4x4 KLM / GMT Load-Sharing Power Distribution Panel

Model 009-8004-0124 Installation Guide

Telect

CONNECTING THE FUTURE®

4x4 KLM / GMT Load-Sharing Power Distribution Panel

Model 009-8004-0124

Installation Guide, Part Number 118872-9

About Telect

Telect offers complete solutions for physical layer connectivity, power, equipment housing and other network infrastructure equipment. From outside plant and central office to inside the home, Telect draws on more than 25 years of experience to deliver leading edge product and service solutions. Telect is committed to providing superior customer service and is capable of meeting the dynamic demands of customer and industry requirements. This commitment to customer and industry excellence has positioned Telect as a leading connectivity and power solution provider for the global communications industry.

Technical Support

E-mail: getinfo@telect.com

Phone: 888.821.4856 or 509.921.6161

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1.1 Overview

Panel brackets provide either flush or extended mounting in an EIA or WECO rack. The panel is configured at the factory for extended mounting in a 19" rack. ETSI mounting kits are also available, contact Telect or your distributor.

Model 009-8004-0124 is UL compliant as stated in UL file E139903.

Figure 1 - Model 009-8004-0124

1.2 Inspection

Please read these instructions carefully before beginning installation. If you need assistance, call Technical Support at 1-888-821-4856 (domestic calls), or 509-921-6161 (Option 2), or email us at getinfo@telect.com.

Inspect equipment after unpacking and compare it to the packing list.

Immediately report any shipping damage, defects, or missing parts to Telect at 1-800-551-4567. Keep all documentation that comes with your shipment.

Telect is not liable for shipping damage. If the product is damaged, notify the carrier and call Telect's Customer Service Department at 1-800-551-4567 (domestic only) or 1-509-926-6000 for further recourse.

NOTE: For service or warranty information, please visit the telect.com website, or email inquiries to getinfo@Telect.com and click on the "Support" tab, or phone us at 800-551-4567 (domestic only) or 509-926-6000.

1.3 Specifications

Physical:	Specifications:
Dimensions, with brackets	Width: 17.50 in. (44.45 cm) Height: 1.75 in. (4.45 cm) Depth: 9.00 in. (22.86 cm)
Weight, without fuses	8 lbs. (3.63 kg.)

Physical:	Specifications:
Weight, shipping	9 lbs. (4.09 kg.)
Mounting capability: (ETSI brackets sold separately)	EIA: 9-inch (48.26 cm) WECO: 23[inch (58.42 cm) ETSI: Kits sold separately.

Environment:	Specifications:
Temperature range, ambient	-17°C to 49°C (0°F to 120°F)
Humidity	0% to 90% and noncondensing

Mechanical Interface:	Specifications:
Ground terminals	Quantity: 2 Stud size: 10-32 Nut: 10-32 Socket size: 3/8 inch (10 mm) Cable: Min #8 to #2 AWG at 125A rating Lugs: 2-hole compression lug Size: Same as input cable: #6 up to 2 AWG — rated to input fuse Center to center: 5/8 inch (1.59 cm) Maximum torque: 20 in-lb (2.26 N•m)
Input terminals	Quantity: 4: 2 BATT, 2 RTN Stud size: 10-32 Nut: 10-32 KEPS Socket size: 3/8 inch (10 mm) Cable: #8 AWG to #2 AWG — rated to input fuse Lugs: 2-hole compression lug Size: Same as cable up to #2 AWG - rated to input fuse size Center to center: 5/8 inch (1.59 cm) Maximum torque: 20 in-lb. (2.26 N•m)
Alarm terminals: wire-wrap	Quantity: 24 Cable: 22-26 AWG
Alarm terminals (WAGO)	Quantity: 24 Cable: 22-26 AWG

Mechanical Interface:	Specifications:
Output terminals	Quantity: 32, 16 BATT, 16 RTN Screw size: #8-32 wire-clamping Cable: #22 to #10 AWG - rated to output fuse size Maximum torque: 9 in-lb (1.01 N•m) Output Terminal maximum lug width: 5/16 in. (0.79 cm.)
GMT fuse Insertion/Withdrawal force	Insertion: 7lbs. +/- 3.1lbs. (3.18 kg. +/- 1.41 kg.) Withdrawal: 5.5 lbs. +/- 2.5 lbs. (2.49 kg. +/- 1.13 kg.)
KLM fuse Insertion/Withdrawal force	Maximum Average force: 12 lbs

