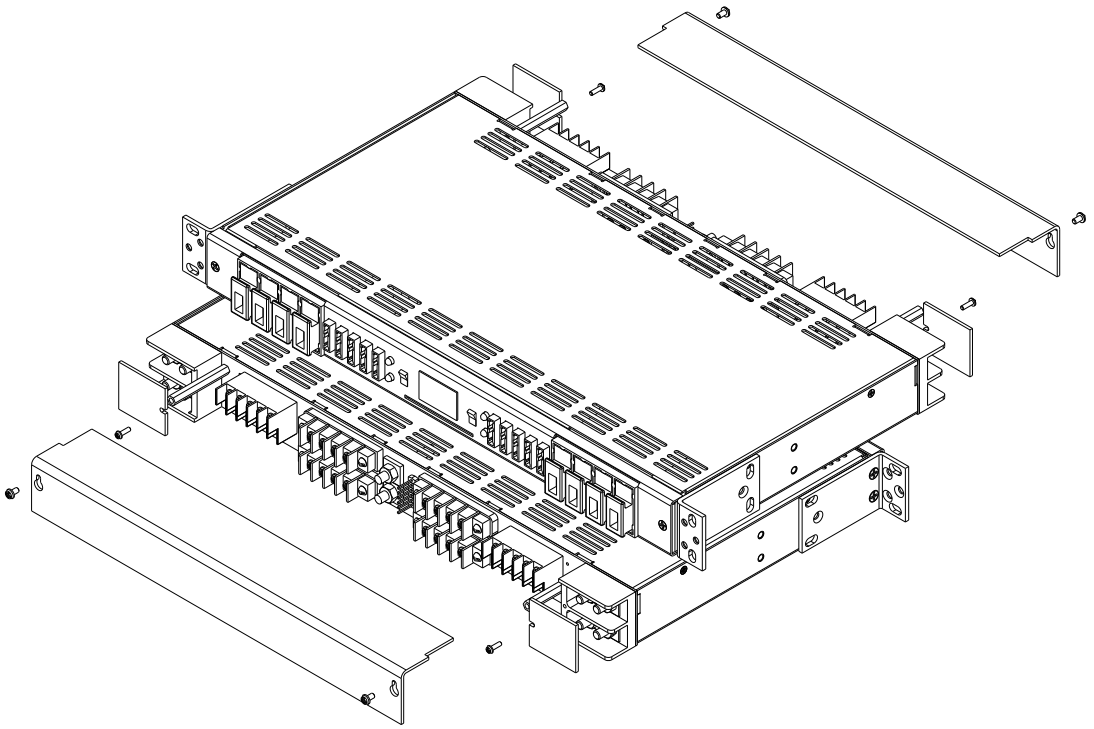
030-101788 REV D
1123-03D
July 2, 2013

Westell

Fuse Panel
Technical Practice

NPTPA1123

4/4 TPA + 5/5 GMT with Voltage/Current Readout



FEATURES

- Compatible with +24V, +48V, -24V or -48V dc input voltages (battery voltages).
- 3-½ Digit LED display indicating Voltage/Current for either bus.
- 2 busses per panel (120 Amps/bus maximum).
- 5 GMT style fuses per bus (20 Amp GMT fuse max, 50 Amps per GMT bus max).
- 4 TPA style fuses per bus (50 Amp TPA fuse max, 120 Amps per TPA bus max).
- Normal and Alarm LEDs for Bus A and Bus B indicate power or fuse failure.
- Two sets of “Form C” relay contacts extend alarm conditions for each bus.
- Brackets supplied are reversible for both 19” and 23” racks, with flush and offset mounting options.
- High current 1/4” stud inputs (1/4”studs on 5/8” centers) for up to 120 Amps/input.
- Offset terminal blocks with rear shield provided (standard).
- UL Listed

1. GENERAL DESCRIPTION

1.1. The Westell NPTPA1123 Fuse Panel provides fused distribution of DC power to equipment. The panel has 2 buses, each bus consisting of 5 GMT style fuse positions and 4 TPA style fuse positions. Alarm circuits are provided to indicate and extend alarm conditions when faults occur.

