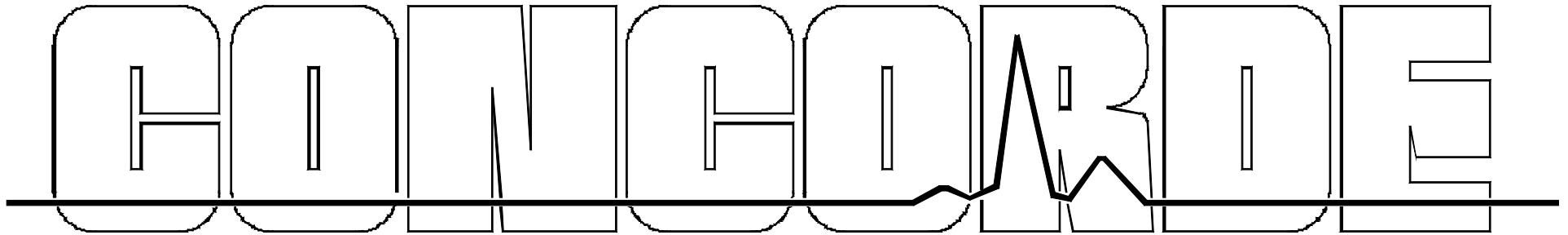


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Concorde Battery Corporation

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

RG-150 Series

24 VOLT Various Ah, VALVE REGULATED, LEAD-ACID, AIRCRAFT BATTERY

DECLARATION OF DESIGN PERFORMANCE

TO THE REQUIREMENTS OF

TSO-C173, RTCA DO-293 and IEC 60952-1

Applications: Fixed and Rotary Wing Aircraft, Fuselage Mounted

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export-controlled information

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance	Remarks
Description	<p>The RG-150 Series are 24 volt, valve regulated lead-acid aircraft storage batteries. This series of batteries consists of one basic battery capacity with a two packaging assemblies.</p> <p>The basic RG-150 series battery consists of twelve 2 volt cells connected in series. The cells are enclosed by an anodized aluminum container which incorporates the hold down. 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>All RG-150 series batteries contain the identical cell with a C1 capacity of 3.5 Ah at the C1 rate.</p> <p>All RG-150 series batteries have a 5A MS3320 circuit breaker on the output.</p> <p>The RG-150-1 and RG-150-2 batteries are identical in construction except for the provision of heater blankets in the RG-150-2.</p> <p>The RG-150-2 and the RG-150-4 are equipped with heater blankets for improved cold performance. Heater blankets are interwoven between the cells and operate when the battery temperature is below 60°F. The heater blankets are connected through the primary electrical connector and operate on 28 VDC. Heaters are controlled by redundant military specification snap action thermal switches which open on rising temperature, removing the heater blankets from the power source.</p> <p>All RG-150 series batteries conform dimensionally to ARINC Specification 404A, 1/4 Short ATR.</p> <p>NOTE: The batteries tested included the RG-150-3 and RG-150-4 which contain a DC-DC convertor and a different output connector. These batteries have not been released for production and the versions with the DC-DC convertor are not included in the TSO approval. Approval of the batteries including the DC-DC convertor will require additional testing for EMI and RFI in accordance with TSO-C174.</p>		
Format	IEC 60952-2	Concorde Drawing No. RG-150	
Connector	IEC 60952-2	The battery is available with a Cannon DXPBMA-D8-34P-0107 or equal connector. See envelop drawings for connection details and schematic.	
Mass		RG-150-1 and RG-150-2	6.4 kg
Charging method	IEC 60952-1, 4.3	Constant potential at 28.25 V	
Any auxiliary requirement:		RG-150-2 is equipped with internal DC powered heaters and controls	
Ventilation	DO-293, 1.9 IEC 60952-2	Battery is not equipped with vent tubes	
Flammability	IEC 60952-2	RG-150 Series outer container is fire resistant	
Unspillability		Non spill	
Electrical Performance		RG-150-1	RG-150-2
Rated Capacity (C1)	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

Ah when discharged at the C1 rate, power was applied across the internal heaters and controls for 1 hour prior to test.

