



Flatpack S (FPS) 1U & 2U Power System

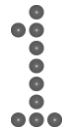
Robert van Witzenburg
October 15, 2020
Public





Flatpack S (FPS) 1U Front & Rear Power System

FPS 1U



SYSTEMS



RACK MOUNTING



RECTIFIERS



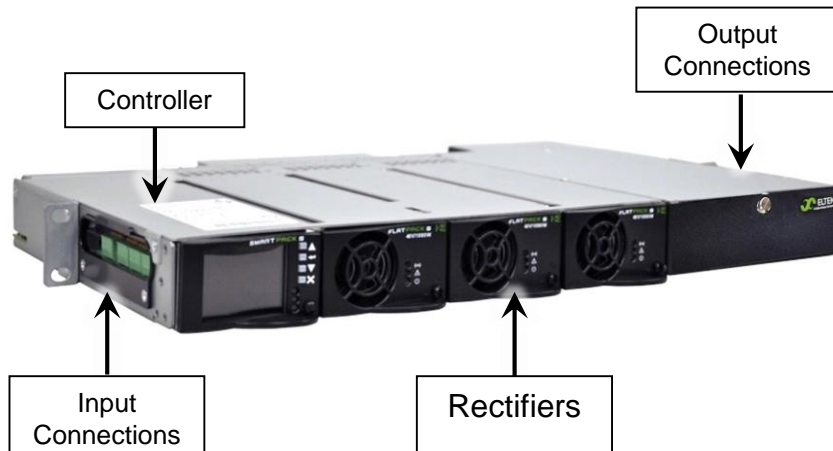
CONTROLLER

FPS 1U



SYSTEMS

FPS 1U System Overview



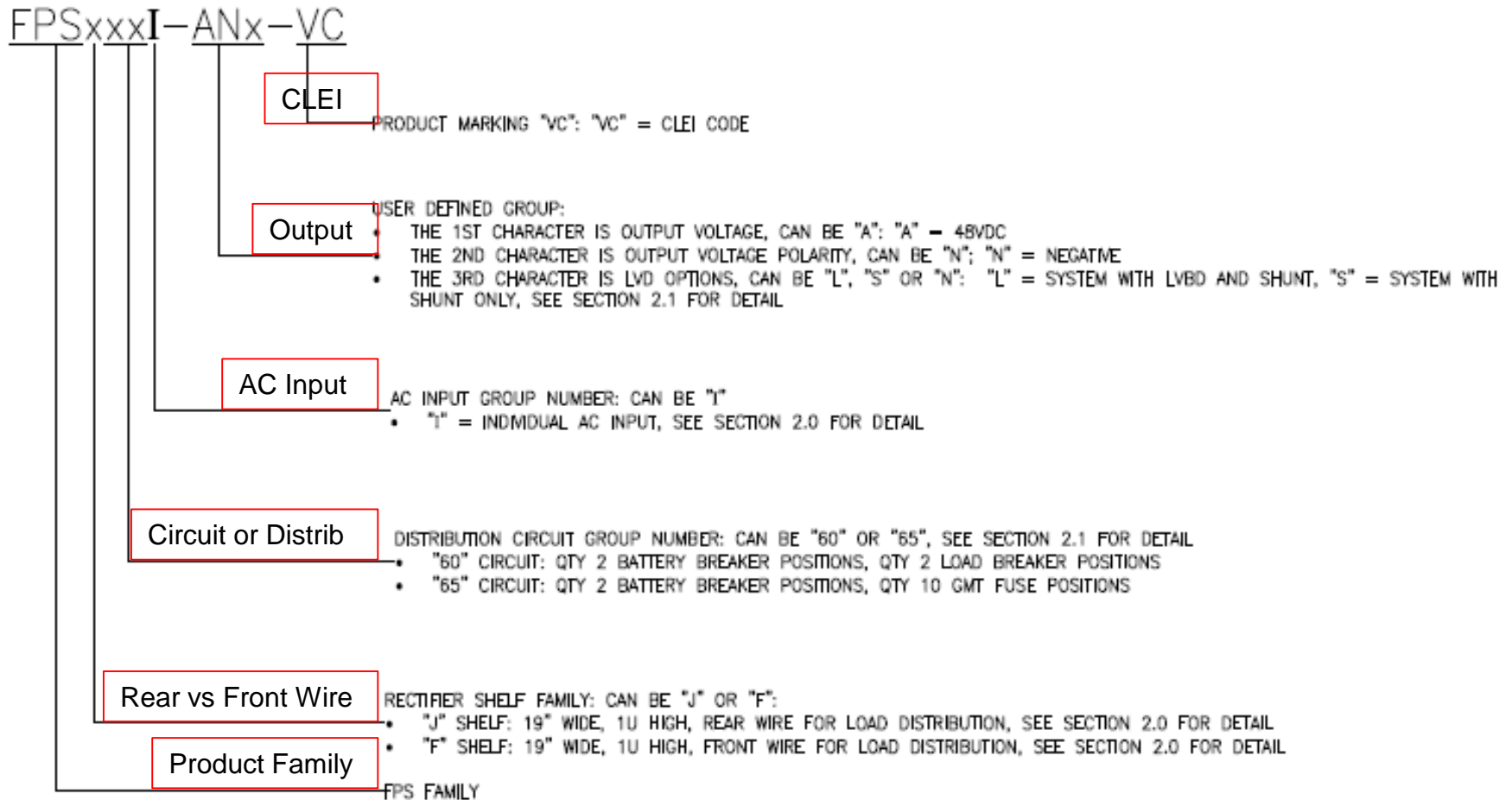
- Shelf - DC Output -48V only
 - F-Series (19", rear access)
 - Front Wire
 - Mid mount
 - J-Series (19", rear access)
 - Rear Wire
 - Mid mount or flush mount
- Input
 - AC or DC
 - One rectifier per input
 - Two rectifiers per input available with input cords
- Output
 - 100A Maximum
 - Up to four Circuit Breaker Positions
 - Up to ten GMT Fuse Positions
 - No Bulk Output Connection
 - LVBD and non-LVBD available
- Rectifier
 - -48V Models only
 - 1000W & 1800W modules
 - Three (3) Flatpack S Rectifiers
- Controller
 - Smartpack S controller