1.2. Input wiring is connected to a high current, 2-hole lug input block located at the rear of the panel. Each bus has its own completely isolated inputs, allowing the distribution of two battery voltages through the same panel.

1.3. The power is distributed to the load side equipment through GMT and TPA style fuses. There are 5 GMT and 4 TPA style fuses per group and two groups per panel. Each fuse position is available for installer connection at the rear of the panel. A designation card is provided for keeping records of which position is connected to which equipment and what amperage is to be used.

1.4. Alarm circuits are provided to alert service personnel of fault conditions. A fuse alarm is a blown fuse (GMT or TPA) within a given bus. A red fuse alarm LED ⚠ on the faceplate will illuminate when a fuse alarm condition is present. As well, the green Normal Operation LED ✓ will extinguish to signal a fuse alarm or input power failure and the appropriate relay contacts will change states. These fuse panels have common (C), normally open (NO) and normally closed (NC) terminals for alarms. Note, the use of the alarm contacts is optional, if you do not wish to extend the alarms, you don't have to do anything with the alarm pins. The "Normal" condition of the relay exists when the panel is powered up without any blown fuses. The local alarm LEDs are located on the front of the panel as shown in Figure 1.4.1

LED	SYMBOL	SIGNIFICANCE
GREEN	✓	NORMAL OPERATION
RED	⚠	BLOWN FUSE

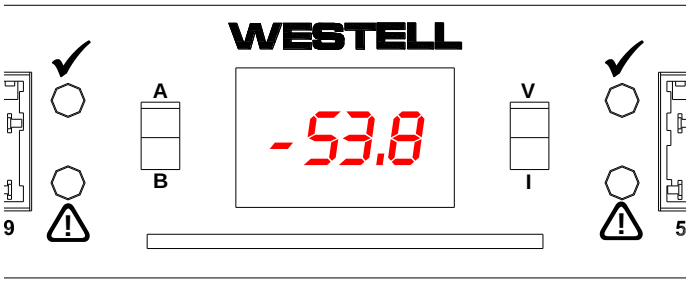


Figure 1.4.1

1.5. These Fuse Panels are made from 0.050" steel and painted off-white. Single rack height panels are shipped with universal brackets (1" & 1-1/4" hole spacing) that will fit both 19" and 23" wide racks and use only one 1.75" panel space. The panel has a clear L shaped plastic shield to protect the wiring connections on the back of the panel.

2. APPLICATION

2.1. The NPTPA1123 Fuse Panel is designed to be used in the rack level distribution of DC power. They are rack mount panels that provide fused DC power through two busses; each bus has 5 GMT style fuses, and 4 TPA style fuses per bus.

2.2. The NPGMT family fuse panels are suitable for installation as part of a Common Bonding Network (CBN). As well, this family of fuse panels is suitable for restricted access locations in Network Telecommunications Facilities and OSP.

3. CIRCUIT DESCRIPTION

3.1. Power is connected to the panel through 1/4" stud input blocks (see fig 4.4.1). There is one set of inputs for each bus. These inputs are high current terminals with a maximum continuous current of 120 Amps. There is a Return (RTN) and Battery (BAT) input for each bus.

3.2. Distribution of current from each bus is provided by GMT and TPA style fuses. Each bus has 5 GMT fuses and 4 TPA fuses. Each fuse position is made available at the rear of the panel via #6 screw terminal blocks. The GMT fuses for both bus A and bus B are numbered 5

thru 9. The TPA fuses are numbered 1 thru 4 for bus A and bus B.

3.3. Fuse Alarm circuitry provides 1 set of form "C" contacts (C, NO and NC) for each bus (Bus A, and Bus B). In the event of a fuse alarm or loss of input power, the proper relay will change states, providing a connection between the Normally Open "NO" and Common "C" terminals for that bus. The normally closed "NC" terminal will open to high impedance.

4. INSTALLATION

Please read completely before beginning.

WARNING: Installation should only be performed by an experienced Installer familiar with DC power distribution systems.

This product must be installed within a RESTRICTED ACCESS LOCATION where access is through the use of a tool, lock and key or other means of security, and is controlled by the authority responsible for the location. This product must be installed and maintained by TRAINED SERVICE PERSONNEL ONLY.

