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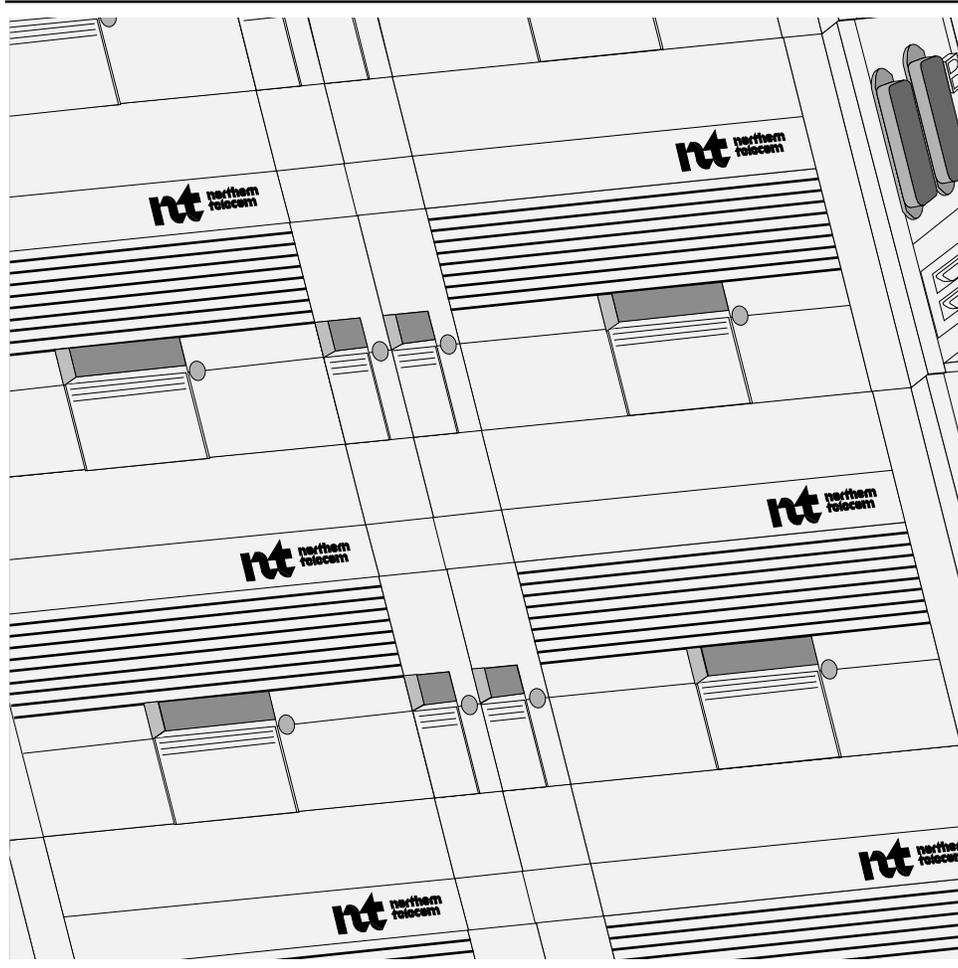
323-3001-118

SONET Products

# AccessNode

## Series 800A Outside Plant Cabinet Description

Issue 1.0 February 1999



**NORTEL**  
NETWORKS™



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SONET Products

# **AccessNode**

## Series 800A Outside Plant Cabinet Description

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# Publication history

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**February 1999**

Release-Independent Standard Issue 1.0 of the document. For this release, the following information was updated or added:

- updated information in Chapters 9 and 12 for BIP.

*Note:* With the February 1999 release, references to the software release number (such as AN15 or AN16) have been deleted, making this document release-independent. This document will be released only when technical changes occur.

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Reissue of AN07 standard.

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# About this document

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This section describes the contents and intended audience for the AccessNode Series 800A (S800A) descriptive Northern Telecom Publication (NTP). It also provides information on how to use the NTP and who to contact for technical assistance on the S800A.

## What this document contains

This document is a reference work. It provides high-level, nontechnical descriptions of the cabinet and equipment. Some of the topics included in this manual are discussed in greater detail in other parts of the AccessNode documentation set. In such cases, this document contains references to those sources of detailed information.

This document contains detailed descriptions of the two available types of mechanical cabinet. It also contains general information on the AccessNode equipment and the configurations in which the equipment can be installed in the cabinet.

The information in this publication is presented in the following chapters:

- Chapter 1, “Cabinet introduction”
- Chapter 2, “S800A cabinet structure”
- Chapter 3, “Electronics compartment description”
- Chapter 4, “AC power compartment description”
- Chapter 5, “Termination compartment description”
- Chapter 6, “Electrical features and requirements”
- Chapter 7, “Cabinet specifications”
- Chapter 8, “Equipment applications and configuration”
- Chapter 9, “Equipment descriptions”
- Chapter 10, “Peripheral equipment descriptions”
- Chapter 11, “Cabinet options”
- Chapter 12, “Battery vault description”

## Who should use this document

This document aids in the installation and maintenance of the Series 800A AccessNode cabinet and is intended for the following groups:

- strategic and current planners
- provisioners
- transmission engineers
- network administrators
- outside plant personnel

## How to use this document

It is recommended that you first read this section, then read Chapter 1, “Cabinet introduction,” and Chapter 2, “S800A cabinet structure.” These chapters will give you a good understanding of the mechanical cabinet.

Then, you can read the other chapters according to your needs and interests to learn about the cabinet specifications, equipment layout, system applications and other features of the S800A cabinet.

## References in this document

This document refers to the following documents:

### **Engineering, Configuration and Ordering Guide, Volume 1**

- *Engineering and Ordering Information*, 323-3001-032
- *Site Installation Planning and Engineering*, 323-3001-200

### **Description, Volume 2A**

- *Configuration and Equipment Description*, 323-3001-100
- *Features and Services Description*, 323-3001-101
- *Signal Flow and Circuit Pack Description*, 323-3001-102

### **Description, Volume 2B**

- *System Specifications*, 323-3001-180

### **Other documents**

- *Series 800A Outside Plant Cabinet Installation*, 323-3001-210

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# Cabinet introduction

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This chapter introduces you to the S800A AccessNode Outside Plant cabinet.

## Chapter contents

This chapter includes the following topics:

Topic	See
S800A cabinet description	page 1-1
Applications	page 1-2
Basic cabinet configuration	page 1-2

## S800A cabinet description

The Series 800A AccessNode (S800A) cabinet is the next generation, high-capacity outside plant enclosure with integrated VF and T1 access and fiber transport services. The cabinet is environmentally controlled and provides ancillary services normally handled by a central office or large remote terminal enclosures such as a hut or Controlled Environment Vault (CEV).

The S800A cabinet features three separate compartments to promote ease of installation and improved craftsperson access. The cabinet is designed for use in an outdoor environment and mounting on a concrete pad. Pad options provide layouts to include the S800A cabinet and a peripheral cabinet to be mounted in one of several configurations.

The cabinet complies with UL/CSA safety, NEC electrical, and FCC emissions regulations and Bellcore specifications.

The system limits radio frequency (RF) emissions to meet FCC Class A requirements.

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed information on pad options and installations.

Table 1-1 shows the compartments and the contents of each.

**Table 1-1**  
**S800A compartments**

Compartment	Contents
Electronics	AccessNode system, dc power distribution facilities, fiber termination facilities, environmental controls and the battery back-up facility.
Termination	Copper outside plant VF/DS1 termination and cross connect options
AC power	ac power feed options

## Applications

The S800A cabinet is designed for a wide range of serving areas such as:

- residential and multi-family complexes
- high traffic commercial areas that require
  - special service lines
  - high-capacity digital service
  - direct fiber access

The cabinet delivers flexible solutions and comprehensive services required for concentrated commercial growth areas such as:

- commercial and industrial business parks
- high-tech business corridors and retail malls

## Basic cabinet configuration

The basic S800A cabinet system consists of the following items:

- AccessNode fiber-optic based network system
- ac and dc power distribution
- environmental controls
- a rectifier/charger
- optional battery backup
- service protection center (SPC) that provides primary protection for VF and HF pairs. Connectorized termination options for up to 1800 pairs are supported:
  - Nortel Networks BIX
  - 3M MS<sup>2</sup>
  - AT&T 710

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## S800A cabinet structure

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This chapter describes the general mechanical structure of the standard S800A cabinet and the virtual tributary bandwidth manager (VTBM) S800A cabinet. Detailed information regarding the equipment and features of the internal compartments of the cabinet is provided in other chapters of this NTP.

### Chapter contents

This chapter includes the following topics:

Topic	See
Basic cabinet structure	page 2-1
Cabinet physical design	page 2-2
Roof options	page 2-5
Electronics compartment fan shelves	page 2-18

### Basic cabinet structure

The series 800A AccessNode cabinet is offered in three distinctive colors. The colors and cabinets are:

- NT maple brown
  - NT1W00DA Standard S800A cabinet
  - NT1W00GA VTBM-ready S800A cabinet
- NT ivory
  - NT1W00EA Standard S800A cabinet
  - NT1W00HA VTBM-ready S800A cabinet
- NT light-green
  - NT1W00FA Standard S800A cabinet
  - NT1W00JA VTBM-ready S800A cabinet

The basic NT1W00 S800A cabinet structure consists of the following items:

- cabinet physical design
  - exterior
  - doors and door locks
  - anchor plate
  - heaters
- roof options
- concrete pad options

### **Cabinet physical design**

The standard and VTBM-ready cabinet physical designs consist of the exterior cabinet and the interior components that are standard features of each cabinet. The two types of cabinet are physically identical. The difference lies in the equipment layout within the cabinet. All information in this chapter pertains to both types of cabinet except where noted.

#### **Exterior**

The exterior structure of the S800A cabinet, including the shell, exterior walls, and floor, is constructed of welded cold-rolled steel. Other parts, such as the equipment frames, use thicker materials. The add-on ac power pedestal and roofs are fabricated from aluminum.

The exterior steel and aluminum surfaces are prepared with a multi-stage metal treatment process followed by a paint process and is offered in the three optional colors shown on page 2-1.

Insulation protects the cabinet against cold weather and sun load. Figure 2-1 on page 2-7 (heat exchanger roof) and Figure 2-5 on page 2-13 (air induction roof) illustrate the exterior housing with the two roof options, and Chapter 7, “Cabinet specifications,” summarizes the cabinet's physical specifications.

#### **Anchor plate**

An anchor plate aligns the cabinet openings and the mounting bolts to a concrete pad.

Pad mounting bolts secure the cabinet to the concrete pad and are accessible by opening the termination and ac power compartments.

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed information on the anchor plate applications and installation.

---

## Doors

Six steel doors enable you to access the S800A cabinet:

- one each for the termination and ac power compartments
- two sets of double doors for the electronic compartment

Gaskets with built-in EMI protection, seal the inner perimeter of the doors and roof area to prevent moisture, dirt and other contaminants from entering the cabinet. The doors on the electronic compartment are insulated and a cover on the inside of each door protects the insulation against damage.

Each door is hinged with concealed locked pins and the cabinet is locked by a three-point latching mechanism.

An alarm switch activates when any of the four main equipment doors are opened.

### Door locks

When the door locks are enabled, the front and rear electronics and the ac power compartment doors may be opened with a 5/16-inch tamperproof hex key tool. The outside plant compartment may be opened with a 216-type socket tool.

*Note:* Each door locking mechanism is disabled at the factory prior to shipment.

### Air flow baffle

An air flow baffle is installed in the electronics compartment of the cabinet to direct air flow through the cabinet.



#### **CAUTION**

##### **Baffle installation requirement**

The air flow baffle must be installed at all times during the operation of the cabinet. Removing the baffle interrupts the air flow over the equipment and disrupts the heating and cooling functions of the environmental controls.

### Heaters

Electric strip heaters are located on the right and left walls and the floor of the electronics compartment. Reference Chapter 3, “Electronics compartment description,” for more detailed information.

The units are flat elements that provide uniform surface heating throughout the electronics compartment (see Table 2-1).

	<p><b>DANGER</b> <b>Fire hazard</b> Remove all paper and any other combustible materials from inside the cabinet before the cabinet is powered-up.</p> <p>Failure to comply with this warning could result in a fire.</p>
---	---

Low temperature alarms are activated when the cabinet interior temperatures drop to 32° F (0° C).

**Table 2-1**  
**Heater activation/deactivation temperatures**

Heater	ON	OFF
Wall	45° F (7° C)	55° F (13° C)
Floor	45° F (7° C)	55° F (13° C)

---

## Roof options

The cabinet features two optional roof designs:

- a closed-loop heat exchanger roof assembly
- an air induction roof assembly (open-loop cooling system)

Each roof option is fitted with four removable lifting eye bolts that support the load during site installation (see on Figure 2-2 on page 2-8 and Figure 2-6 on page 2-14).

**Note:** After you mount the cabinet on its pad, remove each lifting eye and replace it with a stainless steel bolt and stainless steel flat washer, which are included with the cabinet.

An air filter maintenance schedule is necessary for either type roof. For information on air filter maintenance schedules, reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210.

## Environmental considerations

To address the various environmental conditions where the Series 800 cabinets are deployed, Northern Telecom has developed two types of roof assemblies: an air induction roof assembly, which is an open-loop cooling system, and heat exchanger roof assembly, which is a closed-loop air coolant system.

At locations where moderate environmental conditions prevail, the air induction roof assembly should be deployed.

The heat exchanger roof assembly is recommended for locations where large amounts of dust, dirt, and moisture are present in the environment along with windy conditions. These conditions are:

- Dusty areas, which are in or immediately adjacent to areas where substantial airborne particulate can be generated by way of natural wind conditions, automobile traffic, farm equipment, moisture, railroad rights-of-way, and similar locations and conditions.
- Dirty areas, which are susceptible to water and dirt mixtures resulting in mud and/or suspended heavy particles in water.
- High moisture areas, which subject the cabinet to direct water spray or splash (excluding normal rainfall).

**Examples of dusty, dirty and high moisture environments**

The following high dust and dirt environments are examples indicating when the heat exchanger roof assembly is appropriate for the Series 800 cabinet:

- dirt roads that have daily or weekly active vehicular traffic
- paved roads which would be directly adjacent to the placement of the cabinet such that the cabinet would be directly exposed to road dirt, exhaust emissions, the possibility of direct rain splash and spray from passing vehicles
- streets or paved surfaces that are regularly maintained with municipal type street sweeping equipment
- farm land that is seasonally or regularly turned or harvested
- areas that are immediately adjacent to dust producing industrial operations such as paint spraying facilities, concrete or stone working operations, grain handling operations, wood or metal working or cutting facilities
- locations that support the activities of air traffic
- active landfills
- areas that are regularly watered with lawn sprinkler systems that may spray directly at the cabinet
- water cooling towers such as those used for air conditioning, quenching of industrial processes, or wet collectors

**Heat exchanger roof**

The NT7A69DA-EA heat exchanger roof assembly provides a closed-loop cooling system where air is circulated within the cabinet.

The cross-flow heat exchanger is mounted between the cabinet ceiling and the roof (see Figure 2-1 on page 2-7 and Figure 2-2 on page 2-8). The cabinet's interior temperature is controlled by:

- a cross-flow heat exchanger
- fans (roof mounted and swing frame mounted)
- heaters
- insulation
- an air flow baffle



**CAUTION**

**Baffle installation requirement**

The air flow baffle must be installed at all times during the operation of the cabinet. Removing the baffle interrupts the air flow over the equipment and disrupts the heating and cooling functions of the environmental controls.

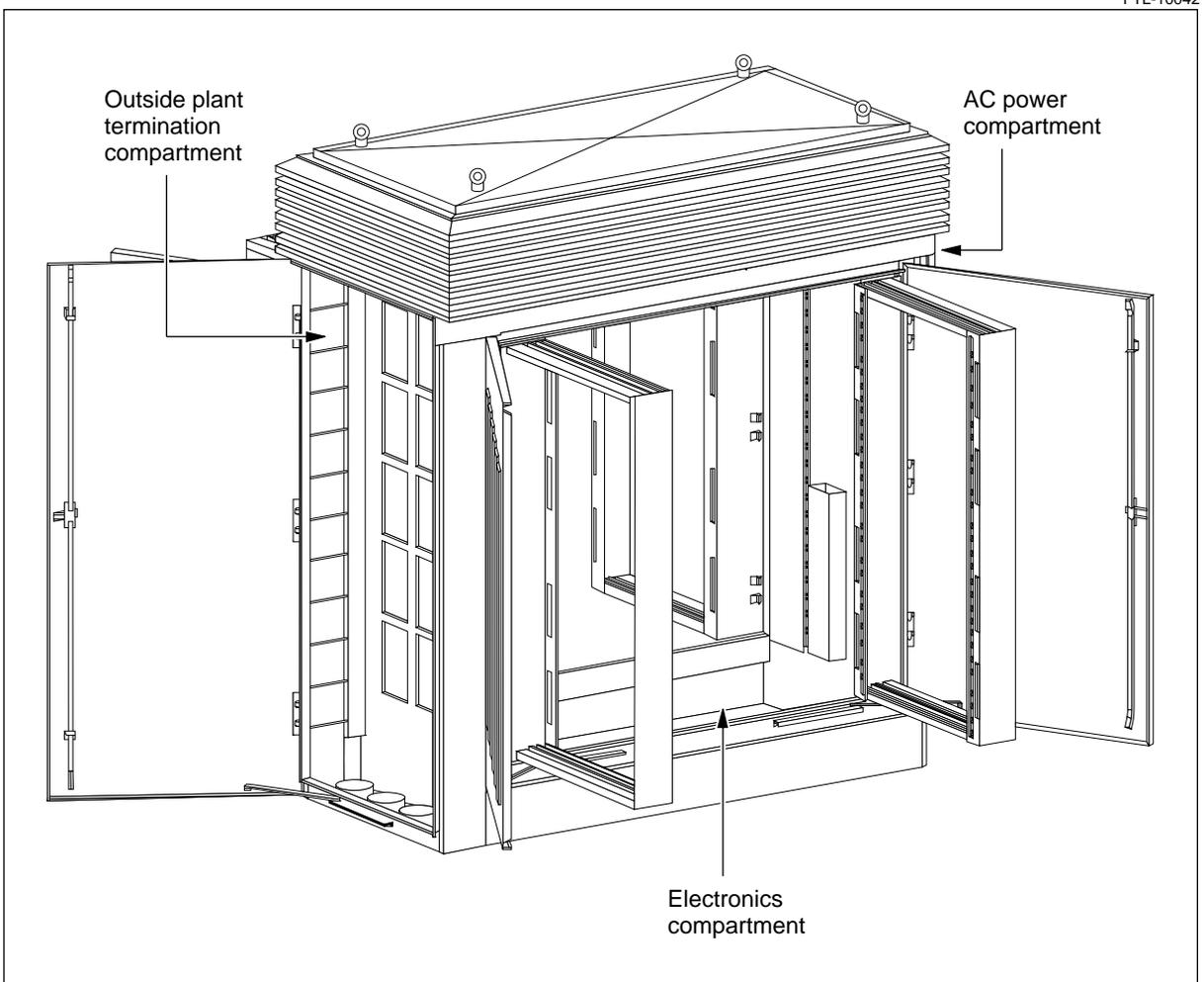
High temperature alarms are activated whenever the cabinet internal temperature reaches 140° F (60° C) at the monitoring point. Low temperature alarms are activated whenever the cabinet internal temperature reaches 32° F (0° C) at the monitoring point.

When within the specified outside operating temperature ranges, the inside temperature range is maintained between the values shown in Table 2-2.

**Table 2-2**  
**Cabinet internal temperature**

Temperature	From	To
Ambient	-40° F (-40° C)	115° F (+46° C)
Internal	32° F (0° C)	140° F (+60° C)

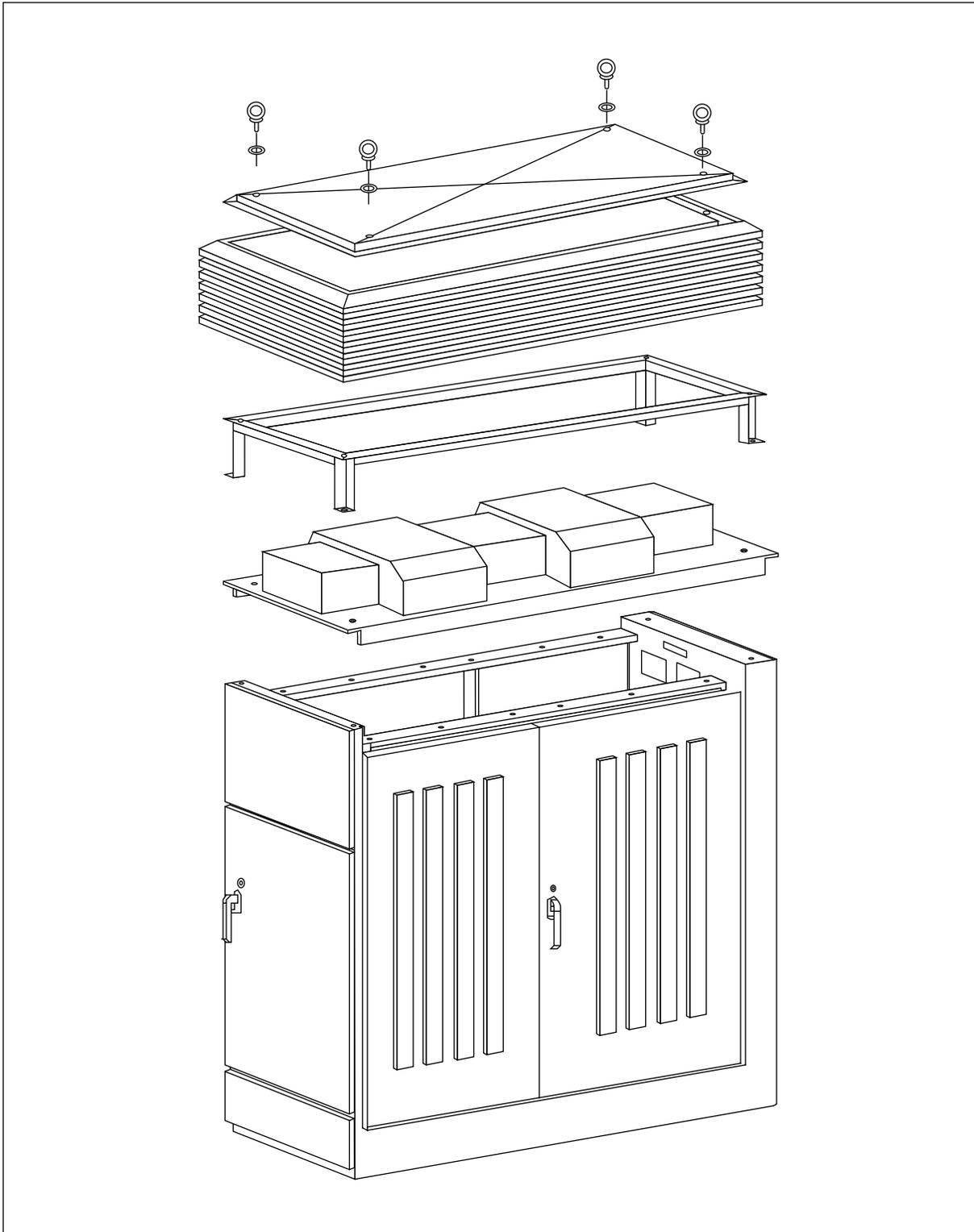
**Figure 2-1**  
**S800A cabinet with heat exchanger roof**



2-8 S800A cabinet structure

Figure 2-2  
Exploded view of heat exchanger roof

FW-15042



### Roof fans

In the heat exchanger roof assembly, twelve 6-inch, 240 f<sup>3</sup>/min, -48 V dc fans maintain air circulation (see Figure 2-3 on page 2-10 and Figure 2-4 on page 2-11). The fans are grouped in two separate banks (front side and rear side) of six fans each.

The fans are thermostatically controlled as two separate banks and are electrically connected to two separate circuit breakers to improve reliability.

Table 2-3 shows the fan types and activation/deactivation (on/off) temperatures.

**Table 2-3**  
**Heat exchanger fan types and factory set activation/deactivation points**

Bank	Fan type	Activate	Deactivate	High temp alarm generation
Exhaust	6 inch, -48 V dc, 240 f <sup>3</sup> /min	65° F (18° C)	63° F (17° C) ± 2° C	140° F (60° C) ± 2° C
Intake	6 inch, -48 V dc, 240 f <sup>3</sup> /min	68.5° F (20° C)	66.5° F (19° C) ± 2° C	140° F (60° C) ± 2° C

### Front side fans

The front-side bank of fans consist of four fans that are mounted inside the cabinet on the ceiling and two fans that are mounted between the ceiling and roof.

- The four fans mounted inside the cabinet on the front-side pull the warm interior air up through the cabinet across the heat exchanger core and move cooler air through the four fans on the rear side back into the cabinet in a closed loop (see Figure 2-3 on page 2-10).
- The two fans mounted between the ceiling and the roof move outside air across the core of the heat exchanger to reduce the interior cabinet temperature (see Figure 2-4 on page 2-11).

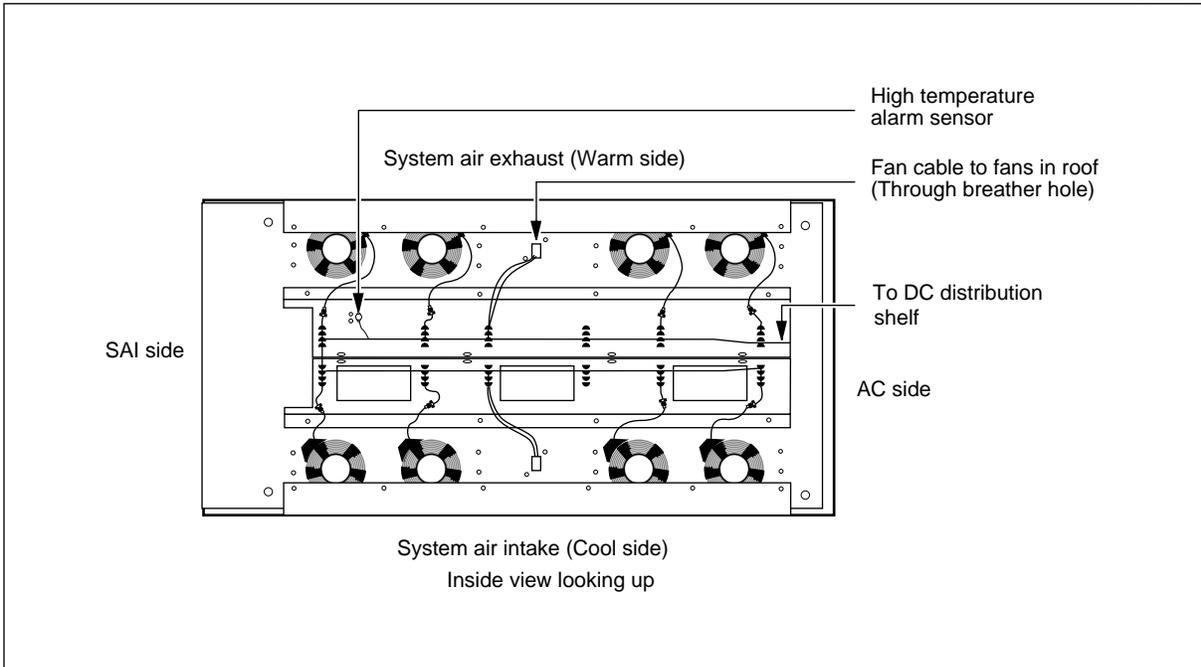
### Rear side fans

The rear-side bank of fans consist of four fans that are mounted inside the cabinet on the ceiling and two fans that are mounted between the ceiling and roof.

