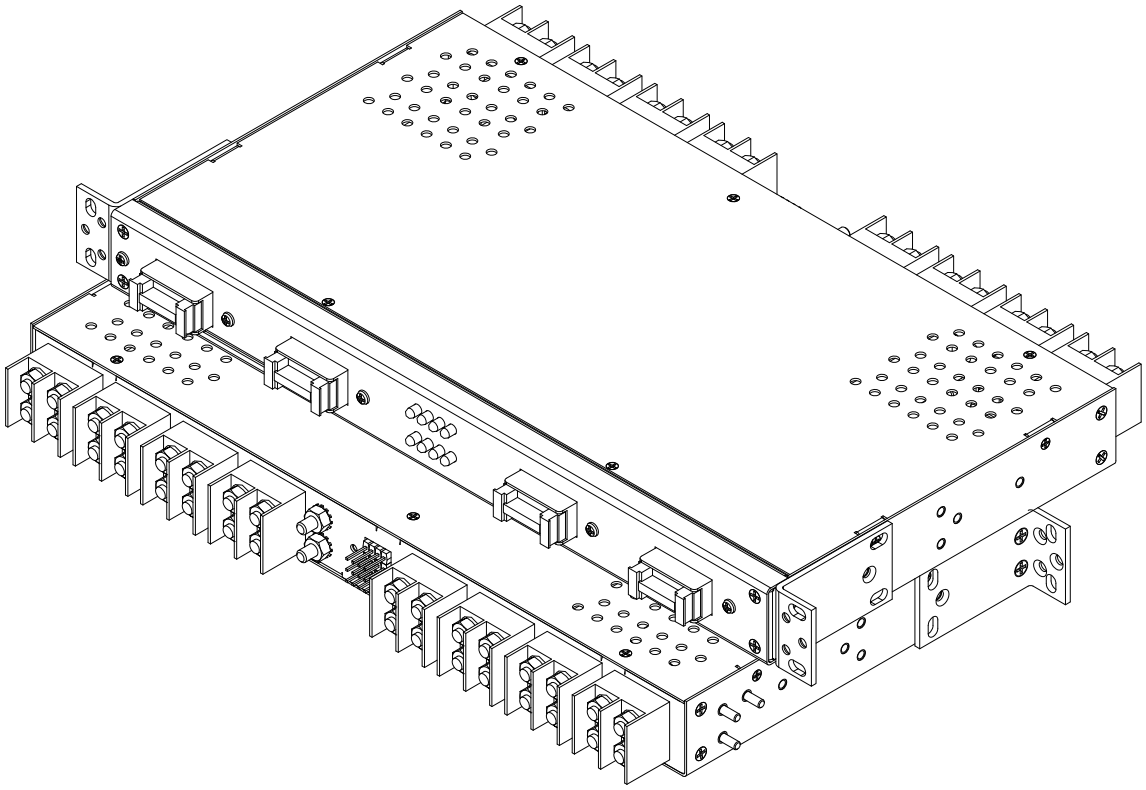
Westell

Fuse Panel
Technical Practice

NPTFD1009
4 POSITION TFD (TLS)



FEATURES

- Compatible with -24 or -48 Vdc battery voltages (polarity insensitive).
- 4 isolated TLS fuse positions, TFD style holder, 125 Amps each (500 Amps per panel).
- TFD fuse holder accepts TLS Fuses (up to 125 Amps) or TPS Fuses (up to 70 Amps).
- Normal and Fuse Alarm LEDs for each fuse position indicates power or fuse failure.
- “Form C” relay contacts to extend alarm conditions for each fuse position.
- 1/4” stud input and output blocks (1/4” studs on 5/8” centers).
- Brackets allow for mounting in 19” or 23” racks (1 RU).
- NEBS level 3 verified, with zone 4 earthquake.

1. GENERAL DESCRIPTION

1.1. The NPTFD1009 Fuse Panel provides fused distribution of DC power to equipment. The panel has 4 isolated fuse positions, each consisting of a TFD fuse holder which can accept both TLS and TPS style fuses. Alarm circuits are provided to indicate and extend alarm conditions for each fuse position.

