Modular HE with Smartpack2

DC Power System

Overview

Eltek’s Modular DC power system, powered by the Flatpack2 line of power modules, delivers up to 1200A in a compact, rack-mount unit. Use of the highly-efficient and reliable Flatpack2 rectifier, a variety of configurable distribution layouts, and the advanced Smartpack2 controller make for optimal system design and cost-effective deployment.
MODULAR HE WITH SMARTPACK2

SMARTPACK2 CONTROLLERS
The Smartpack2 controller system handles plant control and monitoring. A variety of modules are used to collect a large variety of metrics to provide comprehensive system regulation and alarming.

The following three units make up a complete Smartpack2 control system:
- **Smartpack2 Master** is the master controller and contains the interactive display.
- **Smartpack2 Basic** handles internal data aggregation and housekeeping.
- **I/O Monitor2 (Type 2)** handles external alarm inputs and outputs.

The system can be expanded with additional Basic controllers, I/O units and other CAN nodes in the Smartpack2 family. All control and monitoring devices interconnect via the CAN bus.

A single Smartpack2 Master controller is used for the entire system; it is installed in the distribution door. The Smartpack2 Master controller contains an Ethernet port, which can be connected either directly to a computer or to a network (e.g., an office LAN). The Smartpack2 Basic controller is located in the controller tray at the bottom of the distribution section. The controller tray also houses the I/O Monitor2 unit, which provides a total of 6 alarm inputs and 6 alarm output relays.

SMARTPACK2 CONTROL SYSTEM

SUPPORTED CAN NODES
In addition to the devices discussed above, other CAN nodes are available for use with the Smartpack2 control system:
- **Battery Monitor** contains an internal temperature probe to measure battery temperature. It also has monitor inputs for one shunt and one breaker.
- **Load Monitor** can monitor up to eight shunts and eight fuses. Additional Load Monitors can be ordered to monitor external distribution devices or shunts.
- **CAN Power** provides CAN bus isolation and can be used to supplement the available power in the control system.
MODULAR HE WITH SMARTPACK2

FLATPACK2 HE RECTIFIERS AND DC-DC CONVERTERS

Flatpack2 HE rectifiers provide primary output power for the Modular systems. There are three module options available, identified by DC voltage and power output:

- 24V/1800W
- 48V/2000W (Energy Star compliant)
- 48V/3000W (Energy Star compliant)

HE rectifiers feature typical efficiencies higher than 95% (the 48V/2000W module typically performs higher than 96%). See the respective datasheets for more detailed specifications.

Flatpack2 DC-DC converters provide optional, secondary output power for the Modular systems. There are two module options available, identified by input voltage range and nominal output voltage:

- 18-75V/24V
- 18-75V/48V

Both Flatpack2 DC-DC converter modules output up to 1350W. Please refer to the datasheet for more detailed specifications.

CONFIGURABLE DISTRIBUTION

The Modular distribution section features 12U of space that can be configured for the following devices:

- Plug-in, bullet-style circuit breakers (1-, 2-, and 3-pole sizes available, up to 250A)
- TPS-style fuses with plug-in adapter (up to 125A)
- GMT-style fuses (Eltek’s “BG” module required)
- Large GJ-style breakers (1-, 2-, and 3-pole sizes available, up to 600A); shunt option available
- TPL-style fuses (up to 600A); shunt included

There are three styles of distribution panels that can be installed (below), and any combination of panels can be configured within the space available. The panels are tiered to accommodate cabling.