- The four fans mounted inside the cabinet on the rear-side pull the cooler air from the heat exchanger down into the cabinet and back through the four fans on the front side in a closed loop (see Figure 2-3 on page 2-10).
- The two fans mounted between the ceiling and the roof move outside air across the cores of the heat exchanger to reduce the interior cabinet temperature (see Figure 2-4 on page 2-11).

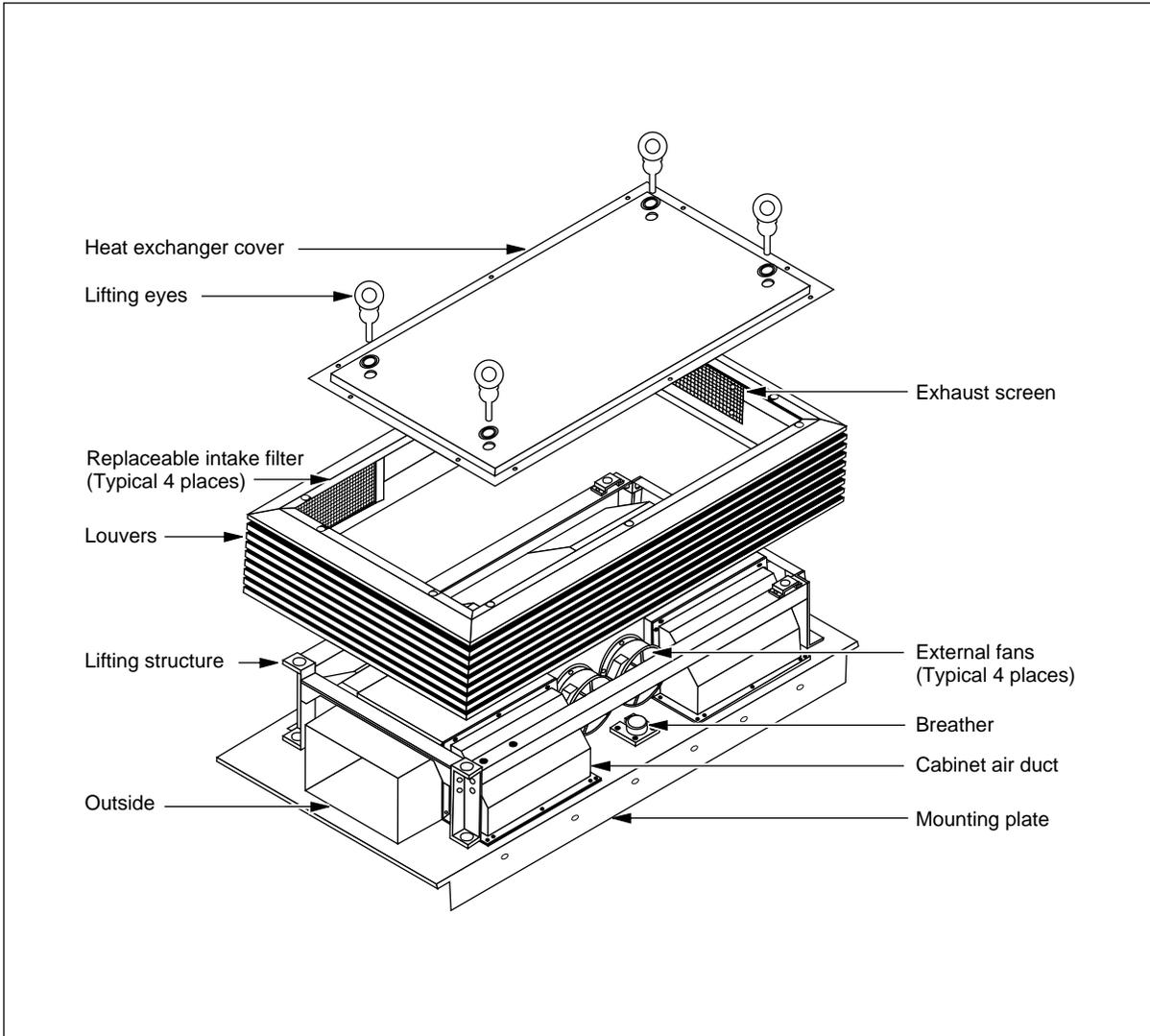
**Figure 2-3**  
**Heat exchanger roof internal fans and sensors**

FW-11324



**Figure 2-4**  
**Heat exchanger roof fan filters and external fans**

FW-11325



**Air induction roof**

The NT7A69AA-CA air induction roof assembly uses a forced convective cooling system (see Figure 2-5 on page 2-13 and Figure 2-6 on page 2-14).

The air induction roof assembly is mounted in, and is part of, the cabinet ceiling.

The cabinet’s temperature is controlled by:

- fans (roof mounted and swing frame mounted)
- heaters
- insulation
- an air flow baffle

	<p><b>CAUTION</b> <b>Baffle installation requirement</b> The air flow baffle must be installed at all times during the operation of the cabinet. Removing the baffle interrupts the air flow over the equipment and disrupts the heating and cooling functions of the environmental controls.</p>
---	---

High temperature alarms are activated whenever the cabinet temperature reaches 140° F (60° C) at the monitoring point.

When within the specified outside operating temperature ranges, the inside temperature range is maintained between the values shown in Table 2-4.

**Table 2-4**  
**Cabinet internal temperature**

Temperature	From	To
Ambient	-40° F (-40° C)	115° F (+46° C)
Internal	32° F (0° C)	140° F (+60° C)

**Figure 2-5**  
**S800A cabinet with air induction roof**

FW-15050

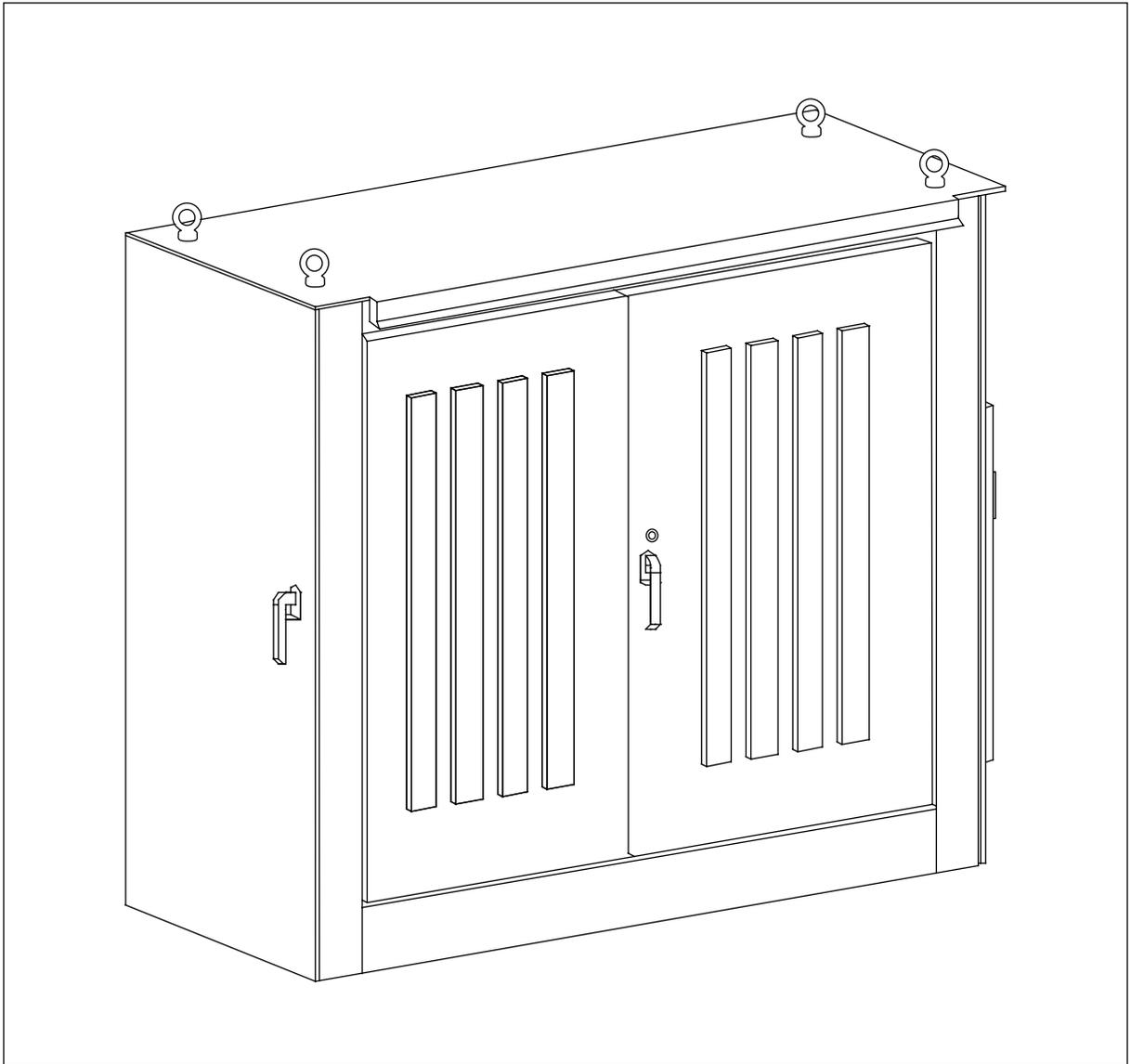
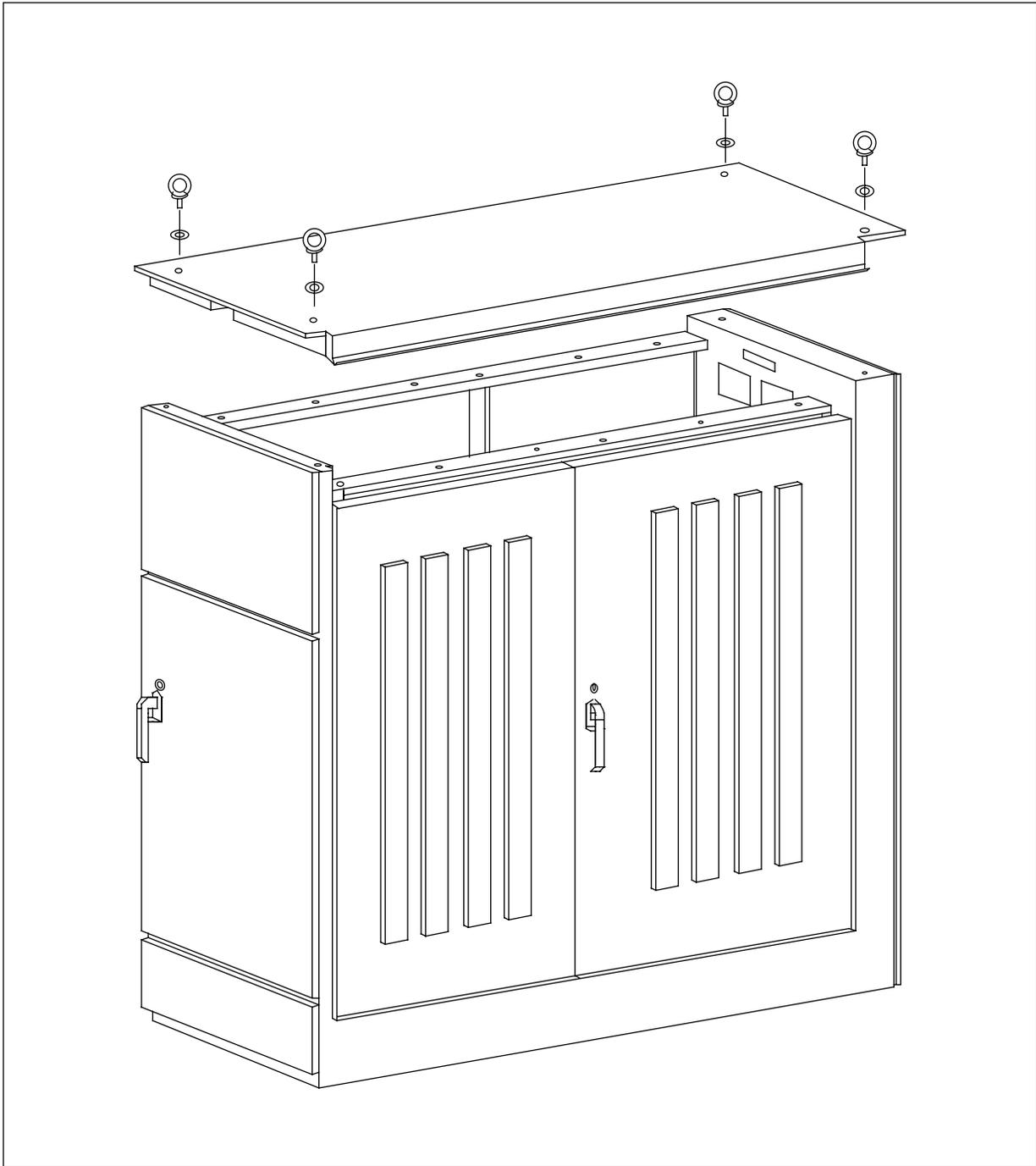


Figure 2-6  
Exploded view of air induction roof

FW-15051



### Roof fans

In the air induction roof assembly, eleven 6-inch, 240 f<sup>3</sup>/min, -48 V dc fans maintain air circulation and provide cooling (see Figure 2-7 on page 2-16). The fans are thermostatically controlled as two separate banks and are electrically connected to two separate circuit breakers to improve reliability.

Table 2-5 shows the fan types and factory set activation/deactivation (on/off) temperatures.

**Table 2-5**

**Air induction fan types and factory set activation/deactivation points**

Bank	Fan type	Activate (on)	Deactivate (off)	High temp alarm generation
Exhaust	6 inch, -48 V dc, 240 f <sup>3</sup> /min	65° F (18° C)	63° F (17° C) ± 2° C	140° F (60° C) ± 2° C
Intake	6 inch, -48 V dc, 240 f <sup>3</sup> /min	68.5° F (20° C)	66.5° F (19° C) ± 2° C	140° F (60° C) ± 2° C

**Exhaust fans**

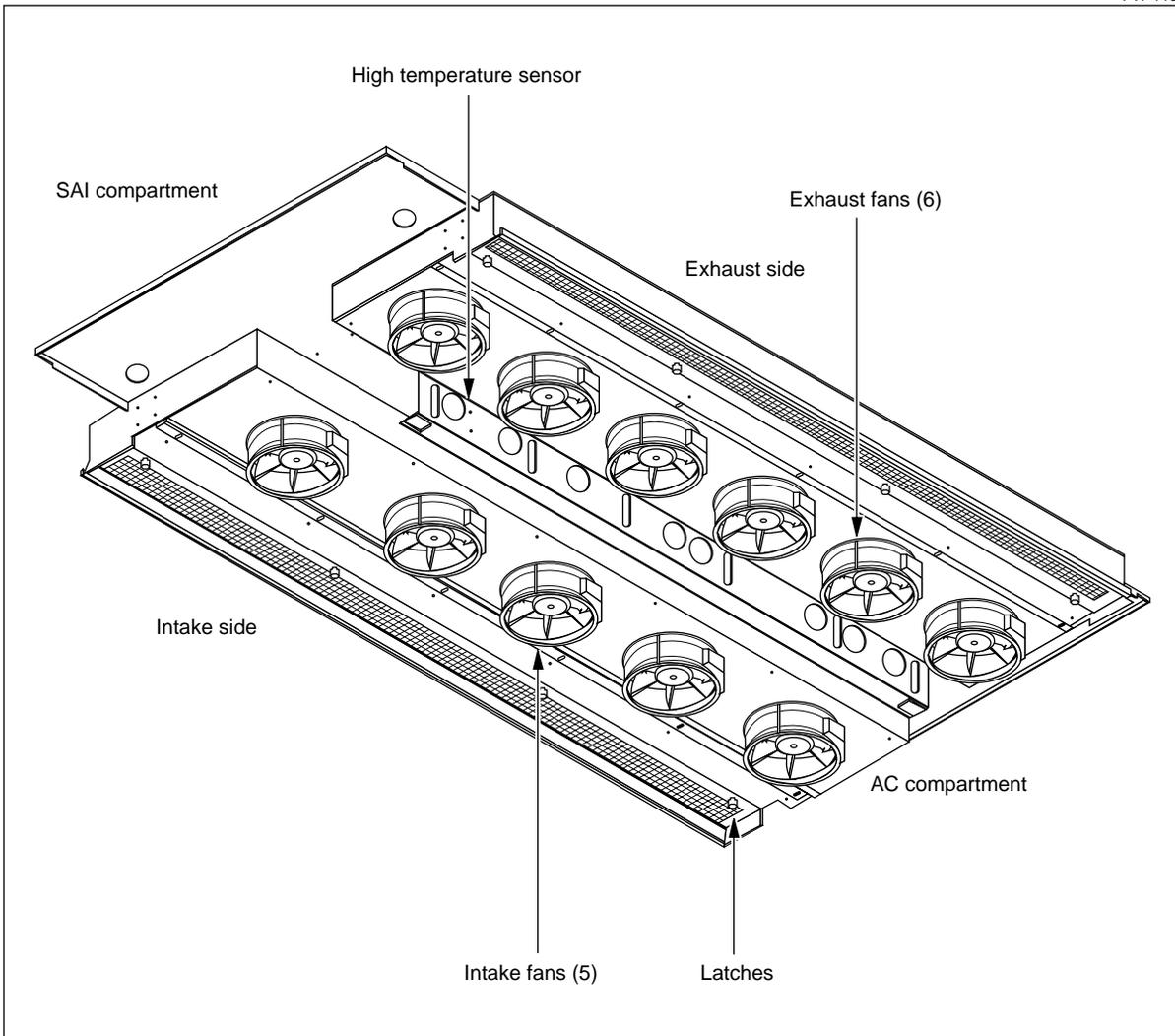
Six of the eleven fans are exhaust fans mounted on the front side of the cabinet which push air out of the cabinet through the front side (see Figure 2-7).

**Intake fans**

Five of the eleven fans are intake fans mounted on the rear side of the cabinet which pull air in through the rear side of the cabinet (see Figure 2-7).

**Figure 2-7**  
**Air induction roof ceiling fans and sensor locations**

FW-11326

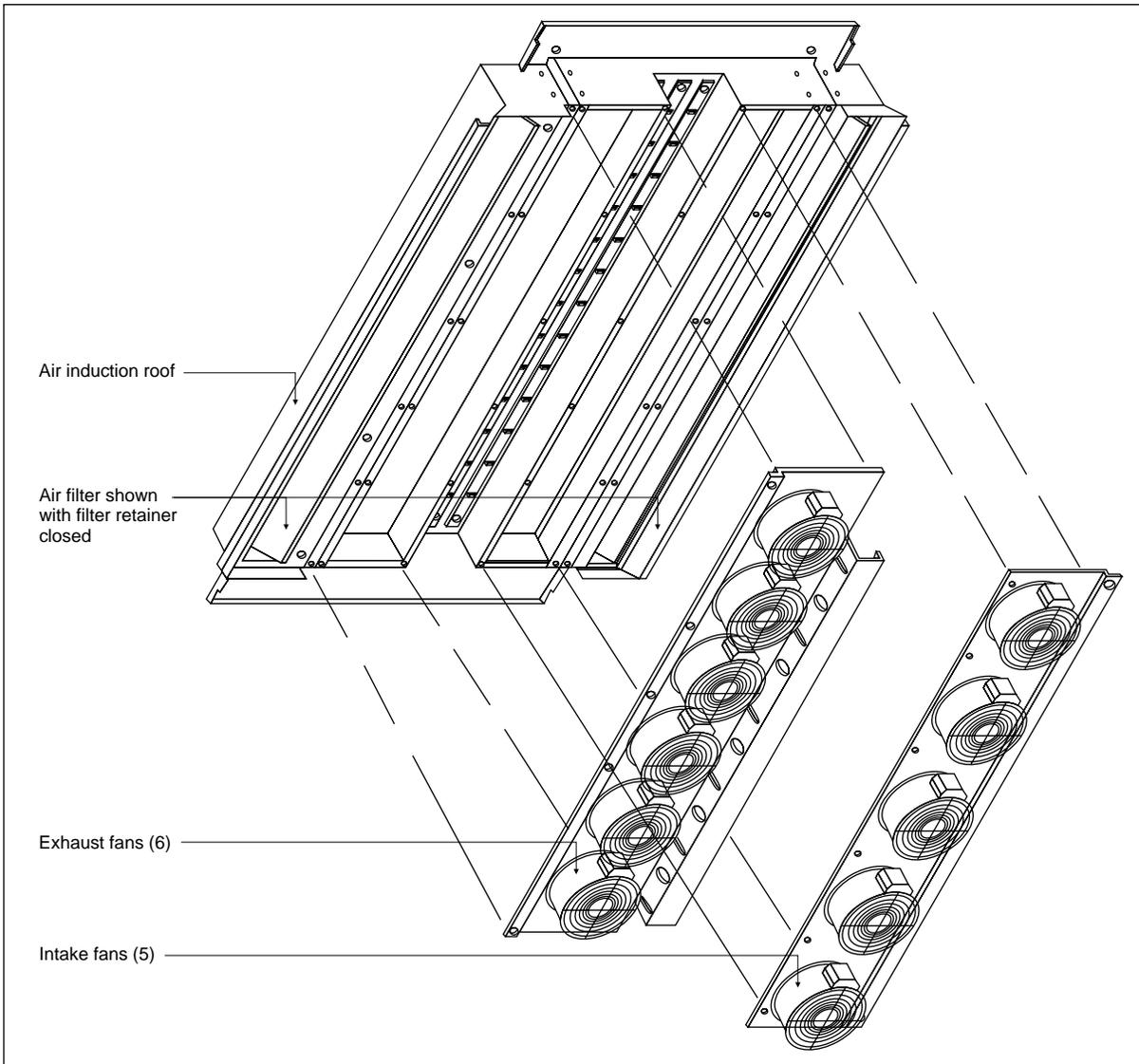


### Air filters

Air filtration is provided by open-cell foam air filters. Two air filters are located behind hinged filter covers; one before the intake and one after the exhaust fans (see Figure 2-8).

**Figure 2-8**  
**Air induction roof fan filters (shown with fans removed)**

FW-15052



## Electronics compartment fan shelves

In addition to the cabinet roof fans, there are factory-installed fan shelf assemblies mounted in the equipment swing frames in the interior electronics compartment to enhance equipment cooling.

One fan shelf is standard equipment in the S800A cabinet and is mounted in the right-hand equipment swing frame. In applications using more than three AccessNode copper-distribution shelves, a second, optional fan shelf must also be installed on the left-hand swing frame in the electronics compartment.

Fan shelves in the electronics compartment are different in the S800A cabinets according to the type of cabinet you have.

Interior fans in the standard NT1W00DA/EA/FA cabinets include the following:

- one NT1W009AA fan shelf mounted below the ABM shelf in the right-hand equipment swing frame
- one optional NT1W09AA fan shelf mounted between CDS shelves in the left-hand equipment swing frame

Interior fans in the VTBM-ready NT1W00GA/HA/JA cabinets include the following:

- one NT4K0610 8-fan shelf mounted below the ABM shelf in the right-hand equipment swing frame
- one optional NT1W09CA fan shelf mounted between CDS shelves in the left-hand equipment swing frame

The NT1W09AA and NT1W09CA fan shelves consists of three 4-inch, -48 V dc, 105 f<sup>3</sup>/min fans in a 1-position, swing frame mounted shelf.

The NT4K0610 fan shelf consists of eight 4-inch, -48 V dc, 105 f<sup>3</sup>/min fans in a 1-position, swing-frame mounted shelf.

These fans run continuously and pull air up through the equipment shelves mounted below and push the air up through the shelves mounted above in a bottom to top direction.

A detailed description of the equipment fan shelves can be found in Chapter 9, “Equipment descriptions.”

---

# Electronics compartment description

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This chapter provides a description of the mechanical components of the electronics compartment.

## Chapter contents

This chapter includes the following topic:

Topic	See
Electronics compartment description	page 3-2

## Electronics compartment description

The electronics compartment houses the equipment frames and batteries, and is the only portion of the cabinet that is environmentally controlled (refer to Chapter 7, “Cabinet specifications”). The compartment is accessible through the front and rear doors of the cabinet.

The electronics compartment is divided into two sections:

- The front side provides mounting space for the AccessNode system.
- The rear side provides space for power and optional or custom equipment mounting.