FPS 1U System Overview

- Dimensions (HxWxD): 1.75" x 19" x 12"
- Weight: 12 lbs without rectifiers
- Standard 19" Rack Mount
- 19" to 23" extender brackets available
- Wall-mount brackets available
- Mid-mount with 5" offset



FPS 1U Smart Part Number



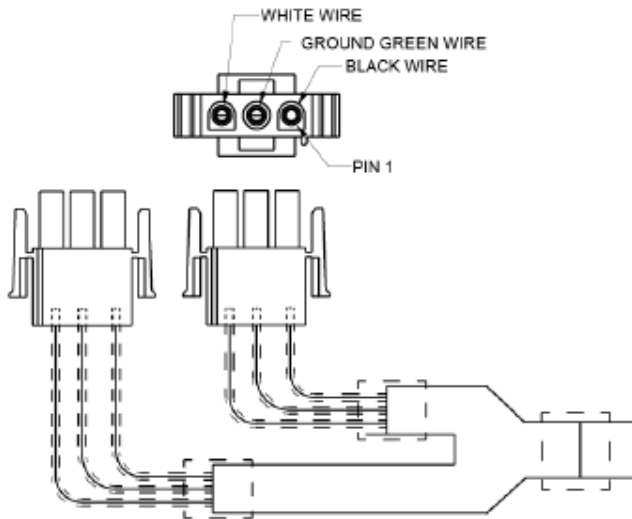
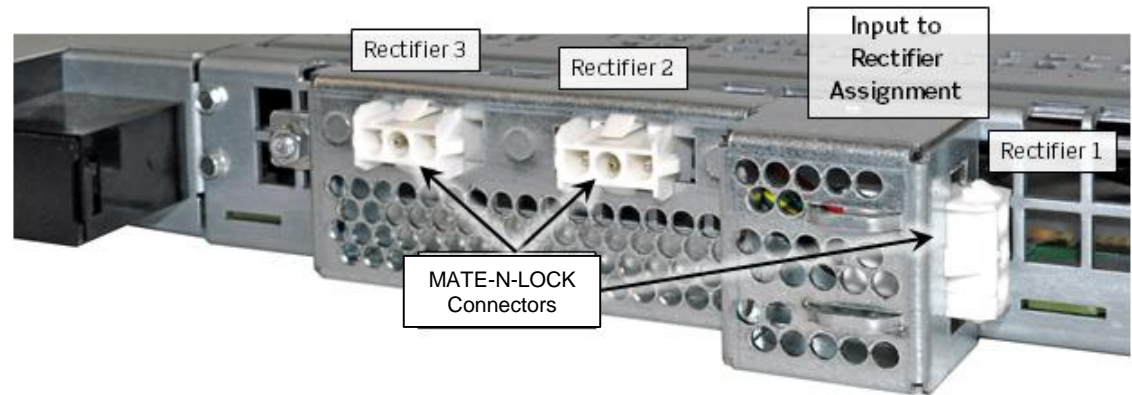
FPS 1U

System Options

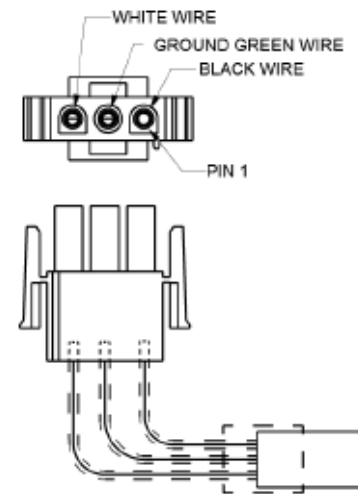
| Shelf Part Number | Circuit Number | Input Type | Nominal Output Voltage | Battery LVBD | Number of Battery Breakers | Number of Load Breakers | Number of GMT Fuses | Bulk Connection |
|-----------------------|----------------|------------|------------------------|--------------|----------------------------|-------------------------|---------------------|-----------------|
| FPSJ60I-ANL-VC | 60 | Individual | - 48 | Yes | 2 | 2 | N/A | N/A |
| FPSJ60I-ANS-VC | 60 | Individual | - 48 | No | 2 | 2 | N/A | N/A |
| FPSJ65I-ANL-VC | 65 | Individual | - 48 | Yes | 2 | 0 | 10 | N/A |
| FPSJ65I-ANS-VC | 65 | Individual | - 48 | No | 2 | 0 | 10 | N/A |
| FPSF65I-ANL-VC | 65 | Individual | - 48 | Yes | 2 | 0 | 10 | N/A |
| FPSF65I-ANS-VC | 65 | Individual | - 48 | No | 2 | 0 | 10 | N/A |

