

EvoRail™ 7PzV490



*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

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	482 Ah
Rated capacity C ₅ to 1.70 Vpc at 30 °C	490 Ah
Current/Power for 0.25 h back-up time 1.60 Vpc 20 °C	693.5 A / 1137 W
Current/Power for 0.5 h back-up time 1.60 Vpc 20 °C	493.5 A / 838 W
Current/Power for 1.0 h back-up time 1.60 Vpc 20 °C	315.2 A / 554 W
Current/Power for 3.0 h back-up time 1.70 Vpc 20 °C	134.3 A / 249 W
Current/Power for 5.0 h back-up time 1.75 Vpc 20 °C	87.5 A / 165 W
Current/Power for 8.0 h back-up time 1.75 Vpc 20 °C	60.3 A / 115 W
Current/Power for 10.0 h back-up time 1.80 Vpc 20 °C	48.2 A / 92 W
Current/Power for 24.0 h back-up time 1.80 Vpc 20 °C	23.5 A / 45 W
Conversion to capacity at 25 °C	102% of Current/Power at 20°C
Internal resistance to IEC/EN 60896-21	0.35 mΩ
Short circuit current to IEC/EN 60896-21	5.87 kA
Self discharge at 20 °C to IEC/EN 60896-21	max. 3% / Month
Heat loss during float service at 20°C	≈ 0.67 W

Mechanical Data

Weight	32.5 kg ±2%
Height of cell / over terminal cover	405 mm / 435 mm
Width	198 mm
Depth	137 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

Hawker® EvoRail™ 7PzV490

Operating specifications

Figure 1



Figure 2

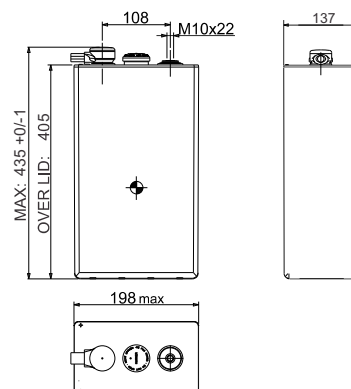
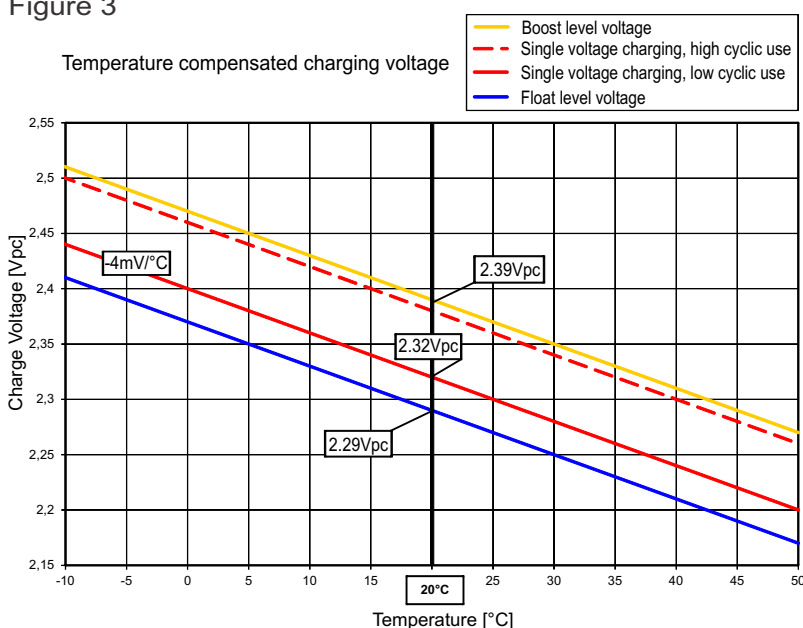


Figure 3



Temperature in °C Percent of the rated capacity (C₅)

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)	89 ... 134 A (minimum for cyclic use: 111 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)