### Equipment

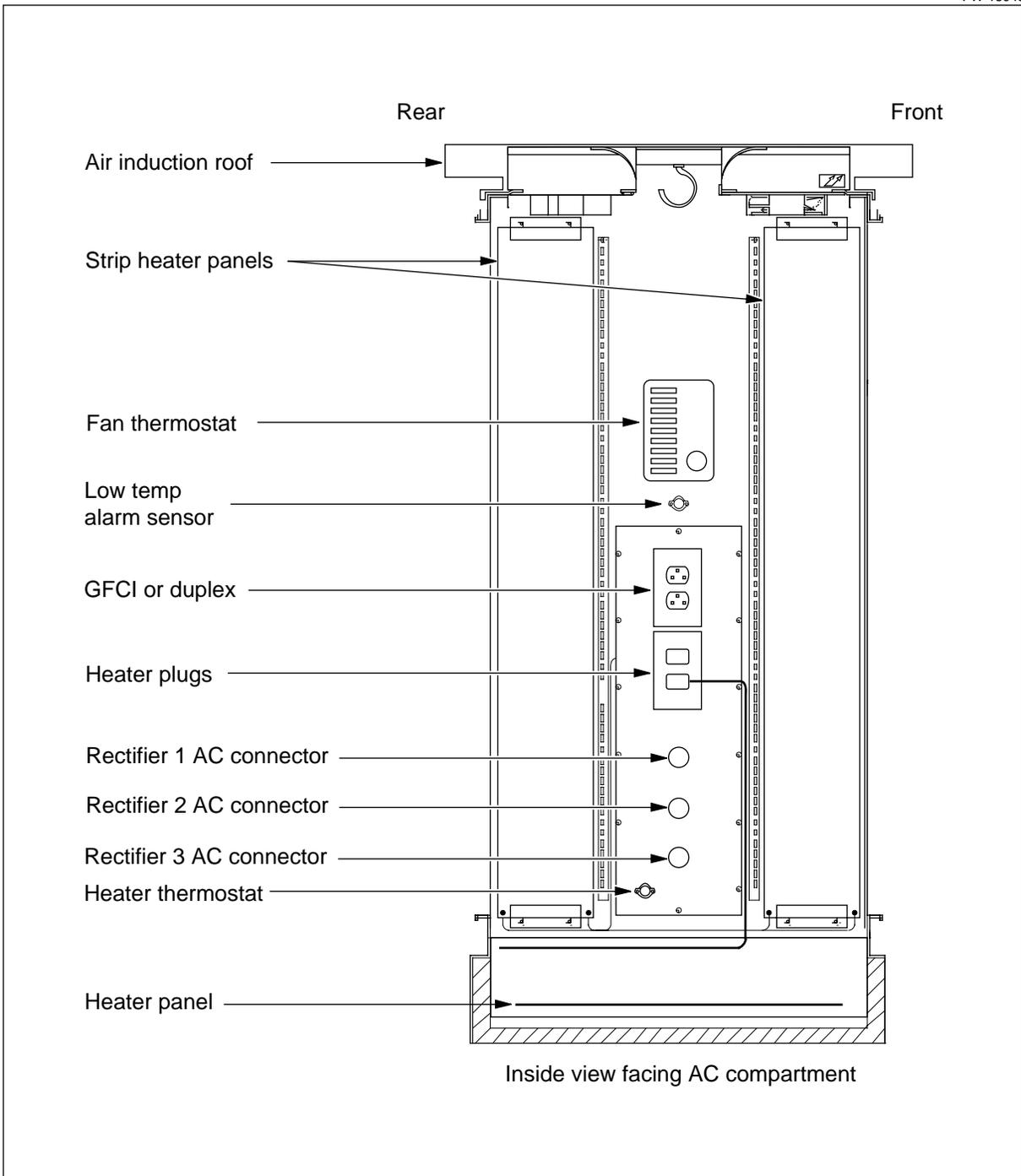
The electronics compartment houses the:

- AccessNode equipment
- swing frames for the equipment
- DS1 cross connect shelves
- fiber distribution shelves
- miscellaneous optional/custom equipment
- ac receptacles for rectifiers, heaters and service outlets
- batteries
- dc power plant
- dc power distribution facility
- heating and cooling facilities including fan shelves, thermostat, temperature alarm sensors and the air flow baffle

Figure 3-1 shows a view of the inside of the electronics compartment facing the ac power compartment.

**Figure 3-1**  
**S800A electronics compartment - inside view of wall facing ac power compartment**

FW-15043



### Swing frames

Four 23-inch (58.4 cm) swing frames (each with 47.25 inches [120 cm] of mounting space) meeting all Zone 4 earthquake requirements hold the equipment shelves and supplemental battery strings.

Each frame is held in position with a locking latch located at the lower part of the frame and pivots on hinges to swing out to allow rear access to the equipment or to the batteries at the base of the cabinet.

Upper and lower shipping brackets secure the frames during cabinet transportation and normal service operation. The upper shipping bracket on the swing frames in each side of the electronics compartment must be installed in all applications to minimize vibration from the surrounding environment.

For Zone 4 earthquake applications, you must also install the lower shipping brackets. All shipping brackets (upper and lower) must be installed on the swing frames in each side of the electronics compartment in Zone 4 applications.

### Battery strings

The battery strings are distributed in the base of the cabinet in battery trays and on shelves in a rear equipment frame.

A 48 V string consists of either:

- four 12V/25 Ampere-hour (AH) batteries
- eight 6V/50 Ampere-hour (AH) batteries

Up to 14 strings of batteries can be installed in the cabinet to provide eight hours of battery backup power.

**Note:** Battery strings 1-12 can provide at least eight hours of battery back-up for a fully configured S800A system. Battery strings 13 and 14 may be used to provide additional battery back-up power should other optional equipment be added.

### AC supply

AC outlets (see Figure 3-1) are located in the electronics compartment for:

- ac duplex receptacles for heaters
- auxiliary 10 A service outlets

The auxiliary service outlets are available with a standard ground fault interrupt (GFI) protection or equipped with an optional straight duplex.

A ground bar for equipment and cabinet grounding is located in the electronics compartment.

## Heater panels

Electric strip heaters (ac fed) are located in the electronics compartment to maintain a regulated temperature range for the equipment and batteries.

The heaters are mounted on the left and right walls and on the floor of the electronics compartment.



### **DANGER**

#### **Fire hazard**

Remove all paper and any other combustible materials from inside the cabinet before the cabinet is powered up.

Failure to comply with this warning could result in a fire.

## Fans

The roof fans, cooling units and thermostats are accessible through the electronics compartment. Reference Chapter 2, “S800A cabinet structure,” for detailed information regarding roof fan description and operation.

In the standard S800A cabinets, there is one factory installed NT1W09AA 3-fan shelf assembly mounted on the front right-side swing frame in the electronics compartment to enhance equipment cooling. In the VTBM-ready cabinets, this fan shelf is an NT4K0610 8-fan shelf assembly.

In applications using more than three AccessNode copper-distribution shelves, a second optional fan shelf must also be installed on the front left-side swing frame in the electronics compartment. In the standard S800A cabinets, this fan shelf is the NT1W09AA. In the VTBM-ready S800A cabinets, this fan shelf is the NT1W09CA 3-fan shelf.

A detailed description of the equipment fan shelves can be found in Chapter 9, “Equipment descriptions.”

## Air flow baffle

An air flow baffle is installed in the electronics compartment of the cabinet to aid the environmental controls. The air baffle directs air flow through the cabinet.



### **CAUTION**

#### **Baffle installation requirement**

The air flow baffle must be installed at all times during the operation of the cabinet. Removing the baffle interrupts the air flow over the equipment and disrupts the heating and cooling functions of the environmental controls.

### 3-6 Electronics compartment description

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# AC power compartment description

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This chapter provides a description of the mechanical components of the ac compartment of the S800A cabinet.

## Chapter contents

This chapter contains the following information:

Topic	See
AC power compartment description	page 4-1

## AC power compartment description

The ac power compartment is located on the right side of the cabinet.

The compartment is a fully enclosed compartment that houses the:

- ac input
- circuit breakers
- emergency input connector
- stand-by emergency switch
- battery vault cabling connection point TB13
- provisions for external ac metering

The ac power compartment distributes ac power from either the load box option (see Figure 4-2 on page 4-4) or the power pedestal option (see Figure 4-3 on page 4-7).

*Note:* Figure 3-1 on page 3-3 shows the locations of the ac power compartment interfaces to the electronics compartment.

Battery vault cabling connection points are located in the bottom of the cabinet in the AC compartment (see Figure 4-1 on page 4-2).

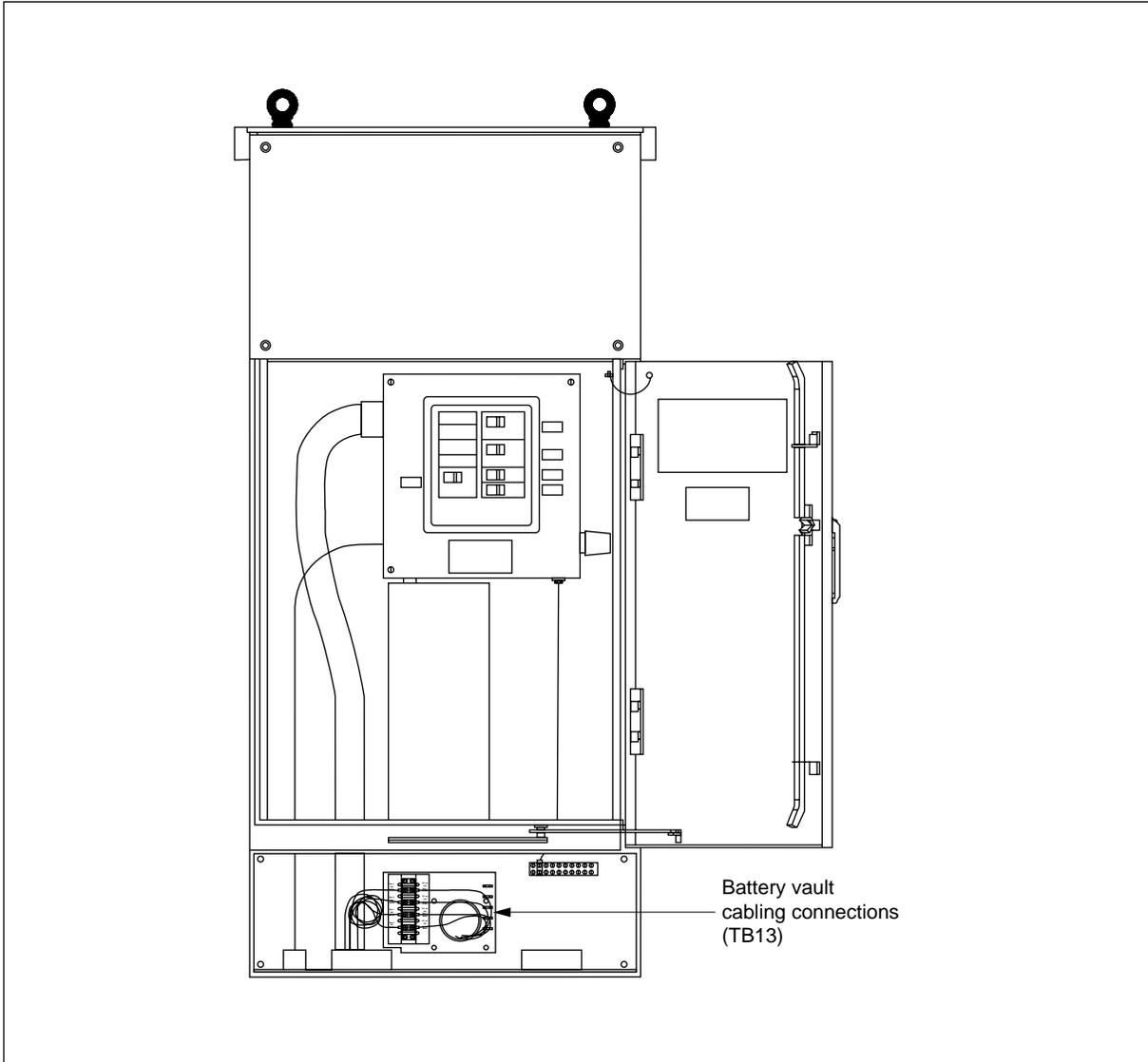
Access to the ac side cabinet mounting holes for securing the cabinet to the mounting pad is provided through the ac power compartment options.

## 4-2 AC power compartment description

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed wiring information.

**Figure 4-1**  
**AC power compartment inside view showing TB13 battery vault power wiring connection points**

FW-15034



## AC load box option

With the NT7A71AA-CA ac load box option, you can configure the S800A cabinet as a main service entrance or branch circuit from an external ac service center.

The ac load box option includes:

- optional emergency generator connections and transfer provisions (see Figure 4-2 on page 4-4)
- rectifier circuit breakers for power distribution and surge protection
- terminal block connection points for battery vault cabling (see Figure 4-1 on page 4-2)
- GFI and heater circuit breakers for surge protection

## Circuit breakers

Table 4-1 lists the ac load box circuit breakers and their ratings.

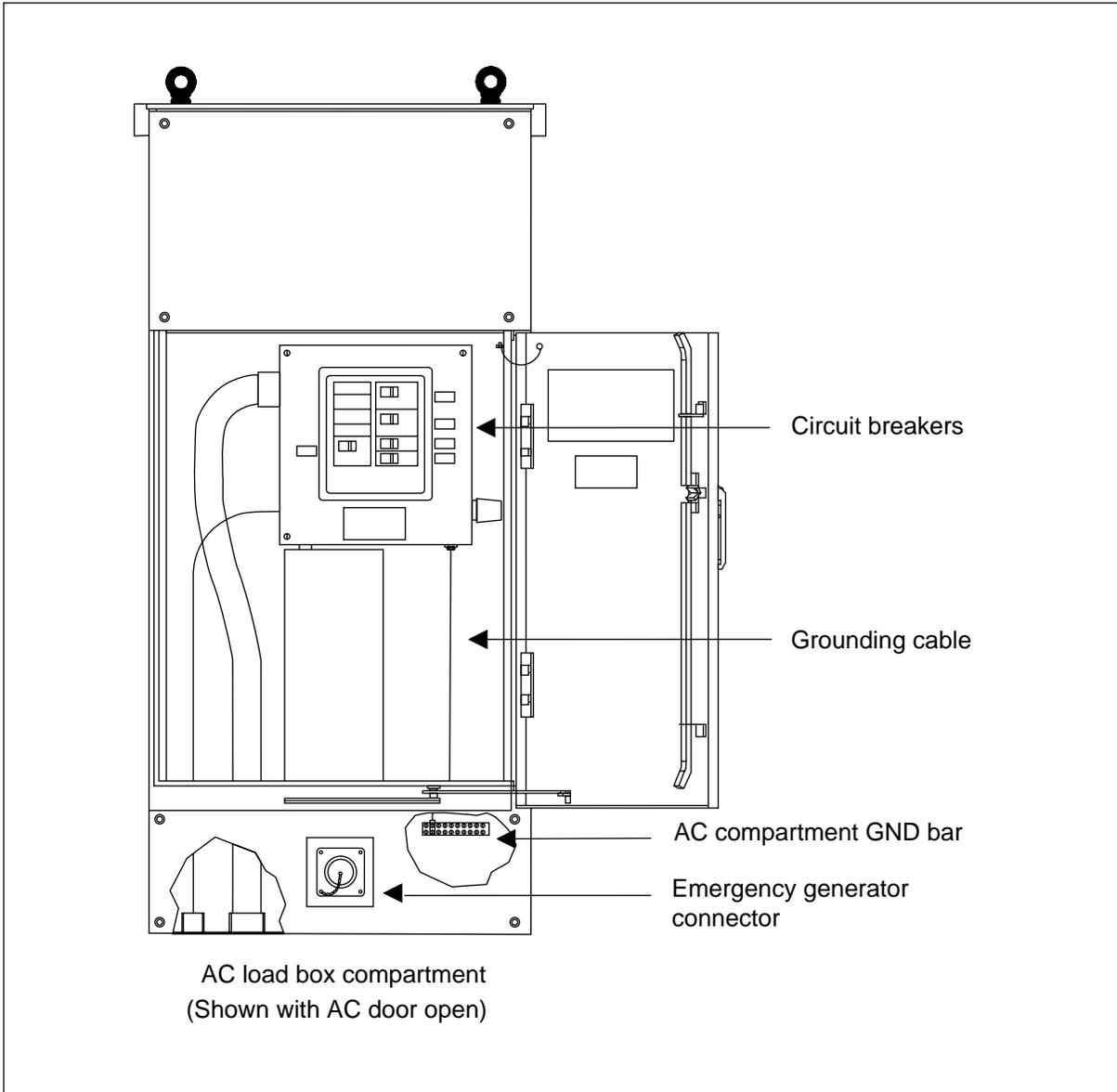
**Table 4-1**  
**AC load box circuit breaker designations and ratings**

Designation	Amperage
Main service panel	
Main	60
Emergency	60
CB1 (Rectifier #1)	20
CB2 (Rectifier #2)	20
CB3 (Rectifier #3)	20
CB4 (Heaters)	15
CB5 (GFI)	10
Branch service panel	
CB1 (Rectifier #1)	20
CB2 (Rectifier #2)	20
CB3 (Rectifier #3)	20
CB4 (Heaters)	15
CB5 (GFI)	10

#### 4-4 AC power compartment description

**Figure 4-2**  
**Exterior view – ac power compartment**

FW-15053



### Conduit openings

The ac power enters the S800A cabinet via conduit holes located on the bottom left side of the ac power compartment. The conduit openings come factory equipped with removable cap plugs that are to be removed during the installation process and discarded.

Table 4-2 shows the conduit openings in the ac load box.

**Table 4-2**  
**AC load box conduit openings**

Opening size	Conduit trade size	Function
2.50 inches (6.35 cm)	2.0 inches (5.08 cm)	Miscellaneous - dc feed, when required
2.50 inches (6.35 cm)	2.0 inches (5.08 cm)	AC entrance - commercial ac feed
1.50 inches (3.81 cm)	1.0 inches (2.54 cm)	Ground - earth ground rod connection entrance

The cabinet master ground bar is located on the lower right portion of the ac power compartment wall and provides grounding access to the ac distribution load box.

Two of the four cabinet mounting holes are located in the bottom of the ac power compartment and are used for final cabinet placement.

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed wiring information.

### AC power pedestal option

With NT7A68AA-GA ac power pedestal option, you can configure the S800A cabinet as a main service entrance (see Figure 4-3 on page 4-7).

A cabinet ac power compartment-mounted interface panel allows the modular attachment of the ac power pedestal that houses all the elements of an ac service equipment deadfront switch.

The ac power pedestal option includes:

- rectifier circuit breakers for power distribution and surge protection
- GFI and heater circuit breakers for surge protection
- optional emergency generator connections and transfer provisions

### Circuit breakers

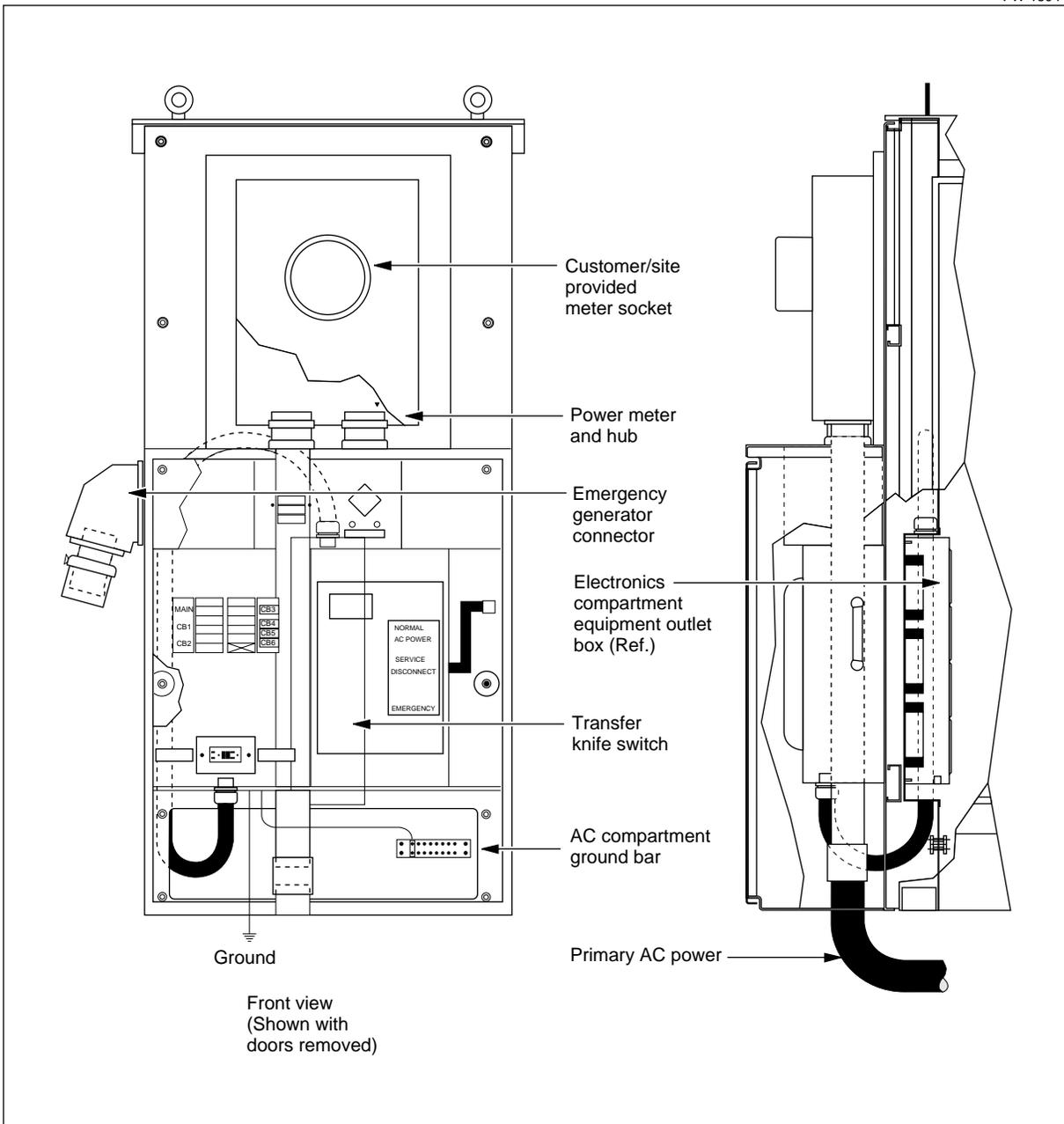
Table 4-3 lists the ac power pedestal circuit breakers and their ratings.

**Table 4-3**  
**AC power pedestal circuit breaker designations and ratings**

Designation	Amperage
Main	100
CB1 (Rectifier #1)	20
CB2 (Rectifier #2)	20
CB3 (Rectifier #3)	20
CB4 (Heaters)	15
CB5 (Internal GFI)	10
CB6 (External GFI)	15

**Figure 4-3**  
**Optional ac power pedestal**

FW-15044



**Conduit openings**

The pedestal is equipped with a 2.50-inch trade size hub for mounting any commercial size meter socket panel (24-inch maximum height). The conduit openings come factory equipped with removable cap plugs that are to be removed during the installation process and discarded.

Table 4-4 shows the conduit openings in the ac power pedestal.

**Table 4-4**  
**AC power pedestal conduit openings**

<b>Opening size</b>	<b>Conduit trade size</b>	<b>Function</b>
3.50 inches (8.89 cm)	2.50 inches (6.35 cm)	AC entrance - commercial ac feed
2.00 inches (5.08 cm)	1.25 inches (3.18 cm)	Miscellaneous - dc feed or grounding
2.00 inches (5.08 cm)	1.25 inches (3.18 cm)	Miscellaneous - dc feed or grounding
2.00 inches (5.08 cm)	1.25 inches (3.18 cm)	Miscellaneous - dc feed or grounding
2.00 inches (5.08 cm)	1.25 inches (3.18 cm)	Miscellaneous - dc feed or grounding

A large opening along the lower rear bulkhead wall inside the ac power pedestal allows full access to the S800A cabinet master ground bar and mounting hole locations.

Also, two additional pedestal mounting holes are located in the bottom of the ac power pedestal (along with the two mounting holes in the cabinet) and are used for final cabinet placement.

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed wiring information.

## AC power supply

The S800A cabinet is serviced by a standard 230 V ac, 60 A, single-phase, 3-wire commercial power supply.



### **DANGER** **Fire Hazard**

Remove all paper and any other combustible materials from inside the cabinet before the cabinet is powered-up.

Failure to comply with this warning could result in a fire.

The cabinet performs to all specifications from a commercial or emergency power source with ac voltage variation of 190–253 V ac (between Line 1 and Line 2, standard setting), frequency 55–65 Hz per Bellcore technical reference TR-TSY-000057.

## Battery reserve

In the event of temporary power failure, a battery reserve of up to 350 Ah powers the system equipment for up to eight (8) hours of uninterrupted operation.

*Note:* When operating with battery back-up, a minimum of six battery strings providing 150 Ah must be installed.

## Manual transfer

For extended power failures, ac power can be supplied through the manual transfer of power from commercial ac (or battery backup) to generator supplied ac power.

Manual transfer is done using one of two options:

- a positive locking knife switch provided as part of the power pedestal option
- a circuit breaker mechanical interlock device offered as part of the ac load box option

*Note:* Both types of mechanical power transfer devices have a positive interlock feature to prevent having both the ac line and emergency power on at the same time.

### **Emergency generator connectors**

Emergency generator connectors are accessible from either the ac power compartment or the ac power pedestal. All ac power options and wiring conform to National Electric Code standards.

The ac load box option offers a choice of either of two 30 amp emergency generator connector styles that are both equipped with a circuit breaker interlock transfer mechanism:

- Hubbell part number 2715WP
- Crouse-Hinds part number ARRH3482-S22

The ac power pedestal options offer a choice of either of two emergency generator connector styles that are both configured with an internally mounted knife switch:

- a 60 amp connector—Hubbell part number 460B12W
- a 100 amp connector—Hubbell part number 4100B9W

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed wiring information.

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# Termination compartment description

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This chapter provides a description of the mechanical components of the termination compartment.

## Chapter contents

This chapter includes the following topic:

Topic	See
Termination compartment description	page 5-2

## Termination compartment description

The outside plant (OSP) cable termination compartment (see Figure 5-1 on page 5-3) is the interface between the electronics equipment and the OSP cables.

VF, HF, miscellaneous and ground cabling enters the termination compartment via conduit holes located in the bottom of the compartment.

The termination compartment is a fully enclosed compartment that houses the:

- VF termination block options
- DS1 termination block options
- VF and DS1 protector modules
- electronics compartment interfaces
- fiber cable entrance
- grounding bar
- cable ladder tie brackets

A ground bar within the compartment connects to the customer preferred earth grounding option and serves as the connection point for the OSP cable sheathing.

Two of the cabinet's mounting bolts are also accessible from this compartment.

Reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210, for detailed wiring information.

## Termination compartment equipment

The termination compartment provides equipment and options for lightning protection and terminating the VF and DS1 cable pairs entering the cabinet:

- service protection center (SPC)
- serving area interface (SAI)

The equipment side of the SPC protector field passes through a connectorized bulkhead panel and connects to the electronics equipment. The bulkhead panel is located in the electronics compartment (see Figure 5-2 on page 5-4).