Electrical Interface:	Specifications:
Operating voltage range	±24V to -48V
Maximum input interruption device rating	125A per side
Maximum continuous output load	50A per side
Maximum output interruption device rating	30A per KLM fuse, 15A per GMT fuse
Maximum continuous output load rating @ ≤ 80% interruption device rating	25A per KLM fuse; 100A continuous load max. for all 8 KLM fuses. 12A max per GMT fuse; 80A continuous load max. for all 8 GMT fuses; 40A max for a group of 4 GMT fuses. Total output load maximum for entire panel is 100A.
Alarm contact ratings, continuous	2A at 30 VDC 0.6A at 60 VDC 1A at 120 VAC
Alarm board power ratings	@20V: 100 mA (2 W) @24V: 153 mA (3.672 W) @27V: 166 mA (4.48 W) @30V: 167 mA (5.01 W) @42V: 173 mA (7.27 W) @48V: 175 mA (8.4 W) @56V: 179 mA (10.02W) @60V: 181 mA (10.86 W)
Max. operating temperature at max. load ratings	55°C (131°F)
Min. operating temperature at max. load ratings	-10°C (14°F)
Ambient operating temp. at half-load	72°C (162°F)
Max. surface temperature of fuses at 26°C (79°F) ambient	Front face: 59°C (138°F) - Top/Bottom face: 91°C (196°F)

Electrical Interface:	Specifications:
Max. panel heat dissipation @ full load	26W per side with 4, 20A KLM fuses + 13W per side with 4, 12A GMT fuses + 46W per side, load-sharing diode assy
Panel heat dissipation @ typical load	Less than 75W per side.

1.4 Installation

1. Clean all contact surfaces.

2. Mount the panel to the upper-most rack position if possible. (Mount the panel as high as possible on the rack.)

3. Allow one rack unit of empty space (1.75 inches or 4.45 cm) below the panel to provide adequate ventilation.

4. Mount the panel using the four screws and star washers provided.

5. Tighten the screws to 35 in-lb (4.29 N•m).

6. Secure the compression lug to the grounding studs with the 1/4-20 HEX nuts provided.

7. Torque the nuts to 20 in-lb (2.26 N•m) with a 3/8-inch (10 mm) socket.

8. Attach the ground cable(s) to the ground relay rack or ground bus according to the operating company's installation procedures.

9. Label the front and the rear of the panel according to the labeling conventions specified in Telect's *Wire Sizing and Label Chart* (117995).
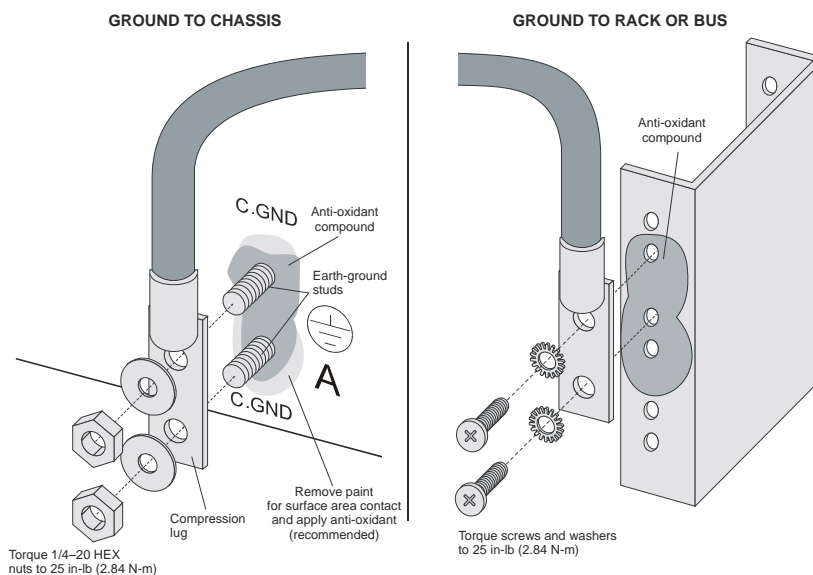

Figure 2 - Grounding

1.5 Connecting Input Power

> ⚠ **DANGER**
>
> **DANGER! Before connecting input power cables, SHUT DOWN THE PDF POWER to the circuits feeding the KLM-PDP. Remove or lock out the PDF circuit breakers, or verify that the PDF fuse positions are open. Failure to do so can result in hazardous conditions!**

