

Lithium Iron Phosphate (LiFePO4) or LFP Battery (N2ERT 6-2018)

Part 1. Advantage of the LiFePO4 Battery Vs. Lead Acid Battery

- **Superior Useable Capacity**
 - It is considered practical to regularly use 80% for more of rated capacity without damage to the battery
- **Lighter Weight**
 - The average weight of an LFP battery is about 0.282 lbs per amp hour of capacity. That means a 100AH battery weighs about 28.2 lbs.
 - A comparable lead acid battery weighs about .726 lbs per amp hour of capacity. That means that a 230 amp hour battery would weigh about 167 lbs which is 2.5 time heavier. In addition, this heavier lead acid battery can only, effectively deliver about 75 AH which is less than the LFP.
- **Very little Wasted Energy in LFP Battery**
 - LFP batteries charge at nearly 100% efficiency. This is especially important for solar charging.
 - Most lead acid batteries are at best only 85% efficient requiring more energy to charge.
- **Fast, Efficient charging**
 - Can be fast charged to 100% of capacity
 - There is no need for an absorption phase as in lead acid battery
 - Unlike lead acid LFP batteries can be charged 80-90% and still function well. They can remain perpetually undercharged.
- **Longer Cycle Life**
 - Durability= 10 years
 - Shelf life is longer= after one year only about 5% self discharge
 - Cycle durability= 2000-5000 cycles
 - Although the nominal cost of LFP batteries is much higher than lead acid batteries the Lifetime cost as calculated by at least one mathematician is that the cost per charge cycle of LFP is **\$1.55/cycle** versus **\$3.68/cycle** for lead acid AGM batteries. The main reason for this difference is not having to replace batteries.
- **Lighter Weight:** About 40% of the weight of a comparable lead acid battery.
- **Low Environmental Impact:** Without Cobalt, the impact on environment is much less hazardous
- **Higher Power:** Delivers twice power of lead acid battery
- **Wider Temperature Range:** -20 C~60 C.
- **Superior Safety:** Lithium Iron Phosphate chemistry eliminates danger of explosion or fire by high thermal and chemical stability.
 - LiFePo batteries do not decompose even at high temperatures.
 - LiFePo batteries are more structurally stable than other lithium batteries.
 - There is low risk of short circuit thermal runaway problems
- **Increased Flexibility:** Modular design enables more voltage variables for various needs
- **Constant discharge voltage until cell is exhausted (about 95%)**
 - Cells maintain close to 3.2 V during entire discharge process.
 - The allows the cell to deliver virtually full power until it is discharged, even at high loads. Lead acid batteries can see as much as a 40% loss of capacity at high loads (known as Peukert's losses).

LFP Battery VS Lead Acid Battery Comparison		
FEATURE	LFP	Lead Acid AGM
Useable Capacity	80+%	30-50%
Life Cycles	2000-5000	500-1000
Charging	Fast to 100%	Fast to 80%
Wasted Energy	0%	15%
Peukert's Losses	None	Yes
Voltage Sag	None	Yes
Size	Small	Big
Weight	Light	Heavy



