

Flatpack2 Power Systems

Overview:

The Eltek Valere *Flatpack2* line consists of versatile, scalable, and highly-configurable systems tailored to customer requirements. Use of established components—including the efficient and reliable *Flatpack2* rectifier, the robust *Smartpack* controller, and flexible distribution units—makes for optimal system design and cost-effective deployment.



Flatpack2 +24V 600A

Flatpack2 Power System

The *Flatpack2* (FP2) power core features an impressive array of distribution configurations and options. Its compact design and efficient use of space complement sites with limited floor and rack space, opening room for better airflow and additional equipment. *Flatpack2* chassis are designed to mount in standard 19" or 23" telecommunications racks. Standard, fully-populated configurations accommodate four to sixteen *Flatpack2* rectifiers, yielding total power output ranges of 8kW to 32kW.

Distribution Features

- Breaker alarming
- Low-voltage disconnect (LVD) contactor options
- Horizontal load landings, vertical bulk battery landings
- Three distribution options for different power levels:
 - Small 175A, 19" wide, 1U shelf with controller slot, LVD option, up to six breaker-protected output buses, and up to two bulk battery buses
 - Three-bus, 600A, 19" wide, 4U high panel with 20 positions for plug-in circuit breakers or fuse holders, up to two LVD contactors, and rear bulk battery terminals
 - Three-bus, 600A, 23" wide, 4U or 6U high panel with 24 positions for plug-in circuit breakers or fuse holders, emergency power-off (EPO) switch, up to two LVD contactors, and rear bulk battery terminals; an additional 23" distribution panel option doubles the number of cable landings

Flatpack2 Rectifiers

- **New!** *Flatpack2 HE* with **96%** typical efficiency
- Input voltage range: 85 – 290 VAC
- 2000W DC output (constant power)
- 1U in height; 4.25" in width
- Hot-swap/hot-plug functionality
- Automatic active load sharing

Smartpack Controllers

- Provide comprehensive system monitoring and control in a single unit
- Local and remote interfaces
- *PowerSuite* software for computer interface
- Advanced battery-monitoring and thermal compensation
- Various models providing up to six configurable alarm inputs and output relays
- Web model for TCP/IP or SNMP communication
- Slave controller option for larger systems






Power Shelves

- Accommodate up to four rectifiers each
- 1U height (1.75"); 19" width
- Individual and dual AC feed options
- Mounting brackets for 19" and 23" racks

Flatpack2 Power Systems Configurations

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Flatpack2 Systems

Standard Systems*	-48V/150A	-48V/300A	-48V/600A	+24V/600A	+24V/1200A
Image					
Output Power	8kW	14kW	32kW	16kW	32kW
Maximum Output Current (DC)	168A	294A	672A	672A	1344A
Total Height**	2RU (3.5")	6RU (10.5")	9RU (15.75")	7RU (12.25")	10RU (17.5")
Controller Slots	1	1	2	2	2
Rectifier Slots	4	7	16	8	16
Distribution Dimensions**	Height: 1RU (1.75") Width: 19" (rack) Depth: 18.75"	Height: 4RU (7.0") Width: 19" (rack) Depth: 18.75"	Height: 4RU (7.0") Width: 23" (rack) Depth: 21.75"	Height: 4RU (7.0") Width: 23" (rack) Depth: 21.75"	Height: 6RU (10.5") Width: 23" (rack) Depth: 21.75"
Configurable Load Buses	See page 3	3	3	3	3
Protected Load Landings	See page 3	Up to 20	Up to 24	Up to 24	Up to 24
Load Landing Lug Sizes	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG
Bulk Battery Landings	2 (option; see page 3)	4	8	8	8
Battery Landing Lug Sizes	Two-hole 1/4-20 on 5/8" centers	Two-hole 3/8-16 on 1" centers	Two-hole 3/8-16 on 1" centers	Two-hole 3/8-16 on 1" centers	Two-hole 3/8-16 on 1" centers
LVD Contactor	Up to 1	Up to 2	Up to 2	Up to 2	Up to 2
EPO Circuit and Service Bypass Switch	No	No	Yes	Yes	Yes
Additional Distribution Panel Option	No	No	Yes	Yes	Yes

