

EvoRail™ 5PzV350



*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™ 5PzV350

Technical specifications

Part number: 1882505V0CP

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	344 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	350 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	495.4 A / 812 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	352.5 A / 599 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	225.2 A / 396 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	95.9 A / 178 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	62.5 A / 118 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	43.0 A / 82 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	34.4 A / 66 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	16.8 A / 32 W
Conversion to capacity at 25 °C	102% of Current/Power at 20°C
Internal resistance to IEC/EN 60896-21	0.48 mΩ
Short circuit current to IEC/EN 60896-21	4.19 kA
Self discharge at 20 °C to IEC/EN 60896-21	max. 3% / Month
Heat loss during float service at 20°C	≈ 0.48 W

Mechanical Data

Weight	23.7 kg ±2%
Height of cell / over terminal cover	405 mm / 435 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)
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 _{nom} 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

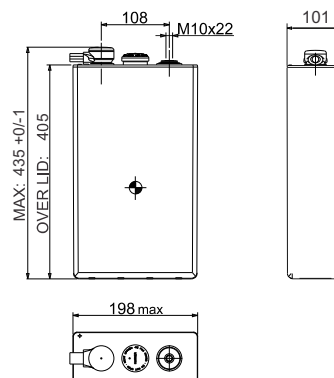
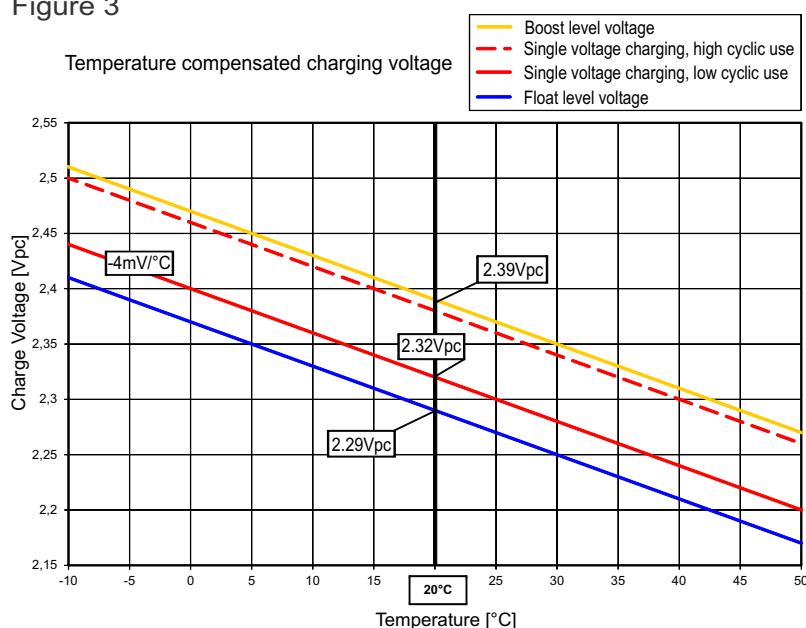


Figure 3



Temperature in °C	Percent of the rated capacity (C 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)	64 ... 95 A (minimum for cyclic use: 80 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	251.6	236.7	218.6	201.5	187.4	175.7	164.7	147.9	134.2	123.2	99.3	83.7	64.6	52.9	45.1	31.8	26.7	23.1	14.0
	25°C	252.3	237.7	221.2	204.9	191.1	179.5	168.9	152.0	138.3	127.1	102.6	86.7	67.0	54.8	46.7	32.9	27.6	23.9	14.4
1.85	20°C	334.4	318.2	288.7	265.0	245.3	227.7	212.9	188.8	169.8	154.8	122.6	102.4	77.9	63.4	53.7	37.5	31.5	27.2	15.7
	25°C	335.1	320.4	293.0	270.0	250.7	233.7	219.0	195.1	175.8	160.5	127.4	106.5	81.0	66.0	55.8	38.9	32.6	28.1	16.2
1.80	20°C	420.7	394.5	354.1	322.4	295.8	273.4	254.7	223.1	198.7	179.8	140.6	116.1	87.1	70.4	59.3	41.1	34.4	29.7	16.8
	25°C	420.7	398.3	359.9	329.6	303.8	281.7	262.7	231.5	206.7	187.3	146.7	121.2	90.9	73.4	61.8	42.6	35.6	30.7	17.3
1.75	20°C	509.7	467.9	414.7	373.8	340.4	312.7	288.5	250.3	220.9	198.1	152.3	124.8	92.7	74.5	62.5	43.0	36.0	31.0	17.2
	25°C	509.7	473.5	422.9	383.1	350.6	323.0	299.2	260.7	230.8	207.2	159.5	130.6	96.9	77.7	65.2	44.7	37.3	32.1	17.8
1.70	20°C	598.6	537.3	470.8	420.1	378.7	344.3	315.6	270.4	236.7	210.7	159.9	130.0	95.9	76.8	64.2	43.7	36.4	31.3	17.2
	25°C	598.6	544.6	481.5	432.3	391.8	357.5	328.7	282.8	248.2	221.1	168.0	136.3	100.4	80.2	67.1	45.4	37.7	32.4	17.8
1.65	20°C	687.6	604.3	523.0	460.7	410.6	370.0	336.6	285.1	247.6	219.2	164.9	133.1	96.8	76.9	64.2	43.7	36.4	31.3	17.2
	25°C	687.6	613.6	536.0	475.9	426.6	386.0	352.2	299.4	260.5	230.7	173.5	140.1	101.6	80.5	67.1	45.4	37.7	32.4	17.8
1.60	20°C	776.5	668.3	570.1	495.4	437.2	390.3	352.5	295.7	255.4	225.2	166.0	133.1	96.8	76.9	64.2	43.7	36.4	31.3	17.2
	25°C	776.5	680.1	586.3	513.7	456.0	409.0	370.3	311.5	269.3	237.6	175.2	140.1	101.6	80.5	67.1	45.4	37.7	32.4	17.8