Part 2. SPECIFICATIONS FOR THE LFP BATTERY

Example Specifications for 12VDC

Electrical Characteristics	Nominal Voltage	12.8V
	Nominal Capacity	32Ah
	Energy	409.6Wh
	Internal Resistance	≤40m Ω
	Cycle Life	>2000 cycles @1C 100%DOD
	Months Self Discharge	<3%
	Efficiency of Charge	100% @0.5C
	Efficiency of Discharge	96~99% @1C
Standard Charge	Charge Voltage	14.6±0.2V
	Charge Mode	0.2C to 14.6V, then 14.6V,charge current to 0. 02C (CC/CV)
	Charger Current	16A
	Max. Charge Current	32A
	Charge Cut-off Voltage	15.6V±0.2V
Standard Discharge	Continuous Current	50A
	Max. Pulse Current	60A(<3s)
	Discharge Cut-off Voltage	8V
Environmental	Charge Temperature	0 °C to 45 °C (32F to 113F) @60±25% Relative Humidity
	Discharge Temperature	-20 °C to 60 °C (-4F to 140F) @60±25% Relative Humidity
	Storage Temperature	0 °C to 40 °C (32F to 104F) @60±25% Relative Humidity
	Water Dust Resistance	IP56
Mechanical	Cell & Method	26650 4S10P
	Plastic Case	ABS
	Dimensions (in./mm.)	195*130*178mm (7.68"*5.12"*7.01")
	Weight (lbs./kg.)	4.80kg (10.58lbs)
	Terminal	T5
	Protocol (optional)	SMBus/RS485/RS232
	SOC (optional)	LED

The above specifications give a reference overview that applies to all LFP batteries and clearly reveals the many advantages of this battery over the typical lead acid battery. Size and weight are important considerations. This is even more emphasized when working with portable systems in a field environment that requires frequent repositioning of equipment such as in an emergency.

In the charts that follow, it is important to notice that LFP batteries do not have to be charged fully in order to be an effective source of power. Even at 80% or less charge, these batteries will still operate at full voltage and amperage. This is one of the great characteristics of LFP. It will continue to give full voltage and power up to virtually 90% discharge. A lead acid battery would have long since been dead and seen a huge voltage drop.

This is because the typical Peukert's Losses & Voltage Sag of lead acid batteries are Virtually Non-Existant in LFP batteries. Put simply, in a lead acid battery the faster you discharge it the greater is the voltage drop, which can be as much as 60% loss. This does not happen in LFP batteries.

The discharge curve of lithium batteries (especially relative to lead acid) is essentially flat – meaning that **a 20% charged battery will provide nearly the same output voltage as an 80% charged battery.**

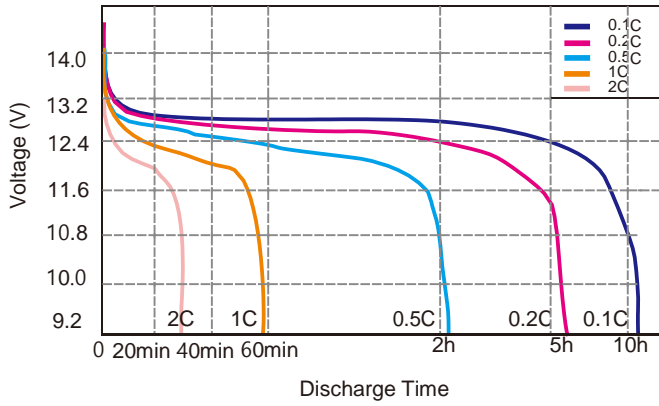
This prevents any issues caused by the "voltage sag" common to lead acid as they discharge. But take note: Due to this characteristic of LFP batteries, any battery monitor or generator auto-start system that is dependent upon voltage levels will likely **not work** when monitoring a LFP battery bank.



