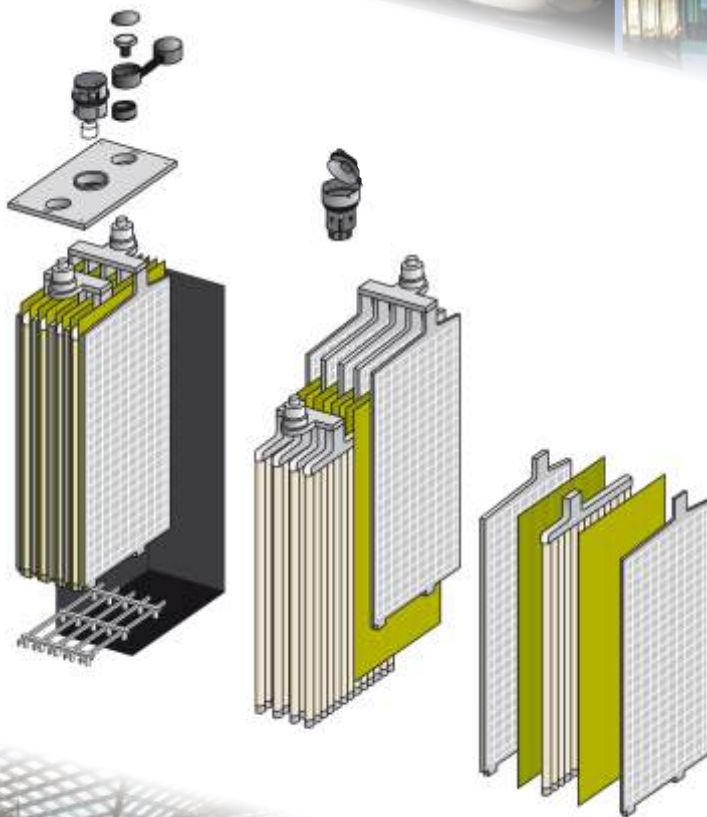


PerfectRail™ 5PzS275



*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™ 5PzS275

Technical specifications

Part number: 3563022

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	285 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	275 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	364.1 A / 598 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	264.5 A / 450 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	169.0 A / 302 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	75.1 A / 141 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	50.3 A / 96 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	35.0 A / 68 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	28.5 A / 55 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	13.6 A / 27 W
Conversion to capacity at 25 °C	103 % of Current/Power at 20°C
Internal resistance	0.74 mΩ
Short circuit current	2.70 kA
Self discharge at 20 °C	max. 6% / Month
Heat loss during float service at 20°C	≈ 0.38 W

Mechanical Data

Weight	19 kg ±2%
Height of cell / over terminal cover	340 mm / 370 mm
Width	198 mm
Depth	101 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™ 5PzS275

Operating specifications

Figure 1



Figure 2

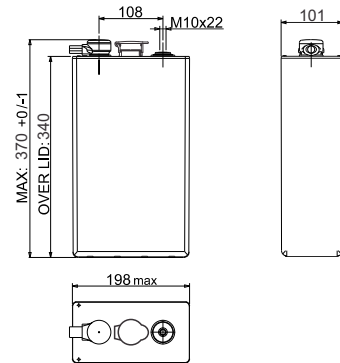
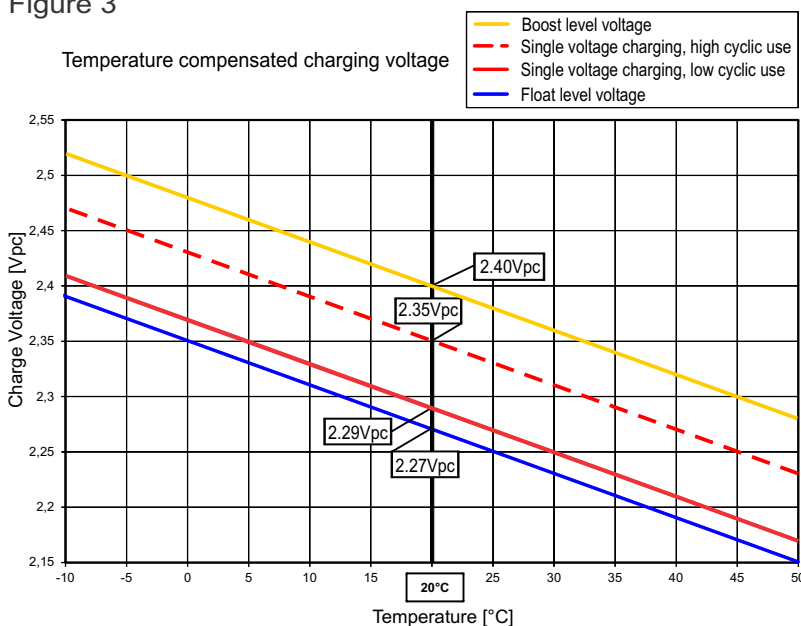