*Please consult with a sales representative for other available configurations

**Dimensions are approximate

Applicable Standards			
NEBS	Level 3 (GR-63-CORE, GR-1089-CORE)	EN 61000-4-2	Electrostatic discharge (ESD) immunity test
IEC 60950-1 UL 60950-1	Electrical safety	EN 61000-4-3	Electromagnetic field immunity test
		EN 61000-4-4	Electrical fast transient/burst immunity test
EN 55022 (CISPR 22)	Radiated disturbance at enclosure port Conducted emission at DC output ports Conducted emission at AC mains ports	EN 61000-4-5	Surge immunity test
		EN 61000-4-6	Conducted radio-frequency (RF) immunity test
		EN 61000-4-8 EN 61000-4-9	Power frequency magnetic field/pulse magnetic field
		EN 61000-3-2 EN 61000-3-3 20	Harmonic current emissions

Distributions

Flatpack2 150A

The -48V/150A system offers five standard distribution configurations that are defined by the number and types of circuit protection accommodated. Distribution consists of up to six protected buses, with each bus having its own front-access, plug-in breaker position (100A max rating) and rear-access cable landing. The buses are organized into three sets of two parallel buses, permitting each pair to be linked together by a two-pole, plug-in breaker rated up to 175A. If no front-access battery breakers are desired, an extra set of buses is installed for bulk output to batteries. A low-voltage disconnect (LVD) contactor can be ordered. A 12-position, 65A GMT fuse block is also available.

FP2 -48V/150A Configurations*	2B 2L	2B 2L GMT	2B 4L	4L GMT	6L
Battery breaker positions	2	2	2	0	0
Load breaker positions	2	2	4	4	6
Unprotected bulk battery landings	0	0	0	2	2
12-position, 65A GMT fuse block	No	Yes	No	Yes	No

*Please consult with a sales representative for other available configurations

Flatpack2 300A, 600A, and 1200A

The larger Flatpack2 systems make use of a unique front-access distribution section that features three discrete, parallel buses. Each bus has positions for moveable breaker holders that screw into the desired bus. This arrangement facilitates a variety of convenient uses for each bus, such as protected battery connections, load-shedding, and converter output. Kits are available for double-pole and triple-pole breakers. Bulk battery cable landings are available in the rear of these distributions. There are also options for up to two LVD contactors.



Distributions*	300A	600A	1200A
Distribution Dimensions	Height: 4RU (7.0") Width: 19" (rack) Depth: 18.75"	Height: 4RU (7.0") Width: 23" (rack) Depth: 21.75"	Height: 6RU (10.5") Width: 23" (rack) Depth: 21.75"
Controller Slot(s)	One (1) in power shelf	Two (2) in dedicated shelf	Two (2) integrated in distribution
Alarm Card(s)	Integrated	Separate shelf	Integrated
Configurable Load Buses	3	3	3
Protected Load Landings	Up to 20	Up to 24	Up to 24
Load Landing Lug Sizes	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG	Two-hole 1/4-20 on 5/8" centers, up to #1 AWG
Bulk Battery Landings	4	8	8
Battery Landing Lug Sizes	Two-hole 3/8-16 on 1" centers, up to 250 MCM	Two-hole 3/8-16 on 1" centers, up to 777 MCM	Two-hole 3/8-16 on 1" centers, up to 777 MCM
LVD Contactors	Up to 2	Up to 2	Up to 2
EPO Circuit and Service Bypass Switch	No	Yes	Yes
Optional Auxiliary Distribution Panel	No	Yes	Yes

*Please consult with a sales representative for other available configurations

Flatpack2 Power Systems

Power Modules

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Flatpack2 HE Rectifiers



Flatpack2 HE rectifiers are available in two voltages: 48V and 24V. They are hot-swap, switched-mode power supply units.