4.1. Unpack and inspect the Fuse Panel for possible damage incurred during shipping. If damage is found, file a claim immediately with the carrier, and notify Customer Service.

4.2. Once the panel is unpacked, verify that there are three mounting brackets. The bracket with the vertical slot is used for both 1" and 1-1/4" hole spacing applications. There will be two brackets with horizontal slots, one will fit 1", and the other 1-1/4", hole spacing. All three brackets are universal for 19" and 23" rack mount spacing (see figure 4.2.1) and can be mounted so the panel can be installed for a flush mounting or 5" offset. Adjust the position and orientation of the correct mounting brackets on the fuse panel, such that it will fit the rack you wish to mount the panel in. Please see drawing 1123-19 on page 6 for mounting bracket configurations.

4.3. Mount the panel on the equipment rack using the thread forming #12-24 rack mounting screws and tooth lock washers provided.

Rack Mount Instructions:

Elevated Operating Ambient *- For closed or multi-unit rack assemblies, the operating ambient may be greater than room ambient. Take care to install the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.*

Reduced air flow *- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation is not compromised.*

Mechanical Loading *- Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.*

Circuit Overloading *- Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.*

Reliable earthing *- Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.*

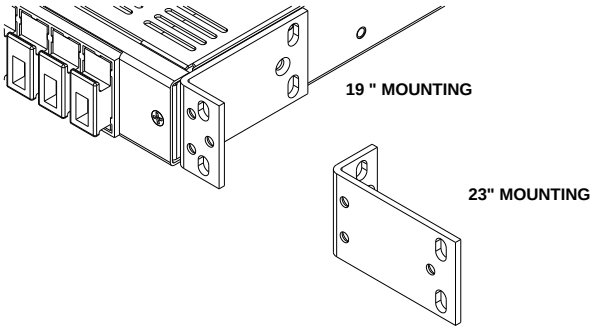


Figure 4.2.1

WARNING: For safety reasons all wiring should be done with all power sources removed (when possible).

Note: A readily accessible disconnect device shall be incorporated in the building installation wiring.

4.4. Remove the distribution fuse feeding the input cables that are to be connected to the new panel. Attach the input cables to the input terminal block in accordance to the National Electrical Code, ANSI/NFPA, and Canadian Electrical code. Hook up the input cables to the input terminal block on the fuse panel ("BAT" & "RTN" for each bus). Each high current input terminal uses a two-hole compression lug (1/4" on 5/8", torque to 5.5 ft-lbs). A two-hole lug must be used for proper operation (see fig 4.4.1)

Note: The supply source must be limited to an instantaneous short-circuit current not to exceed 450 Amps.

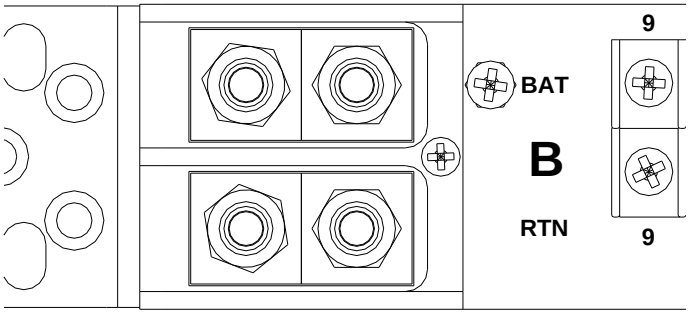


Figure 4.4.1

4.5. The fused battery outputs (BAT) and ground returns (RTN) are also located on the back of the panel. Each fuse holder and terminal position is individually numbered. Connect your load side equipment to the fuse panel, and record which equipment is connected to which input on the designation card (supplied).

4.6. All battery return ("RTN") connections are also terminated on barrier strips (#6 screw, up to 10awg fork). Note, these returns are isolated from the chassis frame.