Hawker® EvoRail™ 7PzV490

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	352.2	331.4	306.1	282.0	262.4	246.0	230.6	207.1	187.8	172.5	139.0	117.2	90.4	74.1	63.1	44.5	37.4	32.4	19.6
	25°C	353.2	332.8	309.7	286.9	267.5	251.3	236.4	212.8	193.6	177.9	143.7	121.4	93.8	76.8	65.4	46.0	38.7	33.4	20.1
1.85	20°C	468.1	445.5	404.2	371.0	343.4	318.8	298.1	264.4	237.7	216.8	171.7	143.3	109.1	88.8	75.2	52.5	44.1	38.1	22.0
	25°C	469.2	448.6	410.2	378.0	350.9	327.2	306.7	273.1	246.2	224.7	178.4	149.1	113.4	92.3	78.1	54.4	45.6	39.4	22.6
1.80	20°C	588.9	552.4	495.7	451.4	414.2	382.8	356.6	312.3	278.2	251.7	196.8	162.6	121.9	98.6	83.1	57.5	48.2	41.6	23.5
	25°C	588.9	557.7	503.9	461.5	425.3	394.4	367.8	324.1	289.3	262.2	205.4	169.6	127.2	102.7	86.5	59.7	49.9	43.0	24.2
1.75	20°C	713.5	655.0	580.6	523.3	476.6	437.7	403.8	350.4	309.3	277.3	213.2	174.7	129.8	104.2	87.5	60.3	50.3	43.4	24.1
	25°C	713.5	662.9	592.0	536.3	490.8	452.2	418.9	364.9	323.1	290.1	223.3	182.9	135.7	108.8	91.3	62.6	52.2	44.9	24.9
1.70	20°C	838.1	752.3	659.1	588.2	530.1	482.0	441.8	378.6	331.4	294.9	223.9	182.0	134.3	107.5	89.9	61.2	50.9	43.8	24.1
	25°C	838.1	762.4	674.1	605.2	548.5	500.4	460.1	395.9	347.5	309.6	235.1	190.9	140.6	112.3	93.9	63.6	52.8	45.3	24.9
1.65	20°C	962.6	846.0	732.1	645.0	574.9	518.0	471.2	399.1	346.6	306.9	230.8	186.3	135.6	107.7	89.9	61.2	50.9	43.8	24.1
	25°C	962.6	859.0	750.4	666.2	597.3	540.4	493.1	419.1	364.6	323.0	242.8	196.1	142.2	112.7	93.9	63.6	52.8	45.3	24.9
1.60	20°C	1087.2	935.6	798.1	693.5	612.0	546.4	493.5	414.0	357.6	315.2	232.4	186.3	135.6	107.7	89.9	61.2	50.9	43.8	24.1
	25°C	1087.2	952.2	820.8	719.1	638.4	572.7	518.4	436.1	377.0	332.6	245.3	196.1	142.2	112.7	93.9	63.6	52.8	45.3	24.9

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	669.3	630.8	581.6	537.5	500.0	468.7	440.6	396.0	360.6	331.7	268.3	227.6	176.0	145.4	123.9	87.4	73.6	63.7	38.5
	25°C	670.3	631.7	588.7	546.4	509.5	479.1	451.5	406.2	371.3	342.2	276.9	235.5	182.2	150.5	128.3	90.3	76.0	65.7	39.5
1.85	20°C	864.8	823.9	748.3	688.4	639.0	594.2	556.5	495.0	446.8	407.5	325.9	272.5	209.1	170.8	145.7	101.4	85.6	74.1	42.8
	25°C	867.1	830.4	759.0	702.0	653.5	609.6	572.1	511.3	462.1	422.2	338.5	283.4	217.4	177.3	151.2	105.1	88.5	76.6	43.9
1.80	20°C	1059.9	994.4	894.3	816.7	751.9	697.0	650.3	573.5	513.1	464.9	366.2	304.8	230.9	187.0	158.7	110.3	92.3	80.0	45.3
	25°C	1059.9	1004.2	909.2	834.2	771.1	716.7	670.2	593.9	532.9	484.2	381.8	318.0	240.5	194.9	164.9	114.6	95.6	82.8	46.6
1.75	20°C	1237.3	1142.3	1021.1	923.2	844.5	778.0	721.6	630.3	560.7	505.5	392.2	323.8	242.8	196.1	165.3	114.8	95.6	82.8	46.5
	25°C	1237.4	1154.6	1040.5	945.5	868.5	803.7	747.2	655.4	584.4	527.7	410.4	338.5	253.3	204.7	172.0	119.3	99.2	85.7	47.9
1.70	20°C	1413.6	1273.2	1125.0	1012.0	918.4	839.9	774.2	670.1	591.2	530.4	407.2	333.8	248.7	200.7	168.5	116.3	96.5	83.4	46.5
	25°C	1413.8	1289.4	1147.5	1039.2	947.6	870.3	804.6	699.2	618.4	555.2	427.0	349.4	260.1	209.7	176.0	121.0	100.3	86.4	48.0
1.65	20°C	1586.8	1394.2	1214.7	1082.1	974.7	886.3	812.1	696.4	610.7	545.2	415.7	339.2	250.7	201.4	168.5	116.3	96.5	83.4	46.5
	25°C	1586.8	1415.3	1242.8	1114.7	1009.0	921.4	847.0	728.9	640.8	572.1	436.8	356.3	262.9	210.6	176.1	121.0	100.3	86.4	48.0
1.60	20°C	1731.1	1504.6	1292.3	1137.3	1017.0	918.5	838.1	713.0	623.1	554.1	418.4	339.5	250.7	201.4	168.5	116.3	96.5	83.4	46.5
	25°C	1731.1	1529.2	1326.2	1175.3	1056.5	958.4	876.6	748.9	654.7	583.0	441.1	357.1	262.9	210.6	176.1	121.0	100.3	86.4	48.0

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