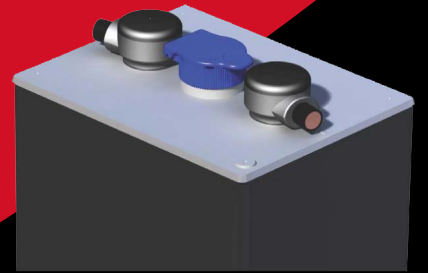


EnerSys[®]

Power/Full Solutions



 **HAWKER**[®]
PerfectRail[™]

PerfectRail[™] LFRBR11

Lead-Acid Battery Technology for Rolling Stock Applications

Hawker[®] PerfectRail[™] LFRBR11 Battery

Technical specifications

Part number: 3200182

Electrical Data

Nominal voltage	2 V
Number of cells	1 (Lead-Acid flat plate Technology)
Specific gravity of acid	1.29 kg/l (at 30°C)
Plate capacity	34 Ah
Rated cell capacity C ₅ to 1.70 Vpc at 20 °C	170 Ah
High rate discharge current for 30seconds to 1.33vpc	300 Amps

Mechanical Data

Weight	14.8 kg ±2%
Height of cell / over terminal cover	348 mm / 378 mm
Width	93 mm
Depth	158 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
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

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™ LFRBR11 Battery

Operating specifications

Figure 1

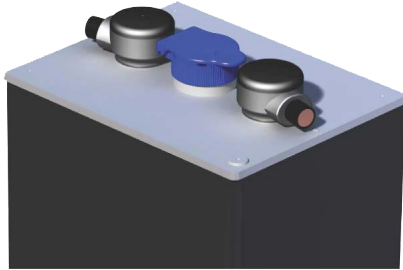


Figure 2

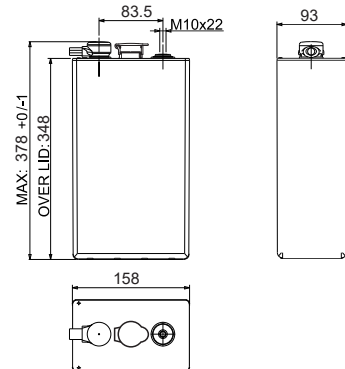
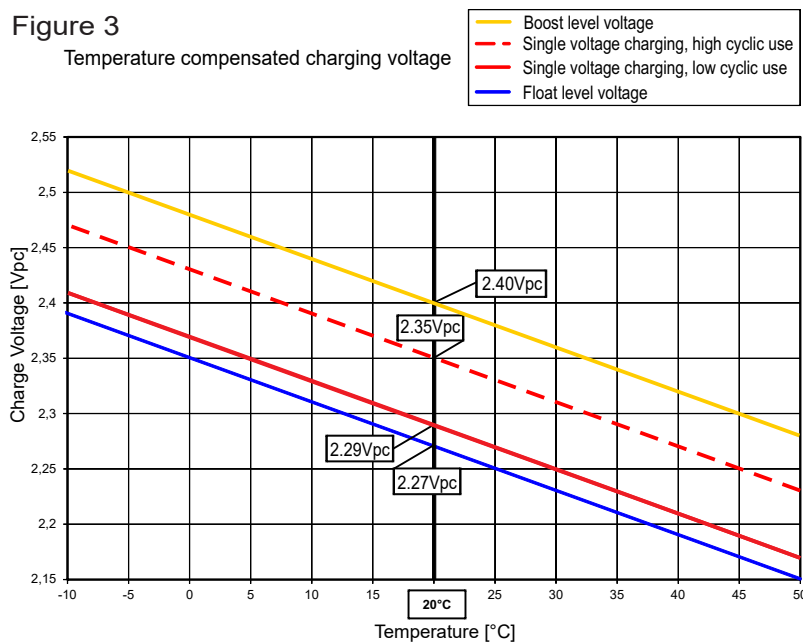


Figure 3

Temperature compensated charging voltage



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

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)	20 ... 30 A (minimum for cyclic use: 25 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)
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 (charged condition)/ +5°C with aquamatic system



Our battery support services range from system design, installation and certification to testing, maintenance and repair.



Our comprehensive recycling support program accepts lead acid batteries of all sizes, from all manufacturers.



Our advanced tools and technologies deliver actionable intelligence to optimize battery maintenance and operation.



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