NOTE: Input power cables connect the KLM-PDP to the PDF. The cables must support 125% of the rated continuous load current of the equipment powered by the KLM-PDP fuses. The maximum continuous load for the panel is 100A (or 50A per side). Each side has a 100A-capacity bus to handle all panel currect in the event of a power failure on the other side. **Keep plastic contact covers in place when not changing leads.**

1. Make sure the input power is OFF.

2. Construct BATT and RTN cables for both A and B input power circuits. Use properly rated cables and two-hole compression lugs. 45° or 90° lugs may be required. Insulate the lug barrels with UL94V0-rated heat-shrink tubing, as shown. It may be necessary to cover the lug inspection hole with the tubing.

   For assistance, refer to the operating company's installation procedures.

3. Locate the two input power terminals (Input A and Input B) on the KLM-PDP backplane. Remove the black plastic terminal covers, and remove the knockout if using 45° or 90° lugs. Remove any sharp edges.

4. Clean the contact areas of the compression lugs and the input power terminal. Use a coarse non-metallic cleaning pad.

Figure 3 - Input Terminal Cover

5. If required by the operating company's installation procedures, use anti-oxidant compound between the cable compression lugs and the input BATT and RTN terminals.

6. Secure the input cables to the lugs.

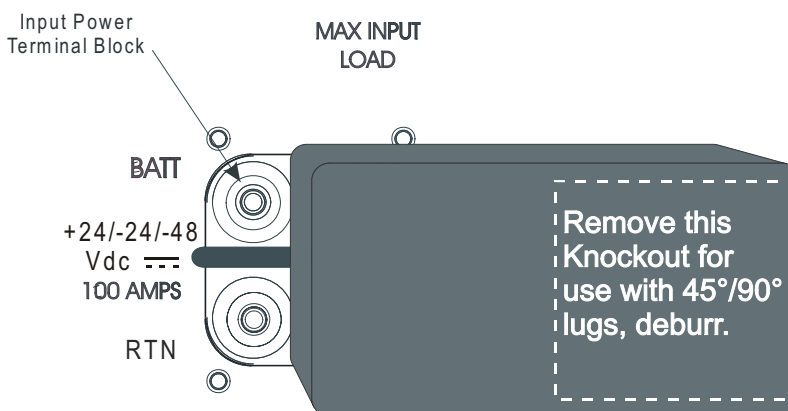7. Re-install the terminal block covers.

1.6 Connecting to the Power Bays

⚠ WARNING

WARNING! Use extreme caution! The DC power circuits surrounding the cable termination points are live! Accidental shorts can cause hazardous conditions, equipment damage, or equipment service interruptions.

Refer to the operating company's installation procedures for connections to power bays. You may be required to have power personnel on site when making these connections. Connect correct cables to the PDF BATT and RTN output terminals.

1.7 Supplying & Testing Input Power

⚠ WARNING

WARNING! DO NOT SUPPLY POWER to the KLM-PDP until it is securely mounted and grounded! Before supplying input power, verify that the KLM-PDP has no fuses installed! This measure prevents power from reaching any output path. Failure to do so could result in hazardous conditions!

Terminate the power cables from the PDF at the correct BATT and RTN input lugs on the KLM-PDP. Test polarity at these input lugs using standard procedures.

1.7.1 Testing the Input Power Alarm Relays

Test the Power Alarm relay with an ohmmeter before installing any further cabling. The alarm relays are located on the KLM-PDP backplane. (They are indicated on the designation card according to their unpowered state.) Test the fuse alarm relays at this time. Use the table below and diagram on the right as a test guide.

Figure 4 - Testing

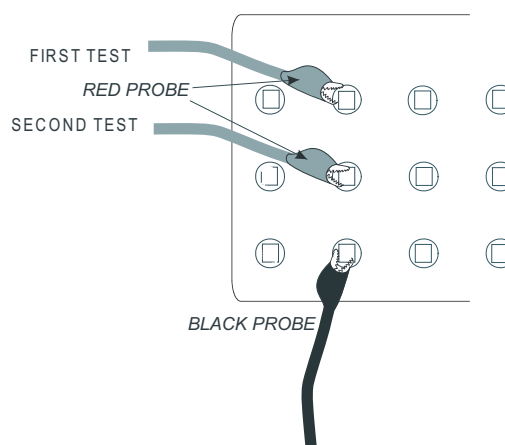| When both A and B input power is ON...	
Place the ohmmeter probes here:	**Ohmmeter reads:**
Black probe: C Red probe: NO	~ Ohms (open load)
Black probe: C Red probe: NC	0 ohm