FPS 1U AC Connections

- AC Input
 - Dual & Individual feed
 - 1000W, 1800W



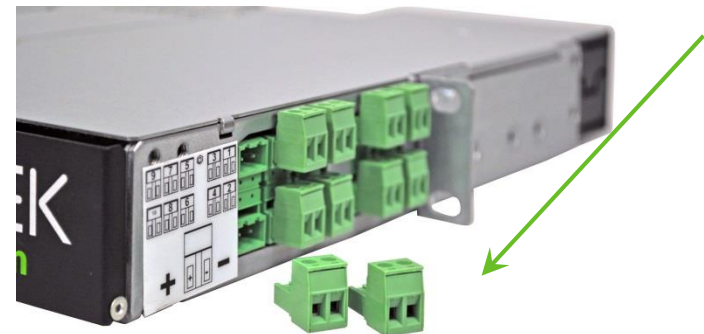
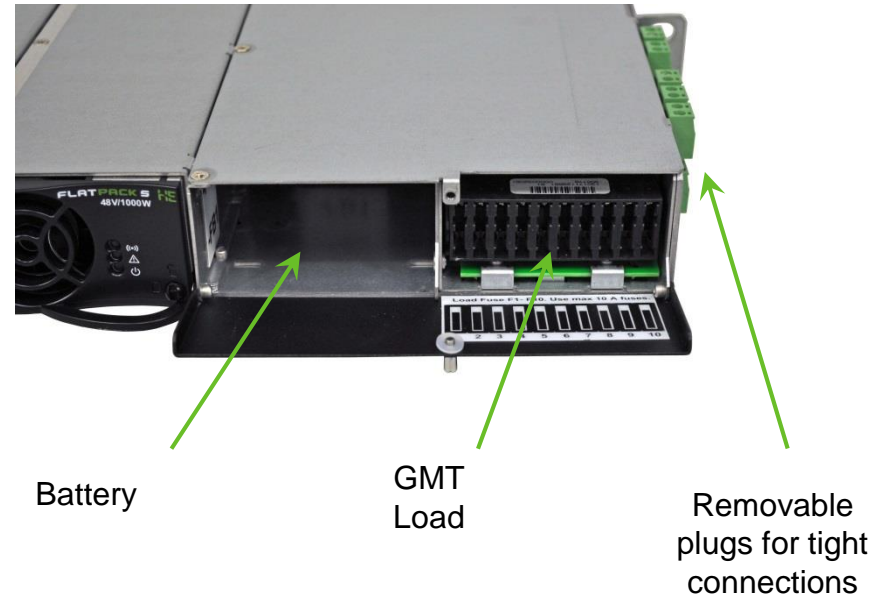
Dual Feed AC Line Cord



Individual Feed AC Line Cord

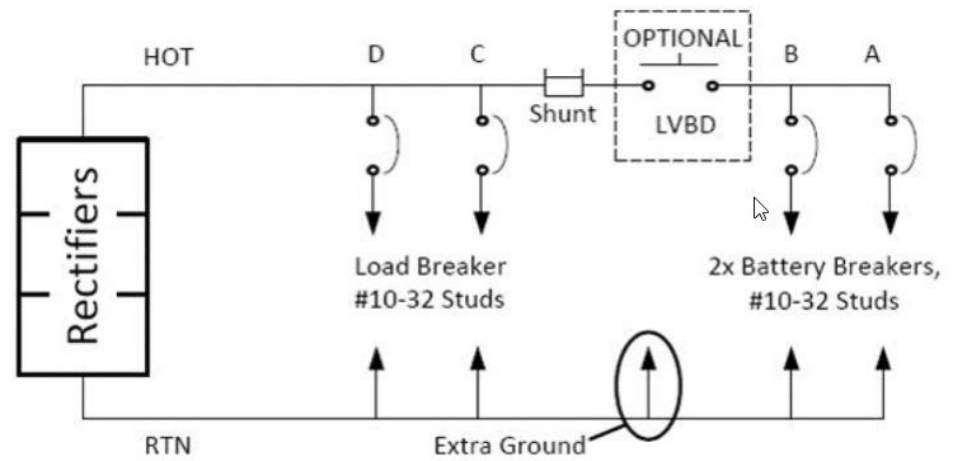
FPS 1U Distribution

- Load Distribution
 - Ten (10) GMT fuse positions
 - Up to two (2) Load Breakers
 - Side access with removable connections
- Battery Distribution
 - Two (2) x Battery Breakers (80A max)
 - 100A/50mV Shunt, 80A LVBD Option
 - Shunt Only



FPS 1U Circuit 60

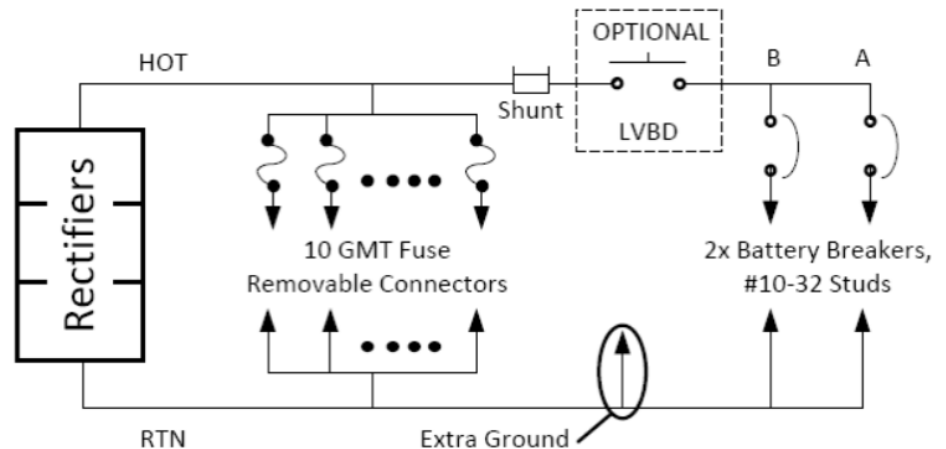
- 48V – 19", 1U / 3R
 - Mid mount
 - Controller + 3x rectifier positions
 - 2x bullet battery breaker positions
 - LVBD & non-LVBD option
 - 2x bullet load breaker positions
 - Coded for 1000W and 1800W 48V rectifiers
 - Individual feed (dual feed jumper options available)
 - Rear AC and battery connections



