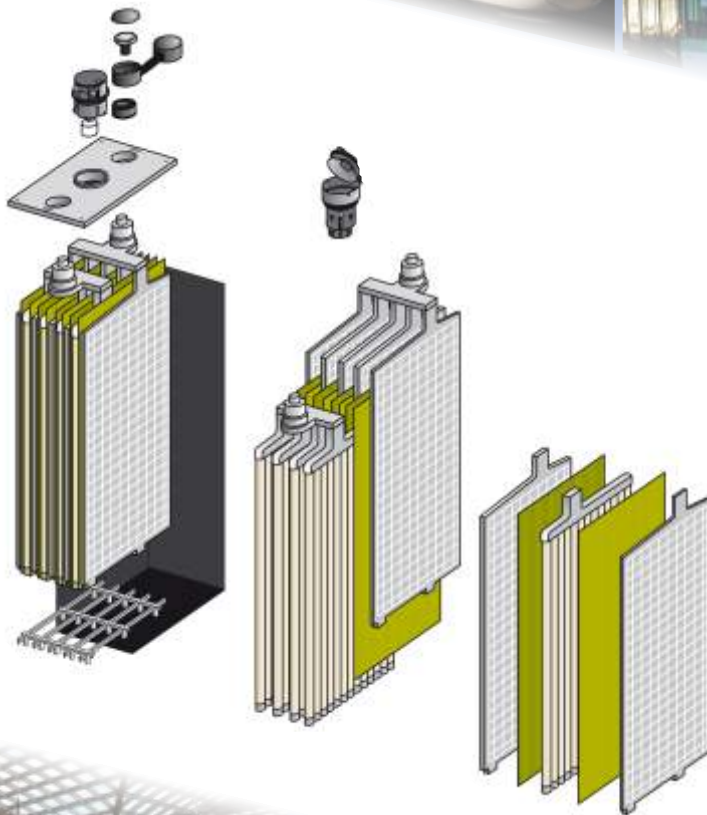


PerfectRail™ 8PzS560



*Lead-Acid Battery Technology
for Rolling Stock Applications*



Robust cell construction

Low maintenance

Shock and vibration resistant

Very high cycle performance

V-0 Flame retardant



Keeping you on track

Hawker® PerfectRail™ 8PzS560

Technical specifications

Part number: 3563144

Electrical Data

Nominal voltage	2 V
Number of cells	1 (Lead-Acid tubular Technology)
Specific gravity of acid	1.24 kg/l (at 30°C) on request 1.27 and 1.29 available
Rated capacity C ₁₀ to 1.80 Vpc at 20 °C	582 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	560 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	711.7 A / 1162 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	529.0 A / 893 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	345.5 A / 612 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	153.2 A / 286 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	102.0 A / 194 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	71.1 A / 136 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	58.2 A / 113 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	28.5 A / 58 W
Conversion to capacity at 25 °C	103 % of Current/Power at 20°C
Internal resistance	0.40 mΩ
Short circuit current	5.06 kA
Self discharge at 20 °C	max. 6% / Month
Heat loss during float service at 20°C	≈0.76 W

Mechanical Data

Weight	35.1 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 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)
Rail service life expected at 15 °C	6 Years (max 30% DoD / day)
Cycle Endurance (DB Test : 30% DOD/8h)	> 80% C _{nom} after 1'300 cycles
Design life	12+ Long Life, according Eurobat Classification
Shipping name	Batteries, wet, filled with acid