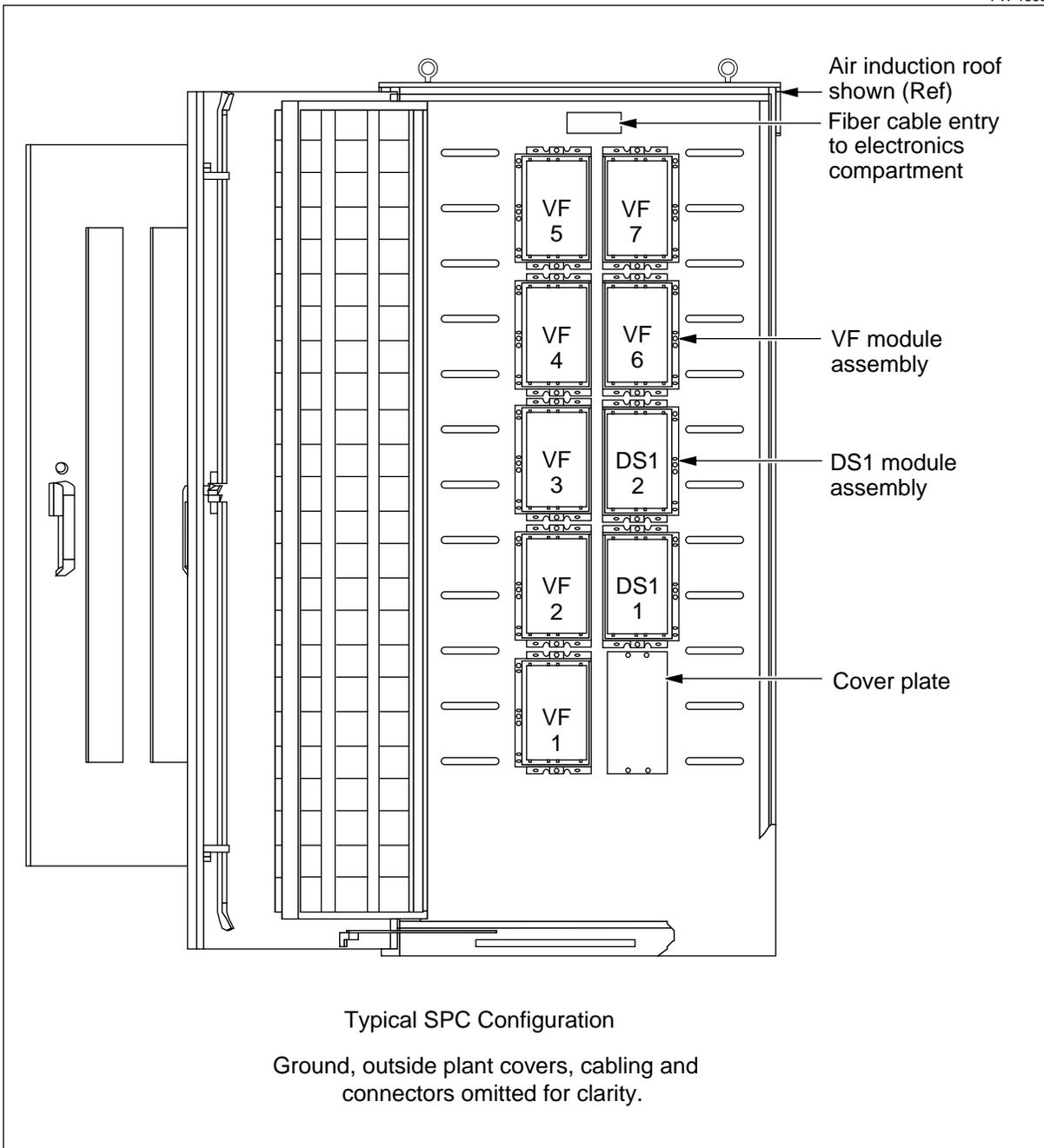
## Fiber termination

Optical fibers are brought directly into the electronics compartment for termination at a rack mounted fiber distribution panel.

The fibers are routed to the electronics compartment through a small opening at the top center of the termination compartment bulkhead. The opening also provides air exchange between the electronics and termination compartments.

**Figure 5-1**  
**Outside cabinet view facing termination compartment - end view**

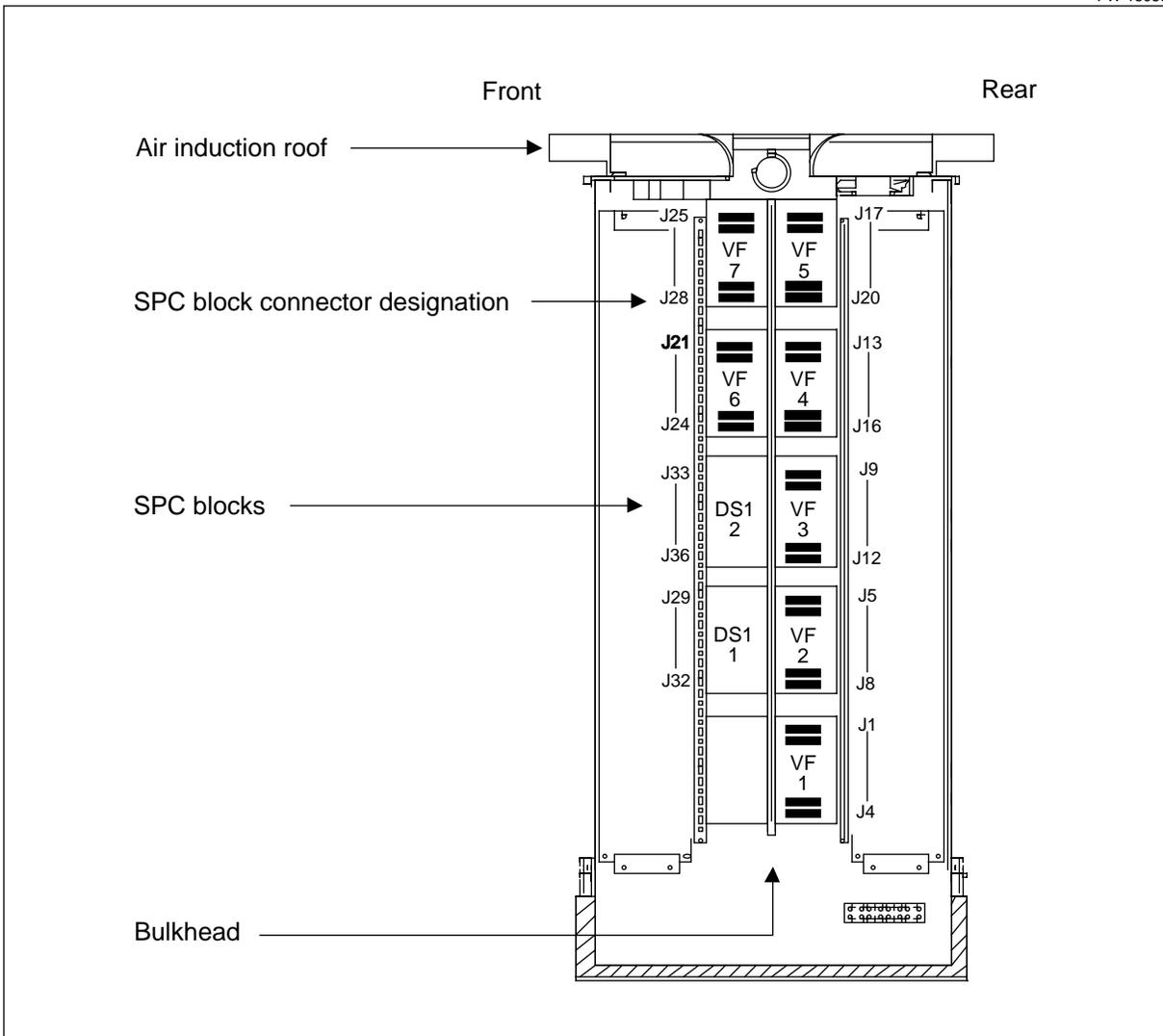
FW-15054



## 5-4 Termination compartment description

**Figure 5-2**  
Inside cabinet view facing termination compartment

FW-15055



**Cross-connect options**

A 2:1 VF cross-connect option is available for up to 600 pairs, or optionally, an external cross-connect cabinet can be provided.

The cross-connect facilities are housed in modules mounted on the bulkhead wall between the OSP compartment and the electronics compartment.

For OSP connections, a cable ladder is built into the compartment to support terminated cables.

An optional swing frame is available with an optional 1800-pair serving area interface (also called a feeder distribution interface or FDI) and standard BIX OSP connectors.

*Note 1:* BIX connector termination is done only on the swing frame.

*Note 2:* OSP cable splicing for MS<sup>2</sup> and 710 connectors is done on the wall facing the electronics compartment or on the swing frame.

**Connector systems**

The termination compartment contains provisions for 5-pin module protection for serving area interface VF connectorized terminations and all DS1 terminations using one of three optional connector systems:

- 700 pair Nortel Networks BIX
- 3M MS<sup>2</sup>
- AT&T 710

### Conduit openings

Table 5-1 shows the conduit openings in the termination compartment. The conduit openings come factory equipped with removable cap plugs that are to be removed during the installation process and discarded.

**Table 5-1**  
**Termination compartment conduit openings**

Opening size	Conduit trade size	Function
4.50 inches (11.43 cm)	4.00 inches (10.16 cm)	VF - pairs 1-600 cable entrance
4.50 inches (11.43 cm)	4.00 inches (10.16 cm)	VF - pairs 601-1200 cable entrance
4.50 inches (11.43 cm)	4.00 inches (10.16 cm)	VF - miscellaneous cable entrance
4.50 inches (11.43 cm)	4.00 inches (10.16 cm)	VF - HF or fiber cable entrance
2.50 inches (6.35 cm)	1.25 inches (3.18 cm)	Ground - earth ground rod connection entrance

### Door gasketing and locking mechanism

The outside plant compartment door is gasketed.

The compartment door locking mechanism is shipped disabled with provision for a padlock.

When the door lock is enabled, the outside plant compartment may be opened with a 216-type socket tool.

To enable the door locking mechanism, reference document *Series 800A Outside Plant Cabinet Installation*, 323-3001-210.

### **Service protection center**

The service protection center (SPC) modules mounted on the rear wall separating the electronics and termination compartments provide termination and lightning protection for a maximum of 1000 pairs.

All VF and T1 signal connections to the electronics compartment are made through the SPCs, which also house the VF and DS1 protector modules (see Figure 5-2 on page 5-4).

### **Mounting**

The SPC units are mounted on the rear wall of the termination compartment with a left-right orientation:

- The first 500 pairs mount on the left side.
- The second 500 pairs mount on the right side.

### **Connectors**

Protector blocks may be configured with three different types of outside plant connectors as listed below:

- AT&T 710
- 3M MS<sup>2</sup>
- Nortel Networks BIX

### **Protector blocks**

Two types of SPC protector blocks are available:

- VF: 100-pair
- DS1: 50-pair transmit/50-pair receive DS1s

### **Protector modules**

Five-pin gas tube or solid state protector modules, rated 7X or better, protect the cabinet from lightning and ac surges:

- two-electrode gas tubes are used for VF lines
- three-electrode modules are used for the T1 and maintenance pairs

Solid-state modules can be used for all pairs.

*Note:* To maintain UL listing, the SPC should employ UL listed, 5-pin protector modules. Nortel Networks recommends the use of solid state protectors in all outside applications. The voltage limiting characteristics of the station protectors have a considerable impact on voltages impressed on the electronics of the system. Solid state protectors offer faster reaction times, a more predictable operating voltage, longer service life and an increased safety factor.

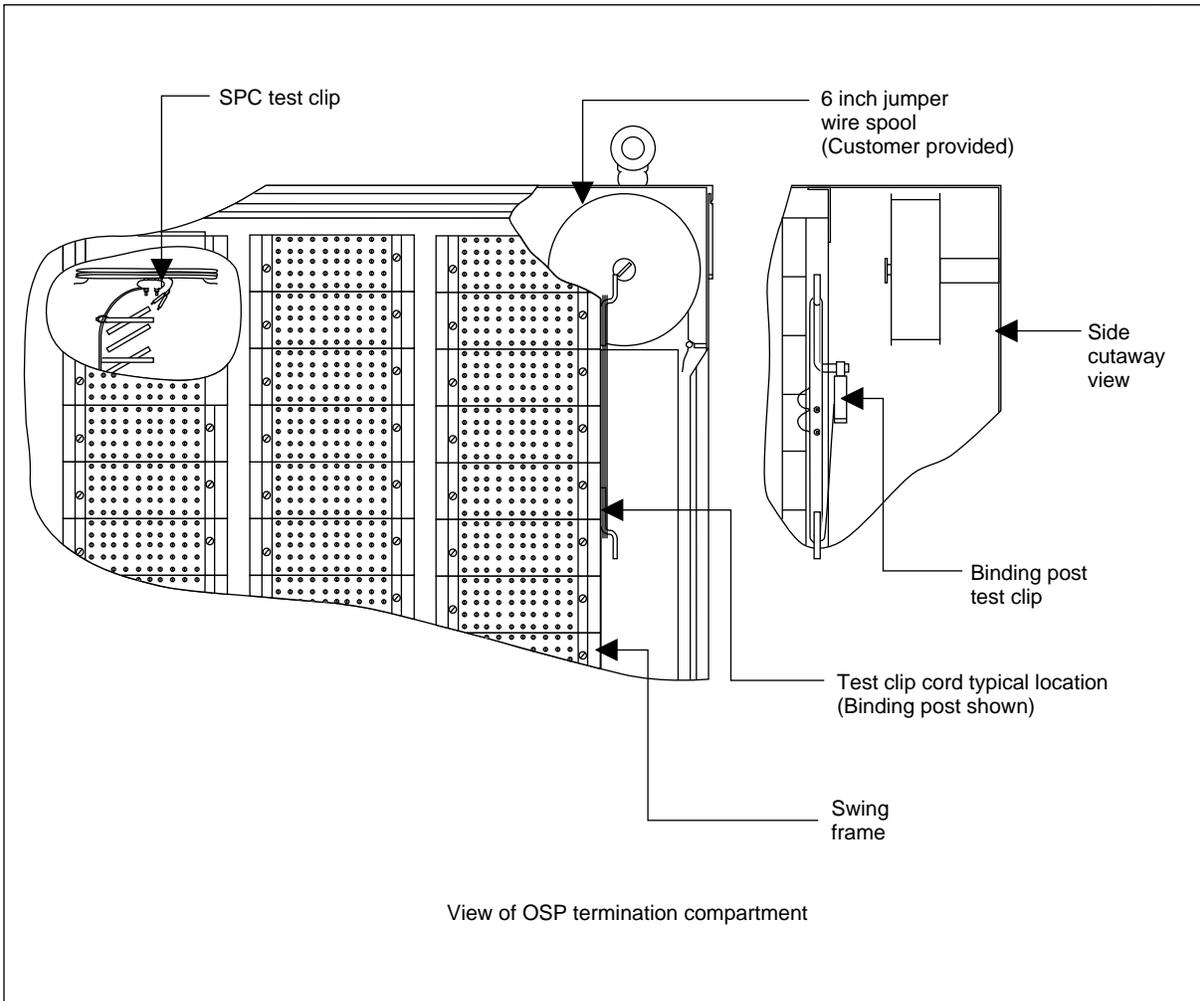
## 5-8 Termination compartment description

### Test access cord

An optional protector module test access cord allows IN/OUT and TIP/RING test access to the protector block (see Figure 5-3). The test access cord is terminated on a standard two-pair station block.

**Figure 5-3**  
**Location of test clip(s) and jumper wire spool**

FW-15056



### **Serving area interface**

An optional serving area interface (SAI) is integrated into the cabinet design. The SAI is located on a hinged swing frame that opens by latches on the top and bottom right edge of the frame.

The SAI provides a convenient means of distributing the AccessNode derived pairs (feeder) among a number of subscriber pairs (distribution) in a local serving area (see Figure 5-4 on page 5-11 and Figure 5-5 on page 5-12).

The S800A SAI is configured for a 2:1 distribution to feeder ratio. The feeder (or derived) pairs are factory spliced to the service protection center, which houses the 5-pin protector modules.

The SAI is also equipped with a jumper wire spool holder and a single-pair test probe (see Figure 5-3 on page 5-8).

### **Protector modules**

Five-pin gas tube or solid state protector modules, rated 7X or better, protect the cabinet from lightning and ac surges:

- two-electrode gas tubes are used for VF lines
- three-electrode modules are used for the T1 and maintenance pairs

Solid-state modules can be used for all pairs.

*Note:* To maintain UL listing, the SPC should employ UL listed, 5-pin protector modules. Nortel Networks recommends the use of solid state protectors in all outside applications. The voltage limiting characteristics of the station protectors have a considerable impact on voltages impressed on the electronics of the system. Solid state protectors offer faster reaction times, a more predictable operating voltage, longer service life and an increased safety factor.

### **Connectors**

The SAI is offered as an 1800-pair interface with either of two connector options mounted on a hinged swing frame in the termination compartment:

- Nortel Networks BIX
- binding post block

Termination pair count begins at the top of each column on the swing frame and progresses toward the bottom.

### **BIX connectors**

The Nortel Networks outside plant BIX option uses a high-density insulation displacement connector (see Figure 5-4).

When equipped with Nortel Networks BIX connectors, the SAI is configured as six 300-pair blocks, with the top two blocks designated as the feeder.

The BIX frame also allows termination of up to 100 DS1 transmit/receive or miscellaneous pairs.

### **Binding post block**

The 76-type binding post option as shown in Figure 5-5 on page 5-12 is configured for 1800 pairs (three columns of 600 pairs):

- 600 derived (feeder) pairs
- 1200 distribution pairs

Derived pairs (feeder) are terminated on the center column (1 to 600) and the two outer columns assigned for distribution (1 to 1200).

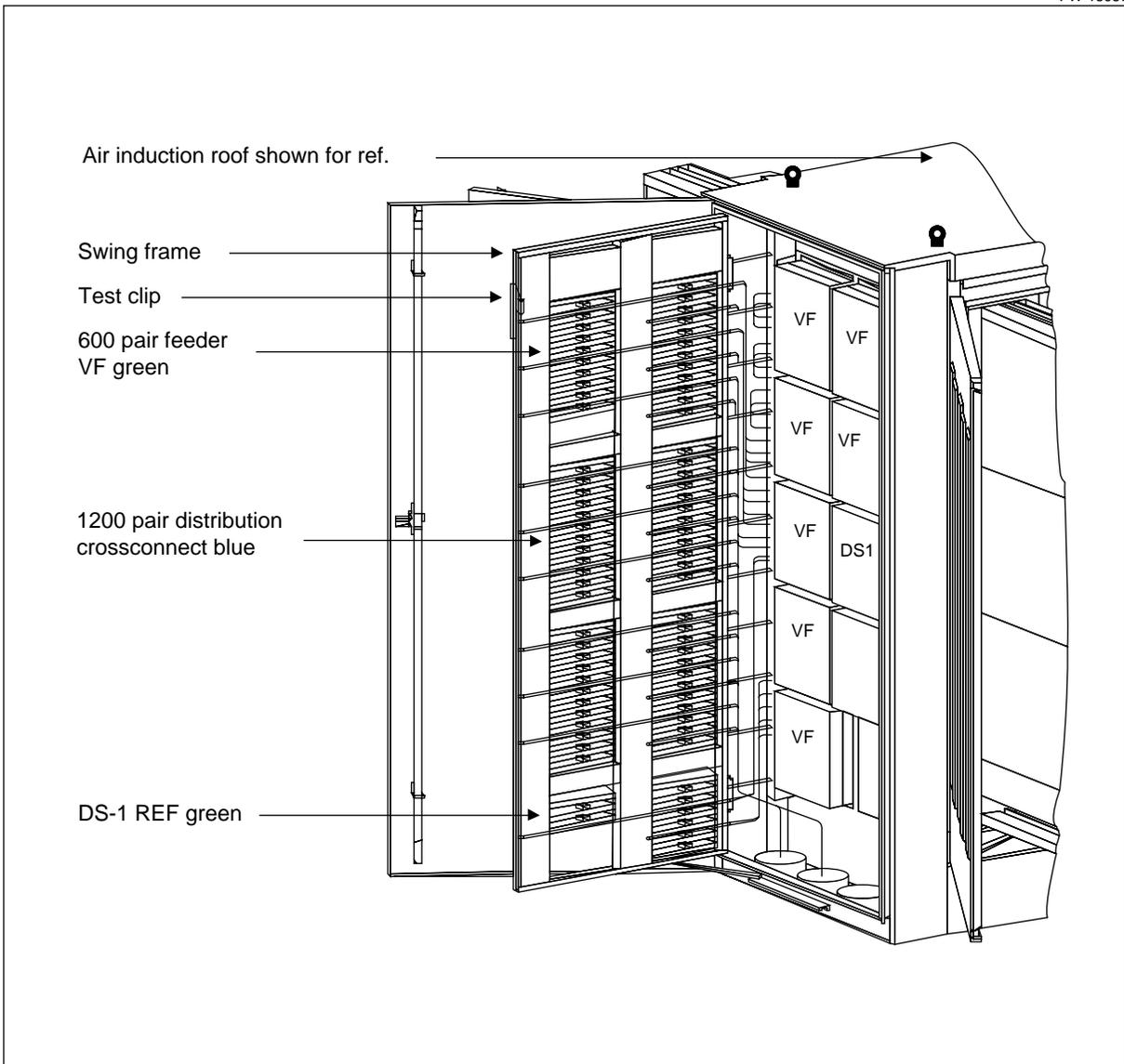
The binding post blocks for distribution pair and feeder termination are available with either:

- NT1W37AA 3M MS<sup>2</sup> connectors
- NT1W37BA AT&T 710 connectors

Termination pair count begins at the top of each column on the swing frame and progresses toward the bottom.

**Figure 5-4**  
**Optional serving area interface (BIX terminations shown)**

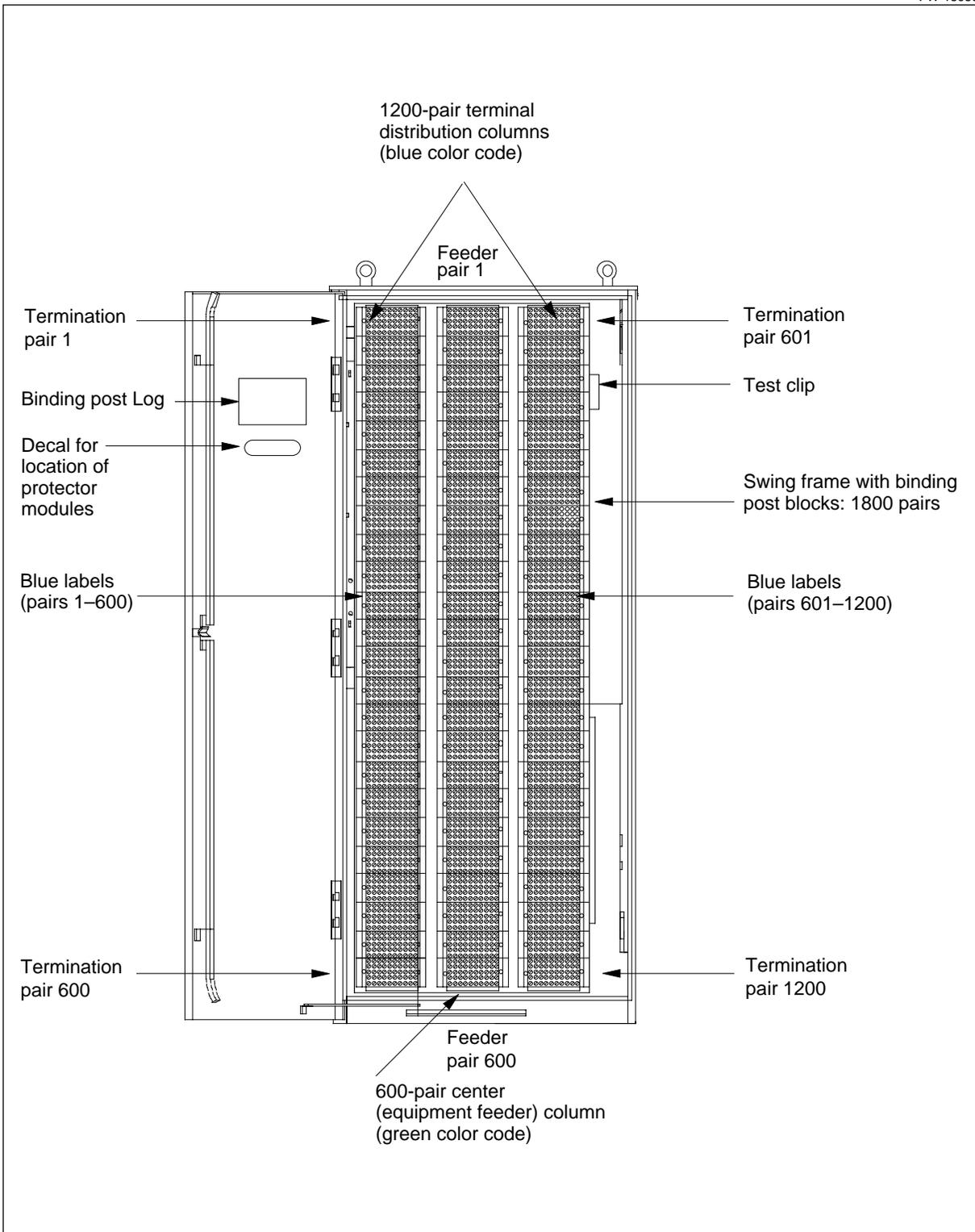
FW-15057



5-12 Termination compartment description

Figure 5-5  
Optional serving area interface (binding posts shown)

FW-15058



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# Electrical features and requirements

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This chapter provides the electrical features and power requirements of the S800A cabinet.

## Chapter contents

This chapter includes the following topic:

Topic	See
Electrical features description	page 6-1

## Electrical features description

The electrical system serves the S800A cabinet with the following features:

- ac interface and distribution
- ac generator/alternator transfer switch
- dc distribution shelf
- rectifier/charger
- batteries
- associated cabling and ground strips

The powering system and electrical equipment are described in further detail in the following sections.



**DANGER**  
**Fire Hazard**

Remove all paper and any other combustible materials from inside the cabinet before the cabinet is powered-up. Failure to comply with this warning could result in a fire.

**AC power requirements**

The cabinet operates within specification with voltage range variations of 190 to 253 V ac [measured between Line 1 (L1) and Line 2 (L2) of the ac input leads] and a frequency variation range of 55 to 65 Hz.

