



## 200 Watt Passive Shunt Module

(Catalog Number 9101-1183)

Drives can require external power dissipation when large inertial loads are present. To ensure that faults due to excessive bus voltage do not occur, loads requiring power dissipation that exceed the internal shunt capability require the use of external shunt resistor.

The passive shunt (Catalog No. 9101-1183, formerly 9101-1079) can be used with the following products:

Drive	Catalog No.
ULTRA 200™ Drives	1398-DDM-010, -010X, -020, -020X, -030, -030x, -075, and -075X
ULTRA Plus™ Drives	1398-PDM-010, -020, -030, and -075
Ultra3000™ Drives	2098-DSD-030, -030-SE, -030-DN, -030X, -030X-DN, -075, -075DN, -075X, and -075X-DN
Ultra5000™ Drives	2098-IPD-030, -030-DN, -075, and -075-DN

**ATTENTION**

Using the passive shunt with modules not listed can cause equipment damage or personal injury.



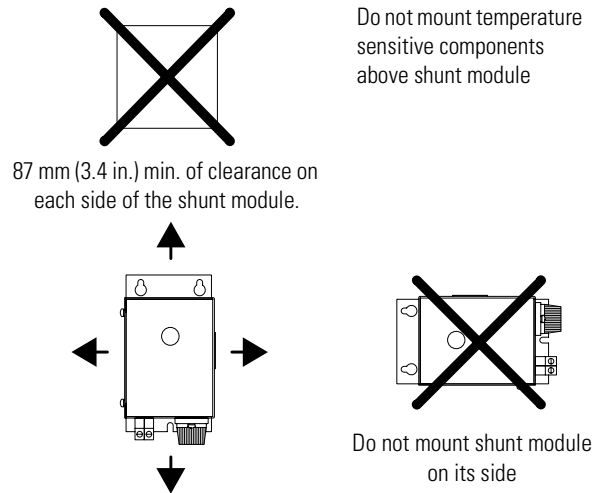
As a motor decelerates, power is returned from the motor to the drive, causing the bus voltage to increase. Ultra servo amplifier products have circuitry that senses the voltage on the DC bus and dissipates power when needed. When the bus voltage reaches the shunt turn-on voltage, the internal shunt circuitry allows the excessive regenerated power to be dissipated through an external resistor. After the bus voltage is reduced to the turn-off voltage level, the shunt transistor turns-off and no additional power is dissipated by the shunt resistor.

## Installing the Shunt

### Orientation and Clearance

The following enclosure restrictions must be considered because the shunt module dissipates excess regenerative power in the form of heat. Refer to Figure 1 for shunt module spacing requirements.

**Figure 1**  
**Shunt Module Spacing Requirements Within an Enclosure**



#### ATTENTION



The shunt module can release a large amount of heat over time.

Any materials above the shunt module or its enclosure may need the protection of a metal plate to keep from deteriorating.

Failure to observe this precaution could result in damage to surrounding materials, possibly leading to fire.

#### ATTENTION



The shunt module can release a large amount of heat inside an enclosure.

Ensure there is enough ventilation so as the maximum ambient temperature of 50° C (122° F) is not exceeded.

Failure to observe this precaution could result in damage to the shunt module.

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If the work environment dictates, mount the shunt module in an enclosure providing protection against dust and splashing water (IP54), or dust free and protected against water jets (IP65).

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**ATTENTION**

Avoid contaminating electronic components.

Provide a quality air source to cabinets; free of debris, oil, corrosives, or electrically conductive contaminants. All cabinets should have scheduled inspections and be cleaned as needed.

Failure to observe these safety procedures could result in breakdown and damage to equipment.

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Many NEMA (National Electrical Manufacturers Association) Type 4 cabinets provide this level of protection.

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**ATTENTION**

If you mount the shunt module inside a cabinet, you must make sure that the ambient temperature inside the cabinet does not exceed 50° C (122° F).