Table 1 - Alarm Card Display

Input power for...		Relay contact closure	Visual indicator (Power LED) is...	
Input A	Input B		Power A	Power B
ON	ON	C–NC	ON (GREEN)	ON (GREEN)
ON	OFF	C–NO	ON (GREEN)	OFF
OFF	ON	C–NO	OFF	ON (GREEN)
OFF	OFF	C–NO	OFF	OFF

NOTE: Any voltage greater than 14vDC is considered ON.

1.8 Connecting Output Cables

Output cables connect the KLM-PDP to equipment that is to be powered. The load current rating cannot exceed 80% of the conductor rating. For example, with a 30-amp maximum fuse rating, use 10-AWG wire to support 25-amps continuous load.

⚠ **WARNING**

WARNING! The KLM-PDP may be powered during this procedure! Also verify that there are no fuses present in the KLM-PDP for the output circuits being cabled. Failure to do so can result in hazardous conditions!

Perform the following procedure to connect and test each circuit, one at time:

1. Construct BATT and RTN cables for both A and B output power circuits. Use properly rated cables and two-hole compression lugs. If lugs are not insulated, insulate the lug barrels with UL94V0-rated heat shrink tubing.

    For assistance, refer to the operating company's installation procedures.

2. Locate Side A output power terminals on the KLM-PDP backplane. Loosen and remove the plastic terminal covers.

3. Clean the contact areas of the compression lugs and the BATT and RTN output terminals. Use a coarse, non-metallic cleaning pad.

4. Remove all power cards and/or equipment fuses from equipment to be connected to and powered by the KLM-PDP.

5. Install only one cable per termination point. Do not connect more than one load (cable) to the same fuse (Output terminal) position.

6. If required by the operating company's installation procedures, use anti-oxidant compound between the compression lugs and the BATT and RTN terminals.

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7. Secure a BATT/-48 cable to the output BATT/-48 terminal with the screws provided, as shown in Figure 5.

8. Torque the screws to 9 in-lb (1.01 N•m) with a torque wrench fitted with a slothead blade.

9. To more easily cable this device, connect to the output BATT terminal *before* you connect to the RTN terminal.

10. Secure a RTN cable to the output RTN terminal with the screws provided, as shown.

11. Torque the screws to 9 in-lb (1.01 N•m) with a torque wrench fitted with a slothead blade.

12. Attach the other ends of these cables to the corresponding BATT/-48 and RTN terminals of the equipment to be powered by the KLM-PDP. Neatly secure the cables according to the equipment manuals or to the operating company's standard installation procedures.

13. Test polarity at equipment end.

14. Repeat Steps 2 through 13 for each circuit, for Side B.

15. Reinstall the plastic terminal block covers.

16. Use designation labels to record output equipment KLM connections A–1 through A–4 and B–1 through B–4, and GMT connections according to the operating company's standard installation procedures.
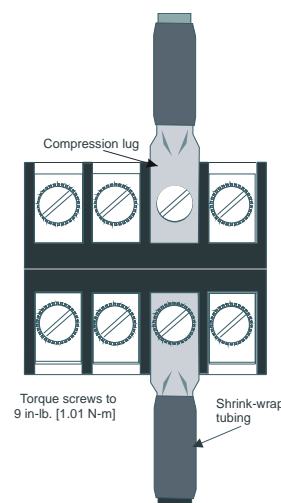
Figure 5 - Securing the Cable

1.9 General Guidelines for Installing Fuses

Record fuse designations on card provided. Choose orientation (text up or down). See Figure 6.

⚠ WARNING

WARNING! The maximum-rated load current for each fuse position must not exceed 25 amps for KLM fuses, 12.5 amps for GMT. The combined current for all output circuits per side must not exceed 50 amps. Never install or remove fuses under load. Fuses are not designed as a disconnect device! Damage can result to fuse holder and technician.

Figure 6 - Designation Card

1.9.1 Installing KLM Fuses

⚠️ **WARNING**

WARNING! Install only UL-listed or R/C Supplementary Protectors in the output fuse-holder positions.