Table 6-1 shows the recommended commercial ac power requirements for servicing the S800A cabinet.

**Table 6-1  
AC power requirements**

Feature	Description
AC load box option	208/230 V ac 60 A Three-wire, 1-phase 55–60 Hz
AC power pedestal option	208/230 V ac 100 A Three-wire, 1-phase 55–60 Hz
Outlets	Four ac outlets: <ul style="list-style-type: none"> <li>• two dedicated for ac heaters</li> <li>• two 120 V ac convenience outlets equipped with either a standard Ground Fault Circuit Interrupt or optional 10 A duplex device</li> </ul>
Surge arrestor	Metal oxide, varistor (solid state)
Emergency power	Up to two rectifier modules require a 30 Amp emergency generator connector. Three rectifier modules require a 60 or 100 Amp emergency generator connector.
Emergency transfer options	Two transfer options: <ul style="list-style-type: none"> <li>• an internal mechanical interlock transfer switch, equipped with a double-pole, double-throw (DPDT) knife switch</li> <li>• an attached ac power pedestal equipped with a DPDT knife switch</li> </ul> Both transfer options are available with either Hubbell or Crouse-Hinds generator connectors. <ul style="list-style-type: none"> <li>- Hubbell part number 2715-WP</li> <li>- Crouse-Hinds part number ARR3482-522</li> </ul>

## DC power requirements

The S800A cabinet powering system is designed to support up to three 25 A rectifier modules to power equipment and system configurations.

A fully loaded 672-line system equipped with 42 repeaters requires:

- 350 Amp-hours (Ah) battery reserve to maintain stand-by power
- two 25 A, 56 V dc rectifier modules

*Note:* A third rectifier may be installed to provide n+1 redundancy.

Table 6-2 lists the dc supply requirements for the S800A cabinet.

**Table 6-2**  
**Commercial power features**

Power features	Description
Rectifiers	Up to three Nortel Networks MPR25 (NT5C06CA) 25 A rectifier modules can be installed.
Battery backup	Up to 350 Amp-hours to provide 8 hours minimum reserve under maximum power drain can be installed.
Emergency power	Up to two rectifier modules require a 30 Amp emergency generator connector. Three rectifier modules require a 60 or 100 Amp emergency generator connector.

### Grounding

All metal parts of the cabinet are grounded for safety and operating performance requirements. The cabinet is specified to operate with a maximum ground-to-earth resistance of 25  $\Omega$ .

A grounding bus bar for connection to the customer supplied ground option is included in both the termination compartment and the ac power compartment. OSP cables must be grounded using QCM2A cable bonding clamps or equivalent on the grounding bar located within the termination compartment.

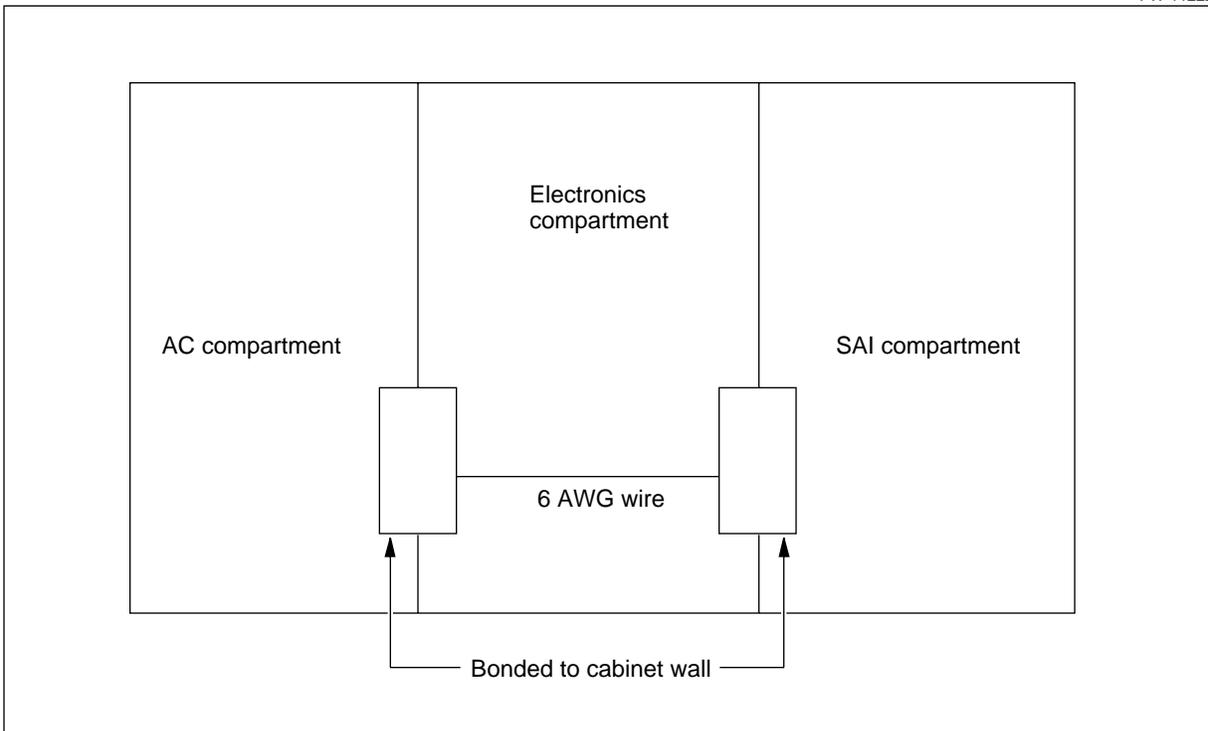
Two ground bars, located on either side wall of the electronics compartment and connected by a 6 AWG cable, collect the ground wires coming from the:

- doors and swing frames
- SPCs
- ac power supply
- outside plant cables

The bars provide superior cabinet bonding as they are “sandwiched” between the cabinet walls for secure metal-to-metal contact (see Figure 6-1). The bars have additional lugs to allow for special customer applications and connections to a customer supplied ground.

**Figure 6-1**  
**S800A cabinet grounding**

FW-11222



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# Cabinet specifications

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This chapter provides the mechanical and environmental specifications of the S800A cabinet.

These specifications are subject to change without notice. Nortel Networks reserves the right to make changes to equipment design or program components, as progress in engineering, manufacturing methods, or other circumstances may warrant.

## Chapter contents

This chapter includes the following topics:

Topic	See
Mechanical features and specifications	page 7-2
Environmental features and specifications	page 7-3

## Mechanical features and specifications

The mechanical features and specifications for the S800A cabinet are listed in Table 7-1.

**Table 7-1**  
**S800A cabinet mechanical specifications**

Feature	Specification
Colors	ivory, light green, or brown
Exterior dimensions	(W x H x D)
- air induction without ac pedestal	71 in. (1.80 m) x 65 in. (1.65 m) x 30 in. (0.76 m)
- air induction with ac pedestal	82.25 in. (2.09 m) x 65 in. (1.65 m) x 30 in. (0.76 m)
- heat exchanger without ac pedestal	71 in. (1.80 m) x 77.5 in. (1.97 m) x 37 in. (0.94 m)
- heat exchanger with ac pedestal	82.25 in. (2.09 m) x 77.5 in. (1.97 m) x 37 in. (0.94 m)
Exterior volume	
- air induction without ac pedestal	80 cubic ft
- air induction with ac pedestal	114 cubic ft
- heat exchanger without ac pedestal	95 cubic ft
- heat exchanger with ac pedestal	136 cubic ft
Construction	welded 11- and 14-gauge, SAE 1008 cold-rolled steel and 5052 aluminum
Weight	
- empty	approximately 1500 pounds (882 kg)
- fully loaded	approximately 3400 pounds (1591 kg)
Door locks	Electronics compartment - Hex-key tamper-resistant locking mechanism Termination compartment - 216-type socket tool/padlock AC compartment - Padlock
Rack mounting space	189 in. (4.81 m) of rack mounting space, in four 47.25-inch (120 cm) swing-out frames

## Environmental features and specifications

The environmental features and specifications for the S800A cabinet are listed in Table 7-2.

**Table 7-2**  
**S800A cabinet environmental specifications**

Feature	Specification																		
Environmental controls	<ul style="list-style-type: none"> <li>- forced air cooling or heat exchanger</li> <li>- strip heaters</li> <li>- R8 Insulation</li> </ul>																		
Altitude	200 ft below sea level to 13,000 ft above sea level																		
Operating environment <ul style="list-style-type: none"> <li>- outside operating temperature</li> <li>- inside operating temperature</li> <li>- relative humidity</li> </ul>	<p>-40° F to +115° F (-40° C to +46° C)</p> <p>32° F to +140° F (0° C to +60° C)</p> <p>For relative humidity specifications, see <i>System Specifications</i>, 323-3001-180, in <i>Description</i>, Volume 2B.</p>																		
- Acoustical noise (measured in dBA for hard* site)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Measured from</th> <th>At distance of 10 ft.</th> <th>At distance of 20 ft.</th> </tr> </thead> <tbody> <tr> <td>Sides (front/rear)</td> <td>≈57</td> <td>≤52</td> </tr> <tr> <td>Ends</td> <td>≈55</td> <td>≤51</td> </tr> </tbody> </table> <p style="text-align: center;"><b>With Air Induction Roof (in dBA)</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Measured from</th> <th>At distance of 10 ft.</th> <th>At distance of 20 ft.</th> </tr> </thead> <tbody> <tr> <td>Sides (front/rear)</td> <td>≈58</td> <td>≤52</td> </tr> <tr> <td>Ends</td> <td>≈50</td> <td>≤48</td> </tr> </tbody> </table> <p>* A hard site is defined as a cabinet/pad installation on paved or concrete surface such as a roadway or parking lot. Grass, trees and bushes will typically provide lower noise readings than those shown above.</p>	Measured from	At distance of 10 ft.	At distance of 20 ft.	Sides (front/rear)	≈57	≤52	Ends	≈55	≤51	Measured from	At distance of 10 ft.	At distance of 20 ft.	Sides (front/rear)	≈58	≤52	Ends	≈50	≤48
Measured from	At distance of 10 ft.	At distance of 20 ft.																	
Sides (front/rear)	≈57	≤52																	
Ends	≈55	≤51																	
Measured from	At distance of 10 ft.	At distance of 20 ft.																	
Sides (front/rear)	≈58	≤52																	
Ends	≈50	≤48																	
Fire resistance	meets Bellcore TR-TSY-000487, section 5.1.3.8. for fire resistance																		
Radiated and conducted emissions	meets the Electro-Mechanical Interference (EMI) requirements of FCC regulations part 15, sub-part B, Class A)																		
—continued—																			

## 7-4 Cabinet specifications

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**Table 7-2 (continued)**  
**S800A cabinet environmental specifications**

<b>Feature</b>	<b>Specification</b>
Wind	meets Bellcore TR-TSY-000487, section 5.1.4.5 for wind resistance
Mechanical shock - transportation and drop test	meets Bellcore TR-TSY-000487, section 5.1.4.10
Mechanical vibration	meets Bellcore TR-TSY-000487, section 5.1.4.11 for vibration and Bellcore TR-EOP-000063, section 4.5.2 for earthquake Zone 4, ground level
Lightning	meets Bellcore TR-EOP-000001 and TR-TSY-000057
Ice and snow loading	295 Kg/m (60 lbs/sq.ft) meets REA 3479 PE-69, section 5.12
Solar radiation	meets Bellcore TR-TSY-000487, section 5.1.3.9
Thermal shock	meets Bellcore TR-TSY-000487, section 5.1.3.4
Corrosion resistance	meets Bellcore TR-TSY-000487, section 5.1.3.6
—end—	

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# Equipment applications and configuration

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This chapter provides information on the applications and configurations that the S800A cabinet product supports.

## Chapter contents

This chapter includes the following topics:

Topic	See
Introduction	page 8-1
Applications	page 8-2
Basic equipment configuration	page 8-2

## Introduction

The S800A product is a field upgradable, 0–672 line AccessNode system base that is housed in the existing Series 800A cabinet.

The AccessNode family of equipment, as installed in the S800A cabinet, provides a Carrier Service Area (CSA) configuration for the AccessNode product line configurations for subnetworks that have point-to-point topology.

The AccessNode service delivery system:

- simplifies networks
- enhances survivability
- packages cost-effective integrated subscriber services management in a remotely located outdoor cabinet

For detailed information regarding the AccessNode family of equipment, refer to *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A.

## Applications

The AccessNode is a next generation access platform that provides narrowband and wideband services in a flexible modular equipment package utilizing:

- point-to-point
- add-drop
- hub and/or ring feeder topologies

AccessNode offers a full range of services, including:

- Plain Old Telephone Service (POTS)
- Meridian Digital Centrex
- residential services; that is, Custom Local Area Signaling Services (CLASS)
- special services
- T1 services
- Integrated Services Digital Network (ISDN)
- Digital Data Services (DDS)
- OC-3/OC-3C Tributaries

For detailed information regarding AccessNode applications, refer to *Features and Services Description*, 323-3001-101, in *Description*, Volume 2A.

## Basic equipment configuration

The S800A AccessNode system consists of the:

- AccessNode fiber-optic based network system
- ac and dc power distribution
- a rectifier/charger
- battery backup
- service protection center (SPC) that provides primary protection for VF and T1 pairs

The basic system can be enhanced and configured as needed to meet a wide variety of application requirements.

For detailed information regarding AccessNode systems and equipment, refer to *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A.

Configurations of the S800A AccessNode cabinet include the following:

- 672-line AccessNode system
- 672-line AccessNode system + 42 external T1 repeaters

### **192-line AccessNode system**

This configuration is the basic AccessNode system serviced from externally provided fiber.

Fiber optic lines are brought into the cabinet and spliced into the Fiber Patch Panel (FPP).

The 1–192 VF lines from up to two copper-distribution shelves are then routed from the system out to the Service Protection Center (SPC). The VF lines can then be spliced directly into the Outside Plant (OSP) cables. A 600-Pair VF cross-connect option is also available.

### **672-line AccessNode system**

This configuration consists of the basic 192-line AccessNode system equipped with up to 5 additional copper-distribution shelves for a total of 7 that provide up to 96 lines each.

The 672 VF lines are then routed from the system out to the Service Protection Center (SPC). The VF lines can then be spliced directly into the Outside Plant (OSP) cables. A 600-Pair VF cross connect option is also available.

### **672-line AccessNode system + 42 external T1 repeaters**

The extended system configuration consists of the basic the 192-line or 672-line systems equipped with repeater shelves and digital signal cross-connect (DSX) facilities.

Forty-two DS1 lines are routed through the Access Bandwidth Manager (ABM) shelf to the DSX facility into two twenty-eight slot repeater shelves and then to the OSP facility.

Service is provided for up to four single mode (SM) fiber optic cables which route into the ABM shelf through an FPP located in the electronics compartment of the cabinet.

Table 8-1 on page 8-4 represents the minimum and maximum configurations for the S800A cabinet 672-line AccessNode System. The 192-line system has only two copper-distribution shelves in the right-side swing frame.

Figure 8-1 on page 8-5 shows the front view equipment layout for the S800A 672-line AccessNode system. Figure 8-2 on page 8-6 shows the rear view equipment layout for the S800A-672 line AccessNode system.

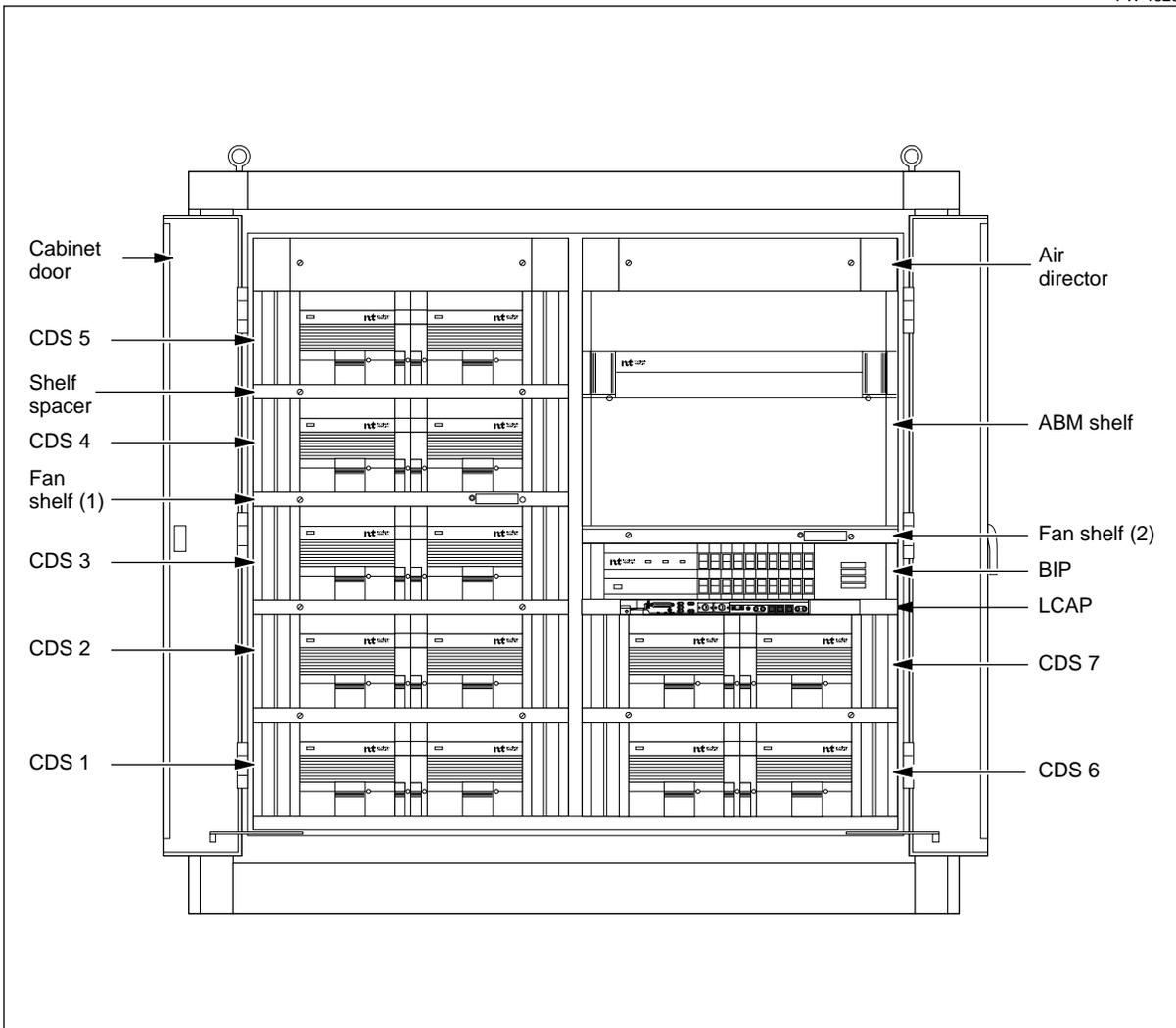
## 8-4 Equipment applications and configuration

**Table 8-1**  
**S800A cabinet 672-line AccessNode configuration**

System equipment	672-line configuration		672-line + 42 Rptr configuration	
	minimum	maximum	minimum	maximum
Access bandwidth manger (ABM)	1	1	1	1
Copper distribution shelf (CDS)	1 (up to 96 lines)	7 (up to 672 lines)	1 (up to 96 lines)	7 (up to 672 lines)
Breaker interface panel (BIP)	1	1	1	1
Local craft access panel (LCAP)	1	1	1	1
Fan shelf assembly	1	2	1	2
Rectifiers	1	2:+1	1	2:+1
Batteries	0 Ah	275 Ah	0 Ah	350 Ah
Termination	100-pairs	700-pairs	100-pairs	800-pairs
SPC pairs	100-pairs	700-pairs	100-pairs	800-pairs
Cross connect	0	576 lines	0	576 lines
Fiber patch panel (FPP)	0	1	0	1
DSX-1	0	1	0	1
Repeaters	-	-	1	42

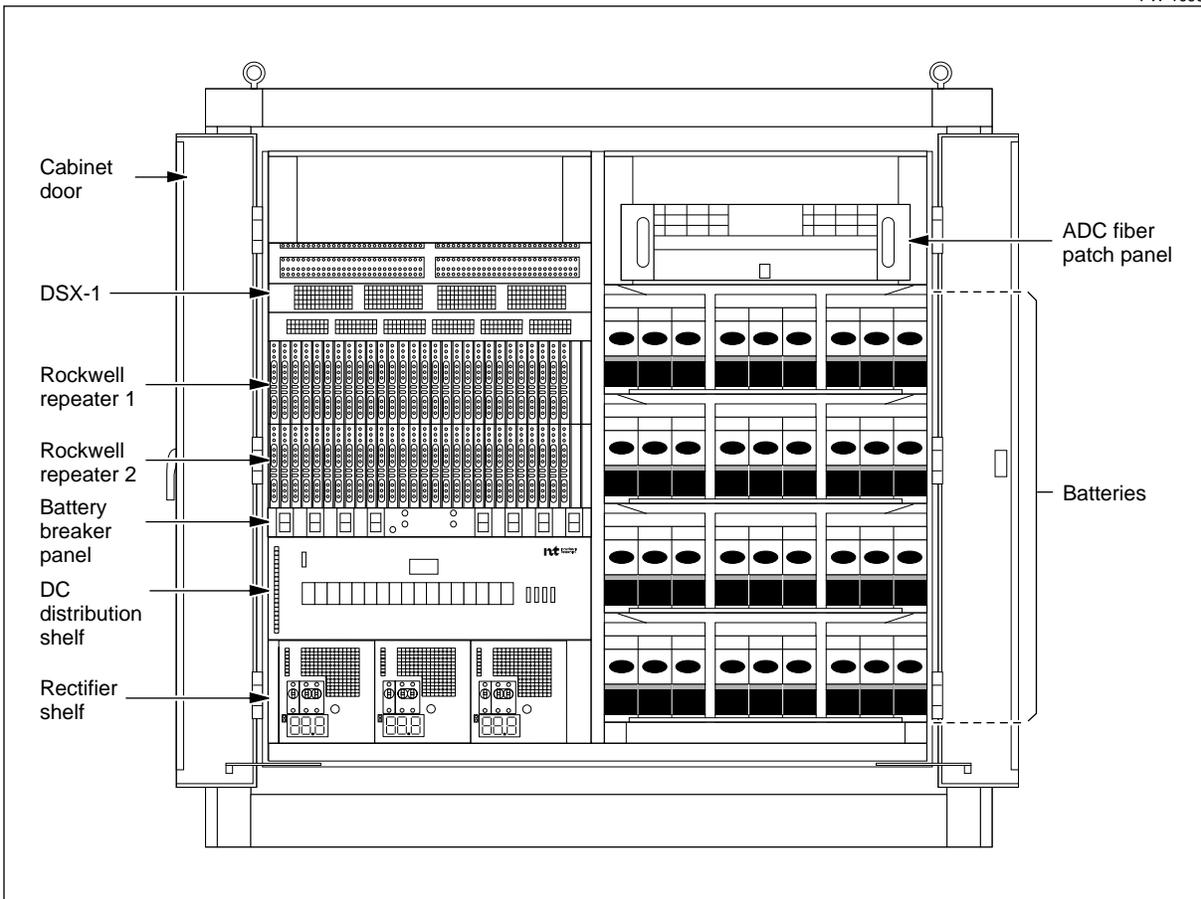
**Figure 8-1**  
**S800A equipment layout front view**

FW-15239



**Figure 8-2**  
**S800A equipment layout rear view**

FW-10991



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# Equipment descriptions

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This chapter provides general descriptions of the AccessNode equipment used in the S800A cabinet.

## Chapter contents

This chapter includes the following topic:

Topic	See
AccessNode equipment descriptions	page 9-1

## AccessNode equipment descriptions

The AccessNode equipment can be configured to any access application. The flexibility is achieved by configuring any combination of the following equipment shelves:

- access bandwidth manager shelf (ABM)
- breaker interface panel (BIP)
- local craft access panel (LCAP)
- copper-distribution shelf (CDS)
- fan shelf

For detailed information regarding the AccessNode equipment descriptions, reference *Configuration and Equipment Description, 323-3001-100, in Description, Volume 2A*.

The following sections describe the AccessNode equipment.

### Equipment layout

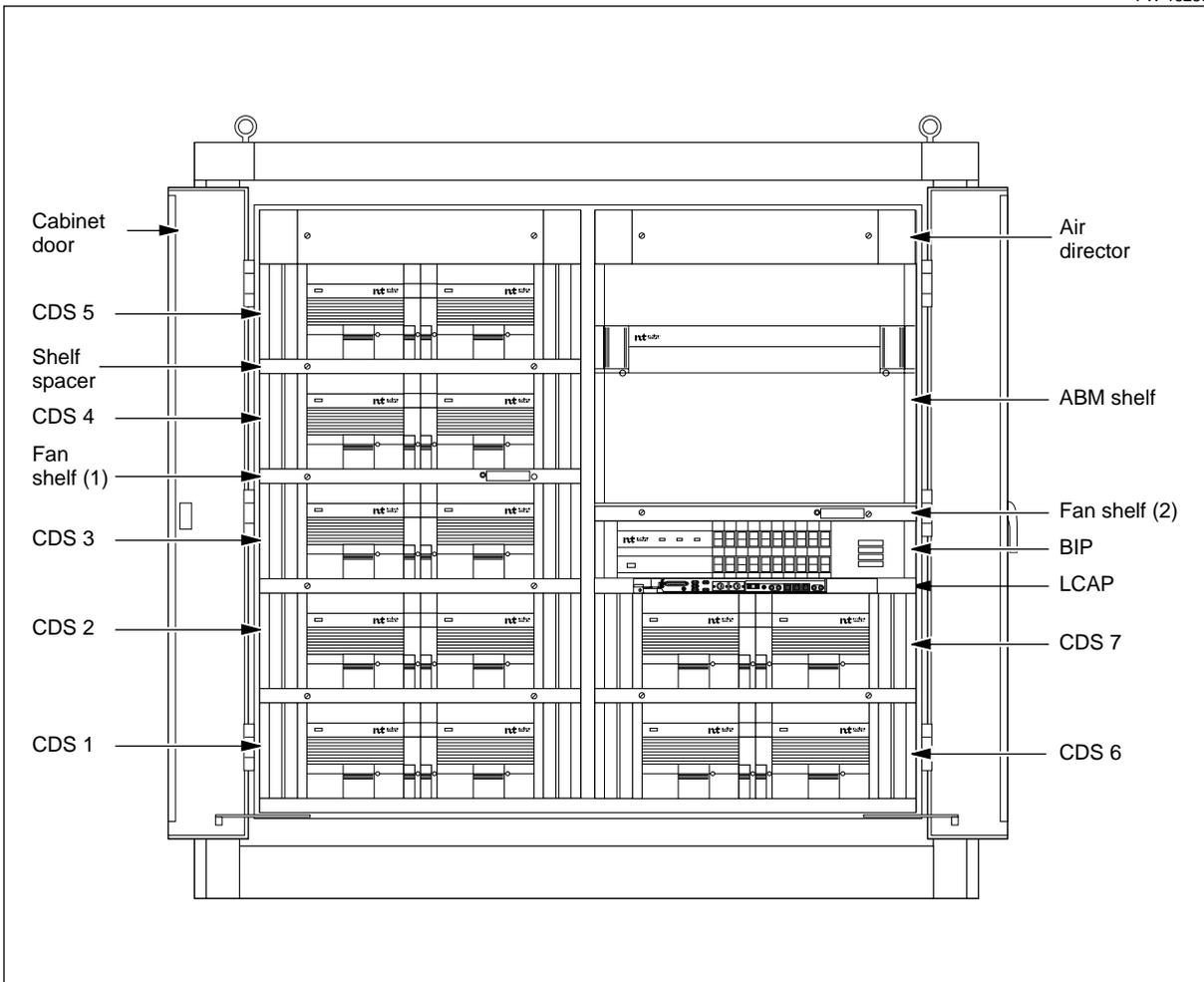
The equipment shelves described in this section mount in the front-side of the cabinet in two swing frames (left-side and right-side).