Circuit 60

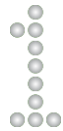
FPS 1U Circuit 65

- 48V – 19", 1U / 3R
 - Mid mount
 - Controller + 3x rectifier positions
 - 2x bullet battery breaker positions
 - LVBD & non-LVBD option
 - 10x GMT fuse positions
 - Coded for 1000W and 1800W 48V rectifiers
 - Individual feed (dual feed line cord options available)
 - Rear AC and battery connections



Circuit 65

FPS 1U



SYSTEMS

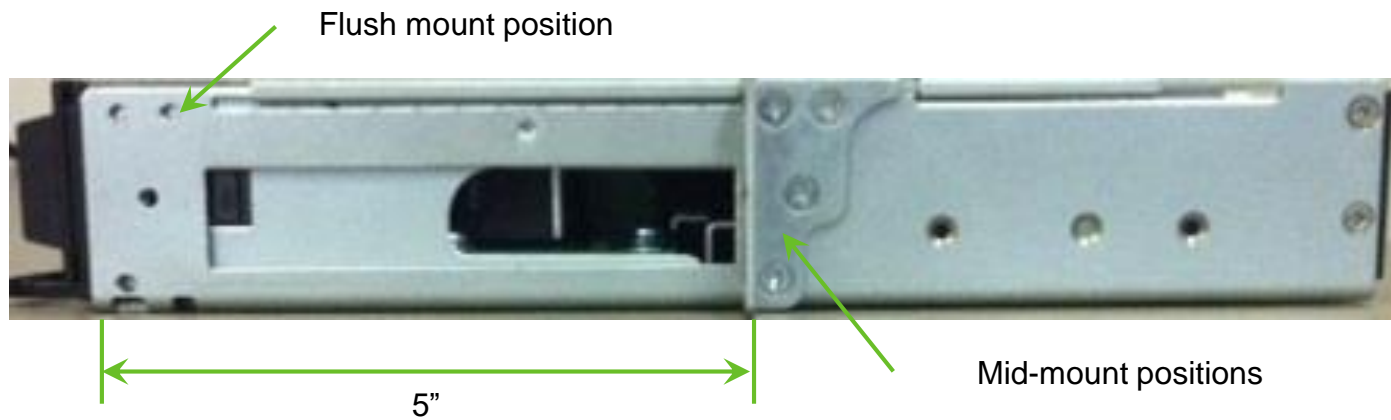


RACK MOUNTING

FPS 1U

Flush or Mid-Mount Options

- Mounting holes exist for all 1U options
- Spacing is standard 5" EIA offset flush to mid



FPS 1U



SYSTEMS



RACK MOUNTING



RECTIFIERS

FPS 1U Rectifiers

- Overview
 - Two versions available
 - 48V - 1000W
 - 48V - 1800W
 - Small (WxHxD): 2.8" x 1.6" x 8.3"
 - Efficiency 95.8% max
 - Energy Star Compliant
 - Reverse current protection
 - Wide input range: 85-305VAC
 - Can operate on DC input: 85-250VDC
 - Mechanical coding to avoid mix of modules
 - Can be shared with FPS 2U



FPS 1U



SYSTEMS



RACK MOUNTING



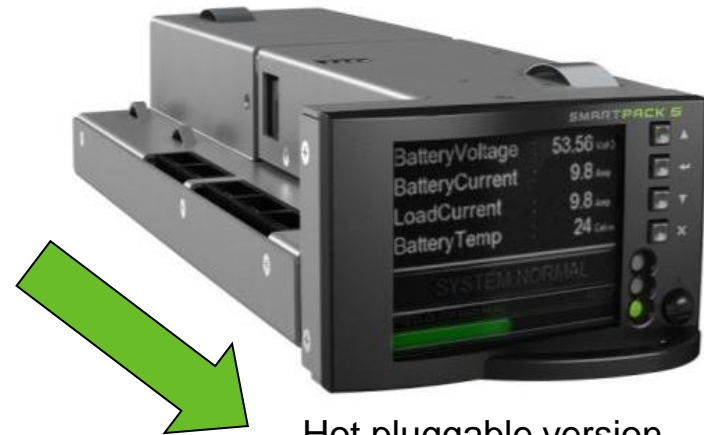
RECTIFIERS



CONTROLLER

FPS 1U Controller Specifications Smartpack S

- Part Number
 - SPS-FPS100-**A01**-W → -48V & 1U Shelf
- Features
 - Hot plug-in
 - Operation voltage 10-75V
 - 6+6 I/O (multi-purpose inputs and potential free alarm contacts)
 - 2x LVD control
 - Display 2.2" 32k color TFT (Thin Film Transistor) LCD w/QVGA resolution
 - Ethernet, TCP/IP
 - RS232, RS485 using RJ11 connection
 - 4 buttons for local operation
 - Slide out feature for craft access
 - Allows controller to stay plugged into system
 - *Note, not directly interchangeable with 2U system*