⚠️ **CAUTION**

CAUTION! Do not install or remove fuses under equipment load. Doing so may damage fuses or fuse holders. Do not exceed a rating of 30 amps for any KLM load position. Use ESD mitigation procedures when replacing fuses or alarm cards.

Install KLM fuses with a forward, clockwise-rotating motion. Insert "phoney" fuses in unpowered circuits.

1.9.2 Installing GMT Fuses

⚠️ **WARNING**

WARNING! Install only UL-listed or R/C Supplementary Protectors in the output fuse-holder positions.

Install GMT fuses by pushing them into place. Insert "phoney" fuses in unpowered circuits. Verify output circuit polarity at the equipment end, using standard techniques correct as needed.

1.9.3 Testing the Fuse Alarm Relays

⚠️ **CAUTION**

CAUTION! Never use fault current to test fuses or the fuse alarm system! Doing so can cause hazardous conditions, equipment damage, or equipment service interruptions.

Test fuse alarm relays using standard operating company procedures.

1.9.4 Fuse Alarm Visual Indicator Test

Observe the KLM-PDP's alarm card while performing the following test for fuse alarm visual indicators:

1. Install a known, good, correctly rated fuse in any KLM position. The alarm card's Alarm LED for that position is off (unlit).
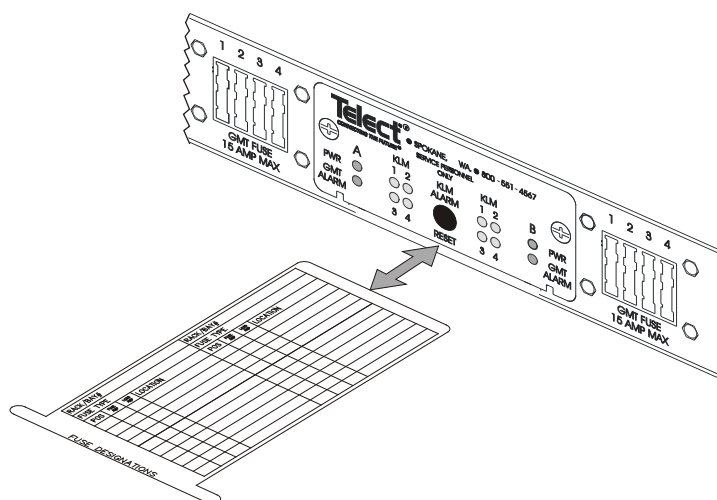

Figure 7 - Fuse Alarm

2. Remove the fuse you just installed. The alarm card's Alarm LED for that specific KLM will turn on (RED). (GMT LED will remain off.)

When the fuse is...	Remote Alarm relay closure status is...	Visual indicator (KLM Alarm LED) is...
Activated, Blown or absent	C–NO	ON (RED)
Present and good	C–NC	GREEN

If the red KLM Alarm LED does not illuminate,

a. Verify that the fuse is absent or a "phoney" fuse is present.

b. Replace the alarm card. (See the additional alarm card functions below.)

Table 2 - Fuse Alarm Reset Operation - *Press button and release*

Condition when pressed	Result of Press	Meaning of result
Normal operating condition No red LEDs, no remote alarms activated	No change.	No alarm conditions to reset.
GMT or KLM LED is red (fuse alarm state).	Fuse alarm LEDs turn OFF. Alarm relays are cancelled, return to normal state.	Fuse alarm LEDs change to reset mode (OFF). Replacing fuse will turn LED to GREEN.
Power A or Power B LED is OFF	No change. Power alarm relay is still on.	Power A and Power B LEDs are turned green (normal) only by restoring power. Power alarm relays are only cleared by restoring power.

Table 3 - Test Alarm Card Function - *Press button for five seconds and hold in*

Condition when pressed	Result of Press	Meaning of result
Any condition	All LEDs turn AMBER. All remote alarm relays switch to alarm condition. (Notify alarm center before test!) This test condition clears when button is released; previous status of all LEDs is restored.	This tests all LEDs and alarm relay circuits, including the Power A and Power B LEDs and remote power alarm relays. Release button to end test and restore previous condition.

1.10 Powering the Load Equipment

If you are required to test the functionality of the rack system, power up each circuit by installing the correctly-rated fuse and examining it for arcing, smoke, etc. Verify that power indicators are lighted on the alarm card and the powered equipment.