1.2. Wiring for the panel is accessible on the rear of the panel. Power is connected via the stud input and output blocks. Alarms are connected via wire-wrap to the connectors on the rear of the panel. Figure 1.2.1 shows the connectors available on the rear of the panel.

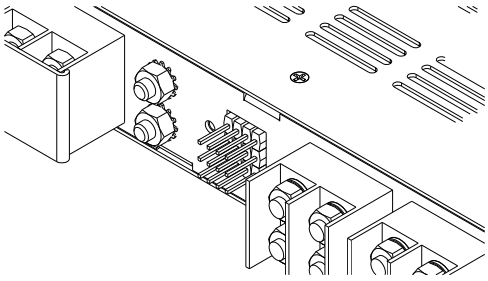


Figure 1.2.1

1.3. Power is provided to and distributed from the panel by using properly rated cables equipped with standard two hole lugs (1/4" studs on 5/8" centers). Two hole lugs must be used for this high current fuse panel to function properly. Power is provided to the load side equipment through TLS or TPS style fuses. There is one fuse position for each input position. Each fuse position can distribute a maximum of 125 Amps.

1.4. Alarm circuits are provided to indicate and extend alarm conditions. Each TFD fuse holder houses the main TLS fuse as well as a GMT alarm indicating fuse. When the cartridge is removed, the alarm is de-activated. When an alarm condition is present a red Fuse Alarm LED ⚠ will illuminate. 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. A set of dry "Form C" contacts is provided for each fuse position to extend alarm conditions. Each relay has a common (COM), normally open (NO), and normally closed (NC) contact. 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

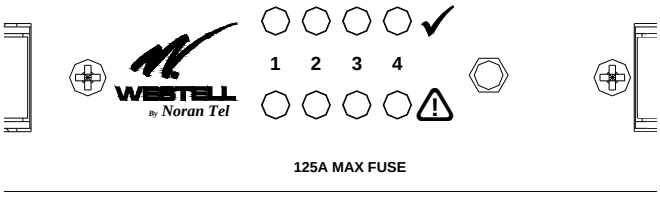


Figure 1.4.1

1.5. The Fuse Panel is constructed from 0.050" steel and painted off-white. The panel is shipped with mounting brackets that allow it to be installed in both 19" and 23" wide racks, with either 1.75" or 1" panel hole spacing (occupies 1 RU in a 1.75" pattern rack).

2. APPLICATION

2.1. NPTFD1009 Fuse Panel is designed to be used in the rack level distribution of DC power. It is a rack mount panel that provides fused DC power for 4 isolated circuits using TLS style fuses in a TFD style fuse holder.

2.2 The NPTFD family fuse panels are suitable for installation as part of a Common Bonding Network (CBN) for electrically bonding the shelf type chassis of this fuse panel to its equipment rack (via mounting brackets or chassis bonding studs). Note that all power return inputs (RTNs) are electrically isolated from each other and from the fuse panel chassis. 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 fuse panel through the ¼" stud input blocks. There is one set of inputs for each fuse position to be supplied from battery (BAT IN) and return (RTN IN) feeds. See figure 3.1.1.

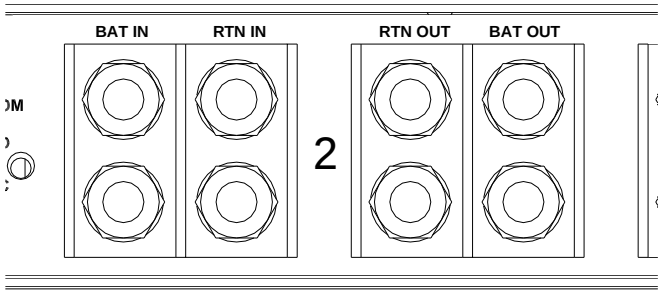


Figure 3.1.1

NOTE: The panel is designed to work with either 24 or 48 Vdc batteries in either polarity (+ or – battery). Please connect the supply voltage from the power plant (that is not connected to earth ground) to the "BAT IN" input. Connect the side that is at ground potential to the "RTN IN" input.

