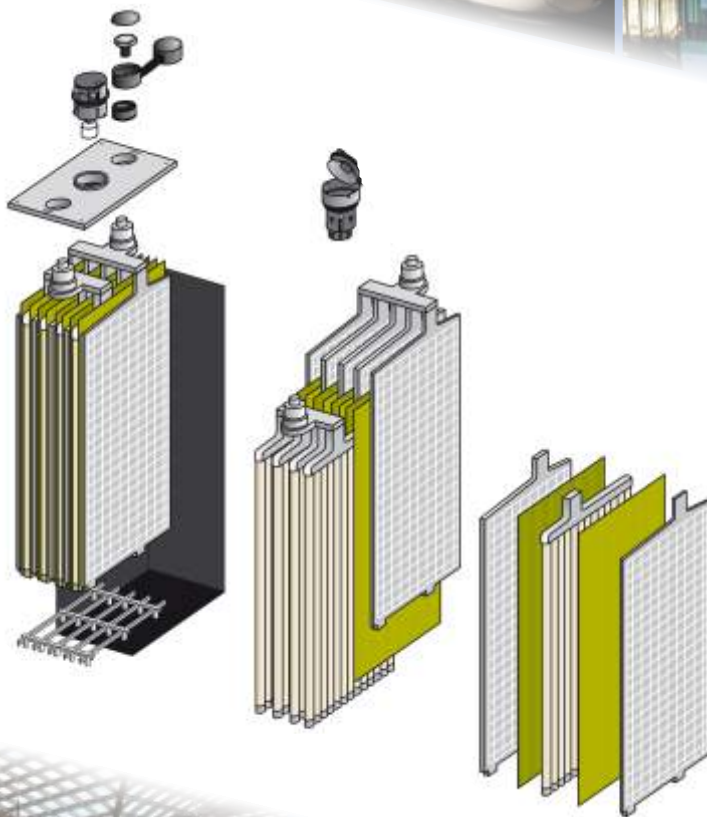


PerfectRail™ 6PzS330



*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™ 6PzS330

Technical specifications

Part number: 3563039

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	342 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	330 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	436.9 A / 717 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	317.4 A / 540 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	202.8 A / 363 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	90.2 A / 169 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	60.4 A / 115 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	42.0 A / 81 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	34.2 A / 66 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	16.3 A / 32 W
Conversion to capacity at 25 °C	103 % of Current/Power at 20°C
Internal resistance	0.62 mΩ
Short circuit current	3.24 kA
Self discharge at 20 °C	max 6% / Month
Heat loss during float service at 20°C	≈ 0.45 W

Mechanical Data

Weight	23 kg ±2%
Height of cell / over terminal cover	340 mm / 370 mm
Width	198 mm
Depth	119 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™ 6PzS330

Operating specifications

Figure 1



Figure 2

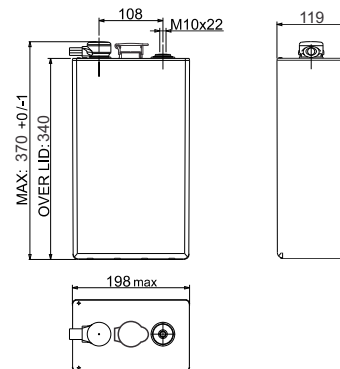
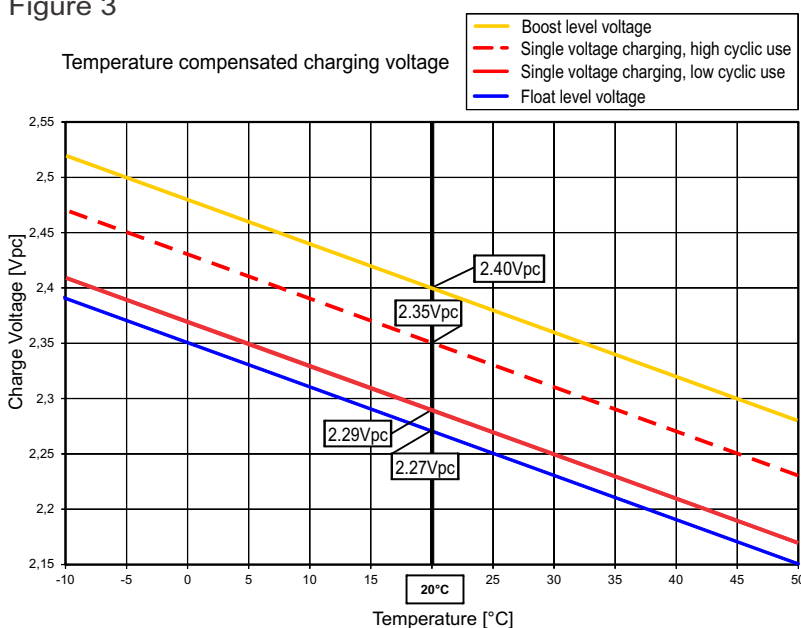


Figure 3



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)	60 ... 90 A (minimum for cyclic use: 75 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)