⚠ **CAUTION**

CAUTION! Do not use fuses as disconnect devices for powered equipment! Use ESD mitigation procedures.

1.11 Replacing the Alarm Card

1. Use a No. 1 Phillips screwdriver to loosen the alarm card's two captive screws.

2. Pull the alarm card straight out of the panel.

3. Align the replacement alarm card to the opening on the face of the panel.

4. Slide the alarm card straight into the opening, so that the card's edges are positioned in the PCB guides.

5. Push until the card's connector is firmly seated. The alarm card's front panel should sit against the face of the distribution panel.

6. Use a No. 1 Phillips screwdriver to secure the card's captive screws just beyond finger-tightness.

7. If desired, test the alarm card according to the alarm testing procedures above. Telect alarm cards are factory-tested. Replacement testing may not be advisable if it affects office system services.

1.12 Replacing Fuses

⚠ **WARNING**

WARNING! Only install UL-listed or R/C Supplementary Protectors in the output fuse holder positions.

⚠ **CAUTION**

CAUTION! Exercise standard ESD mitigation procedures when installing fuses.

Review the following points before installing or replacing fuses in the KLM-PDP:

• The panel's **input** current is limited to 50 amps per side (Input A and Input B), or 100 amps total.

• The panel's total **output** current is 100 amps.

- KLM fuses are limited to 30 amps rating, 25 amps load; GMT fuses are limited to 15 amps rating, 12.5 amps load.

- Identify the reason for the fuse opening and correct it before replacing the fuse.

⚠ **CAUTION**

CAUTION! Perform this procedure when you power up this equipment! Failure to follow this procedure may damage the equipment or cause equipment service interruptions.

1. Notify the alarm center.

2. Press the KLM ALARM RESET button.

3. Remove and replace the fuses.

4. Reinstall the load to the equipment.

5. Verify that the fuses remain closed.

6. Record your activity in the equipment log.

1.13 Service

1.13.1 In-Warranty Service

Contact Telect's quality call center at 877-471-7245 or e-mail us at quality@telect.com. Telect will ship a new replacement product, along with a return shipping label and authorization information. When you receive your replacement product, pack up the defective product and return it to Telect using the return label, box and any additional information provided.

1.13.2 Out-Of-Warranty Service

Follow the In-Warranty directions above. Telect charges a processing fee for out-of-warranty service, and you must submit a Purchase Order along with a Return Material Authorization (RMA) before returning equipment. The processing fee guarantees a repair estimate and is credited against actual material and labor costs. Call Telect's quality call center at 877-471-7245 for more information.

1.13.3 Repacking for Shipment

1. Tag the equipment showing owner's name, address, and telephone number, together with a detailed description of the problem.

2. Use the original shipping container if possible. If you do not have it, package the equipment in a way to prevent shipping damage. Include the RMA inside the container and legibly print the RMA number on the outside of the package, near the shipping address.

