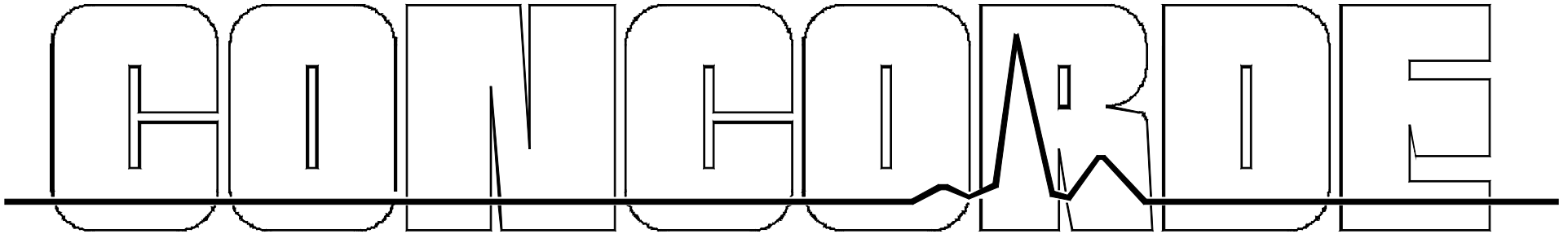


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**Concorde Battery Corporation**

**2009 San Bernardino Road  
West Covina, California, USA 27106**

## **RG-1835 Series**

**24 VOLT 3.5 Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY**

### **DECLARATION OF DESIGN PERFORMANCE**

**TO THE REQUIREMENTS OF**

**RTCA DO-293 and IEC-60952**

**Applications: Emergency Power**

NOTE: Applications may not be a complete list of all applications for this battery type.

*The item or Technical Data contained herein has been reviewed and approved for general release on the basis that it contains no Export-controlled information.*

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Description		<p>The RG-1835 series of batteries are 24 volt, valve regulated, sealed lead acid batteries. Within the series of batteries there are two models, the RG-1835-1 (non-heated) and the RG-1835-2 (heated).</p> <p>Both models are electrically identical with regard to the battery portion of the assemblies. Both models contain twelve identical 2 volt cells grouped in fours in identical modules. The modules are wired in series with identical circuit boards forming the intercell connections. The RG-1835-2 model contains DC powered electrical resistance heaters and heater controls. The system is entirely passive with a diode to prevent the battery from being discharged to heat itself. The battery assembly is also equipped with a diode to prevent the emergency battery from discharging to the charging buss when buss power is lost.</p> <p>All internal components are housed within an aluminum case and covers. The outer case of the RG-1835 series conforms to ARINC 404A, 1/4 ATR Short. Covers are attached to the case with the use of 4-40 stainless steel flat head screws. The complete assembly is mounted to the airframe with an MS14108-12C hold-down, present on both models. Both models have an identical aluminum pull handle located on the front of the battery. Neither models have vent tubes. The electrical connection to the aircraft is made with a Cannon DPXB receptacle for both models.</p> <p>The electrolyte is a sulfuric acid and water solution and is absorbed within the battery plates and separators. There is no free electrolyte. See Material Safety Data Sheet for hazardous material identification and precautions.</p> <p>The RG-1835 series batteries conform to Concorde Battery Drawing RG-1835 and assembly drawing CB-00370.</p> <p>Internally the RG-150 series and the RG-1835 series are electrically similar and may be considered to be representative of each other for many of the tests required by DO-293.</p>	
Format	IEC 60952-2	Concorde Drawing No. RG-1835 Series	
Connector	IEC 60952-2	The battery is equipped with a Cannon DPXB receptacle DPXB-13-34P-0101	
Mass		RG-1835-1 - 5.8 Kg (12.7 lbs) Max RG-1835-2 - 5.9 Kg (13.0 lbs) Max	
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 VDC $\pm$ 0.25 VDC	
Any auxiliary requirement:	N/A	RG-1835-2 is equipped with internal DC powered heaters and controls.	
Ventilation	DO-293, 2.2.2 IEC 60952-2	Batteries are not equipped with vent tubes.	
Flammability	IEC 60952-2	RG-1835 Series outer container is fire resistant.	
Unspillability		Non spill	
<b>Electrical Performance</b>			
		<b>RG-1835-1</b>	<b>RG-1835-2</b>
Rated Capacity (C <sub>1</sub> )	DO-293, 2.2.2 IEC 60952-1, 5.1.1	3.5 Ah	3.5 Ah
Capacity at -18°C	DO-293, 2.2.3 IEC 60952-1, 5.1.2	3.0 Ah	3.5 Ah Heater power applied 1h prior to test

