

FULL FORCE[®]

BATTERY

FFD230-12



CYCLING CAPACITY

20 Hour Rate **230 Amp Hours**

RESERVE CAPACITY

Reserve @25 AMPS **475 Minutes** Reserve @75 AMPS **120 Minutes**

ELECTRICAL SPECIFICATIONS

Nominal Voltage	12 Volt
C100	255 AH
C20	230 AH
C10	210 AH
C5	192 AH
CCA	1100 Amps
CA or MCA	1350 Amps
Internal Resistance	2.8 mΩ

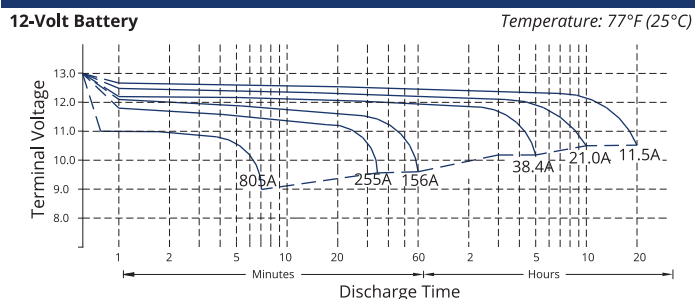
MECHANICAL SPECIFICATIONS

Group Size	921/J185	
Terminal Type	DT	
Terminal Torque	5.8 - 6.7 ft/lbs 62 - 80 lbs/in 7 - 9 Nm	
Height (w/ terminal)	14.61"	371 mm
Height (case only)	13.82"	351 mm
Width	7.09"	180 mm
Length	15.04"	382 mm
Weight	131.8 lbs	59.8 kg
Case Type	ABS Plastic Flame Res. Rating UL94-HB	

DISCHARGE TABLE (Constant Current)

Time	Amps	Rate
20hr	11.5	0.05 CA
10hr	21.0	0.10 CA
8hr	25.5	0.13 CA
5hr	38.4	0.20 CA
3hr	60.3	0.33 CA
2hr	85.5	0.50 CA
1hr	156	1.00 CA

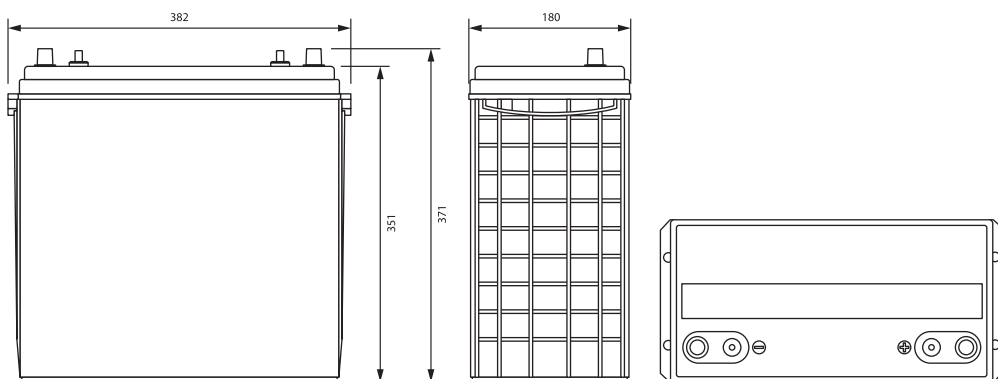
DISCHARGE PROFILE (Constant Current)



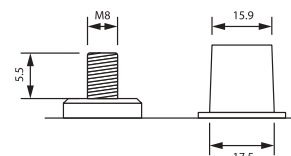
- All listed ratings are @ 100% SoC, T=77°F (25°C), 1.75VPC unless otherwise specified.

- Specifications listed are for estimation purposes only. Battery performance can vary depending on application. Battery design subject to change.

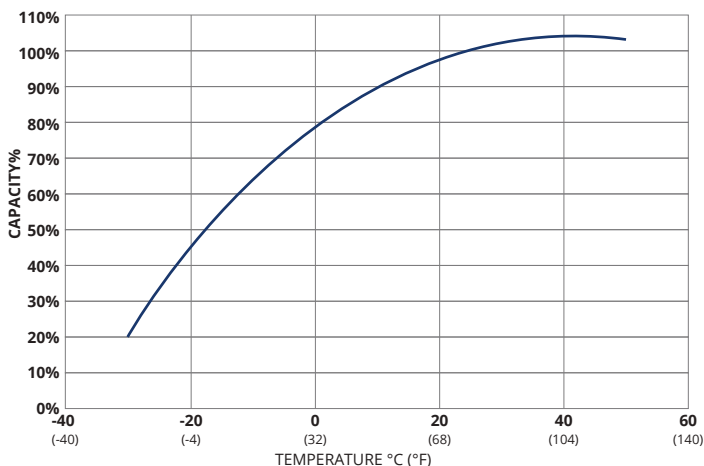
BATTERY & TERMINAL DIMENSIONS (All units shown in mm)