Hot pluggable version



Flatpack S (FPS) 2U Front & Rear Power System

FPS 2U



SYSTEMS

RECTIFIERS

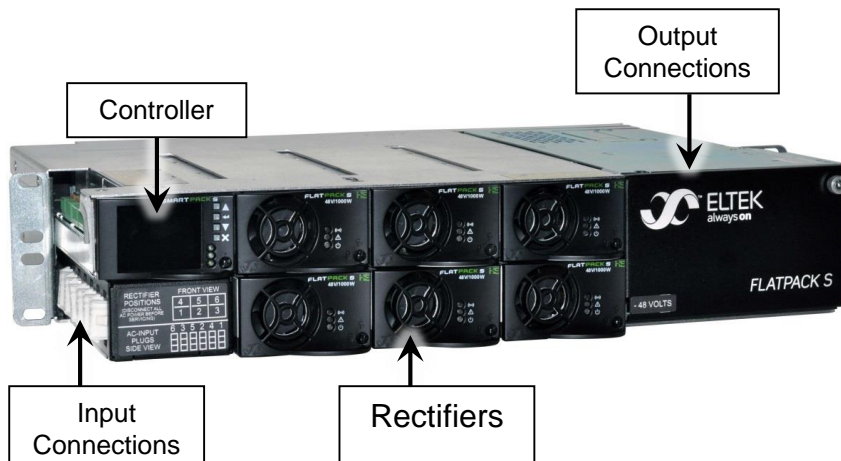
CONTROLLER

FPS 2U



SYSTEMS

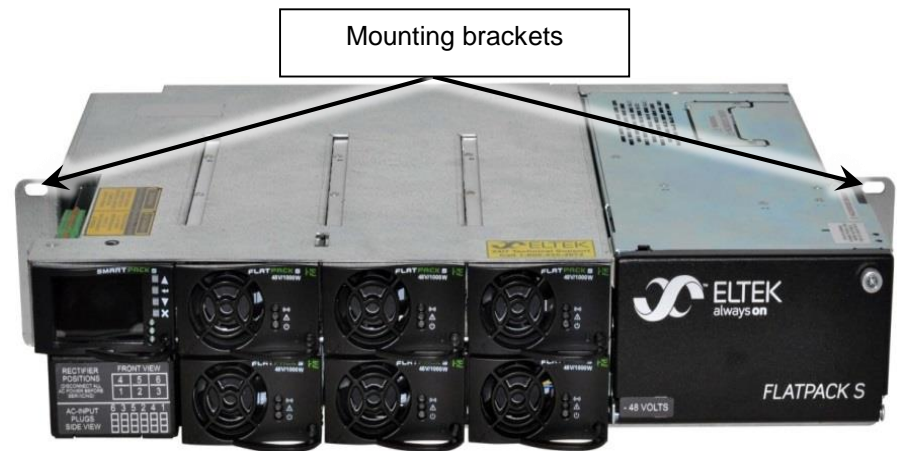
FPS 2U System Overview



- Shelf
 - I-Series (19", front access)
 - Front Wire
 - Mid mount
 - DC Output -48V & +24V
 - K-Series (19", rear access)
 - Rear Wire
 - Mid or Flush mount
 - DC Output -48V
- Input
 - AC or DC input
 - One rectifier per input
 - Two rectifiers per input available with input cords
- Output
 - 200A Maximum
 - Four Circuit Breaker Positions
 - Ten GMT Fuse Positions
 - Bulk Output Connection
 - LVBD and non-LVBD available
- Rectifier
 - 24V and 48V Models
 - 1000W & 1800W modules
 - Six (6) Flatpack S Rectifiers
- Controller
 - Smartpack S controller

FPS 2U System Overview

- Dimensions (HxWxD): 3.5" x 19" x 12"
- Weight: 21 lbs without rectifiers
- Standard 19" Rack Mount
- 19" to 23" extender brackets available



FPS 2U Smart Part Number

FPSxxxI-ANL-VC

CLEI

PRODUCT MARKING "VC": "VC" = CLEI CODE

Output

USER DEFINED GROUP:

- THE 1ST CHARACTER IS OUTPUT VOLTAGE, CAN BE "A" OR "B": "A" - 48VDC, "B" - 24VDC
- THE 2ND CHARACTER IS OUTPUT VOLTAGE POLARITY, CAN BE "N" OR "P": "N" = NEGATIVE, "P" = POSITIVE
- THE 3RD CHARACTER IS LVD OPTIONS, CAN BE "L" OR "S": "L" = SYSTEM WITH LVD AND SHUNT, "S" = SYSTEM WITH SHUNT ONLY, SEE SECTION 2.1 FOR DETAIL

AC Input

AC INPUT GROUP NUMBER: CAN BE "I"

- "I" = INDIVIDUAL AC INPUT, SEE SECTION 1.0 FOR DETAIL

Circuit or Distrib

DISTRIBUTION CIRCUIT GROUP NUMBER: CAN BE "50", "56" OR "59", SEE SECTION 2.1 FOR DETAIL

- "50" CIRCUIT: QTY 2 BATTERY BULK LANDINGS, QTY 4 LOAD BREAKER POSITIONS, AND QTY 10 LOAD GMT FUSE POSITIONS
- "56" CIRCUIT: QTY 2 BATTERY BREAKER POSITIONS, QTY 2 LOAD BULK LANDINGS, QTY 2 LOAD BREAKER POSITIONS, AND QTY 10 LOAD GMT FUSE POSITIONS
- "59" CIRCUIT: QTY 2 BATTERY BREAKER POSITIONS, QTY 4 LOAD BREAKER POSITION, AND QTY 10 GMT FUSE POSITIONS