Hawker® PerfectRail™ 8PzS560

Operating specifications

Figure 1



Figure 2

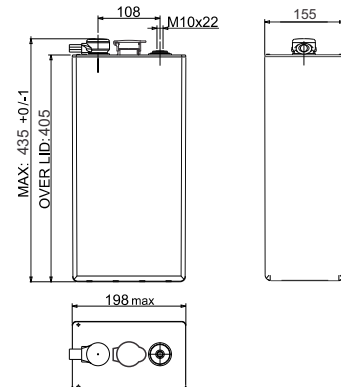
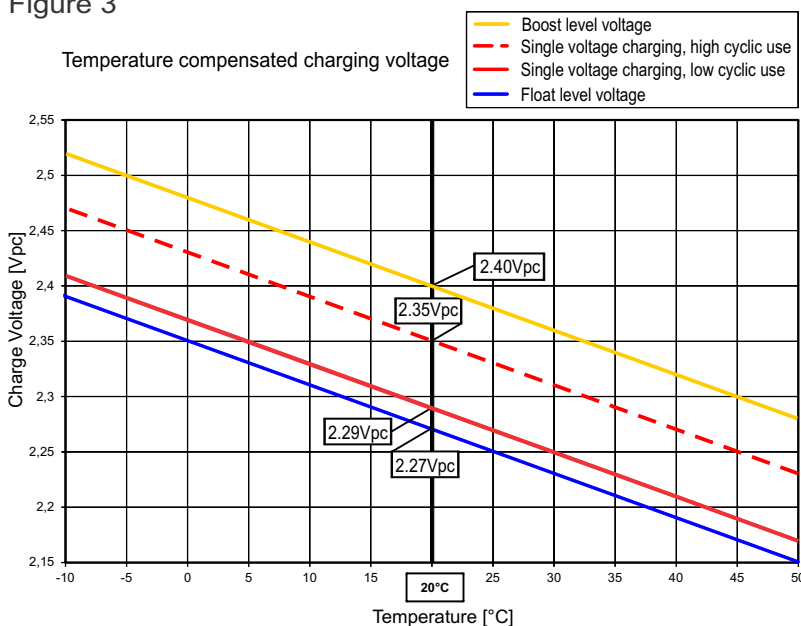


Figure 3



Temperature in °C	Percent of the rated capacity (C ₅)
40	113
35	109
30	106
25	103
20	100
15	97
10	93
5	89
0	84
-5	77
-10	70
-15	62
-20	52
-25	40
-30	29

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	2.40 Vpc (Volt per cell)
Lower or single level voltage setting at 20°C	2.29 ... 2.35 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%)	2.27 Vpc (valid for long term trickle charging at workshop and storage)
Air exchange	According to EN 50272-2 : 2001 $Q = 0.05 * N_{cells} * I_{gas} * C_{AhC10} * 10^{-3} [m^3/h]$ $I_{gas} = 5$ (at 2.29 Vpc) ; $I_{gas} = 20$ (at 2.40 Vpc)
Water refill	manual / optional 'aquamatic' system
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)

Hawker® PerfectRail™ 8PzS560

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	344.7	344.7	344.7	335.9	314.2	295.2	278.7	251.4	229.6	211.5	172.5	147.2	115.0	95.7	82.6	59.4	50.2	43.7	24.8
	25°C	344.7	344.7	344.7	341.2	320.1	301.5	285.3	258.0	236.3	218.0	178.3	152.3	119.1	99.1	85.5	61.3	51.8	45.0	25.4
1.85	20°C	469.4	469.4	444.5	409.4	380.1	354.8	333.6	298.7	270.9	248.1	199.8	168.5	129.8	106.8	91.5	65.2	55.1	47.8	27.1
	25°C	469.4	469.3	450.8	417.0	388.3	363.8	342.4	307.7	279.8	256.8	207.4	174.9	134.9	110.7	94.9	67.5	56.9	49.3	27.8
1.80	20°C	599.0	581.8	522.0	477.4	440.8	410.5	384.3	340.2	306.1	278.9	221.7	185.2	141.0	114.9	97.8	69.0	58.2	50.4	28.5
	25°C	598.9	588.1	530.5	487.2	451.2	421.2	395.7	352.0	317.4	289.6	230.9	192.8	146.8	119.6	101.7	71.6	60.2	52.1	29.2
1.75	20°C	727.8	669.6	596.6	541.5	497.3	460.3	428.5	376.7	336.2	304.1	238.5	197.5	148.8	120.6	102.0	71.1	59.6	51.4	28.8
	25°C	727.8	677.7	607.4	554.1	510.7	473.7	442.7	391.0	349.9	317.0	249.1	206.2	155.3	125.7	106.3	73.9	61.7	53.2	29.6
1.70	20°C	853.3	753.8	667.4	602.2	549.4	504.9	467.4	407.2	360.7	323.9	250.6	206.1	153.2	122.7	103.1	71.1	59.6	51.4	28.8
	25°C	853.3	763.8	680.5	617.3	565.9	522.1	484.6	423.9	376.7	338.9	262.5	215.7	160.4	128.1	107.5	73.9	61.7	53.2	29.6
1.65	20°C	975.0	834.4	734.5	659.2	596.9	544.7	501.0	431.7	379.9	338.9	257.4	208.1	153.2	122.7	103.1	71.1	59.6	51.4	28.8
	25°C	980.4	846.2	750.2	677.1	616.7	565.4	521.5	451.2	398.0	355.6	271.0	218.6	160.4	128.1	107.5	73.9	61.7	53.2	29.6
1.60	20°C	1000.4	910.3	798.5	711.7	639.4	579.0	529.0	451.1	394.1	345.5	257.4	208.1	153.2	122.7	103.1	71.1	59.6	51.4	28.8
	25°C	1000.4	923.9	817.0	733.4	663.2	603.5	552.7	473.0	414.0	365.3	271.0	218.6	160.4	128.1	107.5	73.9	61.7	53.2	29.6