3. Insure the package.
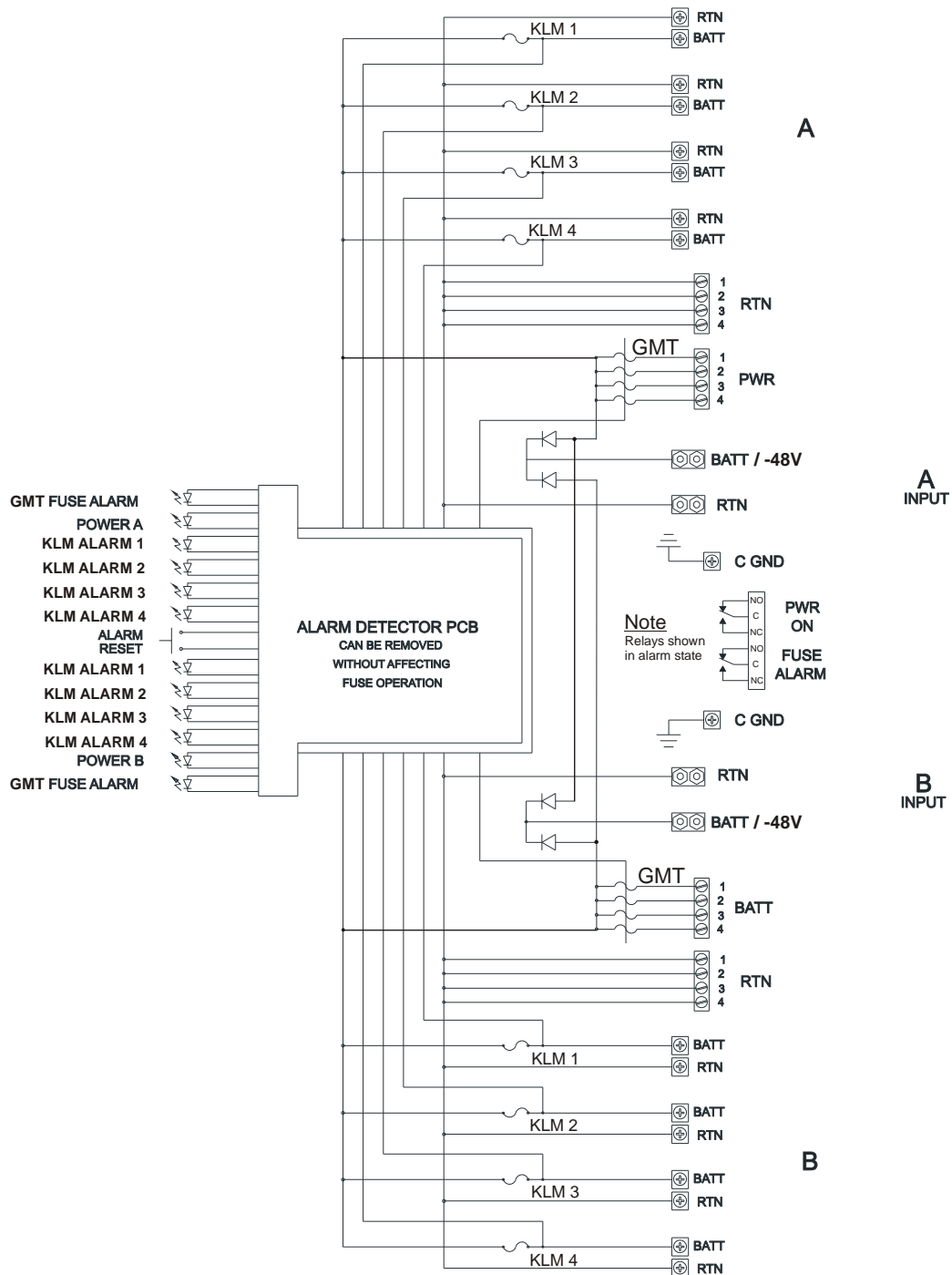
1.14 Reference Schematic

Figure 8 - Schematic

1.15 Accessories and Kits

Contact your Telect customer service representative at 1-800-551-4567 to order any of the accessories listed below:

GMT Fuses	Color	Telect Part Number	Colored Designation Rivet
Dummy fuse (GMT)	N/A	132748	N/A
1/4A	Violet	100151	102435-2
1/2A	Red	004001	102435-5
3/4A	Brown	004008	102435-7
1A	Gray	100991	102435-8
1 1/3A	White	004006	102435-9
1 1/2A	White/yellow	004011	102435-10
2A	Orange	004002	102435-11
3A	Blue	004012	102435-13
4A	White/brown	004013	102435-15
5A	Green	004014	102435-16
7 1/2A	Black/white	004010	102435-17
10A	Red/white	004015	102435-18
12A	Yellow/green	102287	102435-19
15A	Red/blue	102288	102435-20

KLM Fuse Amperage	Telect Part Number
Dummy Fuse	110852
1 A	118675
2 A	118676
5 A	118673
10A	118438
15 A	118439
20A	118440
25A	118441
30A	118442

Item	Description	Part Number
Replacement Alarm card	Standard	400314
Input / Ground terminal compression lugs	for #2 AWG wire for #4 AWG wire for #6 AWG wire	06117-02 110516 101686
Output ring terminals	single-hole	104987
ETSI Mounting bracket	black	090-0041-0030
ETSI Mounting bracket	white	090-0041-0031
Phoney fuses - KLM	Non-functional fuses	110852
Phoney fuses - GMT	Non-functional fuses	132748
KLM/GMT Designation Label	Removable	117750-1