Characteristic	Part / Clause	Requirement/Performance		Test Report / Reference
Capacity at -30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	2.0 Ah	3.5 Ah Heater power applied 1h prior to test	
Capacity at +50°C	DO-293, 2.2.5 IEC 60952-1, 5.1.4	4.5 Ah	4.5 Ah	
Power Rating +23°C	DO-293, 2.2.6.1 IEC 60952-1, 5.2.1.1	N/A, Not rated for engine starting.	N/A, Not rated for engine starting.	
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2	N/A, Not rated for engine starting.	N/A, Not rated for engine starting.	
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3	N/A, Not rated for engine starting.	N/A, Not rated for engine starting.	
Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	2.2 Ah	2.2 Ah	
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	0.5 Ah	2.2 Ah Heater power applied 1h prior to test	
Charge Retention	DO-293, 2.4 IEC 60952-1, 5.4	23°C - Rating value for design = 95 %		
		50°C - Rating value for design = 60 %		
Storage	DO-293, 2.5 IEC 60952-1, 5.5	Battery series successfully completed DO-293 - 1 year storage life test.		
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	The RG-1835 series met the requirements..		
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Battery met all test requirements: Peak current: 427 A Last Current: 212 A at 2.3 sec		
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	RG-1835-1	+23 C = 68%	
		RG-1835-2	-18 C = 152%	
		RG-1835-2 Heaters Activated	-40 C = 270%	
Insulation Resistance	DO-293, 2.9.1 IEC 60952-1, 5.9.1	The RG-1835 series met the requirements.		
		The RG-1835 series met the requirements.		
		The RG-1835 series met the requirements.		
Duty Cycle Performance	DO-293, 2.10 IEC 60952-1, 5.10	N/A, Not rated for engine starting.		
Water Consumption	DO-293, 2.11 IEC 60952-1, 5.11	N/A, applies to flooded electrolyte batteries only.		
Overcharge Endurance	DO-293, no requirement IEC 60952-1, 5.12	Not tested		

<b>Characteristic</b>	<b>Part / Clause</b>	<b>Requirement/Performance</b>	<b>Test Report / Reference</b>
Cyclic Endurance	DO-293, 2.12 IEC 60952-1, 5.13	100 cycle requirement successfully completed.	
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	All requirements were met.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	All requirements were met.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A, battery contains no active electronics.	
<b>Environmental Performance</b>			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	Subjected to the random vibration test per Curve C, section 8 of DO-160E, 1 hr per axis. The battery met the vibration requirements.	
Acceleration	DO-293, no requirement IEC 60952-1, 6.2	Not tested	
Operational Shock	DO-293, 3.3.1 IEC 60952-1, 6.3, Class I	Category B, DO-160E.	
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.3	Category B, DO-160E.	
Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.4	The RG-1835 series met the requirements.	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	Tested to 20,621m (67,654 ft).	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no requirement	Tested from 2,300m (8,000 ft) to 20,621m (67,654 ft).	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	The RG-1835 series met the requirements.	
Fungus Resistance	DO-293, 3.7 IEC 60952-1, 6.8	DO-160E, Category F	
Humidity	DO-293, 3.8 IEC 60952-1, 6.9	DO-160E, Category A	

Characteristic	Part / Clause	Requirement/Performance	Test Report / Reference
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	<p>Test was performed on representative material samples. All samples successfully met the requirement.</p> <p><b>Fluids tested:</b></p> <p>Fuels.</p> <ul style="list-style-type: none"> <li>Aviation Jet A fuel</li> <li>Aviation piston engine fuel (100LL AVGAS)</li> </ul> <p>Hydraulic fluids</p> <ul style="list-style-type: none"> <li>Mineral based (MIL-H-5606)</li> <li>Non-mineral based synthetic (MIL-PRF-83282 and MIL-PRF-87257)</li> </ul> <p>Lubricating oils</p> <ul style="list-style-type: none"> <li>Mineral based (MIL-L-6081)</li> <li>Ester based synthetic (MIL-L-23699)</li> <li>Internal combustion engine SAE 15W40</li> </ul> <p>Solvents and cleaning fluids</p> <ul style="list-style-type: none"> <li>Isopropyl alcohol (TT-I-735)</li> <li>Denatured alcohol</li> </ul> <p>De-icing fluid</p> <ul style="list-style-type: none"> <li>Ethylene Glycol</li> <li>Propylene Glycol</li> <li>AMS 1424 (SAE AEA Type I)</li> <li>AMS 1428 (SAE AEA Type II)</li> </ul> <p>Insecticides - none Sullage - none Disinfectants (heavy duty phenolics) - none Coolant dielectric fluid - none Fire extinguishants - none</p>	
Salt Spray	DO-293, 3.10 IEC 60952-1, 6.11	DO-160E, Category S.	
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	The RG-1835 series met all requirements.	
Flammability	DO-293, 3.12 IEC 60952-1, 6.14	Not tested. See section 1.	
Electrolyte Resistance	DO-293, 3.13 IEC 60952-1, 6.15	All components met the specification requirements with the exception of the heater blanket material. A deviation to DO-293 has been requested from the FAA.	
Thermal Sensors	DO-293, 3.13 IEC 60952-1, 6.15	N/A	
Component Qualification tests	DO-293, 3.14 IEC 60952-1, 6.16	All components met the requirements.	
Battery Airtightness	DO-293, no requirement IEC 60952-1, 6.17	N/A	
Cell Baffle	DO-293, no requirement IEC 60952-1, 6.18	N/A, applies only to nickel-cadmium batteries only.	