Part 3 CHARGE/DISCHARGE GRAPHS FOR LFP BATTERY

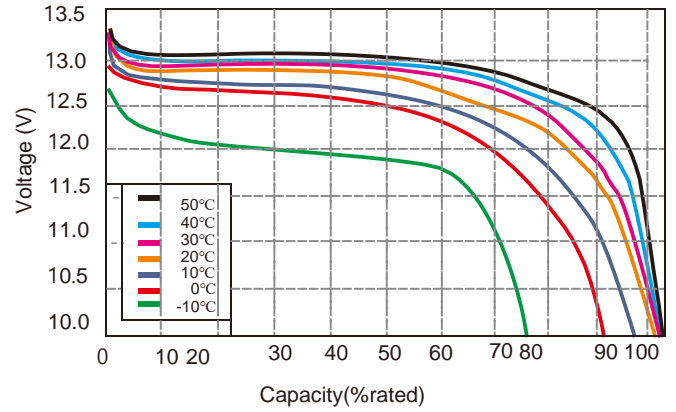
Different Rate Discharge Curve

Different Rate Discharge Curve @25°C



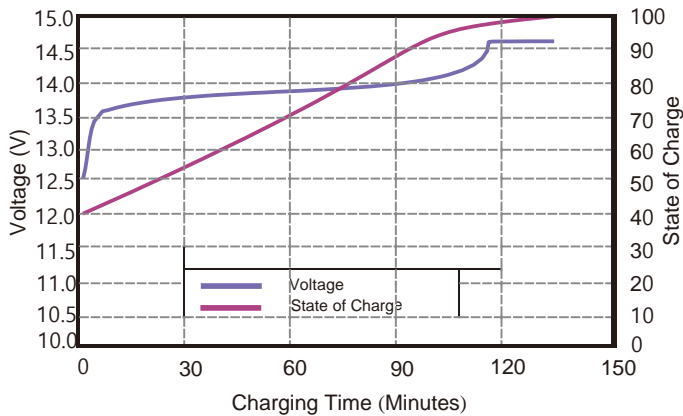
Different Temperature Discharge Curve

Different Temperature Discharge Curve @0.5C



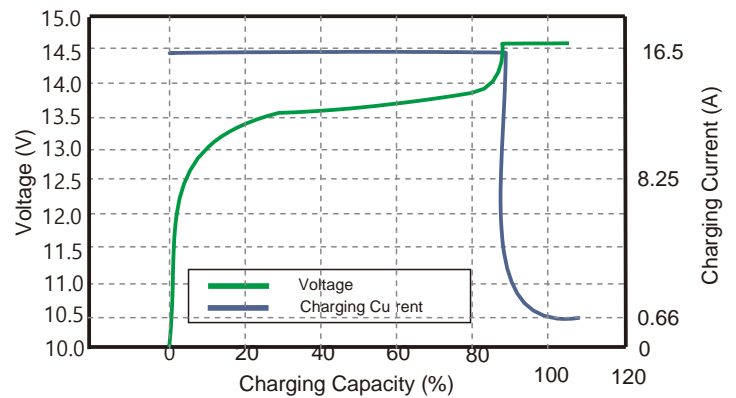
State of Charge Curve

State of Charge Curve @0.5C 25°C



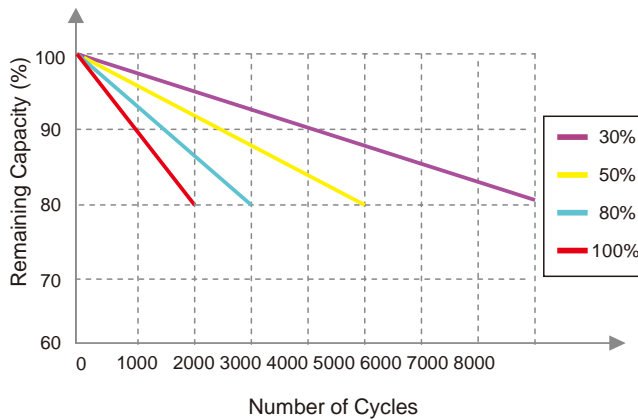
Charging Characteristics

Charging Characteristics @0.5C 25°C



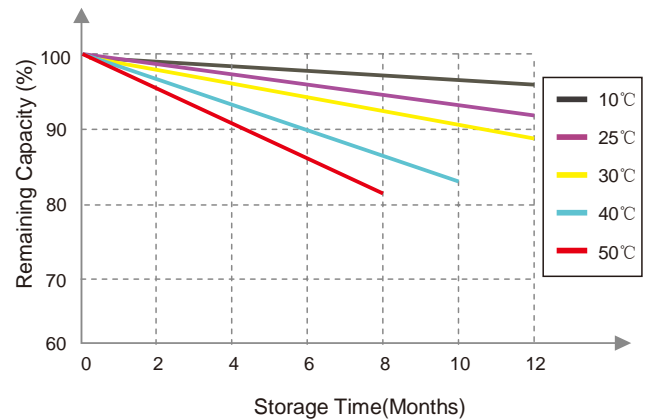
Cycle Life Curve

Different DOD Discharge Cycle Life Curve @1C



Self Discharge Characteristics Curve

Different Temperature Self Discharge Curve



Bioenno Power offers batteries optimized specifically for HAM radio equipment and serve as replacements for traditional lead acid and NiMh batteries. Their batteries, at less than half the weight but with greatly enhanced performance characteristics, are highly attractive as enhanced power options for such applications and offer markedly improved runtime and performance without the need for expensive battery boosting equipment.

Below I am including some of the Duty Cycle and Specifications Comparison charts from Bioenno to assist in determining which battery might work best for a radio and function for an amateur radio operator.

A footnote to this determination is that most modern radios only need less than 1 watt to receive a signal. The Bioenno charts assume a **50/50 duty cycle** meaning that you will be transmitting 50% of the time and receiving 50% of the time. As you know, this can greatly vary depending on the situation especially in many emergency situations where activity levels can be so unpredictable. Many times the duty cycle can be much less than 50/50.

Planning battery amp hour size for your system

An amp-hour is one amp for one hour. It is **amps x hours**. If you have something that pulls 8 amps, and you TX for 10 minutes, then the amp-hours used would be 8 (amps) x .166 (hours), or 1.32 AH. If you are RX 10 minutes at .8 amps then it would be .8 (amps) x .166 (hours) or .133 AH.

Therefore if you plan to TX/RX 15% of the time here are your amp hours:

8 amps x 0.166 hours = 1.32 amp hours (TX)

.8 amps x 0.166 hours = .133 amp hours (RX)

It would require **1.45 amp hour** of battery capacity **per hour** of operation.

Therefore, during a 12 hour day you would need at least 12x 1.45 or **17.5 amp hours or greater** battery capacity to meet your minimum needs.

If one had a solar panel simultaneously charging the battery during the day, there would obviously be a much longer extension of battery life.



BIOENNO POWER LIFEPO4 STANDARD 20-80 DUTY CYCLE BATTERY RUNTIME CHART

Transmit	Receive ¹	Total Draw	Battery ²	CAPACITY	Runtime
5 Watts	5 Watts	5 Watts	BLF-1203A	36 Watt Hours	7.2 Hours
			BLF-12045W	54 Watt Hours	10.8 Hours
			BLF-1206A	72 Watt Hours	14.4 Hours
			BLF-1209A/AS	108 Watt Hours	21.6 Hours
			BLF-1212A/AS	144 Watt Hours	28.8 Hours
10 Watts	5 Watts	6 Watts	BLF-1203A	36 Watt Hours	6 Hours
			BLF-12045W	54 Watt Hours	9 Hours
			BLF-1206A	72 Watt Hours	12 Hours
			BLF-1209A/AS	108 Watt Hours	18 Hours
			BLF-1212A/AS	144 Watt Hours	24 Hours
20 Watts	5 Watts	8 Watts	BLF-1206A	72 Watt Hours	9 Hours
			BLF-1209A/AS	108 Watt Hours	13.5 Hours
			BLF-1212A/AS	144 Watt Hours	18 Hours
			BLF-1215A/AS	180 Watt Hours	22.5 Hours
			BLF-1220A/AS	240 Watt Hours	30 Hours
25 Watts	5 Watts	9 Watts	BLF-1206A	72 Watt Hours	8 Hours
			BLF-1209A/AS	108 Watt Hours	12 Hours
			BLF-1212A/AS	144 Watt Hours	16 Hours
			BLF-1215A/AS	180 Watt Hours	20 Hours
			BLF-1220A/AS	240 Watt Hours	26.7 Hours
50 Watts	5 Watts	14 Watts	BLF-1209A/AS	108 Watt Hours	7.7 Hours
			BLF-1212A/AS	144 Watt Hours	10.3 Hours
			BLF-1215A/AS	180 Watt Hours	12.8 Hours
			BLF-1220A/AS	240 Watt Hours	17.1 Hours
75 Watts	5 Watts	19 Watts	BLF-1209A/AS	108 Watt Hours	5.6 Hours
			BLF-1212A/AS	144 Watt Hours	7.5 Hours
			BLF-1215A/AS	180 Watt Hours	9.4 Hours
			BLF-1220A/AS	240 Watt Hours	12.6 Hours
100 Watts	5 Watts	24 Watts	BLF-1212A/AS	144 Watt Hours	6 Hours
			BLF-1215A/AS	180 Watt Hours	7.5 Hours
			BLF-1220A/AS	240 Watt Hours	10 Hours
			BLF-1230A/AS	360 Watt Hours	15 Hours
200 Watts	5 Watts	44 Watts	BLF-1220A/AS	240 Watt Hours	5.4 Hours
			BLF-1240A/AS	480 Watt Hours	10.9 Hours
			BLF-1260AS	720 Watt Hours	16.3 Hours
			BLF-12100AS	1200 Watt Hours	27.2 Hours