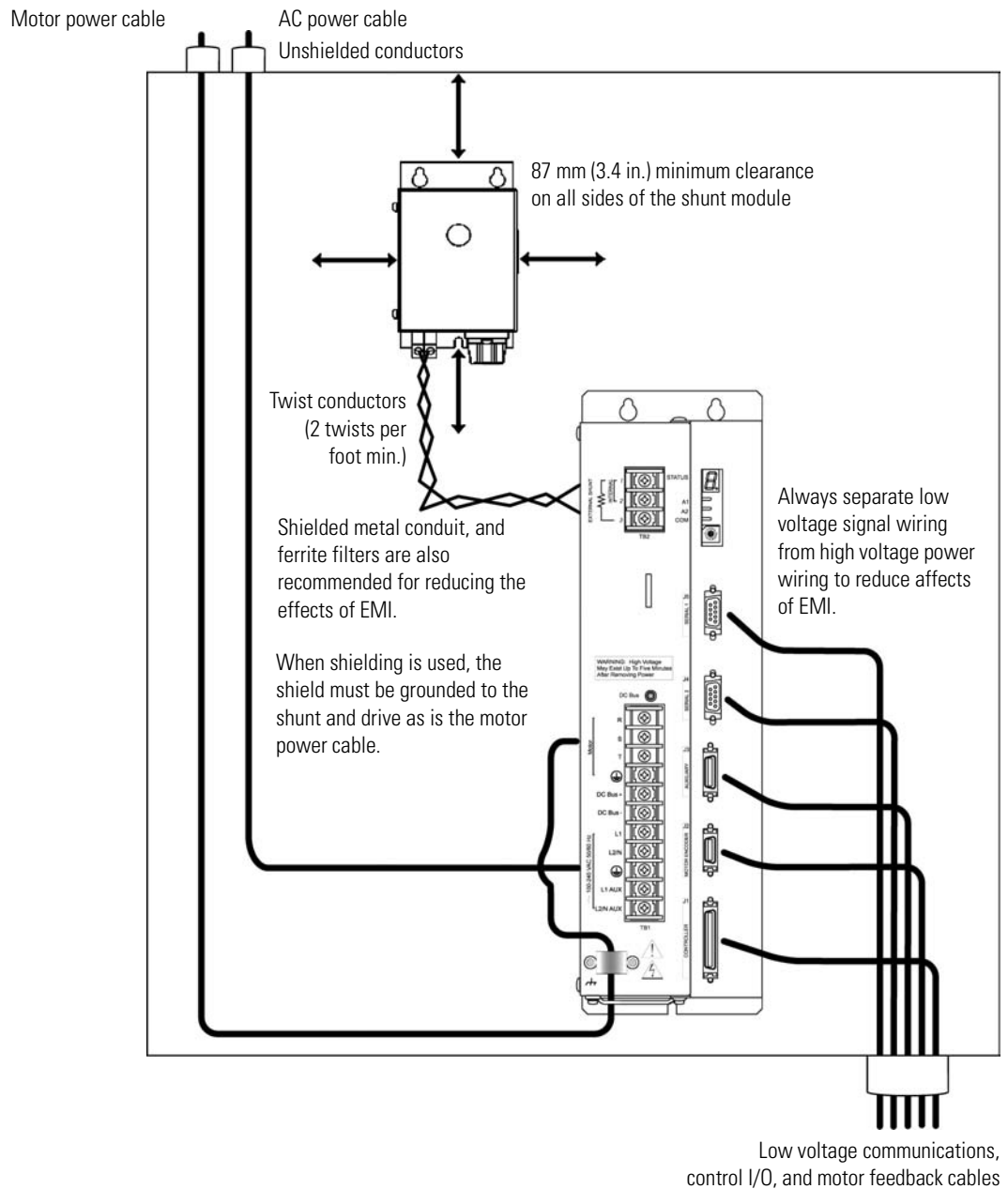
## 200 Watt Continuous Dissipation Cabinet Layout

Figure 2 details the proper position and cable separation for mounting a drive with a shunt module inside a cabinet.

**IMPORTANT**

Only one passive shunt module can be used per drive or damage to the drive will result.

**Figure 2**  
**Typical Shunt Module Position and Conductor Routing for 200W Continuous Dissipation**



## Securing the Passive Shunt Module

The following procedure assumes you have prepared your mounting panel. To mount your passive shunt module:

1. Install the top two mounting fasteners on the sub panel for the shunt module. Refer to Product Specifications on page 7 for mounting hardware specifications.
2. Mount the shunt module on the two fasteners.
3. Install the lower fastener.
4. Tighten all mounting fasteners.

## Wiring the Passive Shunt Module to a Drive

### ATTENTION



DC bus capacitors may retain hazardous voltages after input power has been removed, but will normally discharge in several seconds.

Before working on the drive, measure the DC bus voltage to verify it has reached a safe level or wait a full 5 minutes to ensure that all voltages on the system bus have discharged.

Failure to observe this precaution could result in severe bodily injury or loss of life.

90° C (194° F), 600V, 2.5 mm<sup>2</sup> (14 AWG) copper wire is supplied with the shunt. The maximum length of the wire should be 914.4 mm (36.0 in.).