4.7. This panel has Bus A, and Bus B alarm contacts. Each alarm has a common (C), normally open (NO) and normally closed (NC) alarm contact. In an alarm the "C" contact will short to the "NO" contact, and the "NC" will open. Wire-wrap the alarm connections as per your alarm system requirements. We recommend you fuse the alarm battery supply (ABS) to 1A or less to protect the alarm wiring and circuitry.

4.8. Chassis Ground; For safety reasons, and as recommended by NEBS, the chassis should be electrically connected to the rack ground. From step 4.3. the panel should already be ground to the rack via the #12-24 thread forming rack screws and outside tooth lock washers. In addition to grounding via the mounting brackets, it is recommended you ground the chassis using a ground cable and the two ¼" bolts and locks on back of chassis (1/4" bolt torque; 5.5ft-lbs or 7.5Nm). Consult the National Electric Code, ANSI/NFPA, and Canadian Electrical code for AWG sizes.

4.9. The input wiring feeding this panel should be protected by a Listed fuse/breaker rated for at least 60Vdc, with a trip rating of 150 Amps Max. With input wiring connected and this input fuse installed, the panel should power up with the Normal Operation LED ✓ illuminated and without any red LEDs ⚠ illuminated, and the relays should be in the "Normal" state ("C" connected to "NC").

4.10. If you wish to verify the fuse alarm circuit, you can insert a blown fuse into one of the empty fuse holders. The red Fuse Alarm LED ⚠ should light and the Normal Operation LED ✓ should extinguish and the appropriate alarm extension relay should change states to extend the alarm.

4.10. Install panel output distribution fuses as required. Be sure to size fuses to no more than 70% of their rating (14A max for a 20A fuse). Fuses are not included with this panel. Fuse ratings should be selected to match the load equipment ratings. Once the appropriate fuses have been selected, the fuse information for F1-F9 on BUS A and F1-F9 on BUS B is to be recorded at the time of installation. Use the provided designation card to keep a record of which equipment is connected to which circuit and what the fuse rating is. Be careful not to overload the panel bus or BDFB fuse position rating supplying the panel.

4.12 Install amperage marking labels as required below each fuse for identification of circuit rating. For fuse color codes please see table 4.12.1 below.

Amps	Color Code
18/100 A	Yellow
2/10 A	Red/Black
1/4 A	Violet
3/8 A	Gray/White
1/2 A	Red
65/100 A	Black
3/4 A	Brown
1 A	Gray
1 1/3 A	White
1 1/2 A	White/Yellow
2 A	Orange
2 1/2 A	White/Orange
3 A	Blue
3 1/2 A	White/Blue
4 A	White/Brown
5 A	Green
7 1/2 A	Black/White
10 A	Red/White
12 A	Yellow/Green
15 A	Red/Blue
20 A	Green/White

Table 4.12.1

Chassis Grounding: Depending on the bus input current being supplied, the chassis bonding conductor used should meet the minimum requirements. Please note that 120 A is the maximum allowable bus current rating.

Protective Current Rating	Minimum AWG	Recommended Compression Lug	Minimum Wire Temperature rating
0-40 Amps	10 AWG	Panduit, LCD10-14A	90°C
40-63 Amps	8 AWG	Panduit, LCD8-14A	90°C
63-80 Amps	6 AWG	Panduit, LCD6-14A	90°C
80-100 Amps	4 AWG	Panduit, LCD4-14A	90°C
100-125 Amps	2 AWG	Panduit, LCD2-14A	90°C