3.2. Power distribution is provided by either TLS or TPS style fuses in the TFD style fuse holder. The output for each fuse position is made available through a ¼" stud output block. See Figure 3.1.1. When distributing power from each fuse position use the corresponding battery (BAT OUT) and return (RTN OUT) connections.

3.3. Alarm circuitry provides visual alarm indicators and an alarm extension for each fuse position. Alarm contacts are located on the back of the panel on wire wrap terminals. On the front of the panel, a red FUSE ALARM LED ⚠ will indicate a fuse failure. Otherwise, a green NORMAL OPERATION LED ✓ will be lit provided there is no power failure. Figure 1.4.1 shows the alarm LED layout.

3.4. There is one set of dry "Form C" contacts to extend alarms for each fuse position. In the event of a "Fuse Alarm" or a power failure, a connection between common (C) and normally open (NO) is made. Under "Normal Operation" there is a connection between common (C) and normally closed (NC). A 1 Amp PTC protects each of the relay contacts.

4. INSTALLATION

Please read completely before beginning.

***CAUTION*:** For safety reasons, all wiring should be performed with all power sources removed, and by a trained Installer experienced with DC power systems.

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 please notify Customer Service.

4.2. Once the panel is unpacked, verify that there are three mounting brackets (two on the panel one in the box). The bracket with the vertical slot is universal and used on both 1" and 1.75" spacing rails. There will be two brackets with horizontal slots which will fit 1" or 1.75" spacing. All three brackets are universal for 19" and 23" rack spacing and can be installed with a flush mounting or 5" offset. See Figure 4.2.1 for the bracket mounting configurations. Adjust the position and orientation of the brackets such it will fit properly in your application. The brackets should be attached to the chassis using screws with external tooth lock washers.

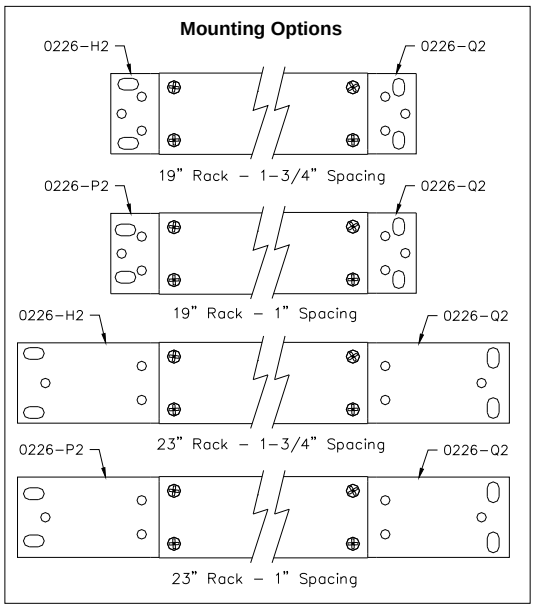


Figure 4.2.1

4.3. Mount the fuse panel in the required position on the equipment rack using #12-24 thread forming rack mounting screws with external tooth lock washers that are provided with the panel.

WARNING: For safety reasons all wiring should be done with power source removed.

4.4. Remove the distribution fuse or breaker feeding the input cables that are to be connected to the new panel. Note this panel can handle a maximum of 125 Amps per input. Please do not fuse/breaker the input cables at more than 150 Amps each. Using input cables specified by the Job Engineer, hook up the battery input cables to the input blocks on the back of the fuse panel ("BAT IN" & "RTN IN" for each input). Each input terminal uses a two hole compression lug (1/4" on 5/8" centers, torque to 3 ft-lbs). See Figure 4.5.1.

4.5. Battery outputs ("BAT OUT" & "RTN OUT") for each fuse position are also accessible through ¼" stud terminal blocks at the rear of the panel. Each fuse position is numbered on the face plate and that circuits output is available at the back of the panel with the same number. Note that each return is isolated from the chassis frame and isolated from all other returns. See Figure 3.1.1.

Note: For this high current panel, a two hole lug must be used on all stud blocks (input and output, battery and return) for the fuse panel to function properly.

