

# VANGUARD™

## Fi Series – Fixed Battery Packs

Leader of the pack in power, safety, and performance.

### Durable

- > Multiple protective features tested to withstand harsh conditions, including extreme temperatures, impact, vibration and dirt.

### Battery Management System

- > Monitors temperatures and voltages of each cell bank to ensure safe operations.

### Unique CMA (Cell Module Assembly) Design

- > For efficient power and safety.

### Flexibility

- > Single CANbus J1939 communication protocol allows OEMs to communicate with the battery's J1939 (automotive standard) CANbus.





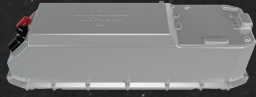

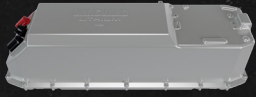
### Assembled In The U.S.A.

- > Designed, engineered, and assembled in the U.S.A. at Vanguard's advanced battery manufacturing facility with automation capabilities that improve product quality and safety.





BATTERY TECHNICAL SPECIFICATIONS

							
SPECIFICATION	48V 1.5 kWh <sup>††</sup>	24V 3.5 kWh <sup>††</sup>	48V 3.5 kWh <sup>††</sup>	48V 5.0 kWh <sup>††</sup>	48V 5.0 kWh <sup>††</sup>	48V 7.0 kWh <sup>††</sup>	48V 7.0 kWh <sup>††</sup>
ENCLOSURE MATERIALS	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
NOMINAL VOLTAGE	51.4 V	25.8 V	51.6 V	51.6 V	51.6 V	51.6 V	51.6 V
DISCHARGE CUTOFF VOLTAGE	35.0 V	17.5 V	35.0 V	35.0 V	35.0 V	35.0 V	35.0 V
DISCHARGE CURRENT, NOMINAL	29 A	134 A	67 A	100 A	100 A	134 A	134 A
DISCHARGE CURRENT, MAX. CONTINUOUS	100 A	200 A	134 A	200 A	200 A	200 A	200 A
DISCHARGE CURRENT, 10S SURGE	‡	400 A	200 A	300 A	300 A	400 A	400 A
NOMINAL CAPACITY (PER IEC 61960)	28.4Ah	135.9 Ah	67.5 Ah	98.7 Ah	98.7 Ah	135.9 Ah	135.9 Ah
NOMINAL ENERGY (PER IEC 61960)	1.5 kWh	3.5 kWh	3.5 kWh	5.1 kWh	5.1 kWh	7.0 kWh	7.0 kWh
DISCHARGE TEMPERATURE RANGE	-40°C to +60°C	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
PARALLEL CAPABLE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MARKETED DURABILITY	Up to 1,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity	Up to 2,000 cycles to 80% initial capacity
CHARGING							
CHARGE VOLTAGE (PER IEC 61960)	58.8 V	29.4 V	58.8 V	58.8 V	58.8 V	58.8 V	58.8 V
CHARGE TEMPERATURE RANGE	0°C to +45°C	0°C to +45°C	0°C to +45°C	0°C to +45°C	0°C to +45°C	0°C to +45°C	0°C to +45°C
CHARGE TIME WITH 1050W VANGUARD™ CHARGER	N/A	6 Hours	4 Hours	5.5 Hours	5.5 Hours	8 Hours	8 Hours
CHARGE TIME WITH 1425W VANGUARD CHARGER	1.25 Hours	5 Hours	3 Hours	4 Hours	4 Hours	6 Hours	6 Hours
CHARGE TIME WITH 3000W VANGUARD CHARGER	N/A	4 Hours	2 Hours	2.5 Hours	2.5 Hours	3 Hours	3 Hours
DIMENSIONS/WEIGHT							
PACK FRAME DIMENSIONS (L×W×H), INCHES	10.1 x 5.1 x 14.6	19.9 x 11.5 x 10.5	19.9 x 11.5 x 10.5	23.3 x 10.5 x 14.4	34.5 x 11.2 x 10.4	23.3 x 10.5 x 14.4	34.5 x 11.2 x 10.4
PACK FRAME DIMENSIONS (L×W×H), MILLIMETERS	256 x 131 x 371	482 x 272 x 266	482 x 272 x 266	597 x 266 x 362	877 x 281 x 262	597 x 266 x 362	877 x 281 x 262
PACK WEIGHT	11.6kg (25.5 lbs)	26.3kg (58lbs)	26.3kg (58lbs)	39kg (86lbs)	40.8kg (90lbs)	46.3kg (102lbs)	47.6kg (105lbs)

<sup>\*</sup>Total energy measured using a 0.2C discharge per IEC 61960-3:2017. <sup>†</sup> Battery packs are not currently in production are subject to changes at time of production launch. <sup>‡</sup>3S surge of 180A.



# VANGUARD™

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