5. SPECIFICATIONS

5.1	Voltage	±24 or ±48 V_{DC} Typical ±22 to ±58 V_{DC} Maximum
5.2	GMT Fuse Size	0.18 to 20 Amps Max* 450A@60V_{DC} I.R. (Littelfuse Type 481 Series)
5.2.	TPA Fuse Size	3 to 50 Amps Max* (Bussmann TPA style fuse)
5.3.	Current/GMT Bus	50 Amps Max**
5.4.	Current/TPA Bus	120 Amps Max**
5.5.	Current/Input	120 Amps Max (fuse at 150A)
5.6.	Output/Bus	4 TPA & 5 GMT
5.7.	Busses/Panel	2 Busses per Panel
5.8.	Input Block	Two ¼" Studs on $^5/_8$ centers Max std lug is 1 AWG Max lug width = 0.710"
5.9.	GMT Output	#22 AWG to 12 AWG wire Or fork/ring for #6 screw, 10AWG forks/rings will work
5.10.	TPA Output	#20 AWG to #10 AWG wire #6 AWG & #8 AWG with narrow tongue lug (#6 screws) Max lug width = 0.375"
5.11.	Alarm Block	0.045" sq wire wrap pin
5.12.	Relay Current	1 Amp/58Vdc max
5.13.	Dimensions	1¾ H, 17 W,10½ D (excluding brackets)
5.14.	Rack Mounting	19" and 23" Racks 1" and 1.25" hole spacing for WECO and EIA style racks
5.15.	Weight	Approx 10 lbs
5.16.	Operating Temp.	-40 to +55C (ambient) (-40 to +131F)
5.17.	Color	Off-white
5.18.	Short Circuit	450A (Max) Withstand Rating
5.19.	Voltage Display	0 to ±60.0 V_{DC}, 0.1V resolution, ±1%
5.20.	Current Display	0 to ±199 $A_{DC,}$ 1 A resolution, ±3%

*We recommend that you size fuses such that they do not run at more than 70% of their rating. Thus a 20A fuse should not be run at more than 14 A. TPA fuses should be sized such that they do not run at more than 70% of their ratings. Thus a 50A fuse should not be run at more than 35A.

**The sum of the fuse currents must not exceed the bus rating.

Compatible lugs for Input Block
2 hole compression lugs for 1/4" studs on 5/8" centers (torque 5.5ft-lbs) example;

Panduit®	LCD1-14A	1awg wire
	LCD2-14A	2awg wire
	LCD4-14A	4awg wire
	LCD6-14A	6awg wire
	LCD8-14A	8awg wire

The Panduit® CT-1700 crimping tool can be used for securing wire to any of these lugs.

Input wiring should be rated 90°C or better and fused at 125% of total Bus current (ie: up to 150 Amps MAX rated input fuse/breaker)

Output lugs (locking fork recommended): Ring or fork for #6 screw (up to 10awg). Torque to 9 in-lbs, use wire rated 90°C or better.

Or "Narrow Tongue" ring lugs by Burndy, for the large cable and the TPA blocks: Burndy# YA8CLNT6 (8 AWG wire)

NOTE: If fuse size is not specified in the equipment manual, fuses should be selected such that they do not run at more than 70% for GMT's and 70% for TPA's, of their rating. When installing fuses, the sum of the fuse currents installed in each bus should not exceed the bus current rating (120 Amps) or input fuse rating.

6. TECHNICAL SERVICES

6.1 If technical or customer assistance is required, contact Westell by calling or using one of the following options:

Voice: (800) 377-8766
email: global_support@westell.com

For additional information about Westell, visit the Westell World Wide Web site at http://www.Westell.com.