¹Modern Radios will receive at <3 Watts – Bioenno Power assumes receiving at 5 Watts to better represent most Radios both older and newer

²A = PVC SOFT PACK, COMES AS STANDARD WITH POWERPOLE CONNECTOR

³AS = ABS HARD CASE, COMES AS STANDARD WITH SCREW TERMINAL OR FASTON

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BIOENNO POWER LIFEPO4 FIELD DAY 50-50 DUTY CYCLE BATTERY RUNTIME CHART

Transmit	Receive ¹	Total Draw	Battery ²	CAPACITY	Runtime
5 Watts	5 Watts	5 Watts	BLF-1203A	36 Watt Hours	7.2 Hours
			BLF-12045W	54 Watt Hours	10.8 Hours
			BLF-1206A	72 Watt Hours	14.4 Hours
			BLF-1209A/AS	108 Watt Hours	21.6 Hours
			BLF-1212A/AS	144 Watt Hours	28.8 Hours
10 Watts	5 Watts	7.5 Watts	BLF-12045W	54 Watt Hours	7.2 Hours
			BLF-1206A	72 Watt Hours	9.6 Hours
			BLF-1209A/AS	108 Watt Hours	14.4 Hours
			BLF-1212A/AS	144 Watt Hours	19.2 Hours
			BLF-1215A/AS	180 Watt Hours	24 Hours
20 Watts	5 Watts	12.5 Watts	BLF-1220A/AS	240 Watt Hours	32 Hours
			BLF-1209A/AS	108 Watt Hours	8.6 Hours
			BLF-1212A/AS	144 Watt Hours	11.5 Hours
			BLF-1215A/AS	180 Watt Hours	14.4 Hours
			BLF-1230A/AS	360 Watt Hours	28.8 Hours
25 Watts	5 Watts	15 Watts	BLF-1230A/AS	360 Watt Hours	24 Hours
			BLF-1209A/AS	108 Watt Hours	7.2 Hours
			BLF-1212A/AS	144 Watt Hours	9.6 Hours
			BLF-1215A/AS	180 Watt Hours	12 Hours
			BLF-1220A/AS	240 Watt Hours	16 Hours
50 Watts	5 Watts	27.5 Watts	BLF-1230A/AS	360 Watt Hours	13 Hours
			BLF-1240A/AS	480 Watt Hours	17.4 Hours
			BLF-1215A/AS	180 Watt Hours	6.5 Hours
			BLF-1220A/AS	240 Watt Hours	8.7 Hours
75 Watts	5 Watts	40 Watts	BLF-1220A/AS	240 Watt Hours	6 Hours
			BLF-1230A/AS	360 Watt Hours	9 Hours
			BLF-1240A/AS	480 Watt Hours	12 Hours
			BLF-1260AS	720 Watt Hours	18 Hours
100 Watts	5 Watts	52.5 Watts	BLF-1230A/AS	360 Watt Hours	6.8 Hours
			BLF-1240A/AS	480 Watt Hours	9.1 Hours
			BLF-1260AS	720 Watt Hours	13.7 Hours
			BLF-12100A/AS	1200 Watt Hours	22.8 Hours
200 Watts	5 Watts	102.5 Watts	BLF-1260AS	720 Watt Hours	7.2 Hours
			BLF-12100AS	1200 Watt Hours	11.7 Hours
			BLF-12150AS	1800 Watt Hours	17.5 Hours
			BLF-12200AS	2400 Watt Hours	23.4 Hours