Flatpack2 Rectifiers*	48V/2000W HE	24V/1800W HE
Module Image		
AC Input Voltage	Range: 85-300 VAC Nominal: 185-275 VAC	Range: 85-290 VAC Nominal: 176-275 VAC
Maximum AC Current	11.6 A _{rms}	11.25 A _{rms}
DC Output Voltage	43.5-57.6 VDC	21.0-29.0 VDC
Maximum DC Current	41.7A	75A
Typical Efficiency	>96%	>95%
Operating Temperature	-40°C to +75°C (-40°F to +167°F)	-40°C to +75°C (-40°F to +167°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)	-40°C to +85°C (-40°F to +185°F)
Cooling	One fan, front-to-back airflow	One fan, front-to-back airflow
Dimensions	Height: 41.5 mm (1.63") Width: 109 mm (4.29") Depth: 327 mm (12.87")	Height: 41.5 mm (1.63") Width: 109 mm (4.29") Depth: 327 mm (12.87")
Weight	1.95 kg (4.30 lbs)	1.95 kg (4.30 lbs)

*Please consult with a sales representative for other available models, such as the non-HE rectifiers

Flatpack Converters

Flatpack DC-DC Converters can be ordered for Flatpack2 systems. Converter shelves are delivered in sets of two or four shelves (four or eight converters, respectively). Each shelf accommodates up to two converter modules. In 300A, 600A, and 1200A distributions, converter output can be routed to one of the three parallel load buses.

Flatpack DC-DC Converters*	48V to 24V	24V to 48V
Module Image		
Input Voltage	40-60 VDC	19.8-32.0 VDC
Input Current	32A at 40 VDC	73A at 19.8 VDC
Output Voltage	24-28 VDC	55 VDC
Output Current	40A at 24 VDC	23A
Output Power	1100W at 27.5 VDC	1250W
Typical Efficiency	90%	90%
Operating Temperature	-40°C to +75°C (-40°F to +167°F) Power limiting may occur above +65°C (+149°F)	-40°C to +75°C (-40°F to +167°F) Power limiting may occur above +65°C (+149°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)	-40°C to +85°C (-40°F to +185°F)
Dimensions	Height: 43 mm (1.69") Width: 218 mm (8.58") Depth: 240 mm (9.45")	Height: 43 mm (1.69") Width: 218 mm (8.58") Depth: 240 mm (9.45")
Weight	<3 kg (<6.6 lbs)	<3 kg (<6.6 lbs)

*Please consult with a sales representative for other available models

Flatpack2 Power Systems Controller Modules

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Smartpack Controller

Smartpack is a robust, comprehensive control and monitoring device used for Eltek Valere's Flatpack2 systems. The controller communicates with each Flatpack2 rectifier through a CAN bus and provides real-time monitoring and control information. The Smartpack controller is accompanied by the PowerSuite software program for PC interface. Alarm inputs and output relays can be increased by using a master/slave configuration in systems that can accommodate two controllers.



Smartpack Modules*	Web/SNMP 6+6	Slave
Module Image	 Rear View	 Front View
Input Voltage	24 – 60 VDC	24 – 60 VDC
Configurable Alarm Inputs	6	6
Form C Output Relays	6	6
Computer Interface	USB Ethernet	USB
Front Display	Yes	No
Battery Symmetry Inputs	4	8
Temperature Sense Inputs	1	2
Battery Current Monitor Input	1	2
Fuse Fail Monitor Input	1	2
LVD Control	Up to 2 contactors	Up to 2 contactors
Dimensions	Height: 44 mm (1.73") Width: 109 mm (4.29") Depth: 140 mm (5.51")	Height: 44 mm (1.73") Width: 109 mm (4.29") Depth: 140 mm (5.51")

*Please consult with a sales representative for other available models