749.1	667.8	603.1	469.0	386.9	289.5	233.9	196.6	136.4	113.4	97.9	54.8
1.70	20°C	1615.6	1455.1	1285.7	1156.6	1049.6	959.9	884.7	765.8	675.7	606.2	465.4	381.5	284.2	229.4	192.6	132.9	110.3	95.3	53.2
	25°C	1615.8	1473.5	1311.5	1187.6	1082.9	994.6	919.5	799.1	706.8	634.6	488.0	399.3	297.2	239.7	201.1	138.3	114.7	98.7	54.8
1.65	20°C	1813.5	1593.3	1388.2	1236.7	1113.9	1012.9	928.2	795.9	698.0	623.1	475.0	387.7	286.5	230.2	192.6	132.9	110.3	95.3	53.2
	25°C	1813.5	1617.5	1420.3	1273.9	1153.2	1053.1	968.1	833.0	732.4	653.8	499.2	407.2	300.4	240.7	201.3	138.3	114.7	98.7	54.8
1.60	20°C	1978.4	1719.5	1476.9	1299.7	1162.3	1049.7	957.8	814.8	712.1	633.3	478.2	388.0	286.5	230.2	192.6	132.9	110.3	95.3	53.2
	25°C	1978.4	1747.6	1515.7	1343.2	1207.4	1095.4	1001.8	855.8	748.3	666.2	504.1	408.1	300.4	240.7	201.3	138.3	114.7	98.7	54.8

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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