Two recommended methods for wiring to reduce EMI noise can be used to connect the passive shunt module with your drive:

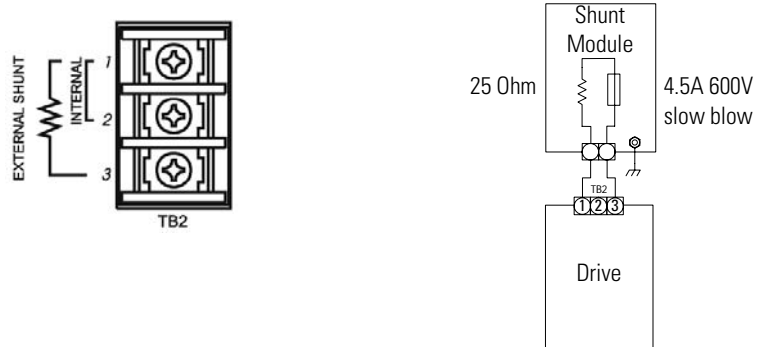
- Twisted conductors (2 twists per foot minimum) with ferrite filters,
- Shield the shunt-to-drive wiring by enclosing in grounded metal conduit.

Always keep unshielded wiring as short as possible. When shielding is used, the shield must be grounded to the shunt and drive chassis ground as is the motor power cable.

## Connecting to the Shunt Terminal Block

1. Locate the external shunt terminal block (TB2) on your drive.

**Figure 3**  
**TB2 Terminal Block and Shunt Connection Schematic**



### IMPORTANT

Ensure that power is not applied to the drive.

2. Remove the factory installed internal shunt jumper between terminals 1 and 2 of TB2.
3. Connect the lead wires to terminals 1 and 3 of TB2. Tighten screws to 1.25 Nm (11 in.-lbs).
4. Gently pull on each wire to make sure it does not release from its terminal.
5. Re-insert and tighten any loose wires.
6. Connect the lead wires to the terminal block on the bottom of the external shunt. Polarity is not important. Tighten screws to 2.25 Nm (20 lb-in.).

## Connecting to the Ground Terminal

1. Locate the ground terminal stud for the shunt module. Refer to Figure 4 on page 8 location.
2. Connect a system level ground wire to the ground terminal. Tighten the terminal nut to 2.25 Nm (20 lb-in.).
3. Connect the other end of the ground wire to the system ground bus.

## Product Specifications

Specifications for the passive shunt module are provided in the following tables. Physical measurements are shown in Figure 4 on page 8.

General Specifications		Description
Weight	net	1.1 kg (2.5 lbs)
	shipping	2.1 kg (4.5 lbs)
Resistance		25 $\Omega \pm 10\%$
Power rating	peak	6000 W
	continuous	200 W
Fuse		4.5 Amp, 600 VDC, slow acting (Littelfuse® CCMR type)