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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	229.7	229.7	229.7	213.4	197.6	184.8	173.6	155.4	141.5	129.7	105.2	89.1	69.0	57.3	49.3	35.1	29.5	25.5	14.2
	25°C	229.7	229.7	229.7	217.2	202.1	189.2	178.2	159.9	145.8	134.0	108.9	92.3	71.6	59.3	51.0	36.3	30.5	26.3	14.6
1.85	20°C	309.5	309.5	283.0	258.0	237.8	220.8	206.6	183.3	165.4	151.1	120.8	101.5	77.8	63.7	54.6	38.5	32.4	27.9	15.5
	25°C	309.5	309.5	287.6	263.1	243.7	226.8	212.6	189.2	171.2	156.5	125.6	105.5	80.8	66.1	56.6	39.9	33.5	28.9	16.0
1.80	20°C	388.4	373.7	330.8	298.9	274.1	253.2	235.9	207.6	185.9	168.7	133.2	110.8	83.9	68.3	58.1	40.8	34.2	29.5	16.3
	25°C	388.4	378.2	336.8	306.2	281.4	260.7	243.6	215.1	193.1	175.4	138.9	115.6	87.5	71.1	60.4	42.3	35.4	30.5	16.9
1.75	20°C	471.4	428.0	376.1	337.8	307.1	282.2	261.5	228.4	202.7	182.9	142.3	117.5	88.1	71.3	60.4	42.0	35.1	30.2	16.6
	25°C	471.4	433.9	383.9	346.6	316.4	291.7	270.9	237.5	211.4	190.9	148.9	122.8	92.0	74.3	62.8	43.7	36.4	31.3	17.2
1.70	20°C	553.9	479.9	418.6	373.2	337.5	308.1	283.6	245.4	216.3	193.5	148.8	122.0	90.2	72.3	60.8	42.0	35.1	30.2	16.6
	25°C	553.9	487.2	427.9	384.1	348.8	319.5	295.0	255.9	226.4	202.8	156.0	127.8	94.4	75.5	63.4	43.7	36.4	31.3	17.2
1.65	20°C	582.1	527.9	458.6	406.5	364.8	330.5	302.3	258.6	226.6	201.4	151.3	122.4	90.2	72.3	60.8	42.0	35.1	30.2	16.6
	25°C	582.1	536.4	469.9	419.5	378.2	344.1	315.7	270.8	237.6	211.8	159.2	128.6	94.4	75.5	63.4	43.7	36.4	31.3	17.2
1.60	20°C	582.1	571.9	495.8	436.9	388.7	349.5	317.4	268.7	231.2	202.8	151.3	122.4	90.2	72.3	60.8	42.0	35.1	30.2	16.6
	25°C	582.1	581.9	508.6	451.7	404.5	365.3	332.7	282.5	244.3	214.3	159.2	128.6	94.4	75.5	63.4	43.7	36.4	31.3	17.2

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	435.5	435.5	435.5	406.9	378.3	354.2	333.4	299.4	272.1	250.3	204.0	173.6	135.2	112.6	97.2	69.3	58.4	50.6	28.0
	25°C	435.4	435.4	435.4	413.9	386.0	362.0	341.6	308.0	280.5	258.2	211.0	179.7	140.1	116.3	100.5	71.6	60.3	52.1	28.7
1.85	20°C	569.4	569.3	524.2	478.9	443.4	412.9	387.4	345.8	313.3	286.9	230.5	194.6	150.4	123.2	106.2	75.4	63.5	54.9	30.5
	25°C	569.3	569.3	532.1	488.4	453.2	423.7	398.1	356.3	323.8	296.9	239.2	202.1	156.2	128.1	110.0	78.1	65.6	56.7	31.3
1.80	20°C	698.3	673.7	597.5	542.4	499.0	462.6	432.3	383.1	345.7	315.2	249.9	209.6	160.3	131.0	111.7	79.1	66.3	57.4	31.9
	25°C	698.4	681.5	608.1	554.5	511.2	476.0	445.5	395.9	358.2	327.2	260.5	218.3	166.8	136.3	115.8	82.0	68.7	59.4	32.7
1.75	20°C	823.9	749.6	661.8	597.6	546.6	504.9	469.8	412.8	369.9	336.1	264.5	219.4	166.3	135.6	114.8	81.1	67.7	58.5	32.3
	25°C	823.9	759.8	674.7	612.2	562.5	520.8	485.6	428.5	384.4	349.8	276.2	228.9	173.4	141.4	119.5	84.2	70.3	60.6	33.2
1.70	20°C	940.6	818.6	716.7	644.3	586.8	539.7	500.1	436.4	387.3	350.7	273.7	225.1	169.2	137.2	115.6	81.1	67.7	58.5	32.3
	25°C	940.6	831.1	731.9	661.6	605.2	557.9	518.4	454.4	404.4	365.8	286.5	235.7	177.0	143.2	120.6	84.3	70.3	60.6	33.2
1.65	20°C	979.4	876.8	765.2	683.8	619.6	567.0	523.4	454.0	400.6	359.7	278.2	226.2	169.2	137.2	115.6	81.1	67.7	58.5	32.3
	25°C	979.4	890.4	783.5	703.5	640.4	587.9	544.0	473.8	419.5	376.2	292.2	237.7	177.0	143.2	120.6	84.3	70.3	60.6	33.2
1.60	20°C	979.3	929.9	806.7	717.1	645.8	587.5	540.3	465.9	408.9	362.6	278.2	226.2	169.2	137.2	115.6	81.1	67.7	58.5	32.3
	25°C	979.3	936.9	826.6	739.8	669.4	611.4	563.2	487.4	429.5	381.8	292.2	237.7	177.0	143.2	120.6	84.3	70.3	60.6	33.2

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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