4.6. Each fuse position has a common (C), normally open (NO) and normally closed (NC) set of contacts for extending alarms. (See figure 4.6.1 for the location and layout of the alarm relay contacts). Wire wrap the alarm connections as per your alarm systems requirements. For example; to achieve a "ground alarm extension", connect a ground supply to the common (C) contact and connect the alarm signal wire to the normally open (NO) contact. In an alarm state a "ground" will be sent out from the panel.

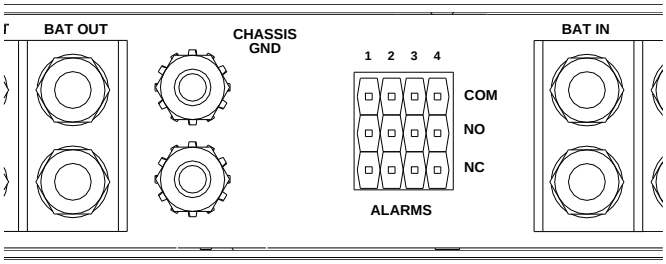


Figure 4.6.1

Note: To protect the alarm wiring and circuitry, the current will be limited through the alarm contacts to 1A by a self-resetting over current device (1Amp P.T.C.). See the attached schematic (drawing 1009-10).

4.7 Chassis Grounding; for safety reasons, the chassis should be electrically connected to the rack ground. From step 4.3, the panel should already be bonded to the rack via the #12-24 thread forming rack screws and outside tooth lock washers used to pierce the paint (this hardware must be used to pierce paint on the panel and the rack). In addition to grounding via the mounting brackets, it is recommended that the chassis be further grounded using a separate ground bonding

cable that is a minimum 6 AWG, 90C, copper cable (green with yellow stripe insulation recommended). Please use an appropriate UL® listed 2 hole lug (¼" on 5/8" centers). Fasten the lug to the provided ¼" studs at the rear of the chassis or on the side (Figure 4.7.1 and 4.7.2), using ¼" external tooth lockwashers and nuts, and torque to 5.5 foot-pounds.

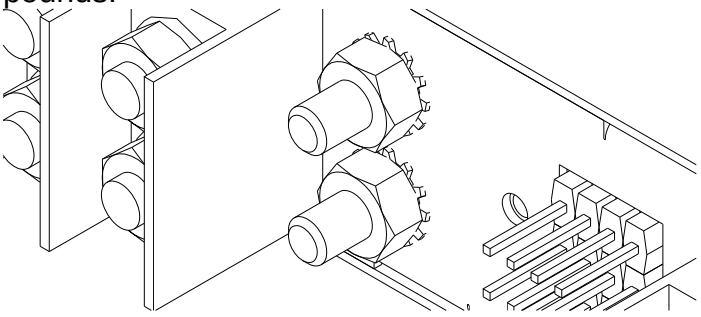


Figure 4.7.1

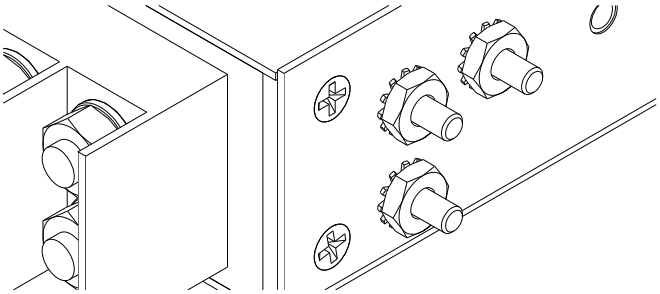


Figure 4.7.2

4.8. Power up the panel by installing a Listed or Recognized fuse rated for at least 60Vdc, with a trip rating of 150 Amps Max. If the TFD cartridges are either removed or installed with operational TLS and GMT fuses, the panel should power up with green Normal Operation LEDs ✓ for each input that has been connected, and have no red Fuse Alarm LEDs ⚠ illuminated.

4.9. Install fuses in each of the TFD cartridges as required. Unless otherwise specified, be sure to size fuses to no more than 70% of their rating. For example, 49A max for a 70A fuse. The TFD holders will accept TLS (Maximum 125Amp) or TPS (Maximum 70Amp) style fuses. Install a GMT alarm indicating fuse into the TFD holder (GMT-A is recommended).

