NATIONAL INSTRUMENTS PXI-5670 Vector Signal Generator User Guide

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NATIONAL INSTRUMENTS PXI-5670 Vector Signal Generator

Product Information

The PXI-5670 is a device that requires forced-air cooling to ensure optimal performance and prevent thermal shutdown or damage. It is designed to be used with PXI, PXI Express, or PC chassis/case.

Forced-Air Cooling Maintenance

Proper air circulation is crucial to maintain the temperature inside the chassis within the recommended operating range. Failure to maintain adequate air flow can result in thermal shutdown or damage to the device.

Refer to the documentation for your specific device to learn more about thermal shutdown and the recommended operating temperature. Additionally, consult your chassis documentation for information on air circulation paths, fan settings, space allowances, and cleaning procedures.

PXI/PXI Express Devices

Follow these guidelines to maintain optimal forced-air cooling for PXI/PXI Express devices:

- Install slot blockers in unused slots to maximize airflow in the populated slots. Refer to **ni.com/info** and enter the Info Code pxisb for information on slot blockers.
- Install filler panels over all unused slots to ensure proper air circulation in the chassis.
- Ensure there is sufficient space around the chassis fan intake and exhaust vents to prevent blockage.
- The ambient temperature of the PXI system should be measured at the chassis fan inlet (air intake).
- Refer to your user manual for specific cooling clearance dimensions. Typically, a rear air intake chassis requires a minimum of 76.2 mm (3 in.) clearance from the air intake and 44.5 mm (1.75 in.) clearance above and on the sides of the chassis.
- Clean fan filters at least every six months, or more frequently depending on usage and ambient dust levels. If regular maintenance is not possible, foam filters can be removed to maintain cooling.

- Set all chassis fans to High unless instructed otherwise by the PXI(e) module user manual. Do not disable the fan(s).
- Ensure that the ambient temperature does not exceed the rated ambient temperature specification. Refer to the chassis temperature LED or use a temperature probe to verify the temperature.

PCI/PCI Express Devices

To maintain optimal forced-air cooling for PCI/PCI Express devices:

- Install all filler panels after installing the device to ensure proper air circulation in the chassis.
- Avoid leaving any slots without filler panels as it disrupts necessary air circulation.

Inadequate air circulation can cause the temperature inside a PXI, PXI Express, or PC chassis/case to rise above the maximum recommended operating temperature for your device, potentially causing thermal shutdown or damage to the device. Refer to the documentation for your device for more information about thermal shutdown. Refer to your chassis documentation for more information about air circulation paths, fan settings, space allowances, and cleaning procedures.

PXI/PXI Express Devices

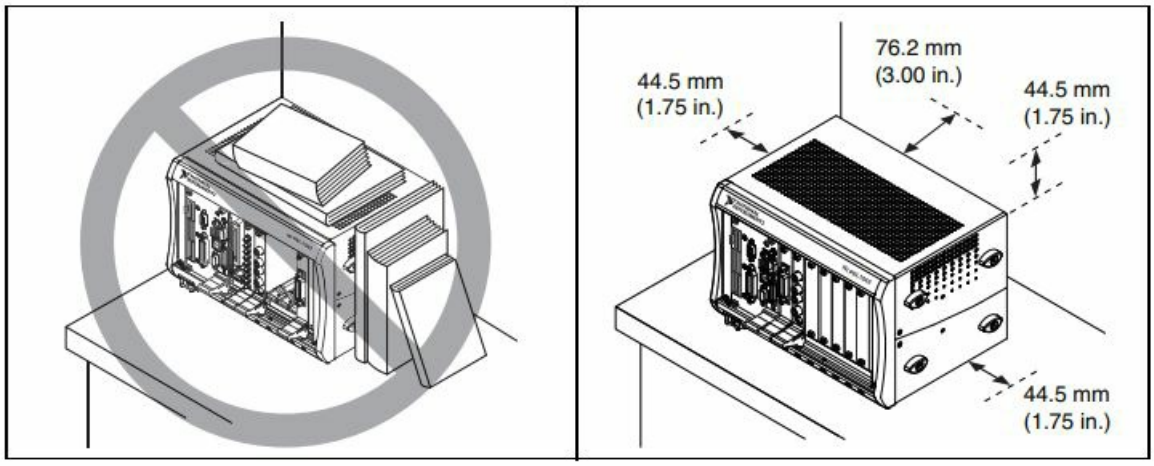
Use the following guidelines to maintain optimal forced-air cooling for PXI/PXI Express devices:

- National Instruments highly recommends installing slot blockers in unused slots to maximize air flow in the slots populated with devices. Refer to ni.com/info and enter the Info Code pxisb for information about slot blockers.
- Install filler panels over all unused slots after installing your devices. Missing filler panels disrupt the necessary air circulation in the chassis.
- Allow plenty of space around the chassis fan intake and exhaust vents. Blocked fan vents impede the air flow needed for cooling. If you remove the chassis feet, allow for adequate clearance below the chassis. Refer to your chassis user manual for further information about fan location, chassis orientation, and clearances. Often, ambient temperature is a concern for rack-mount deployments. If your PXI system is deployed in a rack, the following guidelines should be considered:
- Place high-power units within the rack above the PXI system(s) where possible.
- Use racks with open sides and/or rear panels.
- Use fan trays within the rack, and at the top and bottom of the rack, to increase overall air flow. This will reduce ambient temperatures within the rack.
- Use other methods that reduce ambient temperatures within the rack.

Note: The ambient temperature of a PXI system is defined as the temperature at the chassis fan inlet (air intake).

In addition to ensuring the ambient temperature of your PXI system is within the specifications for all of the system components, it is vital to provide adequate cooling clearances for your chassis so the required chassis air flow is achieved. Your chassis must be installed so cooling clearances meet the specifications stated in your user manual. A typical example for a PXI chassis with a rear air intake and top/side exhaust, provides for a minimum of 76.2 mm (3 in.) of clearance from the air intake on the rear of the chassis and 44.5 mm (1.75 in.) of clearance above and on the sides of the chassis.

The following figure shows an example of a chassis with the required cooling clearances



Note: The previous diagram shows example dimensions, refer to your chassis user manual for specific chassis clearance dimensions.

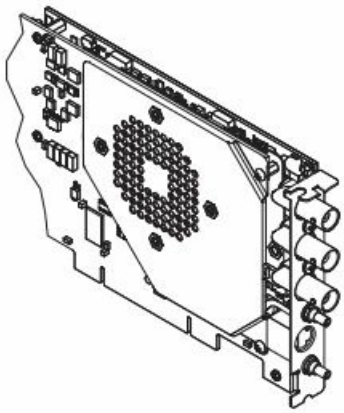
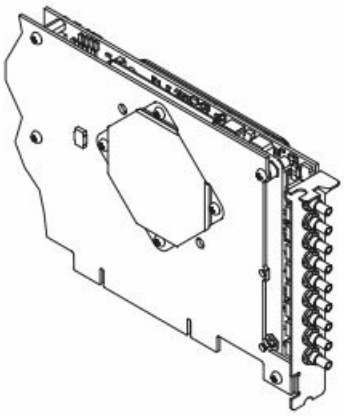
- If your chassis includes fan filters, clean them at least every six months. Depending on the amount of chassis use and the ambient dust levels, filters may require more frequent cleaning. If regular maintenance of dirty or clogged filters is not possible, you can remove foam filters to maintain adequate cooling.
- Set all chassis fans to High, unless directed otherwise by the PXI(e) module user manual. Do not disable the fan(s).
- Ensure the ambient temperature does not exceed the rated ambient temperature specification. Refer to the chassis temperature LED, if available (refer to chassis user manual for LED behavior description), or use a temperature probe to verify temperature. Refer to your chassis user manual for further information about ambient temperature.

PCI/PCI Express Devices

Use the following guidelines to maintain optimal forced-air cooling for PCI/PCI Express devices:

- Install all filler panels after installing the device. Missing filler panels disrupt the necessary air circulation in the chassis.
- Allow plenty of space around the chassis/case fan intake and exhaust vents. Blocking the fan vents impedes the air flow needed for cooling.
- Maintain proper airflow for devices with onboard fans.
    - Ensure that the onboard fan is not obstructed.
    - Leave the slot adjacent to the fan side of the PCI/PCI Express device empty. If you must use the adjacent slot, install a device that allows for the maximum amount of clearance between the fan and the adjacent device (for example, low-profile devices).
- Maintain proper airflow for devices without onboard fans.
    - Ensure that the PC chassis/case has active cooling that provides airflow across the card cage.
    - Leave the slots adjacent to the PCI/PCI Express device empty. If you must use an adjacent slot, install devices that allow for the maximum amount of clearance between each device (for example, low-profile devices).

The following table shows the difference between PCI/PCI Express devices with and without onboard fans

PCI/PCI Express Device with Onboard Fan	PCI/PCI Express Device without Onboard Fan
	

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Documents / Resources

	NATIONAL INSTRUMENTS PXI-5670 Vector Signal Generator [pdf] User Guide PXI-5670, NI PXI-1042, PXI-5670 Vector Signal Generator, Vector Signal Generator, Signal Generator, Generator

References

- Engineer Ambitiously - NI
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