Figure 9-1 shows the equipment layout and shelf positions in the front-side cabinet electronics compartment in the S800A AccessNode outside plant cabinet.

## 9-2 Equipment descriptions

**Figure 9-1**  
**S800A equipment layout front view**

FW-15239



**Access bandwidth manager shelf**

The NT4K10 access bandwidth manager (ABM) shelf supports up to seven copper-distribution shelves installed with wideband interface units providing up to 672 VF lines (see Figure 9-2 on page 9-4).

The ABM also performs bandwidth management at the DS0 level and routes portions of the SONET payload to the copper-distribution shelves.

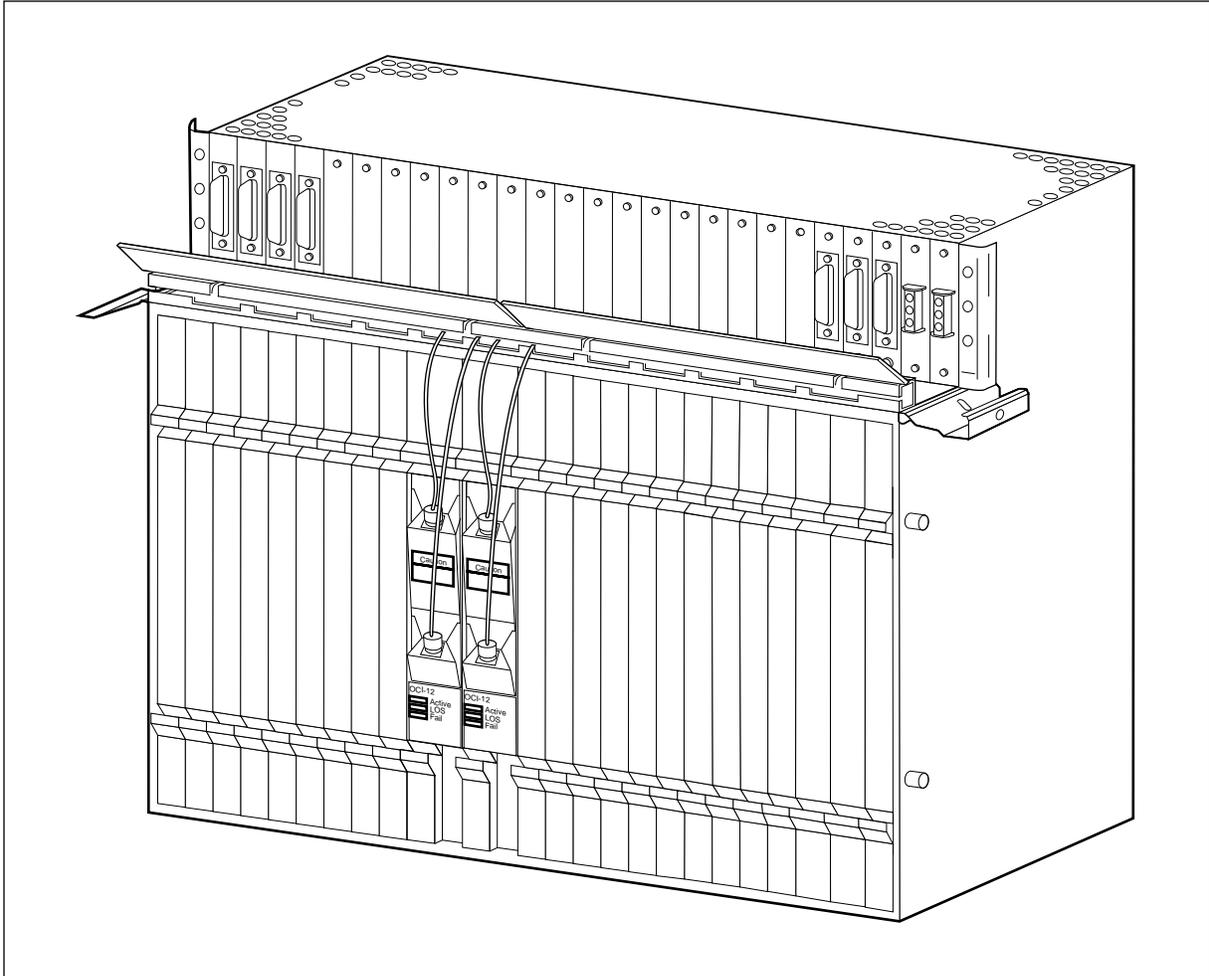
The ABM shelf is designed for full front access to the internally mounted circuit packs. The layout of the ABM shelf includes slots for:

- side interconnect circuit packs (left and right)
- tributary interface circuit pack positions
- primary interface circuit pack positions
- secondary interface circuit pack positions
- access circuit pack positions
- control circuit pack positions

For detailed information regarding the access bandwidth manager shelf and circuit pack descriptions, reference *Configuration and Equipment Description*, 323-3001-100, in *Description*, Volume 2A.

**Figure 9-2**  
**ABM shelf close-up view**

FW-10243



## Breaker interface panel

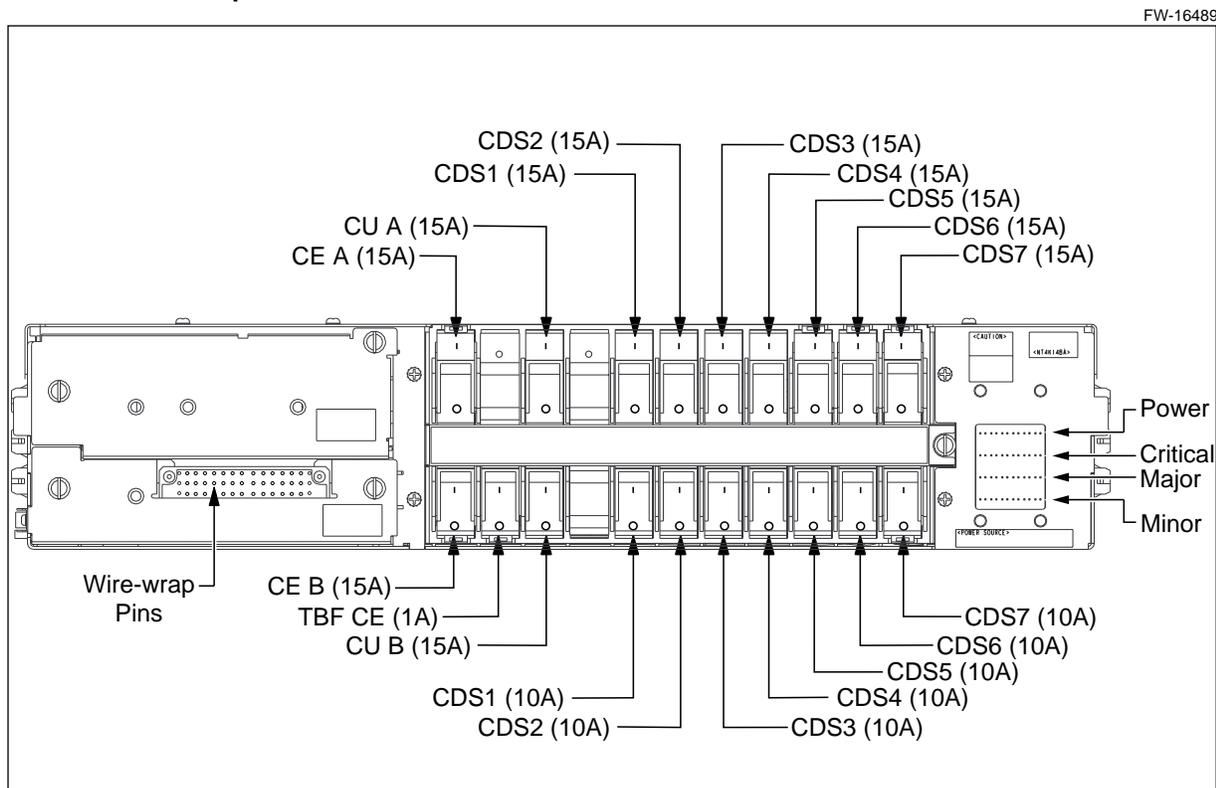
The NT4K14BA breaker interface panel (BIP) is the power distribution unit for the AccessNode equipment (see Figure 9-3). It distributes battery power to the access bandwidth manger shelf, the copper-distribution shelves (CDS), and cooling units (CU).

The BIP contains provisions for up to nineteen (19) circuit breakers to:

- protect talk-battery and power feeds to the CDS
- protect the A and B power feeds to the ABM
- protect the test access card
- protect cooling units in the system

For detailed information regarding the breaker interface panel description, reference *Configuration and Equipment Description, 323-3001-100, in Description, Volume 2A*.

**Figure 9-3**  
Breaker interface panel



**Note:** For the NT4K14AB BIP product releases 03 and below, CU A and CU B are 10A breakers. All later BIP releases CU A and CU B are 15A breakers.

**Local craft access panel**

The NT4K16 local craft access panel (LCAP) provides the craftsperson with access to the ABM shelf status information, alarms and the local test access bus (see Figure 9-4).

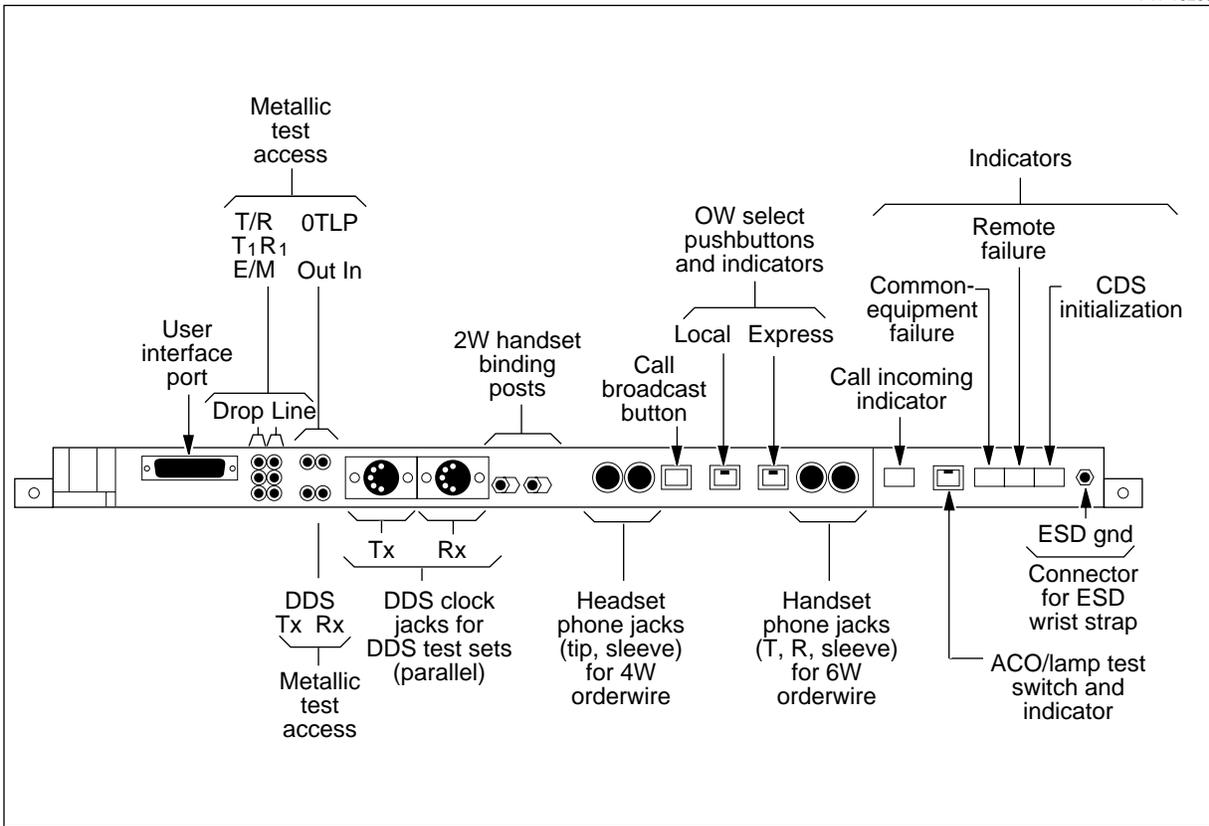
Functions available through the LCAP include:

- orderwire
- line test access
- RS-232C interface for system configurations
- DDS clock access
- alarm cut-off (ACO)
- alarm indicator LEDs
- ESD grounding

For detailed information regarding the local craft access panel description, reference *Configuration and Equipment Description, 323-3001-100, in Description, Volume 2A.*

**Figure 9-4**  
**Local craft access panel**

FW-10208



## Copper-distribution shelf

The NT4K12 copper-distribution shelf (CDS) provides copper interfaces to serve subscribers on loops of up to 1900 ohms (including the telephone set). Using only five different types of line interface units, a full range of copper-based services are supported.



### CAUTION

#### Risk of damage to equipment

During initial setup of the AccessNode, Nortel Networks recommends that the equipment side remain disconnected from the outside plant subscriber loops (at the protector modules) until the line cards are installed and powered up.

For example, when using five-pin protector modules, pull the modules out slightly, to the first detent position.

The CDS is divided into two drawers each containing 48 line interface slots for:

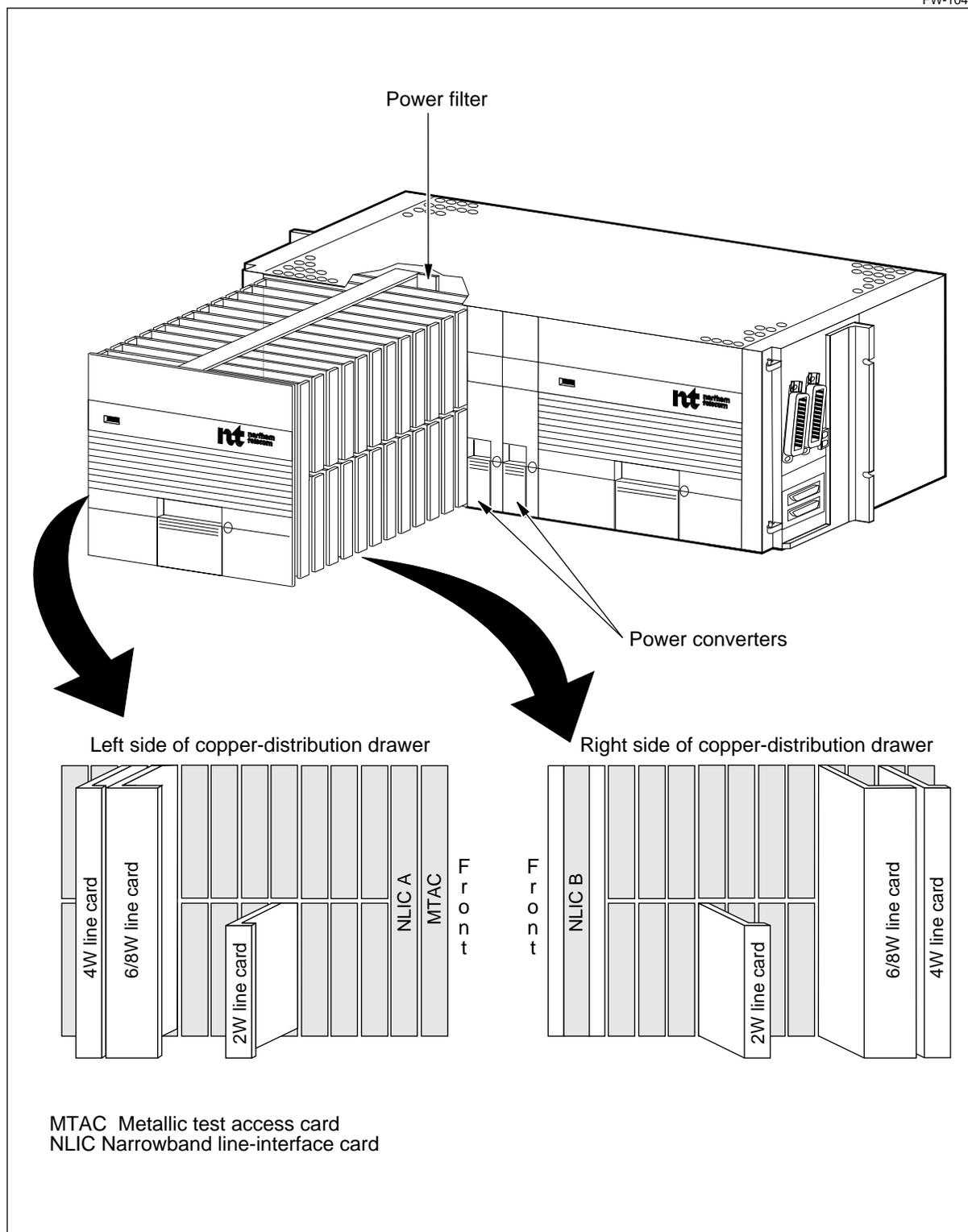
- 2-wire services
- 4-wire services
- 6/8-wire services

Mounted between the two drawers are two redundant power converters that supply power to the line interface units (see Figure 9-5 on page 9-8).

For detailed information regarding the copper-distribution shelf and circuit pack descriptions, reference *Signal Flow and Circuit Pack Description*, 323-3001-102, in *Description*, Volume 2A.

Figure 9-5  
CDS close-up view

FW-10431



## Equipment fan shelves

In addition to the cabinet roof fans, there are equipment fan shelf assemblies mounted in the equipment swing frames in the interior of the electronics compartment. They are used to enhance equipment cooling.

Up to two fan shelves, fan shelf 1 and fan shelf 2, can be mounted in the electronics compartment front-side swing frames.

### Fan shelf 2

There is one factory-installed fan shelf assembly mounted in the electronics compartment.

The factory installed fan shelf (Fan Shelf 2) mounts above the BIP and below the ABM shelf in the right-side equipment swing frame (see Figure 9-1 on page 9-2).

A connectorized power cable connects the fan shelf (in parallel with the roof fans) to -48 V dc battery feeds from the CU B circuit breaker on the BIP.

### Fan shelf 1

In applications using more than three AccessNode copper-distribution shelves, a second fan shelf must be ordered and installed in the electronics compartment.

The second fan shelf (Fan Shelf 1) mounts above the CDS 3 and below the CDS 4 shelf positions in the left-side swing frame (see Figure 9-1 on page 9-2).

A connectorized power cable connects the fan shelf (in parallel with the roof fans) to -48 V dc battery feeds from the CU A circuit breaker on the BIP.

### Fan shelf equipment

Fan shelf equipment depends on the type of cabinet. There are two types of cabinets:

- standard S800A cabinet
- VTBM-ready S800A cabinet

**Standard cabinet**

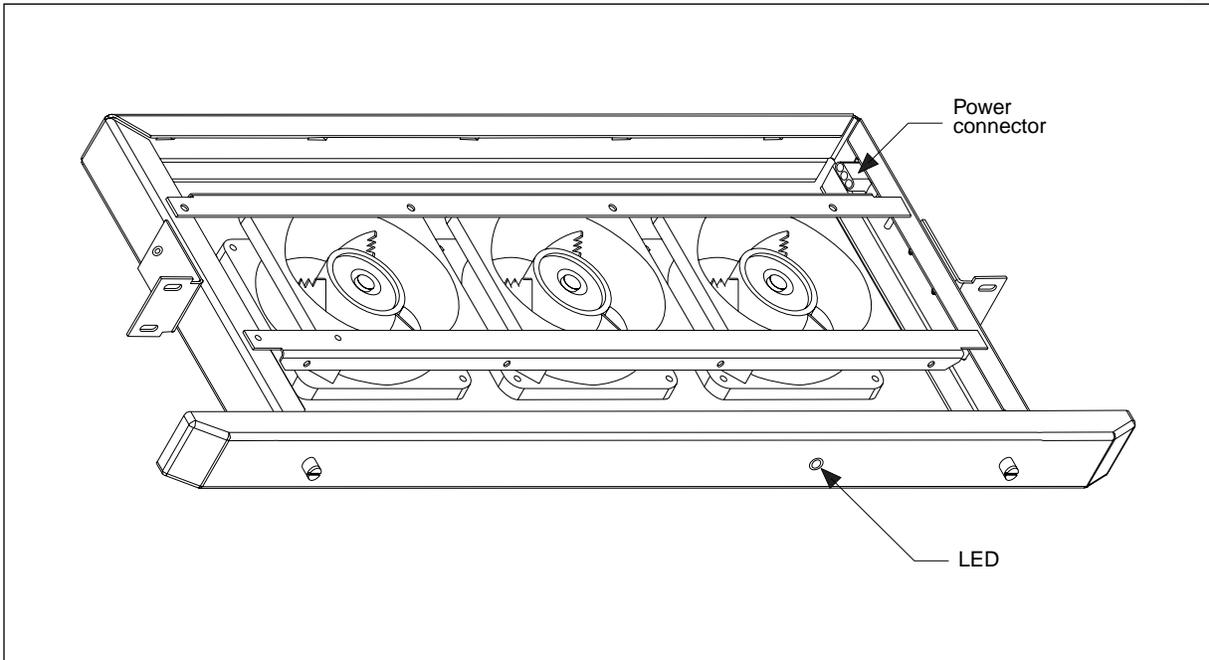
Equipment fan shelves (see Figure 9-6) in the standard NT1W00DA/EA/FA cabinets include the following:

- one NT1W009AA fan shelf mounted in the right-hand swing frame
- one optional NT1W09AA fan shelf mounted in the left-hand swing frame

The two fan shelves run continuously and pull air up through the equipment shelves mounted below and push the air up through the shelves mounted above in a bottom to top direction. The two fan shelves each consist of three 4-inch, -48 V dc, 105 f3/min fans in a 1-position mounting framework. Each individual fan unit is thermally fused for protection against overheating.

**Figure 9-6**  
**NT1W09 3-fan shelf**

FW-15237



**VTBM-ready cabinet**

Equipment fan shelves in the VTBM-ready NT1W00GA/HA/JA cabinets include the following:

- one NT4K0610 8-fan shelf (see Figure 9-7) mounted in the right-hand swing frame
- one optional NT1W09CA fan shelf (see Figure 9-6) mounted in the left-hand swing frame

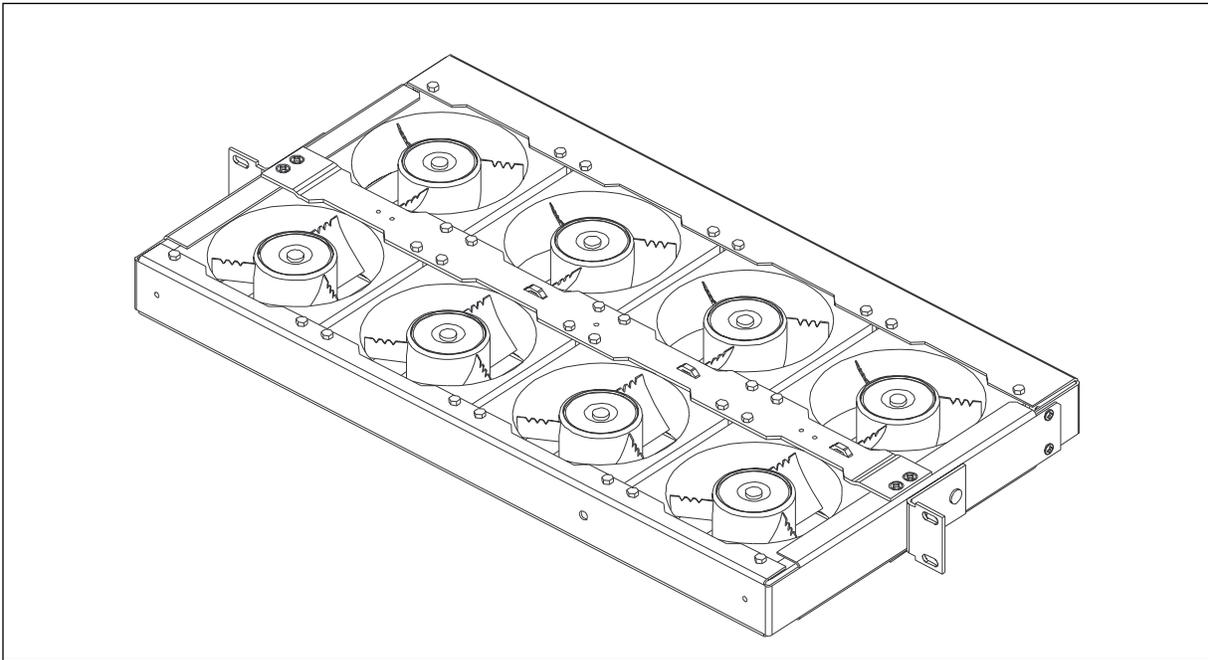
The two fan shelves run continuously and pull air up through the equipment shelves mounted below and push the air up through the shelves mounted above in a bottom to top direction.