4.10. If you wish to verify the alarm circuit, you can insert a blown GMT alarm indicating fuse into the TFD cartridge. The red Fuse Alarm LED ⚠ for that fuse position should light on the face plate, the Normal Operation LED ✓ should extinguish, and the alarm extensions contact should change state to indicate an alarm condition.

4.11 Please use the provided designation card to keep a record of which equipment is connected to which circuit and what the fuse rating is.

5. SPECIFICATIONS

5.1 Voltage	+/-24 or +/-48 Vdc +/-22 to +/- 58Vdc Max.
5.2 Fuse size	125 Amps Max per fuse* 125 Amps Max (TLS)* 70 Amps Max (TPS)*
5.3. Current/Input	125 Amps Max.**
5.4. Current/Panel	500 Amps Max.**
5.5. Power Dissipation	13 Watts per position (at max load)
5.6. Input Blocks	Two ¼" studs on 5/8" centers (Torque 3ft-lbs)
5.7. Output Blocks	Two ¼" studs on 5/8" centers (Torque 3ft-lbs)
5.8. Alarm Block	0.045" sq wire-wrap pins
5.9. Alarm Fuses	1 Amp Max (GMT) (GMT18/100A referred)
5.10. Dimensions	1.75"H, 17"W, 11"D
5.11. Mounting	19" and 23" Racks 1.75" and 1" Spacing
5.12. Weight	Approx 11 lbs
5.13. Operating Temperature	-40 to +50 C (ambient) (-40 to 131 F)
5.14. Color	Off-White
5.15. Relay current	1Amp/58Vdc max

*We recommend that you size fuses such that they do not run at more than 70% of their rating. Thus a 70A fuse should not be run at more than 49 A.

**The sum of the fuse ratings must not exceed the panels rating.

Compatible lugs for Input and Output Blocks

(2 hole compression lugs for 1/4" studs on 5/8" centers (torque 3ft-lbs)).

Cable Size	T & B	Burndy	Panduit
#8	542040410	YA8CL2TC14	LCD8-14A
#6	54205	YA6CL2TC14	LCD6-14A
#4	54206	YA4CL2TC14	LCD4-14A
#2	54207	YA2CL2TC14	LCD2-14A

We suggest you heat shrink the barrels of the compression lugs for added safety.

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% of their rating. When installing fuses, the sum of the fuses installed in the panel should not exceed the panel's rating (500 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.

6.2 This equipment is identified by a model number ie. NPTFD1009. Be sure to have the model number and serial number available when making inquiries about the equipment.

7. WARRANTY & REPAIRS

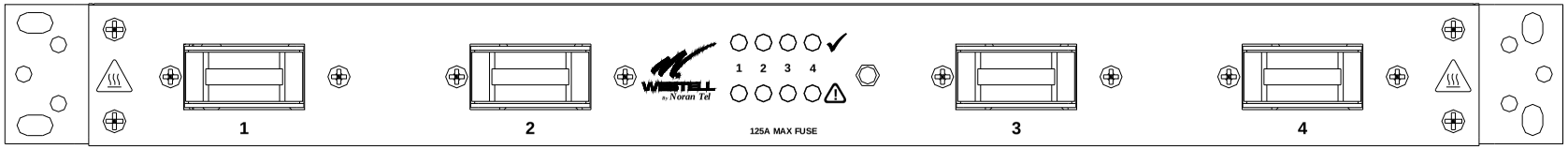
7.1 Westell warrants this product to be free of defects at the time of shipment. Westell also warrants this product to be fully functional for the time period specified by the terms and conditions governing the sale of the product. Any attempt to repair or modify the equipment by anyone other than an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