Front vs Rear Wire

RECTIFIER SHELF FAMILY: CAN BE "I" OR "D":

- "I" SHELF: 19" WIDE, 2U HIGH FRONT WIRE SHELF, SEE SECTION 2.0 FOR DETAIL
- "K" SHELF: 19" WIDE, 2U HIGH REAR WIRE SHELF, SEE SECTION 2.0 FOR DETAIL

Product Family

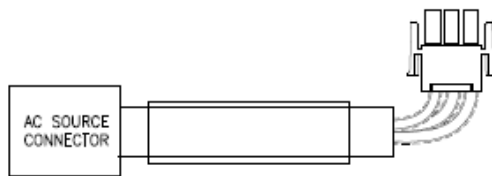
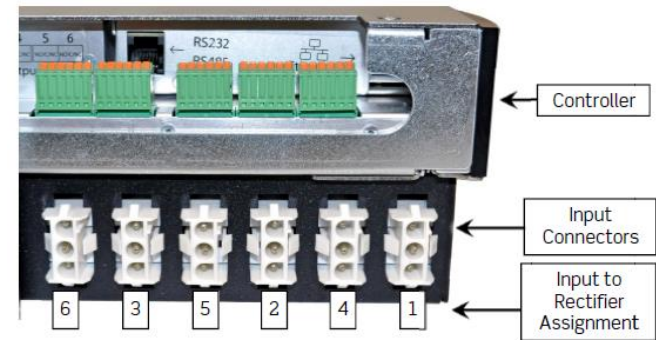
FPS FAMILY

FPS 2U System Options

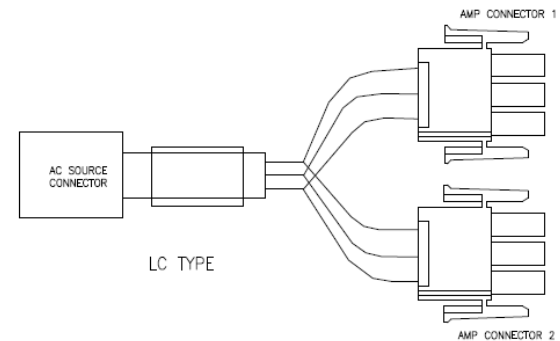
| Shelf Part Number | Circuit Number | Input Type | Nominal Output Voltage | Battery LVBD | Number of Battery Breakers | Number of Load Breakers | Number of GMT Fuses | Bulk Connection |
|-----------------------|----------------|------------|------------------------|--------------|----------------------------|-------------------------|---------------------|-----------------|
| FPSI50I-ANL-VC | 50 | Individual | - 48 | Yes | 0 | 4 | 10 | Battery |
| FPSI50I-ANS-VC | 50 | Individual | - 48 | No | 0 | 4 | 10 | Battery |
| FPSI56I-ANL-VC | 56 | Individual | - 48 | Yes | 2 | 2 | 10 | Load |
| FPSI56I-ANS-VC | 56 | Individual | - 48 | No | 2 | 2 | 10 | Load |
| FPSI56I-BPL-VC | 56 | Individual | +24 | Yes | 2 | 2 | 10 | Load |
| FPSI56I-BPS-VC | 56 | Individual | +24 | No | 2 | 2 | 10 | Load |
| FPSK59I-ANL-VC | 59 | Individual | - 48 | Yes | 2 | 4 | 10 | Load |
| FPSK59I-ANS-VC | 59 | Individual | - 48 | No | 2 | 4 | 10 | Load |

FPS 2U AC Connections

- Six (6) Individual Rectifier Feeds
- Individual Input per Rectifier
 - LA-Series AC Cords
- Dual Feed Input (Two rectifiers per Cord)
 - LC-Series AC cords
 - Two (2) connectors per cable
- UL Rated: 100V – 250V* AC or DC
 - AMP Mate-N-Lock connectors