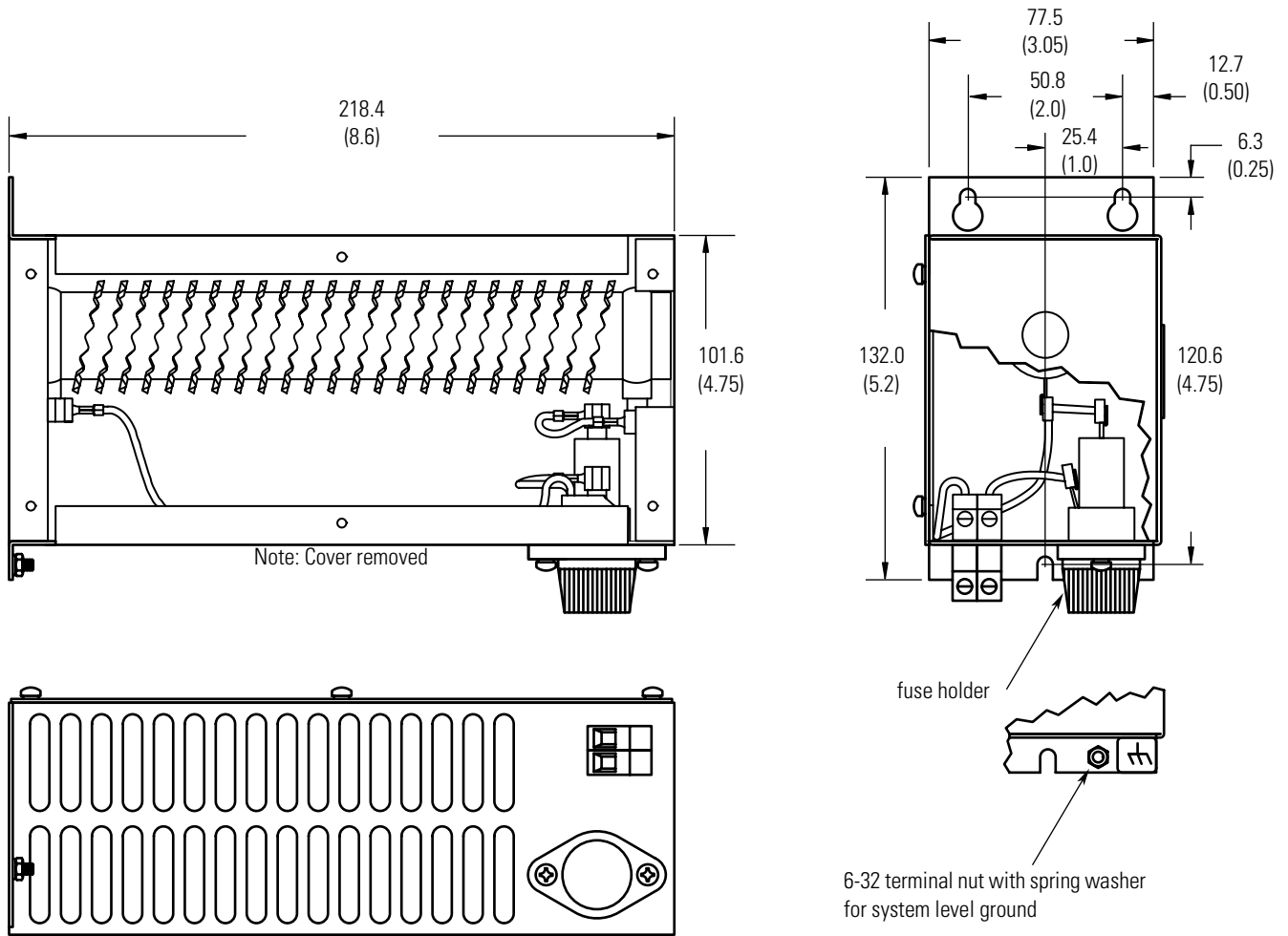
Environmental Conditions	Value
Vibration	2g at 10 to 2000 Hz
Shock	15g 11 msec half sine
Altitude	1500 m (5000 ft)
Humidity	5% to 95% non-condensing
Ambient operating temperature	0° to 50° C (32° to 122° F)
Air flow clearances	87 mm (3.4 in.) on all sides for air flow.

Mounting Hardware	Size
Hex cap screws	1/4 in. - 20
Hex cap screws (metric)	M6

Wiring	Size
90°C (194° F), 600V copper wire	2.5 mm <sup>2</sup> (14 AWG)
Maximum length	914.4 mm (36.0 in.)

Terminal Block Screws	Torque
Chrome plated brass	2.25 Nm (20 lb-in.)

**Figure 4**  
**200 Watt Passive Shunt Module Dimensions**



Measurements are in millimeters and (inches).



## Related Documentation

The following documents contain additional information concerning related Allen-Bradley® products. To obtain a copy, contact your local Rockwell Automation office or distributor, or access on-line at:

**[www.theautomationbookstore.com](http://www.theautomationbookstore.com)** or **[www.ab.com/manuals/gmc](http://www.ab.com/manuals/gmc)**.

<b>For information about:</b>	<b>Read this document:</b>	<b>Publication Number</b>
Other External Shunts	<i>900 Watt Passive Shunt Module Installation Manual</i>	2090-IN001x-EN-P
	<i>300 Watt Active Shunt Regulator Installation Manual</i>	2090-IN002x-EN-P
	<i>2090 Series (460V) Passive Shunts Installation Manual</i>	2090-IN004x-EN-P
Connecting to an ULTRA 200 drive	<i>ULTRA 200 Digital Servo Drives Installation Manual</i>	1398-5.0
Connecting to an ULTRA Plus drive	<i>ULTRA Plus Series Positioning Drive Module Installation Manual</i>	1398-5.1
Connecting to an Ultra5000 drive	<i>Ultra5000 Intelligent Positioning Drives Installation Manual</i>	2098-IN001x-EN-P
Connecting to an Ultra3000 drive	<i>Ultra3000 Digital Servo Drives Installation Manual</i>	2098-IN003x-EN-P
Commissioning and troubleshooting an Ultra3000 drive	<i>Ultra3000 Digital Servo Drives Integration Manual</i>	2098-IN005x-EN-P
A glossary of industrial automation terms and abbreviations	<i>Allen-Bradley Industrial Automation Glossary</i>	AG-7.1
How to minimize and control system-level noise	<i>System Design for Control of Electrical Noise</i>	GMC-RM001x-EN-P
An overview of Allen-Bradley motion controls and systems.	<i>Motion Control Selection Guide</i>	GMC-SG001x-EN-P

## Notes



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