The NT4K0610 8-fan shelf (fan shelf 2) consists of eight 4-inch, -48 V dc, 105 f3/min fans in a 1-position mounting framework. Each individual fan unit is thermally fused for protection against overheating.

The NT1W09CA 3-fan shelf (fan shelf 1) consists of three 4-inch, -48 V dc, 105 f3/min fans in a 1-position mounting framework. Each individual fan unit is thermally fused for protection against overheating.

**Figure 9-7**  
**NT4K0610 8-fan shelf**

FW-15607



**Fan alarms**

The roof fans generate high temperature alarms when interior temperatures exceed 140° F (60° C) ± 2° C.

The fan equipment shelves generate a major fan fail alarm (FFA) and the front panel red LED illuminates when at least one fan unit fails in the shelf.

The fan shelves provide connection points for fan failure alarm reporting to the battery breaker panel (BBP). The fan shelf alarms are wired in parallel to one another to the BBP FAN alarm connector Pin 9.

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# Peripheral equipment descriptions

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This chapter provides general descriptions of the peripheral equipment used in the S800A cabinet.

## Chapter contents

This chapter includes the following topic:

Topic	See
Peripheral equipment descriptions	page 10-2

## Peripheral equipment descriptions

External to, and working in conjunction with, the AccessNode system, are other equipment shelves and options that provide extended flexibility in meeting customer needs.

Other cabinet equipment and options include:

- rectifiers
- batteries
- battery breaker panel
- serving area interface interconnection facilities
- fiber patching facilities
- dc distribution shelves
- DSX-1 cross-connect facilities
- repeater/span termination facilities

The cabinet equipment and options as listed above are described in the sections that follow.



**DANGER**  
**Fire hazard**

Remove all paper and any other combustible materials from inside the cabinet before the cabinet is powered-up.

Failure to comply with this warning could result in a fire.

### Rectifiers

The S800A cabinet offers the NT5C06CA-3 MPR25 25A rectifier in combinations of one, two or three plug-in modules mounted in the NT5C10CE rectifier shelf (see Figure 10-1).

The three rectifiers provide n+1 redundancy when the third rectifier is installed.

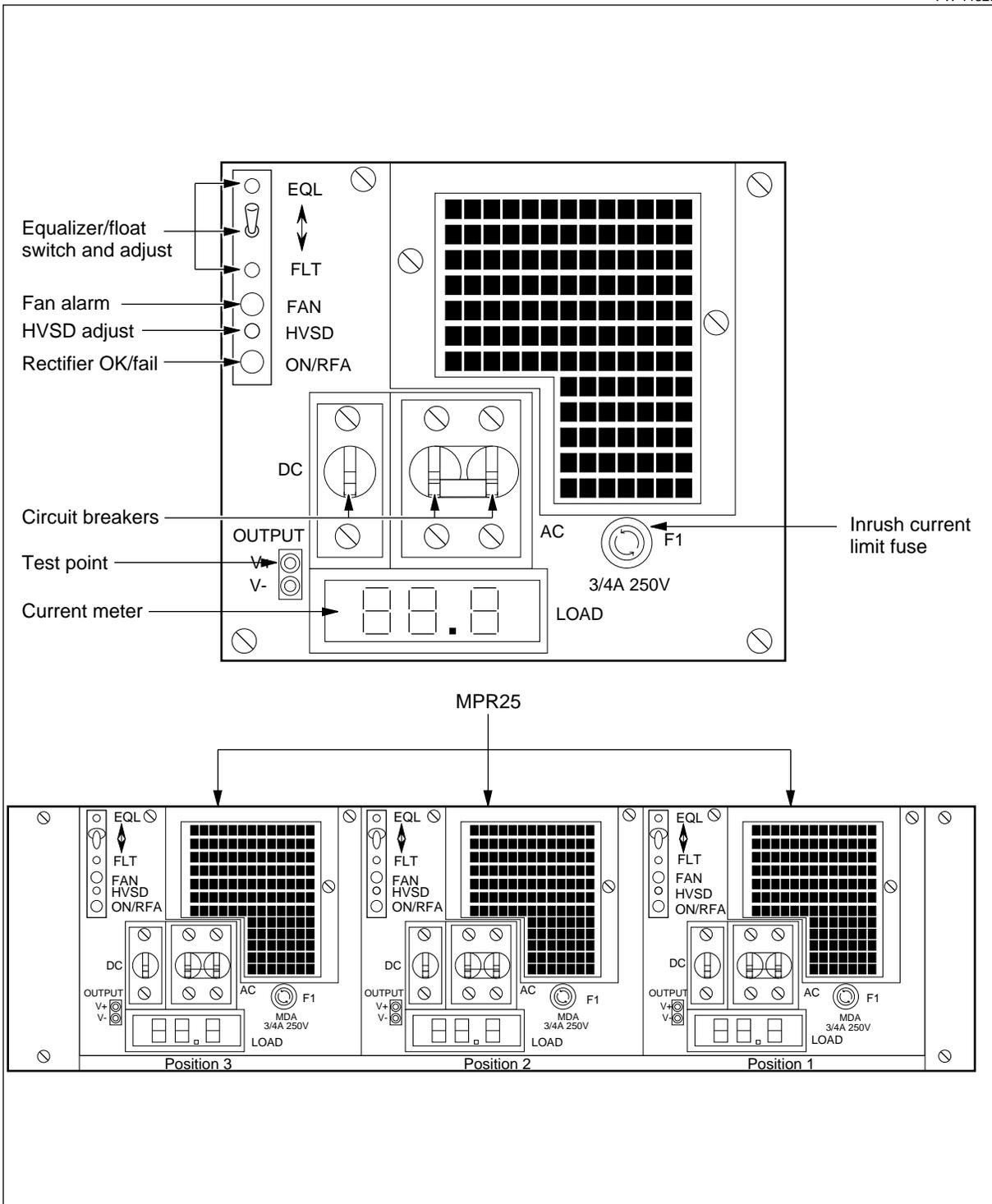
The rectifiers:

- power the installed equipment
- power the cabinet fans
- provide battery charge current

The output voltage of the NT5C06CA rectifier is adjustable from -44 V dc to -56 V dc and is nominally adjusted to provide an output of -55 V dc.

**Figure 10-1**  
**NT5C10CE rectifier shelf e/w three NT5C06CA-3 rectifiers**

FW-11328



**Batteries**

The S800A cabinet offers a variety of battery options. Eight hours of battery reserve power can be delivered at up to a maximum of 350 Amp-hours (Ah).

The following battery options are available:

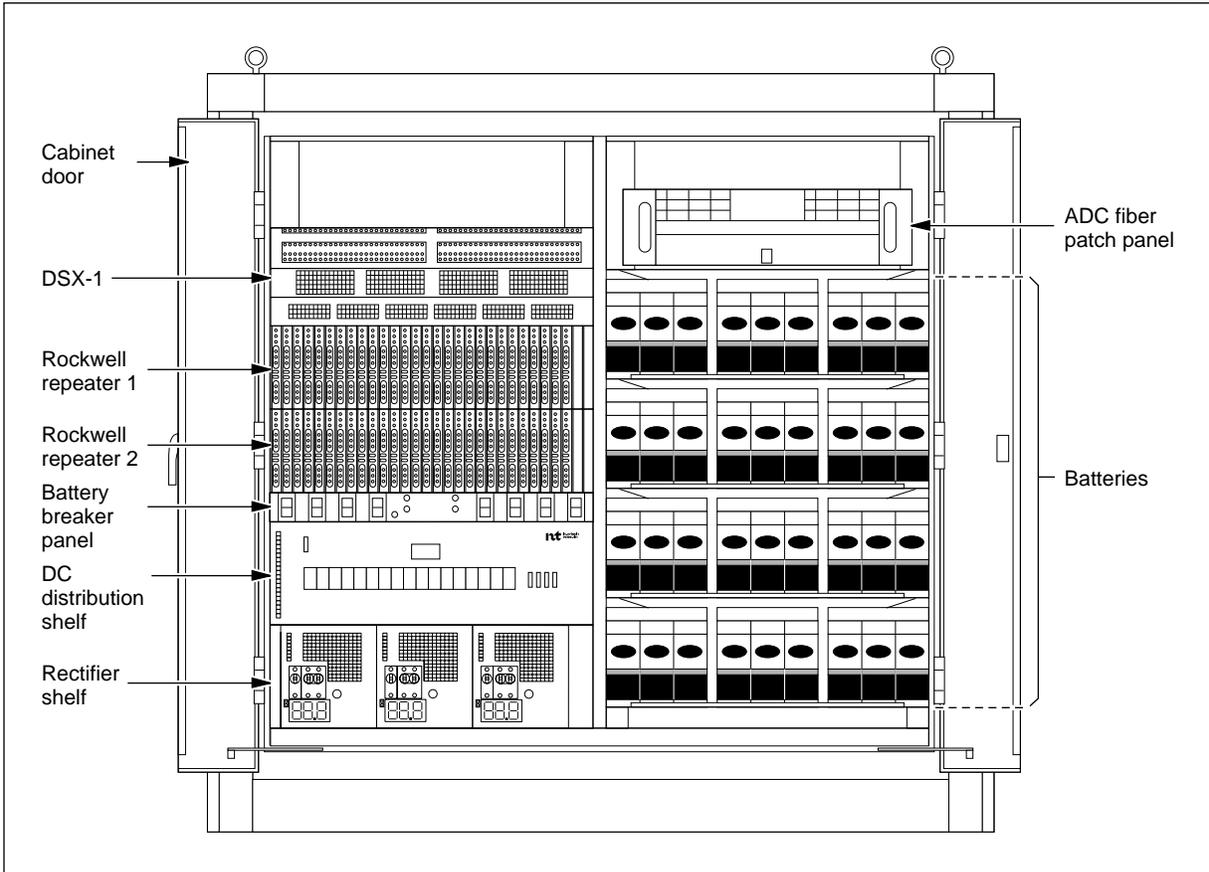
Manufacturer	Voltage	Rating
Gates	12 V dc	25 Ah
Yuasa	12 V dc	25 Ah
Eagle-Picher	6 V dc	50 Ah

The batteries are valve-regulated lead-acid cells equipped with plug-in connectors for ease of installation and maintenance.

The batteries are mounted in the S800A cabinet (see Figure 10-2) or, optionally, inside an in-ground battery vault (see Chapter 12, “Battery vault description”).

**Figure 10-2**  
S800A rear view with battery shelves

FW-10991



**Battery breaker panel**

The battery breaker panel (BBP) provides circuit breaker protection for up to 14 battery strings and a second repeater shelf (see Figure 10-3 on page 10-6).

Two separate circuits, A and B, provide monitored circuit protection for four circuits each.

Rack mounted above the dc distribution shelf in the left-hand equipment swing-out frame in the rear of the cabinet, the BBP is equipped with:

- trip alarm indicators
- fail safe circuitry
- power line noise filtering
- stud type input power connections for two-hole lugs having 5/8-inch centers
- quick-connect output power connections for 22 AWG to 10 AWG wiring
- wire-wrap alarm block for 22 AWG to 24 AWG external alarm wiring

Alarms are generated and the front panel alarm indicator LEDs illuminate when the breakers are tripped due to overload or short circuiting. The alarms are extended to the AccessNode via the wire-wrap pin connections at the rear of the unit.



### Serving area interface

The serving area interface (SAI) options for VF and DS1 termination for 2:1 cross-connection facilities up to 576 VF pairs or termination for up to 672 pairs include the:

- NT1W37AA 100-pair VF SPC module kit with 3M MS<sup>2</sup> type connectors
- NT1W37BA 100-pair VF SPC module kit with AT&T 710 type connectors
- NT1W37CA 100-pair VF SPC module kit with Nortel Networks BIX type connectors

The modular SPC provides interconnection facilities between the OSP cables and the electronics compartment for all VF and T1 lines. SPC options include 100-pair protector blocks using 5-pin lightning protector modules. Up to a maximum of ten protector blocks (1000 pairs) can be installed.

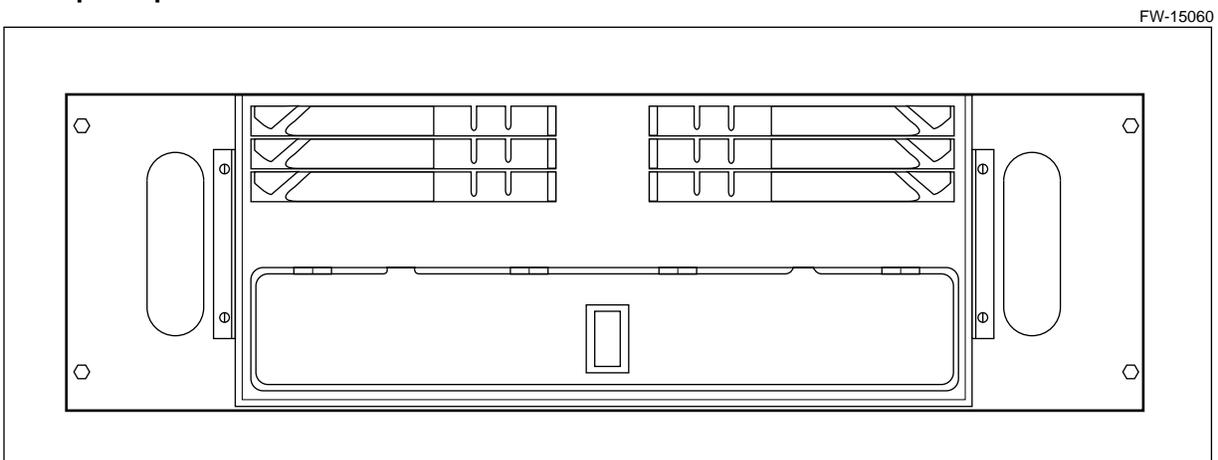
**Note:** To maintain UL listing, the SPC should employ UL listed, 5-pin protector modules. Nortel Networks recommends the use of solid state protectors in all outside applications. The voltage limiting characteristics of the station protectors have a considerable impact on voltages impressed on the electronics of the system. Solid state protectors offer faster reaction times, a more predictable operating voltage, longer service life and an increased safety factor.

For detailed information regarding the SPC option ordering, reference *Engineering and Ordering Information*, 323-3001-032, in *Engineering, Configuration, and Ordering Guide*, Volume 1.

### Fiber patching facilities

The NT7A65AA fiber patch panel (FPP) provides OSP fiber cable termination and pigtail splicing for up to 24 fibers (see Figure 10-4). Fiber patch cords carry the fiber signal to the ABM shelf.

**Figure 10-4**  
Fiber patch panel



### **DC distribution shelf**

The S800A cabinet is equipped with the NT6C14JC dc distribution shelf equipped with the analog NT6C14PC control circuit pack for a -48 V dc power system with a current capacity of up to 150 A (see Figure 10-5 on page 10-9).

The unit distributes -48 V dc power to the S800A equipment and performs all the supervisory and control functions required for a reliable and continuous power supply.

Reference material for the shelves include:

- NTP 167-9021-104, *MFA150 Modular Front Access Power System*
- NTP 167-9051-100, *Modular Business Package Distribution Panel*

### **Functional features**

The unit provides the following service features:

- 150 A charge/discharge capacity
- integrated distribution and control/monitoring facilities
- battery of batteryless operation
- circuit breaker protection for equipment
- low voltage disconnect (LVD) facilities for battery protection
- battery connection for battery back-up switching
- fully connectorized backpanel for ease of installation and operations

### **NT6C14JC dc distribution shelf**

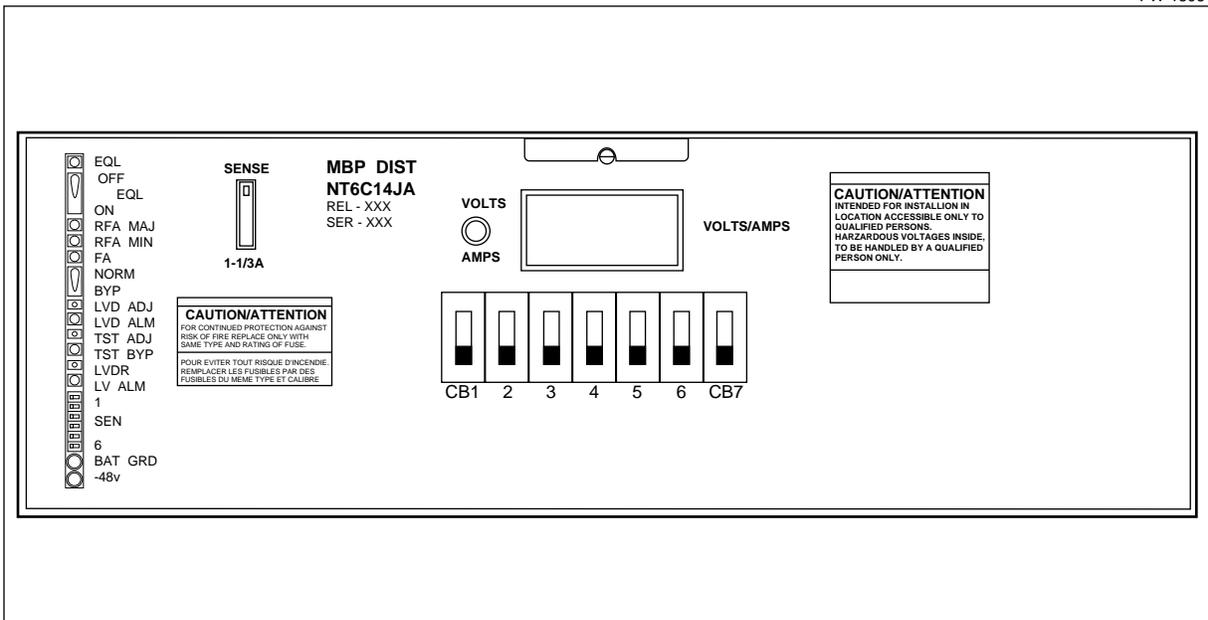
The NT6C14JC dc distribution shelf (see Figure 10-5 on page 10-9) serves as a dc power distribution point for the rectifiers and batteries in the S800A equipment.

Functional features of the NT6C14JC include:

- four 30 A circuit breakers to protect the power output to the BIP for the AccessNode equipment load
- one 30 A circuit breaker designated as spare
- one 10 A circuit breaker to protect the second repeater shelf if installed
- battery connection
- NT6C14PC analog control and monitoring unit

**Figure 10-5**  
**NT6C14JC dc distribution shelf**

FW-15061



### NT6C14PC analog control and monitoring unit

The NT6C14PC provides the:

- equalize voltage control and adjustments
- low voltage disconnect (LVD) and adjustment facility
- monitoring of the power supplies to the AccessNode load
- alarming indications

### LVD

The adjustable level LVD disconnects the batteries from the equipment at a pre-set level (refer to your battery manufacturer's specifications) in the event of an extended period of ac or dc power failure where rectifier charging is not possible.

Re-connection of the batteries for low voltage disconnect/reconnect (LVDR) is done when the voltage level regains the pre-set level.

The LVD protects the batteries from being discharged to the point of being severely damaged. LVD voltage operating limits are:

- LVD: -42 V dc to -52 V dc
- LVDR: -47 V dc to -56 V dc

### **EQL**

Equalize (EQL) voltage level is sensed by the NT6C14PC and provides a battery return signal to the remote equalize input of the rectifiers.

Equalizing action start/stop is manually selected by operation of the EQL toggle switch on the front panel of the unit.

### **Alarm indications**

Visual alarm indicators show the status of the monitored equipment and are transmitted to the AccessNode equipment. Table 10-1 defines the alarms.

**Table 10-1**  
**NT6C14PC alarm indications**

<b>Alarm</b>	<b>Indication</b>	<b>Lamp color</b>
RFA MIN	Single rectifier failure	Yellow
RFA MAJ	Multiple rectifier failure	Red
FA	Fuse failure	Red
LVA	Low voltage alarm	Red
LVD	Low voltage disconnect	Red
EQL	Equalize activated	Yellow

### **DSX-1 cross-connect facilities**

Installed in the left-side equipment rack in the rear of the S800A cabinet, the DSX-1 panels interconnect the span termination shelves and the ABM shelf.

DSX cross-connect facilities are available in two optional configurations:

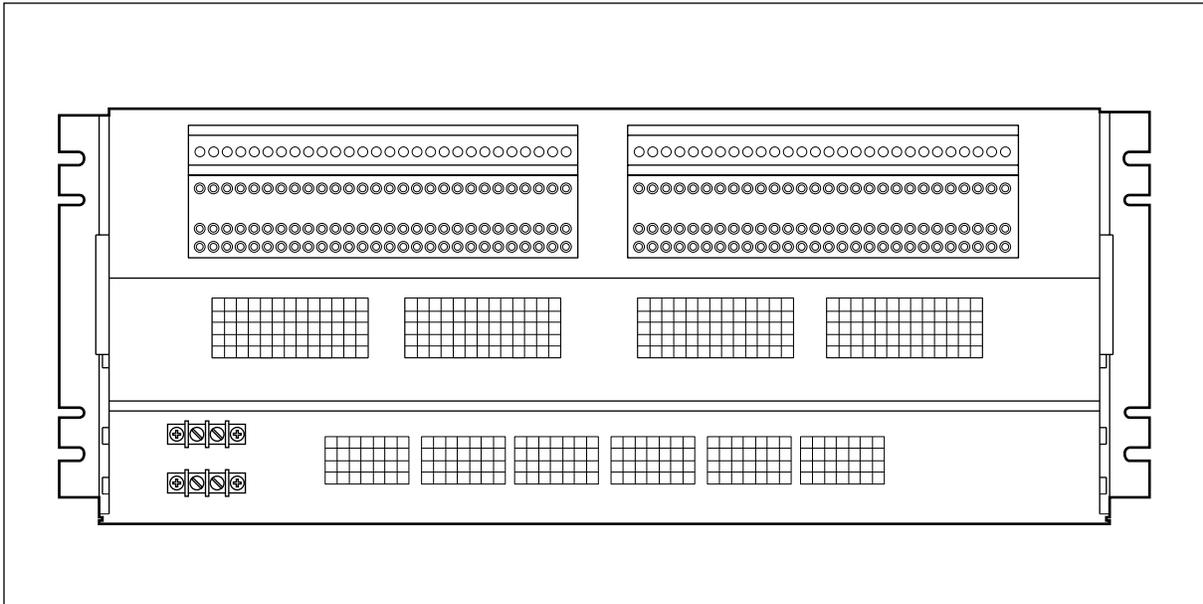
- one 28-circuit panel (56 positions)
- one 42-circuit panel (84 positions)

The two cross-connect panels (see Figure 10-6 on page 10-11 and Figure 10-7 on page 10-11) are provided in the AccessNode + 42 External T1 configuration.

The DSX panels provide bantam jack access ports for testing and cross-connecting DS1 lines.

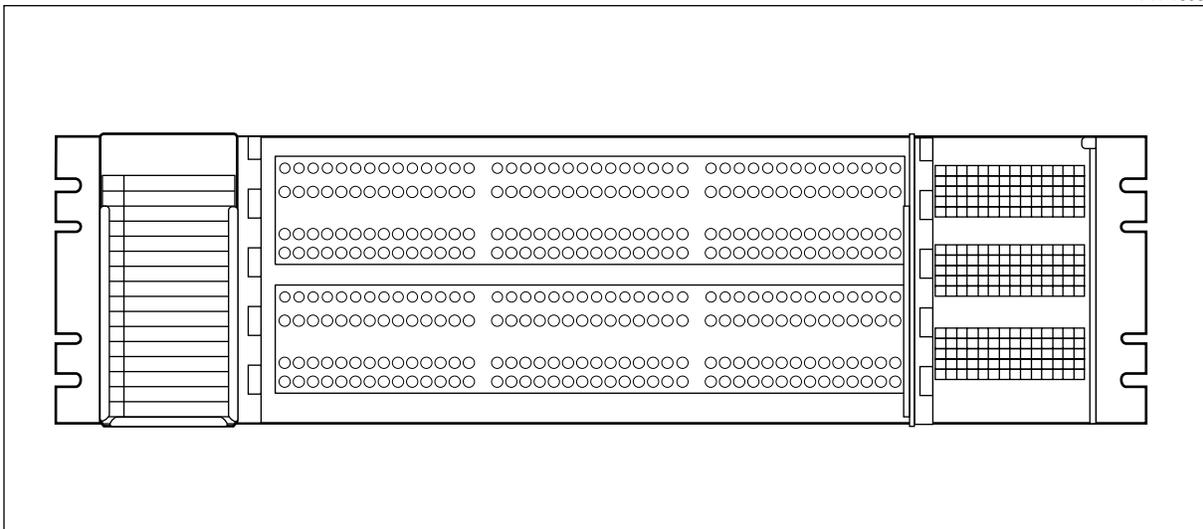
**Figure 10-6**  
**DSX-1 cross-connect panel (56 position)**

FW-15062



**Figure 10-7**  
**DSX-1 cross-connect panel (84 position)**

FW-15063



**Repeater/span DS1 termination facilities**

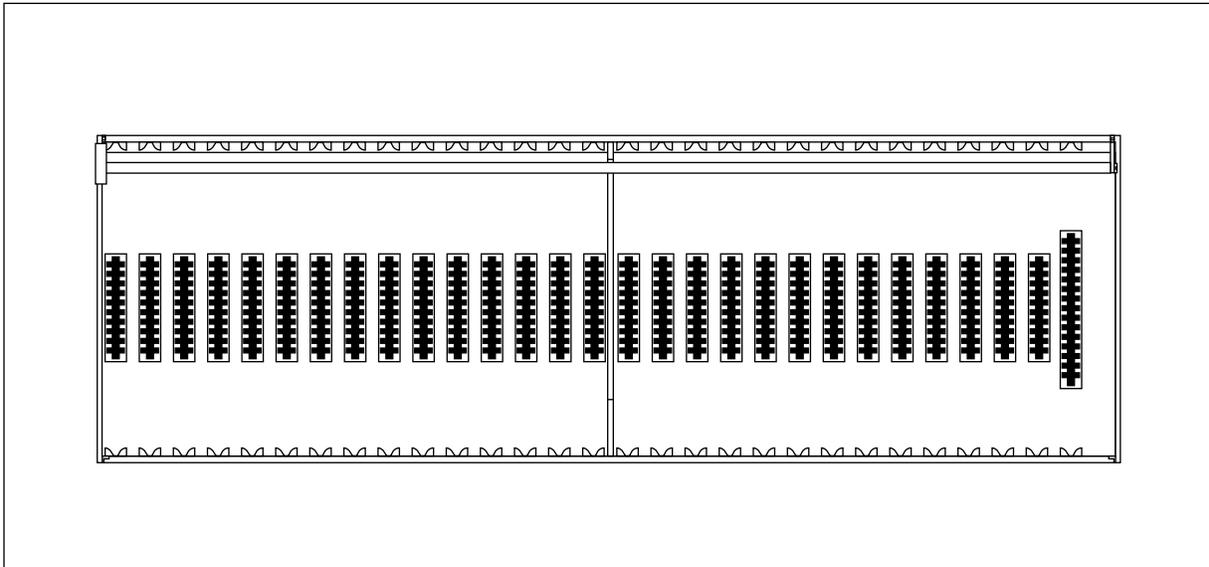
DS1 termination facilities are provided by up to two 28-position repeater shelves (see Figure 10-8).