7. WARRANTY & REPAIRS

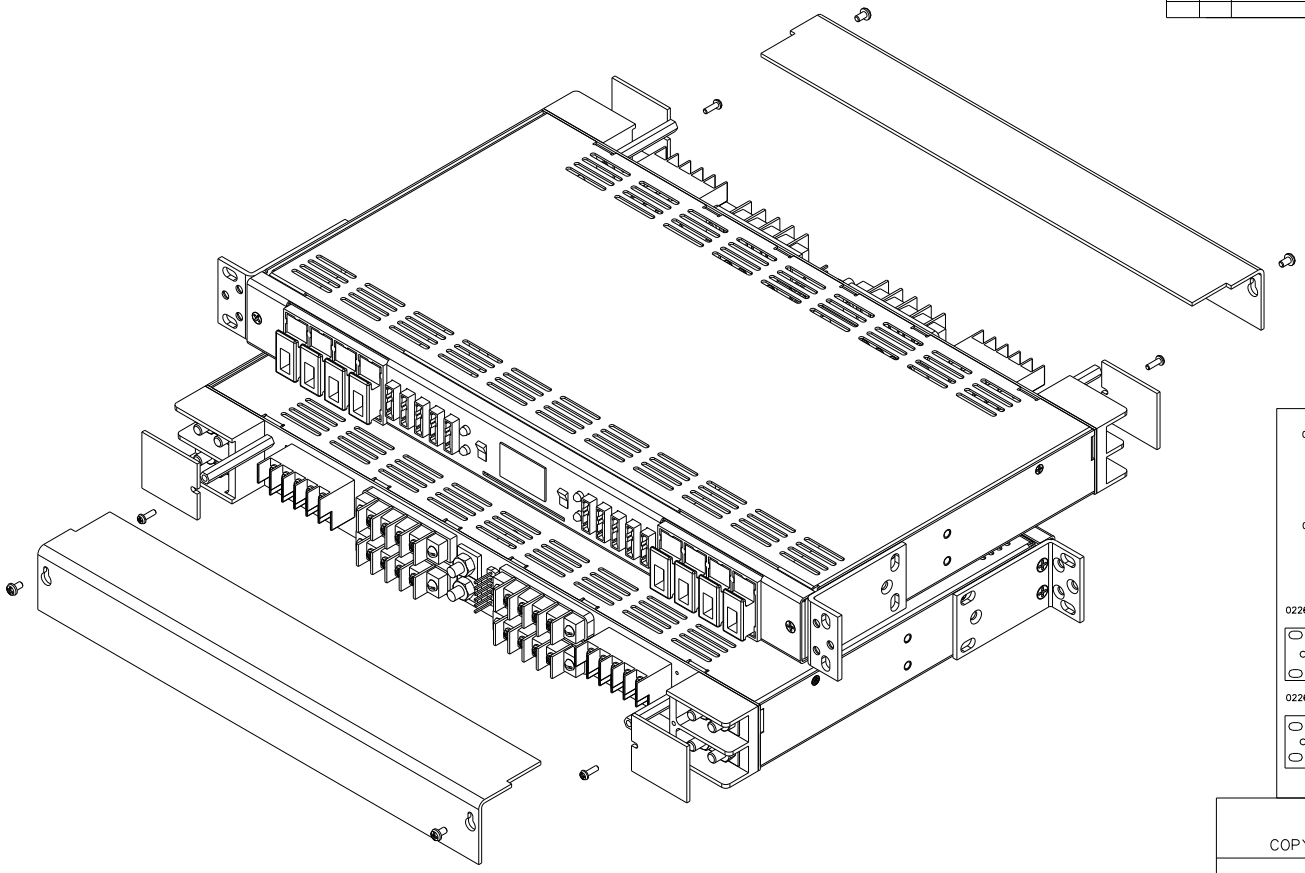
7.1 Westell warrants this product to be free of defects at the time of shipment. Westell also warrants this product to be fully functional for the time period specified by the terms and conditions governing the sale of the product. Any attempt to repair or modify the equipment by anyone other than an authorized Westell representative will void the warranty.

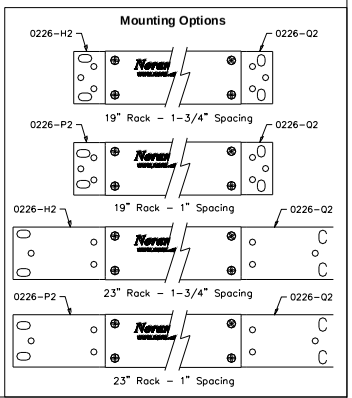
7.2 Westell will repair or replace any defective Westell equipment without cost during the warranty period if the unit is defective for any reason other than abuse, improper use, or improper installation. To return defective equipment, first request a Return Material Authorization (RMA) number from Westell by calling or using one of the options shown below. Once an RMA number is obtained, return the defective unit (freight prepaid), along with a brief problem description, to the address we will provide to you when you contact us.

email: rgmdept@westell.com

Replacements will be shipped in the fastest manner consistent with the urgency of the situation. Westell will continue to repair or replace faulty equipment beyond the warranty period for a nominal charge. Contact Westell for details.