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	478.1	450.6	415.4	383.9	357.1	334.8	314.7	282.9	257.6	237.0	191.6	162.6	125.7	103.8	88.5	62.4	52.6	45.5	27.5
	25°C	478.8	451.2	420.5	390.3	363.9	342.2	322.5	290.2	265.2	244.4	197.8	168.2	130.1	107.5	91.7	64.5	54.3	46.9	28.2
1.85	20°C	617.7	588.5	534.5	491.7	456.4	424.5	397.5	353.6	319.1	291.0	232.8	194.7	149.4	122.0	104.1	72.4	61.1	52.9	30.6
	25°C	619.4	593.2	542.2	501.4	466.8	435.4	408.7	365.2	330.0	301.6	241.8	202.4	155.3	126.6	108.0	75.1	63.2	54.7	31.4
1.80	20°C	757.1	710.3	638.8	583.3	537.1	497.8	464.5	409.6	366.5	332.0	261.6	217.7	164.9	133.6	113.4	78.8	66.0	57.1	32.4
	25°C	757.1	717.3	649.4	595.9	550.8	511.9	478.7	424.2	380.6	345.8	272.7	227.1	171.8	139.2	117.8	81.8	68.3	59.1	33.3
1.75	20°C	883.8	815.9	729.4	659.4	603.2	555.7	515.4	450.2	400.5	361.0	280.2	231.3	173.4	140.1	118.1	82.0	68.3	59.1	33.2
	25°C	883.9	824.7	743.2	675.4	620.4	574.1	533.7	468.2	417.4	376.9	293.1	241.8	180.9	146.2	122.8	85.2	70.9	61.2	34.2
1.70	20°C	1009.7	909.4	803.6	722.9	656.0	599.9	553.0	478.6	422.3	378.8	290.9	238.4	177.6	143.4	120.3	83.1	68.9	59.5	33.2
	25°C	1009.9	921.0	819.7	742.3	676.8	621.7	574.7	499.4	441.7	396.6	305.0	249.6	185.8	149.8	125.7	86.4	71.7	61.7	34.3
1.65	20°C	1133.4	995.8	867.6	772.9	696.2	633.1	580.1	497.4	436.2	389.4	296.9	242.3	179.1	143.8	120.4	83.1	68.9	59.5	33.2
	25°C	1133.4	1011.0	887.7	796.2	720.7	658.2	605.0	520.6	457.7	408.6	312.0	254.5	187.8	150.4	125.8	86.4	71.7	61.7	34.3
1.60	20°C	1236.5	1074.7	923.0	812.3	726.4	656.1	598.7	509.3	445.1	395.8	298.9	242.5	179.1	143.8	120.4	83.1	68.9	59.5	33.2
	25°C	1236.5	1092.3	947.3	839.5	754.6	684.6	626.1	534.9	467.7	416.4	315.1	255.1	187.8	150.4	125.8	86.4	71.7	61.7	34.3

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



Global & Americas
Headquarters
EnerSys
2366 Bernville Road
Reading,
Pennsylvania 19605
USA
Tel. + 1-610-208-1991

EMEA
Headquarters
EH Europe GmbH
Löwenstrasse 32
8001 Zürich
Switzerland
Tel: +41 (0)44 215 74 10
Fax: +41 (0)44 215 74 11

EH Europe GmbH
PDAC EMEA
Hagnastrasse 27
4132 Muttenz
Switzerland
Tel: +41 61 706 36 36
Fax: +41 61 706 36 37