DS1 lines IN are terminated with powering or bridging repeater modules or cut-through repeater modules as required.

The repeater shelves are equipped with a fuse and alarm module for power protection of the modules and fuse alarm generation/transport to the alarm reporting section of the BIP.

**Figure 10-8**  
**Repeater shelves**

FW-15059



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# Cabinet options

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This chapter lists the available provisionable options for the S800A cabinet.

## Chapter contents

This chapter contains a table that lists and describes AccessNode S800A cabinet equipment.

Where multiple units are listed together, you may select one of the options listed. For detailed ordering and configuration information, reference the following AccessNode documentation volumes:

**Engineering, Configuration and Ordering Guide, Volume 1**

- *Engineering and Ordering Information*, 323-3001-032
- *Site Installation Planning and Engineering*, 323-3001-200

**Description, Volume 2A**

- *Configuration and Equipment Description*, 323-3001-100

## Cabinet option table

Table 11-1 lists a general synopsis of the cabinet options available to meet the requirements of either provisionable S800A system configuration.

**Table 11-1**  
**S800A cabinet options**

Equipment	Description
AccessNode S800A cabinets	Field upgradable 0 to 672-line AccessNode system base housed in the existing NT7A51 Series 800E outside plant cabinet  Standard cabinets: NT1W00DA - Brown NT1W00EA - Ivory NT1W00FA - Green  VTBM-ready cabinets: NT1W00GA - Brown NT1W00HA - Ivory NT1W00JA - Green
Two options are available for the S800A cabinet: air induction roof and heat exchanger roof.  NT7A69AA roof assembly NT7A69BA roof assembly NT7A69CA roof assembly NT7A69DA roof assembly NT7A69EA roof assembly NT7A69FA roof assembly	Air induction roof assembly, Brown Air induction roof assembly, Ivory Air induction roof assembly, Green Heat exchanger roof assembly, Brown Heat exchanger roof assembly, Ivory Heat exchanger roof assembly, Green
NT7A52CA anchor plate kit NT7A52DA anchor plate kit NT7A52EA anchor plate kit NT7S52FA anchor plate kit	Standard raised Cabinet w/attached pedestal Cabinet w/remote pedestal Cabinet w/attached pedestal, raised pad
NT4K10AB ABM shelf	Access bandwidth manager shelf
NT4K12AA/AB CDS	Copper distribution shelf
NT4K16CA LCAP shelf	Local craft access panel allows jack access to multiple FL/OW pairs
NT4K14BA BIP shelf	Breaker interface panel
NT1W09AA fan shelf (standard cabinets) NT4K0610 fan shelf (VTBM-ready cabinets) NT1W09CA fan shelf (VTBM-ready cabinets)	Fan shelf assemblies • Fan shelf 2 standard factory equipped • Fan shelf 1 required option when >3 CDS installed
NT5C10CE rectifier shelf	Equipped with NT5C06CA-3 rectifiers (qty. 3 max.)
—continued—	

**Table 11-1 (continued)**  
**S800A cabinet options**

Equipment	Description
ADC DSX-1 shelves	<ul style="list-style-type: none"> <li>• one ADC DSX-1 84-position panel for use with fiber multiplex terminals</li> <li>• two ADC DSX-1 56-position panel for use with fiber multiplex terminals</li> </ul>
Rockwell Repeater shelf	Rockwell Int'l 28-position span shelf
NT7A65AA ADC fiber patch panel	Provides connectorized access and splice shelf for fiber optic cables in electronics compartment
NT6C14JC DC distribution shelf	Analog dc distribution facility
NT1W37AA SPC NT1W37BA SPC NT1W37CA SPC NT1W37DA NT1W37EA NT1W37FA NT1W37GA NT1W37HA NT1W37AC SPC NT1W37BC SPC NT1W37CC SPC NT7A74AA NT7A61EA NT7A61FA NT7A61GA	100-pair VF with 3M MS <sup>2</sup> connectors 100-pair VF with AT&T 710 connectors 100-pair VF with BIX connectors Cross connect, 3M 100-pair VF Right w/3M MS <sup>2</sup> connectors 100-pair VF Right w/AT&T 710 100-pair VF Right W/BIX Cross-connect right, 3M 50 DS1 with 3M MS <sup>2</sup> connectors 50 DS1 with AT&T 710 connectors 50 DS1 with BIX connectors SAI Swing frame, cross-connect, 3M 1200 pair binding post kit (MS <sup>2</sup> ) 1200 pair binding post kit (710) SAI swing frame, BIX
NT7A68-- NT7A68-- NT7A68-- NT7A71--	Power pedestal kit, 600/100 A Power pedestal kit, 100/100 A, 3P Power pedestal kit, CSA Load box kit
Emergency power connectors NT7A56AA NT7A56BA	Hubbell 60 A pin and sleeve Hubbell 30 A twist-lock
NT7A72BA AC outlet box NT7A72DA AC outlet box	Non-GFCI duplex receptacle Ground Fault Circuit Interrupter receptacle
—continued—	

11-4 Cabinet options

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**Table 11-1 (continued)**  
**S800A cabinet options**

Equipment	Description
P0731383 battery shelf P0705554 battery tray	Battery shelves for right-rear equipment frame mounting of batteries
Batteries only A0621109 A0602087 A0381713	<ul style="list-style-type: none"><li>• Eagle Picher 6V/50 100 Ah battery kit (2 Strings Only)</li><li>• YUASA 12V/25 150 Ah battery kit (6 Strings Only)</li><li>• Gates 12V/25 150 Ah battery kit (6 strings only)</li></ul>
NT1W52DA	Battery vault, 7 X 9, concrete
—end—	

---

# Battery vault description

---

This chapter provides a general description of the optional battery vault used in S800A applications using external battery storage.

## Chapter contents

This chapter includes the following topics:

<b>Topic</b>	<b>See</b>
Introduction	page 12-2
Construction	page 12-2
Battery vault features	page 12-6
Battery options	page 12-8
Battery vault specifications	page 12-9

## Introduction

An optional underground concrete enclosure vault for external battery storage can be ordered for applications where external battery storage is required for primary or secondary back-up batteries (see Figure 12-1 on page 12-3).

The battery vault provides a strong and watertight underground enclosure for external battery storage (see Figure 12-2 on page 12-4 and Figure 12-3 on page 12-5).

This enclosure includes above-ground mounting for the S800A AccessNode cabinet and underground mounting for the external batteries.

The vault is accessible through a single, flush mounted, waterproof hatch in the roof that opens from the top of the roof using a recessed handle and lock. The hatch is gasketed to prevent water intrusion.

The battery vault is buried below grade except for the roof which is at ground level. The battery vault includes mounting space for the S800A cabinet.

## Construction

The battery vault is constructed from reinforced concrete.

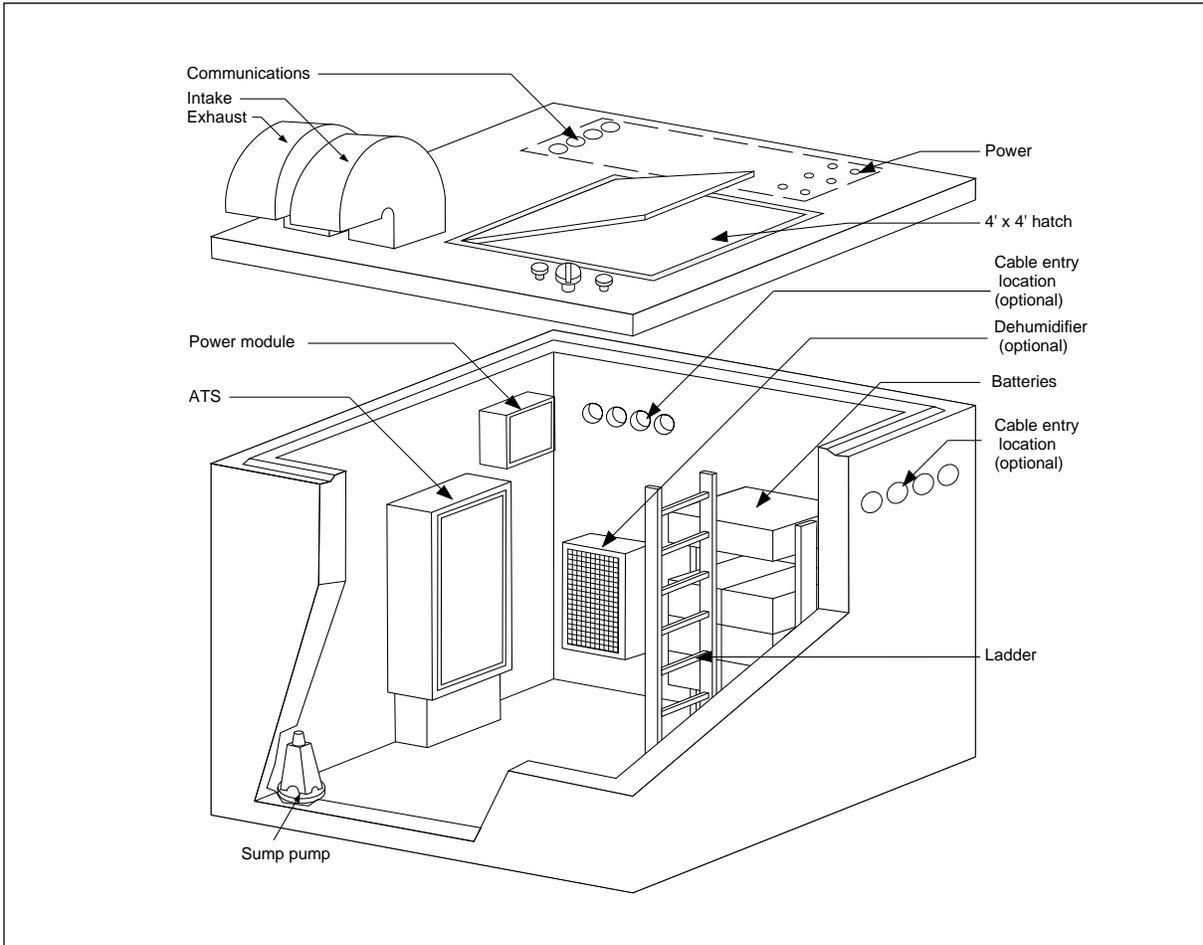
Table 12-1 shows the battery vault wall thicknesses.

**Table 12-1**  
**Battery vault wall thicknesses**

Structure	Minimum thickness
Roof and walls	6.0 inches (152 cm)
Floor	8.0 inches (20.3 cm)

Figure 12-1  
Battery vault layout (typical)

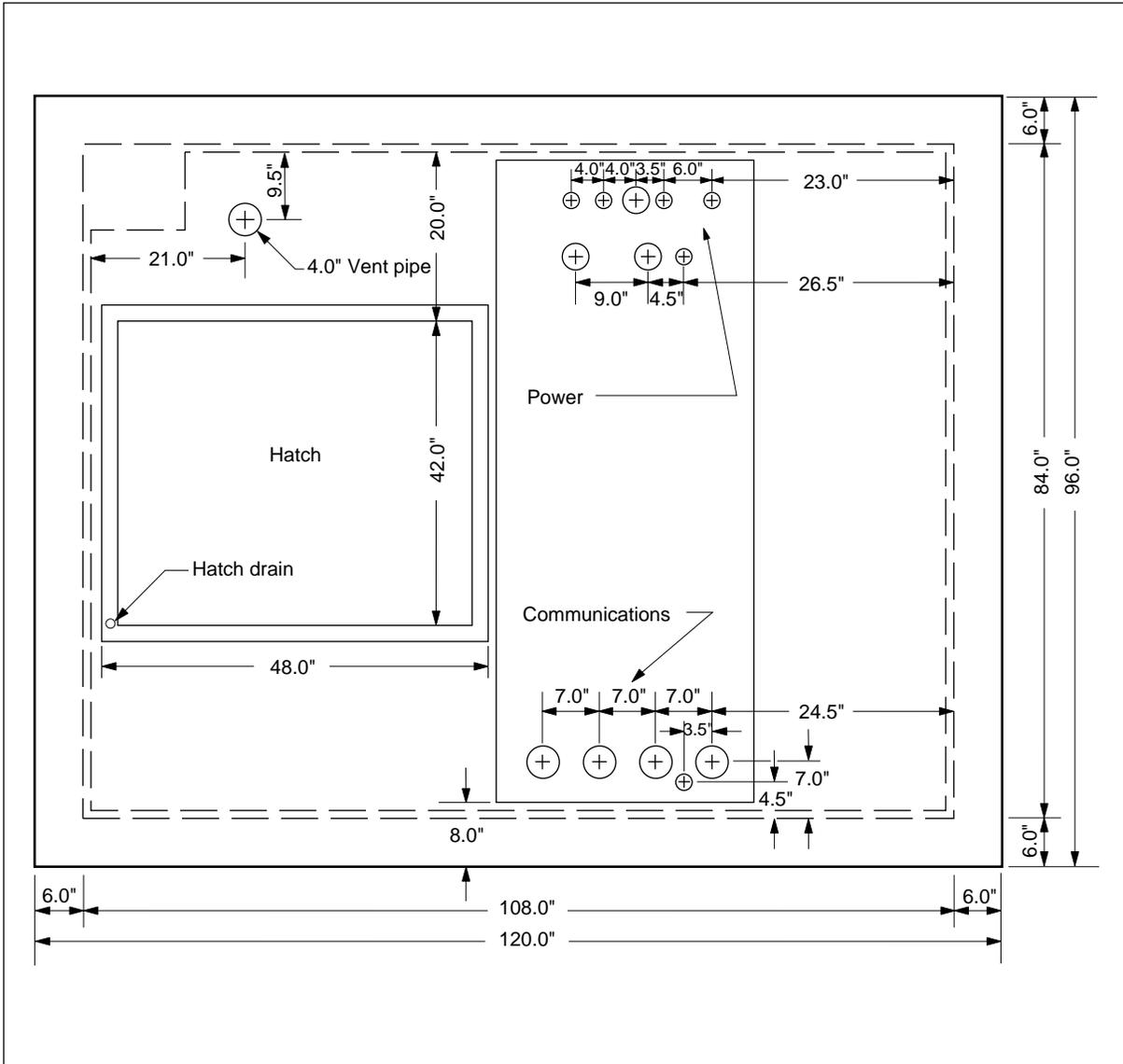
FW-15064



12-4 Battery vault description

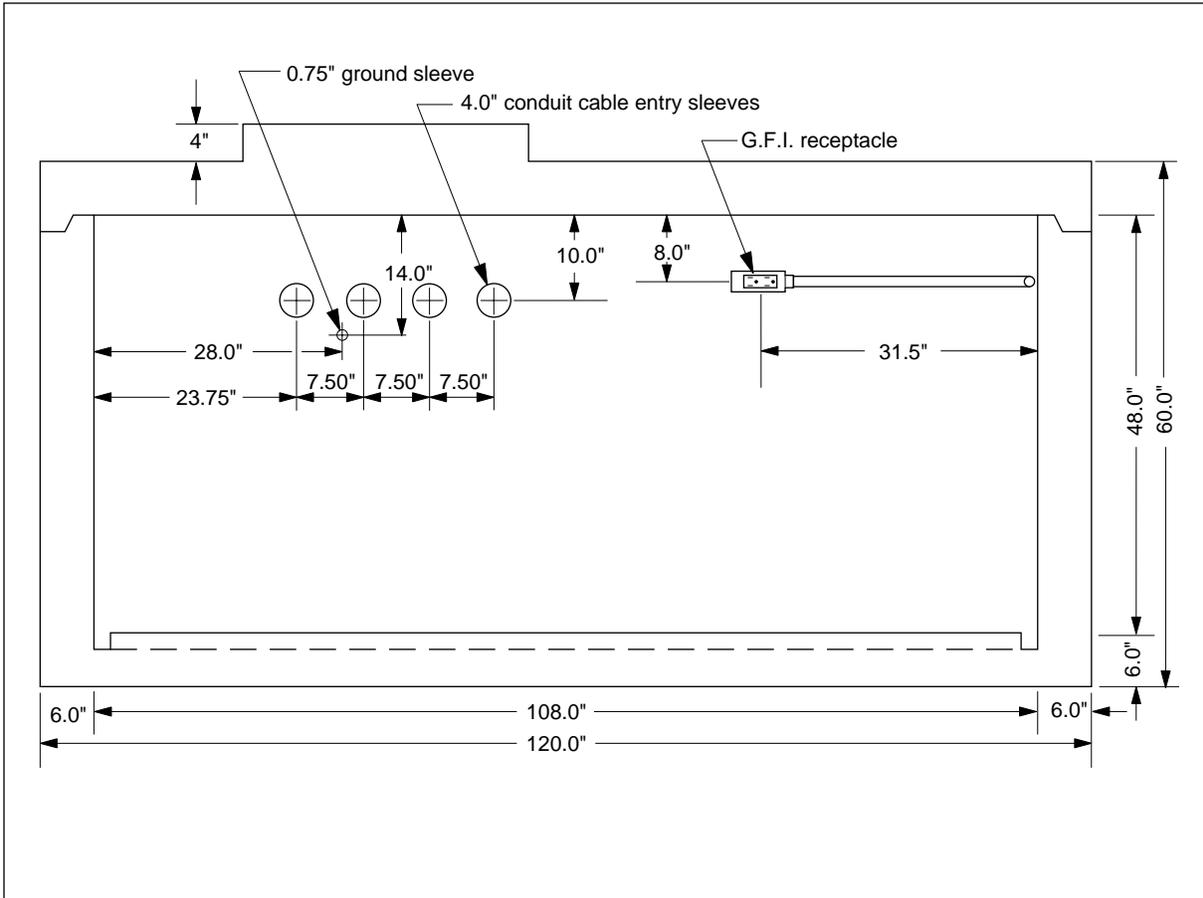
Figure 12-2  
Battery vault dimensions (top view)

FW-15048



**Figure 12-3**  
**Battery vault dimensions (side view)**

FW-15049



## Battery vault features

The battery vault comes equipped with a variety of standard features and offers an array of optional equipment and configurations to meet a wide range of customer requirements.

### Sump pump

A standard offering sump pump powered by 120 V ac located in one corner of the vault floor provides a self-actuating control system to remove water from the vault. Automatic shut-off of the pump is built in.

### Dehumidifier

Geothermal environmental control of the vault is provided. The dehumidifier option is offered for maintaining a relative humidity (RH) 50% to 80%. A built-in sensor detects the humidity of the vault and activates the dehumidifier when RH exceeds 80%.

### Lighting

An optional 120 V ac, 60 W industrial lighting fixture protected by a wire cage is mounted on the inside surface of the vault roof. An ON/OFF switch is located inside the vault adjacent to the access ladder.

### Series 800A anchor plate

One anchor plate option is provided. The raised pad is the standard for battery vault installations. Conduit ports are provided in the vault roof matching the conduit ports of the anchor plate for cabling access to the S800A cabinet.

### Cable entry

Cabling to the cabinet is fed from the vault, up through the cabinet conduit openings to the ac power compartment (or pedestal). A terminal block (TB13) is mounted in the bottom of the cabinet for single-point connection of the battery cabling from the vault (see Figure 12-4 on page 12-7).

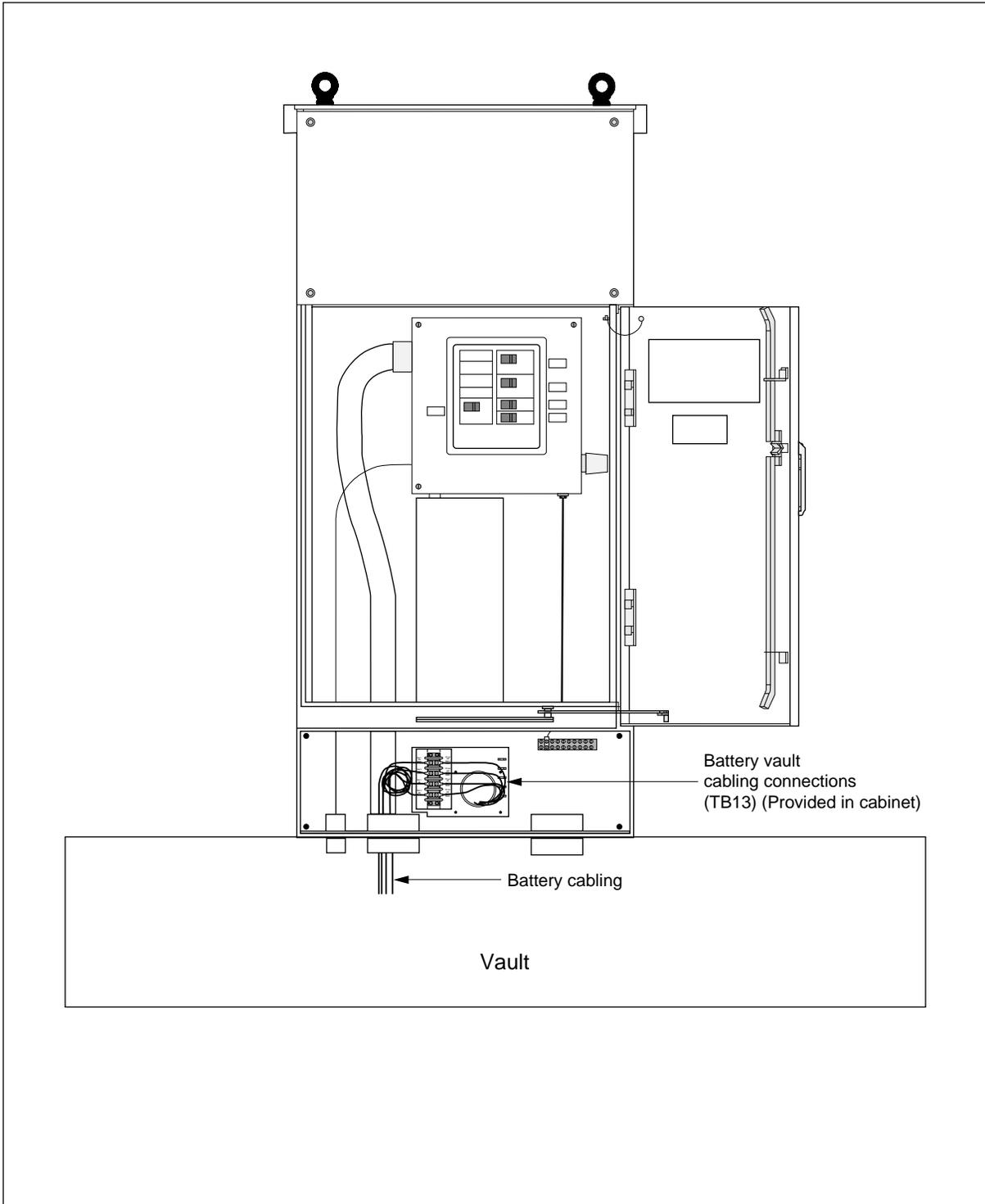
Optional wall-mounted cable entry ports for cabling entry into the vault is provided in two optional configurations. The configurations include:

- 1 high x 2 wide
- 2 high x 2 wide

Cable conduit and port openings are sealed by the customer to prevent water intrusion.

**Figure 12-4**  
**End view of the cabinet showing the battery connection point (TB13)**

FW-15036



### Electrical

The electrical system consists of a 220 V ac, 100 A circuit breaker panel. Circuit breakers are provided in the following format:

- a 220 V ac, 60 A circuit breaker supplies the S800A cabinet ac options
- a 120 V ac, 20 A circuit breaker supplies a GFI convenience outlet in the vault

### Gas venting

Hydrogen battery gas venting is accomplished through one 4-inch (10.16 cm) diameter (minimum) snorkel in the roof. One intake and one exhaust vent is mounted in the roof for gas venting.

### Alarms

All optional electromechanical equipment alarm cabling is terminated through screw-down terminal block connections in the vault. External alarms are generated via contact closure for the following conditions:

- dehumidifier failure
- sump pump failure
- sump pump ON
- door open

## Battery options

Battery installation into the CEV is not supported by Nortel. Customer specified 100 Amp-hour (Ah) batteries may be installed into the CEV at the customer's discretion.

Table 12-2 lists the battery back-up requirements as determined by the AccessNode configuration. The following table shows the battery back-up requirements for each configuration:

**Table 12-2**  
**Battery backup requirements**

Configuration	Battery back-up - Omega line cards
672-line AccessNode	275 Ah
672-line AccessNode + 42 repeaters	350 Ah
<b>Note:</b> Battery capacity is rounded to the nearest 25Ah.	

## Battery vault specifications

The battery vault specifications are listed in Table 12-3.

**Table 12-3**  
**Battery vault specifications**

Feature	Description
Construction	reinforced concrete minimum compression strength of 4000 PSI @ 7 days meets ACI 302.R80 and ASTM C94 specification requirements
Weight - Loaded (without batteries) - Fully Loaded with batteries	approximately 2400 pounds (1088 kg) approximately 3500 pounds (1587 kg)
Mechanical shock - Transportation and drop test - Mechanical vibration	meets Bellcore TR-TSY-000487, section 5.1.4.10 meets Bellcore TR-TSY-000487, section 5.1.4.11
Radiated and conducted emissions	meets EMI requirements of FCC regulations, part 15, subpart B, Class A
Fire resistance	meets Bellcore TR-TSY-000487, section 5.1.3.8
Operating environment - Outside operating temperature - Relative humidity	40° F to +115° F (-40° C to +46° C) 5% to 95%
Water intrusion	meets REA 345-79 PE-69, section 5.12 requirements
Ice and snow loading	295 kg/m (60 lbs/sq.ft)
Solar radiation	meets Bellcore TR-TSY-000487, section 5.1.3.9
Corrosion resistance	meets Bellcore TR-TSY-000487, section 5.1.3.6
Altitude	200 ft below sea level to 13,000 ft above sea level

**12-10** Battery vault description

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SONET Products

## **AccessNode**

### Series 800A Outside Plant Cabinet Description

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