REV	Qty	Description or Release Note	ECN	CKD	APD	DATE





Noran Tel

NPTPA1123
Front/Rear Views
Illustration Drawing

Drawing Number:	Rev:	Drawn with: AutoCAD by Autodesk	Computer File: Noran Tel use only 1123-16
1123-19			
Date: 16 December 11		Plotted Scale: NTS	
Drawn by: S. Dolinsky		Sheet: 1 of 1	

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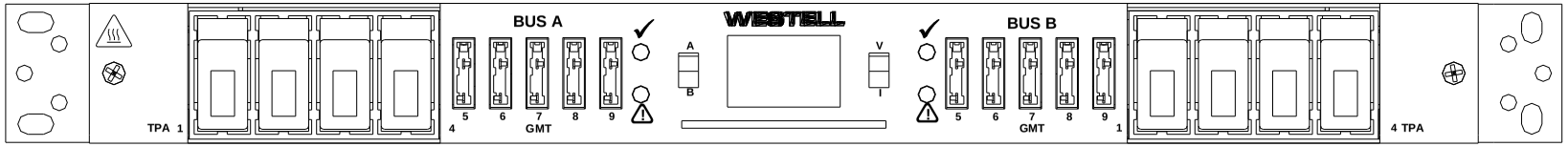

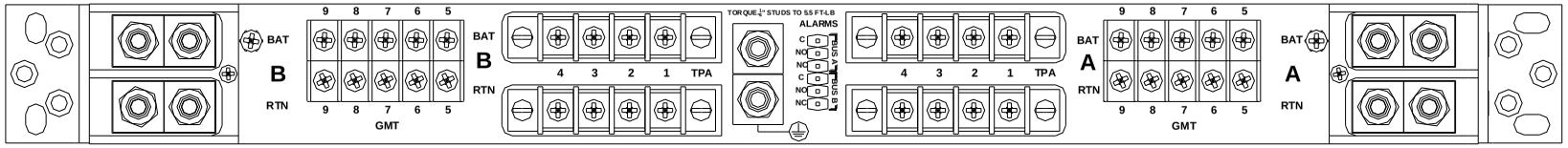

Noran Tel

NPTPA1123
Front/Rear Views
Illustration Drawing

Drawing Number:	Rev:	Drawn with:	Computer File:
1123 – 17		AutoCAD by Autodesk	Noran Tel use only 1123–17
Date: 19 December 11		Plotted Scale: NTS	
Drawn by: S. Dolinsky		Sheet: 1 of 1	