¹Modern Radios will receive at <3 Watts – Bioenno Power assumes receiving at 5 Watts to better represent most Radios both older and newer

²A = PVC SOFT PACK, COMES AS STANDARD WITH POWERPOLE CONNECTOR

³AS = ABS HARD CASE, COMES AS STANDARD WITH SCREW TERMINAL OR FASTON

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BIOENNO POWER MOBILE TRANSCIVER COMPATIBILITY GUIDE: **YAESU, ICOM**

YAESU	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
FT-817ND	5	2	0.45 (0.25A Squelch)	BLF-1209W/A/AB, BLF-1204SW, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS
FT-818ND	6	2.4	0.45 (0.25A Squelch)	BLF-1209W/A/AB, BLF-1204SW, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS
FT-857D	100/50/20	22	1 (0.6A Squelch)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FT-991A	100/50	15 (23A at 100W)	2.2 (1.8 No Signal)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FT-450D	5-100(Variable)	22	1.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FT DX 891	100/40	23	2	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FT DX 1200	5-100(Variable)	23	2.1 (1.8A No Signal)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FT DX 3000D	5-100(Variable)	23	2.1 (1.8A No Signal)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FTM-400KDR	50/20/5	12, 11	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-400KDE	50/20/5	12, 11	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-1000R	50/20/5	12, 11	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-100DE	50/20/5	12, 11	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-3200DR	65/30/5	15, 10, 5	0.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
FTM-3200DE	65/30/5	15, 10, 5	0.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
FTM-3207DR	55/25/5	12, 6, 4	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-3207DE	55/25/5	12, 6, 4	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FT-8900R	50/30/20/10/5	8.5, 8	0.8	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FT-7900R	50/45/20/10/5	9, 8.5	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FT-7900E	50/45/20/10/5	9, 8.5	0.5	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
FTM-3100R	65/30/5	15, 10, 5	0.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
FTM-3100E	65/30/5	15, 10, 5	0.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
FT-2980R	80/30/10/5	15, 9, 5, 4	0.7	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
ICOM	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
IC-78	2-100(Variable)	20	2 (1.3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-718	2-100(Variable)	20	2 (1.3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-7100	2-100(Variable)	22	1.5 (1.2A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-7200	2-100(Variable)	22	2 (1.3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-7300	2-100(Variable)	21	1.25 (0.9A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-7600	2-100(Variable)	23	3.5 (3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-7610	1-100(Variable)	23	3.5 (3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-9100	2-100(Variable)	24, 9	4.5, 5.5	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
IC-2730A	50/25/15/5	13	1.8 (1.2A Standby)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
IC-5100A	50/15/5	13	1.8 (1.2A Standby)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
IC-4100A	50/15/5	13	1.2 (0.9A Standby)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
IC-2730H	65/25/10/5	11	1.5 (0.4A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
IC-V8000	75	15	1 (0.3A Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS

*All transmit and receive figures represented are as listed by their respective manufacturers for current production mobile radio transceivers, handheld units and basecamp units are not represented. Bioenno Power bases the recommendations for compatible battery models herein based on average benchmark figures across multiple models using standard duty cycle representations, actual performance and usage may vary in accordance to how an individual radio transceiver is set up.