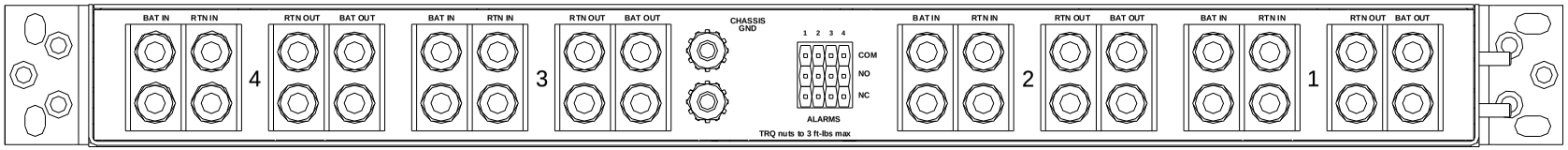
7.2 Westell will repair or replace any defective Westell equipment without cost during the warranty period if the unit is defective for any reason other than abuse, improper use, or improper installation. To return defective equipment, first request a Return Material Authorization (RMA) number from Westell by calling or emailing (Customer Service) at the address 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
Voice: (800) 377-8766

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
A		Original				





Noran Tel

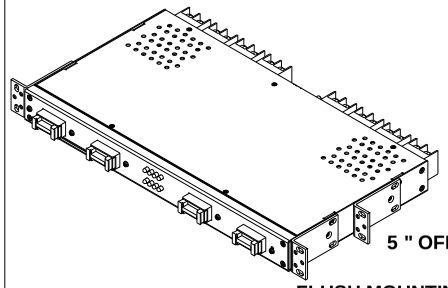
N41C104-N
Front/Rear Views
Illustration Drawing

Drawing Number:	Rev:	Drawn with:	Computer File:
1009-16		AutoCAD by Autodesk	1009-16A

Date: 25 November 10
Drawn by: S. Dolinsky

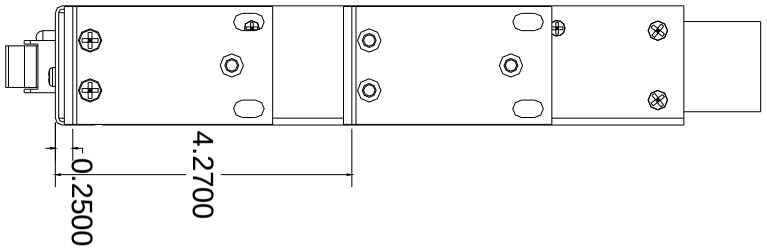
Plotted Scale: NTS
Sheet: 1 of 1

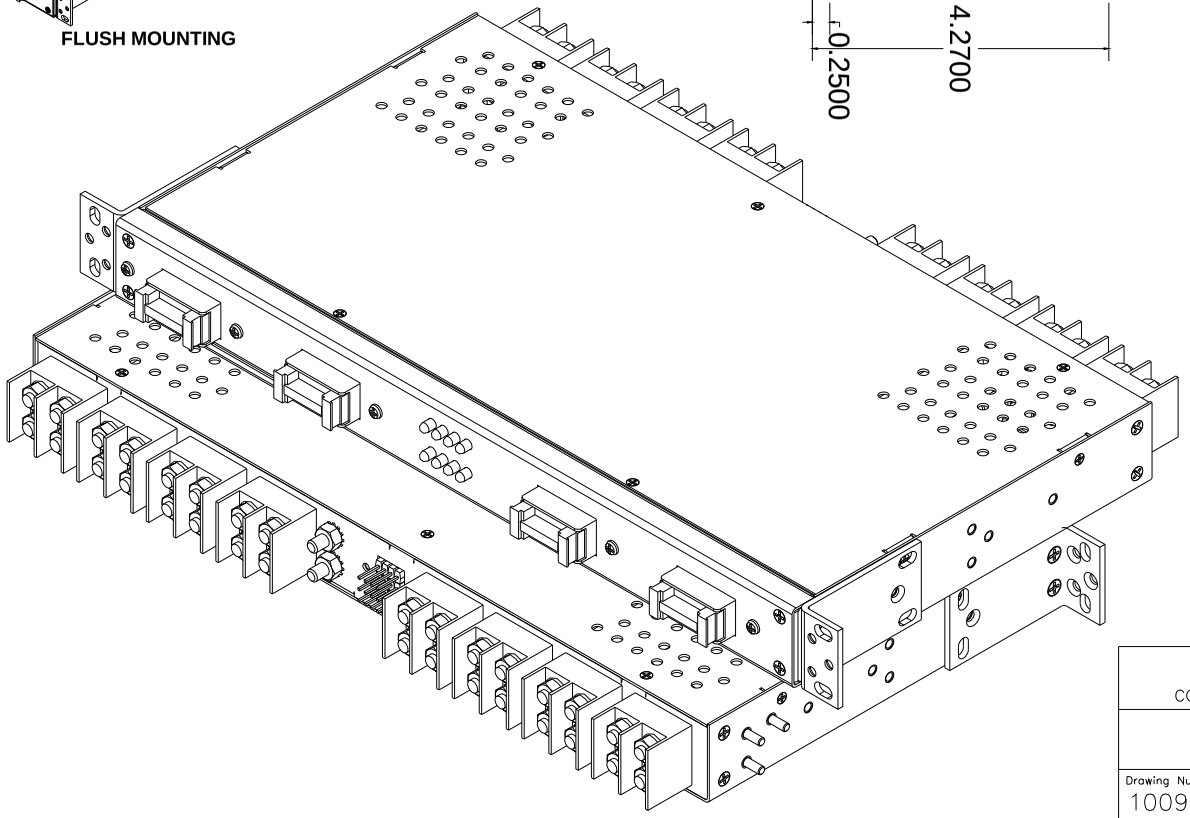
REV	Qty	Description or Release Note	ECN	CKD	APD	DATE
A		Original				