Figure 3



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)	50 ... 75 A (minimum for cyclic use: 63 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 [V _{pc}]	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	191.4	191.4	191.4	177.8	164.7	154.0	144.6	129.5	117.9	108.1	87.7	74.2	57.5	47.8	41.1	29.2	24.6	21.2	11.8
	25°C	191.4	191.4	191.4	181.0	168.4	157.7	148.5	133.2	121.5	111.7	90.7	76.9	59.6	49.4	42.5	30.2	25.4	21.9	12.2
1.85	20°C	258.0	257.9	235.8	215.0	198.2	184.0	172.1	152.8	137.8	125.9	100.7	84.6	64.8	53.1	45.5	32.1	27.0	23.3	12.9
	25°C	257.9	257.9	239.7	219.3	203.1	189.0	177.2	157.7	142.6	130.4	104.7	87.9	67.4	55.1	47.1	33.3	27.9	24.1	13.3
1.80	20°C	323.7	311.4	275.7	249.1	228.4	211.0	196.5	173.0	154.9	140.5	111.0	92.4	69.9	56.9	48.4	34.0	28.5	24.6	13.6
	25°C	323.7	315.2	280.7	255.1	234.5	217.3	203.0	179.3	160.9	146.2	115.7	96.3	72.9	59.2	50.3	35.2	29.5	25.4	14.0
1.75	20°C	392.8	356.7	313.4	281.5	255.9	235.2	217.9	190.4	168.9	152.4	118.6	97.9	73.4	59.4	50.3	35.0	29.2	25.2	13.8
	25°C	392.8	361.5	319.9	288.8	263.7	243.1	225.8	197.9	176.2	159.1	124.0	102.4	76.7	62.0	52.4	36.4	30.3	26.1	14.3
1.70	20°C	461.6	399.9	348.9	311.0	281.2	256.8	236.4	204.5	180.3	161.3	124.0	101.6	75.1	60.2	50.7	35.0	29.2	25.2	13.8
	25°C	461.6	406.0	356.6	320.1	290.7	266.3	245.8	213.3	188.6	169.0	130.0	106.5	78.7	62.9	52.8	36.4	30.3	26.1	14.3
1.65	20°C	485.1	439.9	382.1	338.8	304.0	275.4	251.9	215.5	188.8	167.8	126.1	102.0	75.1	60.2	50.7	35.0	29.2	25.2	13.8
	25°C	485.1	447.0	391.6	349.5	315.2	286.7	263.1	225.7	198.0	176.5	132.7	107.1	78.7	62.9	52.8	36.4	30.3	26.1	14.3
1.60	20°C	485.1	476.6	413.2	364.1	323.9	291.3	264.5	223.9	192.6	169.0	126.1	102.0	75.1	60.2	50.7	35.0	29.2	25.2	13.8
	25°C	485.1	484.9	423.9	376.4	337.1	304.4	277.2	235.4	203.6	178.6	132.7	107.1	78.7	62.9	52.8	36.4	30.3	26.1	14.3

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

Voltage [V _{pc}]	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	362.9	362.9	362.9	339.0	315.2	295.1	277.8	249.5	226.8	208.6	170.0	144.7	112.6	93.8	81.0	57.7	48.7	42.1	23.3
	25°C	362.9	362.8	362.8	344.9	321.7	301.6	284.7	256.6	233.8	215.2	175.9	149.7	116.8	96.9	83.8	59.7	50.3	43.4	23.9
1.85	20°C	474.5	474.4	436.9	399.1	369.5	344.1	322.9	288.2	261.1	239.1	192.1	162.1	125.3	102.7	88.5	62.8	52.9	45.8	25.4
	25°C	474.4	474.4	443.5	407.0	377.7	353.1	331.8	297.0	269.9	247.4	199.3	168.4	130.2	106.7	91.7	65.1	54.7	47.3	26.1
1.80	20°C	581.9	561.5	497.9	452.0	415.8	385.5	360.2	319.3	288.1	262.7	208.2	174.7	133.6	109.1	93.1	65.9	55.3	47.9	26.5
	25°C	582.0	567.9	506.7	462.1	426.0	396.6	371.3	329.9	298.5	272.7	217.1	181.9	139.0	113.6	96.5	68.4	57.3	49.5	27.3
1.75	20°C	686.6	624.7	551.5	498.0	455.5	420.8	391.5	344.0	308.3	280.1	220.4	182.8	138.6	113.0	95.6	67.6	56.5	48.8	27.0
	25°C	686.6	633.1	562.3	510.2	468.7	434.0	404.6	357.1	320.3	291.5	230.2	190.8	144.5	117.8	99.6	70.1	58.6	50.5	27.7
1.70	20°C	783.8	682.2	597.2	536.9	489.0	449.8	416.7	363.7	322.7	292.2	228.1	187.6	141.0	114.3	96.3	67.6	56.5	48.8	27.0
	25°C	783.8	692.6	609.9	551.4	504.3	464.9	432.0	378.7	337.0	304.9	238.8	196.4	147.5	119.3	100.5	70.2	58.6	50.5	27.7
1.65	20°C	816.1	730.7	637.7	569.9	516.4	472.5	436.2	378.3	333.8	299.8	231.8	188.5	141.0	114.3	96.3	67.6	56.5	48.8	27.0
	25°C	816.1	742.0	652.9	586.2	533.7	489.9	453.3	394.9	349.6	313.5	243.5	198.0	147.5	119.3	100.5	70.2	58.6	50.5	27.7
1.60	20°C	816.1	774.9	672.3	597.6	538.2	489.6	450.3	388.2	340.7	302.2	231.8	188.5	141.0	114.3	96.3	67.6	56.5	48.8	27.0
	25°C	816.1	780.7	688.9	616.5	557.8	509.5	469.4	406.1	357.9	318.1	243.5	198.0	147.5	119.3	100.5	70.2	58.6	50.5	27.7

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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