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BIOENNO POWER MOBILE TRANSCIVER COMPATIBILITY GUIDE: *ELECRAFT, KENWOOD, FLEX RADIO, POWERWERX*

ELECRAFT	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
KX2	10/8 (Variable)	1-3 (Variable)	0.135 Standby	BLF-1203W/A/AB, BLF-1204SW, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS
KX3	0.1-10	1-2+ (Variable)	0.150 Standby	BLF-1203W/A/AB, BLF-1204SW, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS
K3S	0.1-100	17-22 (Variable)	3-4 (Variable)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS

KENWOOD	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
TM-D710GA	50/10/5	13-4 (Mode Variable)	<1.2 (2W Audio)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
TM-V71A	50/10/5	13-4 (Mode Variable)	<1.2 (2W Audio)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
TM-281A	65/25	14,8	<1	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
TS-480HX	200/100 (Variable)	20.5	<1.5 (Standby)	BLF-1220A/AS/ BLF-1230A/AS, BLF-1240A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS, BLF-12150AS, BLF-12200AS, BLF-12300AS
TS-480SAT	200/100 (Variable)	20.5	<1.5 (Standby)	BLF-1220A/AS/ BLF-1230A/AS, BLF-1240A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS, BLF-12150AS, BLF-12200AS, BLF-12300AS
TS-2000	100/50/10	20.5, 18,9	2.6 (Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
TS-2000X	100/50/10	20.5, 18,9	2.6 (Standby)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS

FLEX RADIO	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
FLEX-6300	1-100	23	1.7	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FLEX-6400	1-100	23	1.7	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FLEX-6500	1-100	23	1.7	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FLEX-6600	1-100	23	2	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
FLEX-6700	1-100	23	3	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS

POWERWERX	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
DB-750X	50-5 (Mode Variable)	N/A	N/A	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS

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BIOENNO POWER MOBILE TRANSCIVER COMPATIBILITY GUIDE: ALINCO, TYT

ALINCO	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
DX-SR8T/E	0.4-100	20	1 (0.7A Squelch)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
DX-SR9T/E	0.4-100	20	1 (0.7A Squelch)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L, BLF-12100AS
DR-735T/E	50/20/5	12	0.6 (0.4A Squelch)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-638H/E	50/40/25/10	12	0.6 (0.4A Squelch)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-138HT/HE	60/25/10	12	0.6 (0.4A Squelch)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
DR-438HE	45/25/10	12	0.6 (0.4A Squelch)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-818SHT/HE	85/5	20	1	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS, BLF-1250A/AS, BLF-1260AS/L
DR-03T	10/5/2 (Variable)	3	0.6	BLF-1203W/A/AB, BLF-12045W, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS
DR-06T	50/20/5	11	0.6	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-135T/EMKIII	50/20/5	11	0.4 (Squelch)	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-235T/EMKIII	25/10/5	8	0.6 (0.4A Squelch)	BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-435/EMKIII	35/20/5	10	0.6 (0.4A Squelch)	BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-CS10	60/25/10	10	0.6	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS
DR-D18	25	N/A	N/A	BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-D18H	45	N/A	N/A	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-D48	25	N/A	N/A	BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
DR-D48H	40	N/A	N/A	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
TYT	Transmit (WATTS)	Transmit (AMPS)	Receive (AMP)	Compatible Models (*For runtime benchmarks, please consult 2080 and 5050 Duty Charts)
TH-7800	50/20/10/5	8.5,8	0.5 (Squelch)	BLF-1203W/A/AB, BLF-12045W, BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS
TH-8600	25	4	0.2 (Standby)	BLF-1206A, BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
TH-9000D	60-10 (Mode Variable)	N/A	N/A	BLF-1209A/AS, BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS
TH-9800	50-5 (Mode Variable)	8.5,8	0.5 (Squelch)	BLF-1212A/AS, BLF-1215A/AS, BLF-1220A/AS, BLF-1230A/AS

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