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1.16 Physical Attributes

Front View

Rear View
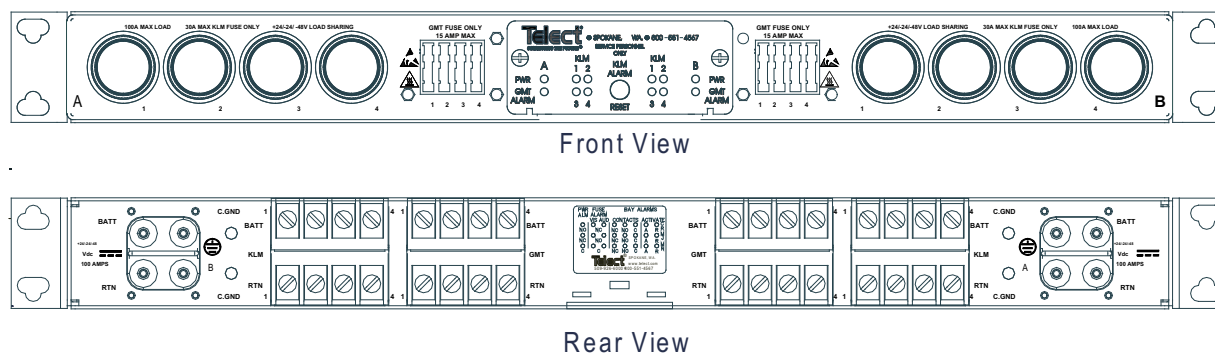
Figure 9 - 4x4 KLM Distribution Panel - PN 009-8004-0124

17.25 in. (43.82 cm.)

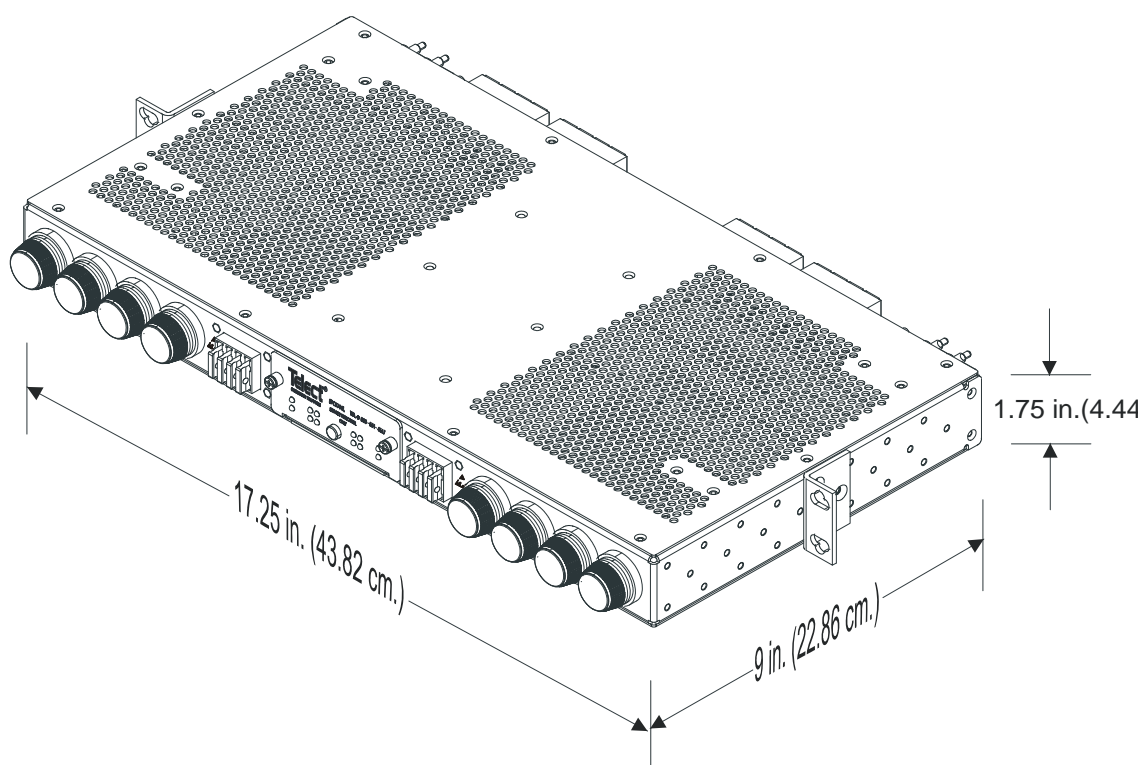1.75 in.(4.44

9 in. (22.86 cm.)

Figure 10 - Dimensions

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