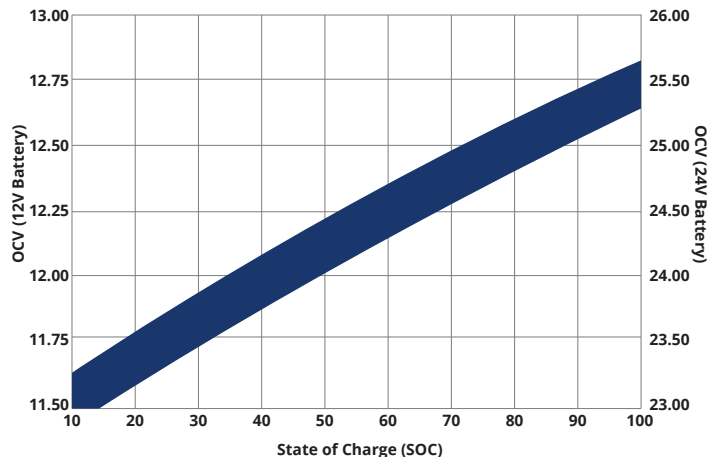
Terminal: DT



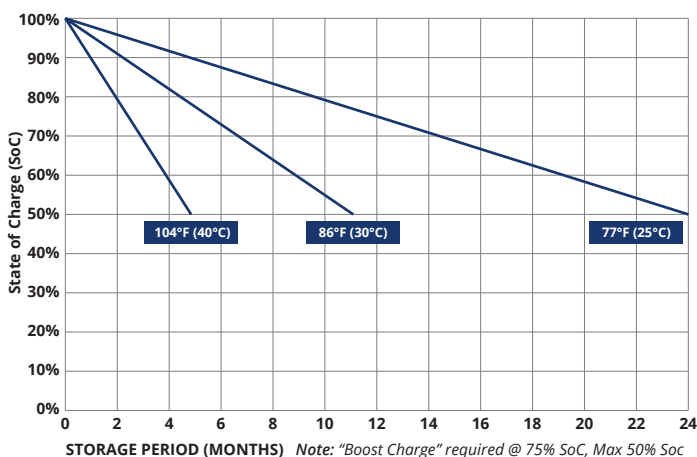
TEMPERATURE vs CAPACITY



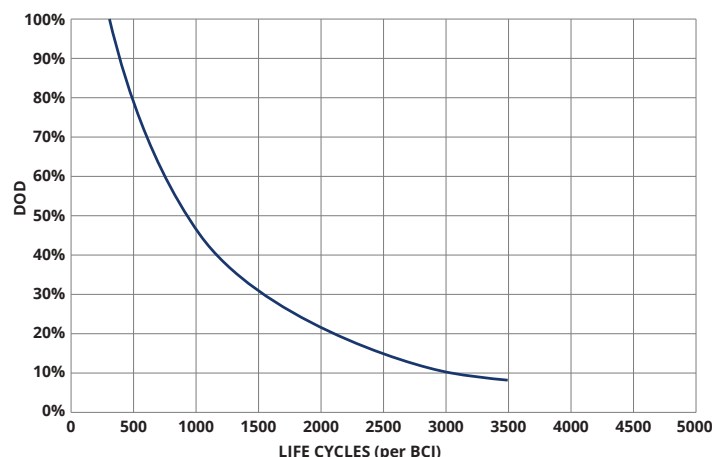
STATE of CHARGE (SOC) vs OPEN CIRCUIT VOLTAGE (OCV)



SELF DISCHARGE vs TIME/TEMPERATURE



CYCLE LIFE vs DEPTH of DISCHARGE (DOD)



TEMPERATURE RANGE SPECIFICATIONS

Condition	Recommended	Maximum	Recommended	Maximum
Storage	5°F to 122°F	-40°F to 160°F	-15°C to 50°C	-40°C to 71°C
Operation	5°F to 104°F	-40°F to 160°F	-15°C to 40°C	-40°C to 71°C
Charge with TC	5°F to 122°F	-40°F to 160°F	-15°C to 50°C	-40°C to 71°C
Charge w/o TC	32°F to 104°F	5°F to 122°F	0°C to 40°C	-15°C to 50°C

*TC= Temperature Compensation

CHARGE VOLTAGES

	Battery Voltages			
Charge Stage	12V	24V	36V	48V
Bulk	14.40V	28.80V	43.00V	58.00V
Absorption	14.00V	28.00V	42.00V	56.00V
Float	13.50V	27.00V	40.50V	54.00V

TC Factor: (-2mV°F/cell) or (-4mV°C/cell)

TERMINAL TORQUE SPECS

M5TAS	M6	M8	M10	M6M (Stud)	M8M (Stud)	M10M (Stud) & 3/8" Stud	FR45	TP06 (AP)	TP08/TP68 (AP)	AP
1.67-2.5ft-lbs	3.3-4.8ft-lbs	5.2-6.7ft-lbs	8.1-10.3ft-lbs	2.6-3.7ft-lbs	4.4-5.9ft-lbs	7.4-8.8ft-lbs	4.8-6.3ft-lbs	2.6-3.3ft-lbs	4.6-6.3ft-lbs	4.2-5.8ft-lbs
20-30lbs-in	40-57.5lbs-in	62-80lbs-in	97-124lbs-in	31-44lbs-in	53-71lbs-in	88.5-106lbs-in	57-75lbs-in	31-40lbs-in	55-75lbs-in	50-70lbs-in
2.26-3.39Nm	4.5-6.5Nm	7-9Nm	11-14Nm	3.5-5Nm	6-8Nm	10-12Nm	6.5-8.5Nm	3.5-4.5Nm	6.2-8.5Nm	5.6-7.9Nm



9001:2008 Quality Management System
14001:2004 Environmental Management System
18001:2007 Occupational Health & Safety Management System

DELIVERY APPROVED!
**LAND, SEA
& AIR**

Fullriver batteries are sealed lead acid batteries made with Absorbed Glass Mat (AGM) technology. The electrolyte is absorbed into the fiberglass separator material rather than in a free-flowing liquid form. Fullriver batteries are non-spillable electric storage batteries. They are exempted from the requirements of DOT's hazardous materials regulations, since they adhere to the requirements of code 49 CFR Section 173.159(D) - (CLASSIFIED APPROVED: DOT, CFR, HMR49, IATA, ICAO67, IMDG27)