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance		Remarks
Capacity at -30°C	DO-293, 2.2.4 IEC 60952-1, 5.1.3	2.0 Ah	3.4 Ah	
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		
Power Rating -18°C	DO-293, 2.2.6.2 IEC 60952-1, 5.2.1.2			
Power Rating -30°C	DO-293, 2.2.6.3 IEC 60952-1, 5.2.1.3			
Rapid Discharge Capacity at 23°C	DO-293, 2.3.1 IEC 60952-1, 5.3.1	N/A Battery has a 5A current limiting device on the output.		
Rapid Discharge Capacity at -30°C	DO-293, 2.3.2 IEC 60952-1, 5.3.2	N/A Battery has a 5A current limiting device on the output.		
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	DO-293 - 1 year storage life test. Battery delivers 100% of rated capacity after 1 year of storage.		
Charge Stability	DO-293, 2.6 IEC 60952-1, 5.6, Class I	OK. For all battery types, max battery temperature on charge = 50°C. Charge current fell during the entire charge period. Capacity at end of test > C1		
Short-circuit Current	DO-293, 2.7 IEC 60952-1, 5.7	Peak current = 0 A at 0.01s, Circuit breaker tripped immediately.		
Charge Acceptance	DO-293, 2.8 IEC 60952-1, 5.8	RG-150-1	+23°C = 68%	Test at low temperatures is conducted on batteries with heaters only.
		RG-150-2	-18°C = 152%, 4.1AH	
		RG-150-2	-40°C = 270%, 4.2AH	
Insulation Resistance	DO-293, 2.9.1 IEC 60952-1, 5.9.1	All samples successfully met the test requirement.		
Dielectric Strength	DO-293, 2.9.2 IEC 60952-1, 5.9.2	All samples successfully met the test requirement.		
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		
Cyclic Endurance	DO-293, 2.12 IEC 60952-1, 5.13	100 cycles		

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance	Remarks
Deep Discharge	DO-293, 2.13 IEC 60952-1, 5.14	All samples successfully met the test requirement.	
Induced Destructive Overcharge	DO-293, 2.14 IEC 60952-1, 5.15	All samples successfully met the test requirement.	
Electrical Emissions	DO-293, 2.15 IEC 60952-1, 5.16	N/A Battery contains no active electronics.	
Environmental Performance			
Vibration	DO-293, 3.1 IEC 60952-1, 6.1	All samples successfully met the test requirement.	
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	All samples successfully met the test requirement.	
Crash Safety Shock	DO-293, 3.3.2 IEC 60952-1, 6.4	All samples successfully met the test requirement.	
Explosion Containment	DO-293, 3.4 IEC 60952-1, 6.5	All samples successfully met the test requirement.	
Altitude	DO-293, 3.5 IEC 60952-1, 6.6	All samples successfully met the test requirement.	
Rapid Decompression	DO-293, 3.5.2 IEC 60952 no requirement	All samples successfully met the test requirement.	
Temperature Shock	DO-293, 3.6 IEC 60952-1, 6.7	All samples successfully met the test requirement.	
Fungus Resistance	DO-293, 3.7 IEC 60952-1, 6.8	All samples successfully met the test requirement.	
Humidity	DO-293, 3.8 IEC 60952-1, 6.9	All samples successfully met the test requirement.	

Characteristic	RTCA DO-293 IEC 60952-1	Requirement/Performance	Remarks
Fluid Contamination	DO-293, 3.9 IEC 60952-1, 6.10	Test was performed on representative material samples. Fluids tested: Fuels. All samples successfully met the test requirement. Aviation Jet A fuel Aviation piston engine fuel (100LL AVGAS) Hydraulic fluids Mineral based (MIL-H-5606) Non-mineral based synthetic (MIL-PRF-83282 and MIL-PRF-87257) Lubricating oils Mineral based (MIL-L-6081) Ester based synthetic (MIL-L-23699) Internal combustion engine SAE 15W40 Solvents and cleaning fluids Isopropyl alcohol (TT-I-735) Denatured alcohol De-icing fluid Ethylene Glycol Propylene Glycol AMS 1424 (SAE AEA Type I) AMS 1428 (SAE AEA Type VI) Insecticides - none Sullage - none Disinfectants (heavy duty phenolics) - none Coolant dielectric fluid - none Fire extinguishants - none	
Salt Spray	DO-293, 3.10 IEC 60952-1, 6.11	All samples successfully met the test requirement.	
Physical Integrity at High Temperature	DO-293, 3.11 IEC 60952-1, 6.12	All samples successfully met the test requirement.	
Flammability	DO-293, no requirement IEC 60952-1, 6.13	Not tested. See Section 1	
Electrolyte Resistance	DO-293, 3.12 IEC 60952-1, 6.14	All samples successfully met the test requirement.	
Thermal Sensors	DO-293, 3.13 IEC 60952-1, 6.15	All samples successfully met the test requirement.	
Component Qualification tests	DO-293, 3.14 IEC 60952-1, 6.16	All samples successfully met the test requirement.	
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.	
Strength of Receptacle	DO-293, 3.15 IEC 60952-1, 6.19	N/A. Connector strength dictated by specification for connector.	