<table>
<thead>
<tr>
<th>24-POSITION BULLET BREAKER PANEL</th>
<th>11-POSITION BG MODULE PANEL</th>
<th>GJ BREAKER/TPL FUSE PANEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodates up to 24 one-pole, plug-in, bullet-style circuit breakers and TPS-style fuses with plug-in adapters. Kits are available for multi-pole circuit breakers. Up to two panels can be installed per tier, for a maximum of four panels in one Modular plant.</td>
<td>Provides up to 11 positions for “BG” modules, which are designed for the following devices: Two one-pole circuit breakers Four one-pole circuit breakers One two-pole circuit breaker Ten GMT fuses Up to two panels can be configured for one Modular plant.</td>
<td>Provides up to 12 positions for GJ-style circuit breakers and TPL-style fuses. Up to two panels can be configured for one Modular plant.</td>
</tr>
</tbody>
</table>

Bulk battery cable landings are available in the rear of the distribution.
MODULAR HE WITH SMARTPACK2

AC INPUT
Nominal Input Voltage
208/240/277 Vac (48V/3000W rectifier only)
Rated Input Voltage Range
100-250 Vac (24V/1800W, 48V/2000W rectifiers)
100-277 Vac (48V/3000W rectifier only)
AC Connectors
Compression terminals: Individual or dual-feed options, bare wire
Barrier strip: Individual-feed, one-hole lugs
Input Protection
MOVs and fuses in the rectifier modules

DC OUTPUT
Nominal Voltage
24 Vdc Systems
24 Vdc
Adjustable Range
21.7 – 28.8 Vdc
Maximum Power
30 kW
Maximum Current
1200A
Converter Option
48Vdc, 108A (5400W) max
48 Vdc Systems
48 Vdc
43.2 – 57.6 Vdc
50 kW
1000A
24Vdc, 216A (5400W) max

MONITORING
Monitoring Unit
Smartpack2 control and monitoring devices
Local Operation
Interactive Display (Smartpack2 Master unit)
Remote Operation
WebPower (WEB Interface, SNMP protocol and email)
Alarm Relays
6 x Form C dry contact relays (NO, NC, C) on I/O Monitor2
Visual indications
Green LED – System ON
Yellow LED – Warnings and Minor alarm(s)
Red LED – Major alarm(s)
Controller Inputs
6 x multipurpose digital inputs configurable as digital / analog, or temperature measurement (I/O Monitor2)
Current Measurements
Battery current
Rectifier current
Alarms
Load fuse alarm
Battery fuse alarm
LVD operated
Low output voltage alarms (2 individual alarm levels)
High output voltage alarms
(2 individual alarm levels)
Battery capacity
Temperature alarm
Symmetry alarm and more

DC DISTRIBUTION OPTIONS
24-position Bullet Breaker Panel
24 positions for one-, two-, and three-pole plug-in circuit breakers and TPS-style fuses (with plug-in adapters). Up to four panels can be installed in one system.
11-position BG Module Panel
Up to 11 positions for Eltek’s “BG” modules, which accommodate one- and two-pole plug-in circuit breakers or up to ten GMT fuses. Up to two panels can be installed in one system.
GJ Breaker/TPL Fuse Panel
Up to 12 positions for GJ-style circuit breakers and TPL-style fuses; shunt option available for each device. Up to two panels can be installed in one system.
Bulk connections
Up to 15 connections, 3/8” studs on 1” centers
Programmable LVD
Up to one LVD per system

ALARM CONNECTIONS
I/O Monitor2
Pluggable terminal blocks, up to 1.5 mm² [AWG 12]

OTHER SPECIFICATIONS
Operating temp.
-40 to +45°C (-40 to +113°F)
Storage temp.
-40 to +70°C (-40 to +158°F)
Nominal rack size
Standard 23” rack
Dimensions
Overall depth: 570.8 mm (22.47”)
Maximum height: 932.90 mm (36.41”/22U), with up to 5 power shelves (1U each)
Weight (excluding rectifiers and rack)
Approx. 102 [225 lbs], depending on distribution panels and number of power shelves installed

APPLICABLE STANDARDS
Electrical Safety
UL/CSA 60950-1, 2nd Edition
EN/IEC 60950-1, 2nd Edition
EMI/EMC
GR-1089-CORE
EN 61000-6-1
EN 61000-6-2
EN 61000-6-3
EN 61000-6-4
Environment
GR-63-CORE

Specifications are subject to change without notice