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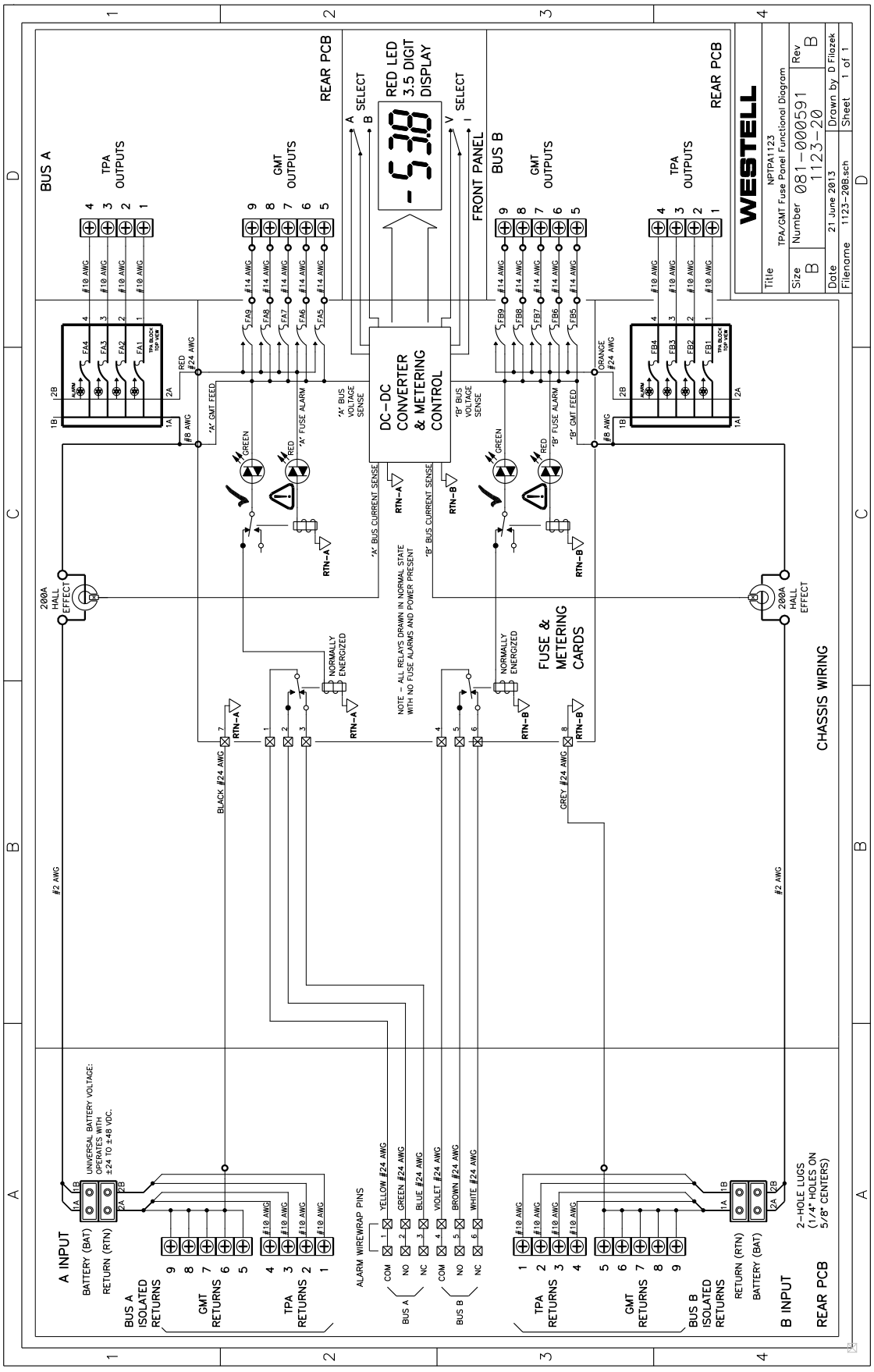
WESTELL
Title NPTPA1123 TPA/GMT Fuse Panel Functional Diagram
Size B
Number 081-000591 1123-20
Rev B
Date 21 June 2013
Drawn by D Filazek
Filename 1123-208.sch
Sheet 1 of 1
BUS A
BUS B
REAR PCB
FRONT PANEL
TPA OUTPUTS
GMT OUTPUTS
RED LED 3.5 DIGIT DISPLAY
SELECT
DC-DC CONVERTER & METERING CONTROL
'A' BUS VOLTAGE SENSE
'B' BUS VOLTAGE SENSE
'A' BUS CURRENT SENSE
'B' BUS CURRENT SENSE
'A' GMT FEED
'B' GMT FEED
'A' FUSE ALARM
'B' FUSE ALARM
GREEN
RED
RTN-A
RTN-B
200A HALL EFFECT
NORMALLY ENERGIZED
NOTE – ALL RELAYS DRAWN IN NORMAL STATE WITH NO FUSE ALARMS AND POWER PRESENT
FUSE & METERING CARDS
CHASSIS WIRING
A INPUT
BATTERY (BAT)
RETURN (RTN)
UNIVERSAL BATTERY VOLTAGE: OPERATES WITH ±24 TO ±48 VDC.
BUS A ISOLATED RETURNS
GMT RETURNS
TPA RETURNS
ALARM WIREWRAP PINS
YELLOW #24 AWG
GREEN #24 AWG
BLUE #24 AWG
VIOLET #24 AWG
BROWN #24 AWG
WHITE #24 AWG
COM
NO
NC
BUS A
BUS B
B INPUT
RETURN (RTN)
BATTERY (BAT)
BUS B ISOLATED RETURNS
2-HOLE LUGS (1/4" HOLES ON 5/8" CENTERS)
REAR PCB
#2 AWG
#8 AWG
#10 AWG
#14 AWG
#24 AWG
BLACK #24 AWG
GREY #24 AWG
RED #24 AWG
ORANGE #24 AWG