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	651.4	651.4	651.4	640.0	599.3	564.1	533.9	482.4	441.2	407.9	334.1	286.3	224.7	188.0	162.4	117.7	101.3	89.0	51.6
	25°C	651.4	651.4	651.4	649.6	610.1	576.1	545.8	495.1	454.0	419.5	345.4	295.6	232.8	194.3	168.1	121.2	104.1	91.4	52.9
1.85	20°C	862.4	862.3	821.4	760.0	707.1	662.7	624.5	561.8	511.2	469.4	380.5	322.1	250.6	206.0	177.8	127.2	108.8	95.7	55.8
	25°C	862.3	862.3	832.5	772.8	722.4	678.9	640.1	577.7	527.2	485.5	394.0	334.5	260.1	213.9	184.2	131.6	112.1	98.5	57.1
1.80	20°C	1075.6	1045.5	940.4	862.8	799.7	747.2	701.7	626.7	567.4	519.1	414.5	349.2	268.5	219.9	187.8	133.2	113.0	99.5	58.1
	25°C	1075.7	1056.4	955.3	879.7	817.8	765.6	721.5	646.7	587.0	538.0	431.5	363.4	279.2	228.9	194.8	138.1	116.7	102.5	59.6
1.75	20°C	1269.2	1171.9	1048.2	954.9	880.8	819.0	765.9	677.9	611.2	556.9	440.8	367.5	279.9	228.7	193.8	136.4	114.9	100.8	58.7
	25°C	1269.4	1184.9	1066.9	975.9	903.6	842.2	789.7	702.1	633.7	578.9	459.9	383.0	291.5	238.3	201.8	141.8	119.1	103.9	60.2
1.70	20°C	1449.1	1281.9	1141.2	1036.2	951.1	879.6	819.0	720.1	643.0	583.9	458.4	378.8	286.2	232.2	195.7	136.5	114.9	100.8	58.7
	25°C	1449.1	1298.5	1161.6	1062.2	977.6	907.3	847.2	747.8	669.4	608.2	479.4	395.9	299.1	242.3	204.1	142.0	119.1	103.9	60.2
1.65	20°C	1611.8	1382.3	1220.9	1104.2	1009.4	929.1	861.5	751.8	667.2	601.8	469.6	382.4	286.2	232.2	195.7	136.5	114.9	100.8	58.7
	25°C	1616.5	1400.4	1245.7	1132.1	1039.9	961.1	893.0	782.9	697.0	628.3	492.0	401.7	299.4	242.3	204.1	142.0	119.1	103.9	60.2
1.60	20°C	1639.7	1466.8	1292.5	1161.7	1055.8	967.5	893.2	775.0	684.5	611.9	469.9	382.4	286.2	232.2	195.7	136.5	114.9	100.8	58.7
	25°C	1642.7	1487.7	1321.8	1193.7	1090.7	1003.5	928.6	809.1	716.7	642.9	493.5	401.7	299.4	242.3	204.1	142.0	119.1	103.9	60.2

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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