5 " OFFSET MOUNTING

FLUSH MOUNTING





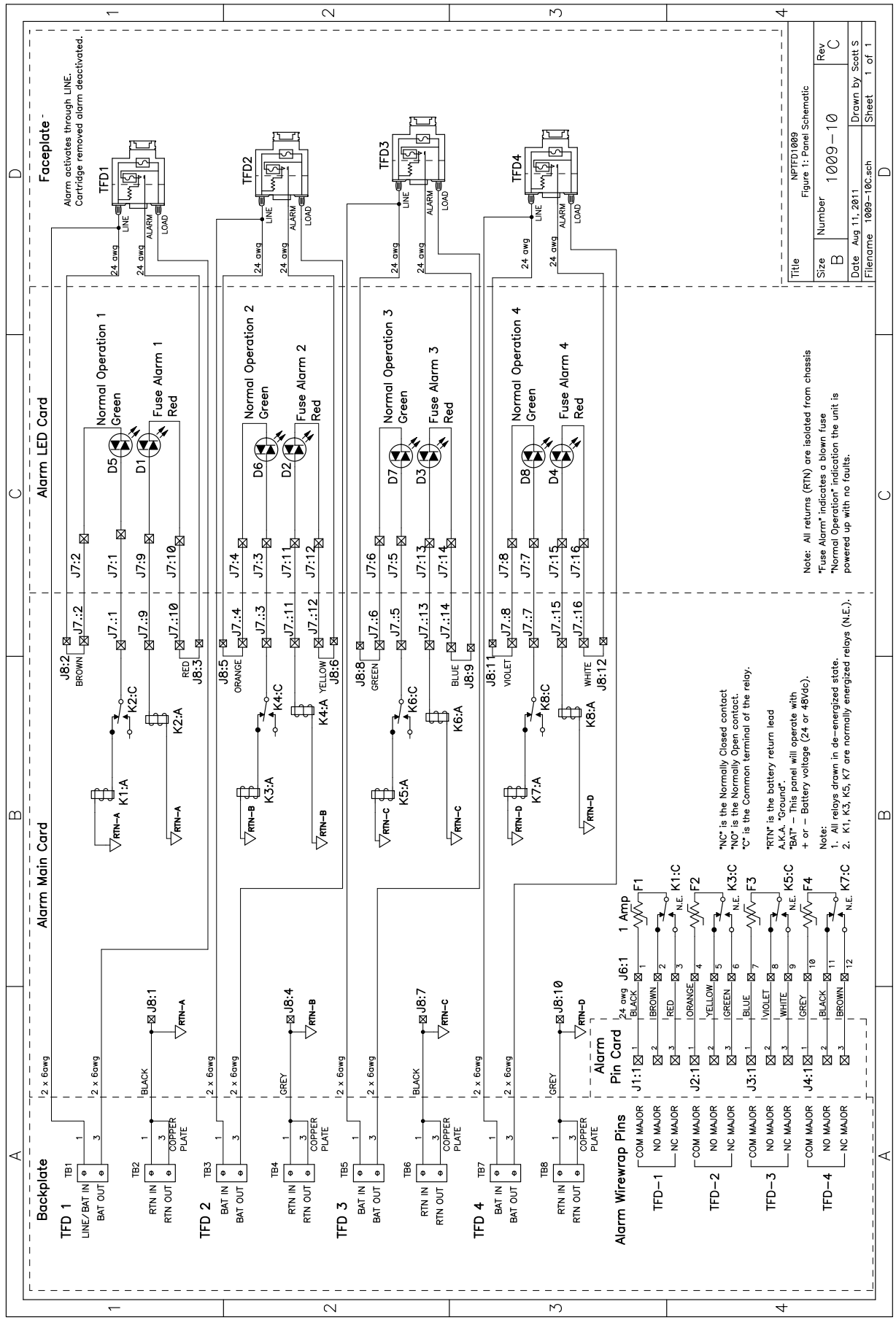
Noran Tel

NPTFD1009
Complete Panel
Illustration Drawing

Drawing Number:	Rev:	Drawn with: AutoCAD by Autodesk	Computer File:
1009-17			1009-17A

Date: 02 August 2010
Drawn by: S. Dolinsky

Plotted Scale: NTS
Sheet: 1 of 1


Backplate
Alarm Main Card
Alarm LED Card
Faceplate
Alarm activates through LINE.
Cartridge removed alarm deactivated.
TFD1
TFD2
TFD3
TFD4
LINE
ALARM
LOAD
24 awg
Normal Operation 1
Green
Fuse Alarm 1
Red
Normal Operation 2
Fuse Alarm 2
Normal Operation 3
Fuse Alarm 3
Normal Operation 4
Fuse Alarm 4
D5
D1
D6
D2
D7
D3
D8
D4
TFD 1
TFD 2
TFD 3
TFD 4
LINE/BAT IN
BAT OUT
RTN IN
RTN OUT
BAT IN
2 x 6awg
COPPER PLATE
BLACK
GREY
J8:1
J8:4
J8:7
J8:10
RTN-A
RTN-B
RTN-C
RTN-D
J8:2
BROWN
J8:5
ORANGE
J8:8
GREEN
J8:11
VIOLET
J8:3
RED
J8:6
YELLOW
J8:9
BLUE
J8:12
WHITE
J7:1
J7:2
J7:3
J7:4
J7:5
J7:6
J7:7