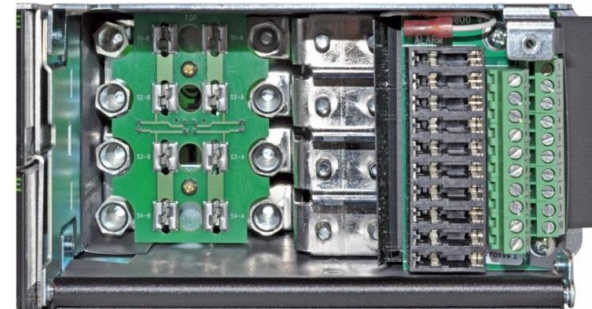
LA TYPE



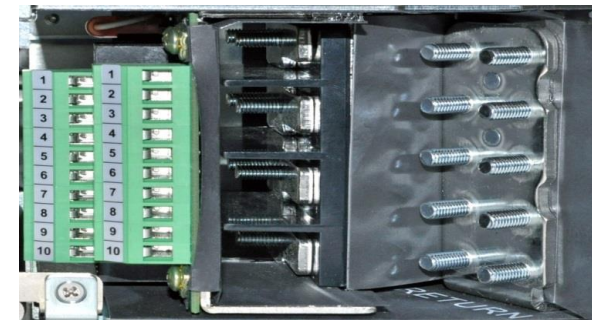
LC TYPE

FPS 2U Distribution

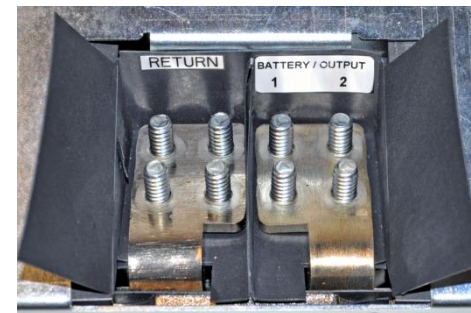
- Load Distribution
 - Four (4) Circuit Breakers
 - Ten (10) GMT Fuses
 - Up to two (2) Bulk Connections
- Battery Distribution
 - LVBD and Shunt (200A)
 - 100A/50mV Shunt, 150A LVBD Option
 - Shunt Only
- Output Connections
 - Breakers: #10-32 studs on 5/8" centers
 - GMTs: Compression style terminal block up to 12 AWG wire
 - Bulk Connections: 1/4"-20 studs on 5/8" centers
 - Extra return connection for DC ground



Front View



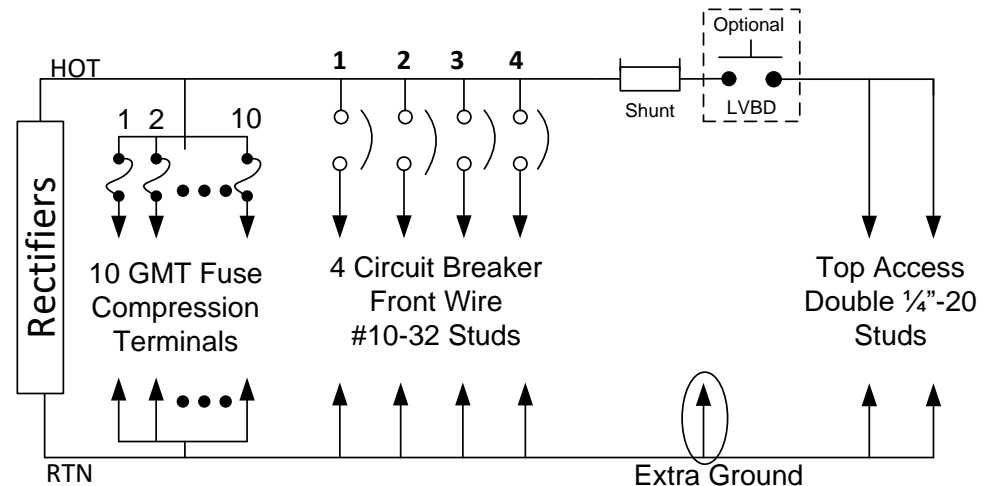
SideView



Top View

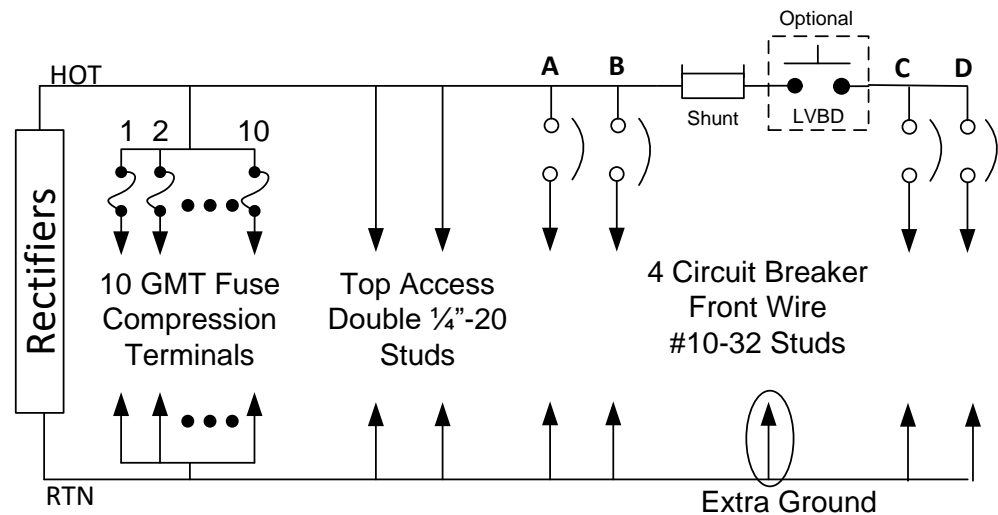
FPS 2U Circuit 50

- 19", 2U / 6R
 - Mid mount only & AC front access (I-Family)
 - Controller + 6x rectifier positions
 - Four (4) Load Breakers
 - Ten (10) GMT Fuses
 - Two (2) Bulk Battery Connections