J7:8
J7:9
J7:10
J7:11
J7:12
J7:13
J7:14
J7:15
J7:16
K1:A
K2:C
K2:A
K3:A
K4:C
K4:A
K5:A
K6:C
K6:A
K7:A
K8:C
K8:A
Alarm Pin Card
Alarm Wirewrap Pins
TFD–1
TFD–2
TFD–3
TFD–4
COM MAJOR
NO MAJOR
NC MAJOR
J1:1
J2:1
J3:1
J4:1
J6:1
1 Amp
F1
F2
F3
F4
K1:C
K3:C
K5:C
K7:C
N.E.
"NC" is the Normally Closed contact
"NO" is the Normally Open contact.
"C" is the Common terminal of the relay.
"RTN" is the battery return lead
A.K.A. "Ground".
"BAT" – This panel will operate with
+ or – Battery voltage (24 or 48Vdc).
Note:
1. All relays drawn in de-energized state.
2. K1, K3, K5, K7 are normally energized relays (N.E.).
Note: All returns (RTN) are isolated from chassis
"Fuse Alarm" indicates a blown fuse
"Normal Operation" indication the unit is
powered up with no faults.
Title
NPTFD1009
Figure 1: Panel Schematic
Size
B
Number
1009–10
Rev
C
Date
Aug 11, 2011
Drawn by
Scott S
Filename
1009–10C.sch
Sheet
1 of 1