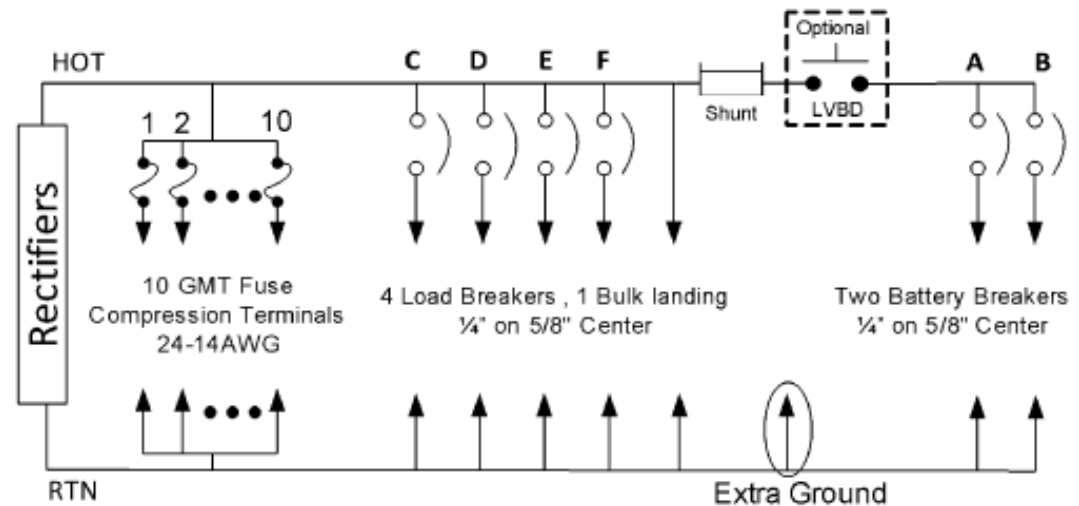
FPS 2U Circuit 56

- Circuit 56
 - Mid mount only & AC front access (I-Family)
 - Controller + 6x rectifier positions
 - Two (2) Load Breakers
 - Two (2) Battery Breakers
 - Ten (10) GMT Fuses
 - Two (2) Bulk Load Connections

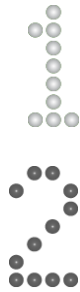


FPS 2U Circuit 59

- Circuit 59
 - Mid or flush mount & AC rear access
 - Controller + 6x rectifier positions
 - Four (4) Load Breakers
 - Two (2) Battery Breakers
 - Ten (10) GMT Fuses
 - One (1) Bulk Load Connections



FPS 2U



SYSTEMS

RECTIFIERS

FPS 2U Rectifiers

- Overview

- Three versions available
 - 48V - 1000W
 - 48V - 1800W
 - 24V - 1000W
- Mechanical coding to avoid mix of modules
- Small (WxHxD): 2.8" x 1.6" x 8.3"
- Efficiency 95.8% max
- Energy Star Compliant
- Hot Pluggable
- Reverse current protection
- Wide input range: 85-305VAC
- Can operate on DC input: 85-250VDC
- Can be shared with FPS 1U



FPS 2U Rectifier Spec

| Part No. | Nominal DC Voltage (V DC) | DC Output Voltage (V DC Range) | Max DC Output Current (A) | Maximum DC Output Power (W) | Rated Input Voltage (V AC or DC) | Operating Input Voltage (V AC or DC Range) |
|---------------|---------------------------|--------------------------------|---------------------------|-----------------------------|----------------------------------|---|
| 241122.105.vc | 48 | 43.5 – 57.6 | 20.9 | 1000 636 (@ 120Vin) | 100 – 250 | 185 – 300 (full power) 85 – 185 (de-rated) |
| 241122.125.vc | 48 | 43.5 – 57.6 | 37.5 | 1800 1050 (@ 120Vin) | 100 – 250 | 195 – 305 (full power) 85 – 195 (de-rated) |
| 241122.205.vc | 24 | 21.5 – 28 | 41.7 | 1000 636 (@ 120Vin) | 100 – 250 | 185 – 300 (full power) 85 – 185 (de-rated) |



FPS 2U



SYSTEMS

RECTIFIERS

CONTROLLER

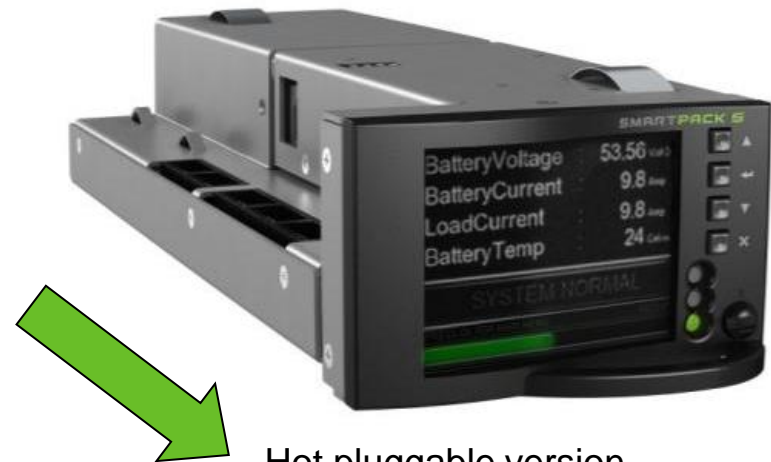
FPS 2U Controller Specifications Smartpack S

- Part Numbers

- SPS-FPS200-A01-W → -48V for 2U Shelf
- SPS-FPS200-B01-W → +24V for 2U Shelf

- Features

- Hot plug-in
- Operation voltage 10-75V
- 6+6 I/O (multi-purpose inputs and potential free alarm contacts)
- 2x LVD control
- Display 2.2" 32k color TFT (Thin Film Transistor) LCD w/ QVGA resolution
- Ethernet, TCP/IP
- RS232, RS485 using RJ11 connection
- 4 buttons for local operation
- Slide out feature for craft access
 - Allows controller to stay plugged into system
- *Note, not interchangeable with 1U system*



Hot pluggable version

