



kaleidescape

Environmental Specifications for Kaleidescape Components

Engineering Bulletin

This document provides environmental specifications and guidance for designing proper cooling for Kaleidescape component installations. For more best practices in designing rack enclosure cooling for A/V components, refer to the white paper, [A/V Installation Cooling](#).

Temperature

The maximum air intake temperature for Kaleidescape components is specified in the table below. Note that if a system is installed in a rack enclosure, and the system includes a 1U/3U/5U Server, then the maximum air intake temperature for the rack enclosure is 86°F (30°C). The minimum air intake temperature for all Kaleidescape components is 41°F (5°C). Measure ambient air temperature within 1 in. (2.5 cm) of the front of the component, and at any rack enclosure air intake vents.

Component	Maximum air intake temperature
Cinema One (KCINEMA-1, KSYSTEM-120)	95°F (35°C)
1U Server (KSERVER-1500)	86°F (30°C)
3U Server (KSERVER-5000)	86°F (30°C)
5U Server (KSERVER-2500)	86°F (30°C)
M700 Disc Vault (KVAULT-M700)	95°F (35°C)
M500 Player (KPLAYER-M500)	95°F (35°C)
M300 Player (KPLAYER-M300)	95°F (35°C)
1080p Player (KPLAYER-6000)	86°F (30°C)
1080p Mini Player (KPLAYER-300)	86°F (30°C)
Movie Player 2 (KPLAYER-5000)	95°F (35°C)

Component	Maximum air intake temperature
Movie Player (KPLAYER-2000, KPLAYER-2500)	86°F (30°C)
Music Player (KMUSIC-4000)	95°F (35°C)
Speed Reader (KSPEEDREADER, KSPEEDREADER-2)	86°F (30°C)
Reader (KREADER-2000)	95°F (35°C)

Some Kaleidescape components can be installed in a vertical orientation, and the maximum intake air temperature decreases for some components when mounted vertically. Refer to the Engineering Bulletin, [Vertical Mounting of Kaleidescape Components](#).

The storage temperature range for all Kaleidescape components is 4°F to 140°C (-20°C to 60°C).

Relative Humidity

The operating relative humidity range (non-condensing) for all Kaleidescape components is 20% to 80%; the range is 5% to 90% for storage.

Maximum Operating Altitude

All Kaleidescape components have a maximum operating altitude of 10,000 ft (3000 m).

Heat Output

The table below specifies maximum heat output for Kaleidescape components. These specifications can be used in combination with the room temperature to calculate the required airflow. See the section Calculating Rack Airflow in the white paper, [A/V Installation Cooling](#).

Component	Maximum heat output
Cinema One (KCINEMA-1, KSYSTEM-120)	310 BTU/hr (90 W)
1U Server (KSERVER-1500) 250 GB, 750 GB or 1 TB Disk Cartridges 2 TB Disk Cartridges	382 BTU/hr (112 W) 290 BTU/hr (86 W)
3U Server (KSERVER-5000) 750 GB or 1 TB Disk Cartridges 2 TB Disk Cartridges	921 BTU/hr (270 W) 699 BTU/hr (205 W)
5U Server (KSERVER-2500)	853 BTU/hr (250 W)
M700 Disc Vault (KVAULT-M700)	180 BTU/hr (52 W)

Component	Maximum heat output
Modular Disc Vault (KVAULT-10)	44 BTU/hr (13 W)
M500 Player (KPLAYER-M500)	143 BTU/hr (42 W)
M300 Player (KPLAYER-M300)	96 BTU/hr (28 W)
1080p Player (KPLAYER-6000)	150 BTU/hr (45 W)
1080p Mini Player (KPLAYER-300)	100 BTU/hr (30 W)
Movie Player 2 (KPLAYER-5000)	89 BTU/hr (26 W)
Movie Player (KPLAYER-2000, KPLAYER-2500)	75 BTU/hr (22 W)
Music Player (KMUSIC-4000)	68 BTU/hr (20 W)
Speed Reader (KSPEEDREADER-2)	358 BTU/hr (105 W)
Speed Reader (KSPEEDREADER)	375 BTU/hr (110 W)
Reader (KREADER-2000)	96 BTU/hr (28 W)

Airflow

The table below specifies maximum airflow generated by internal fans in Kaleidescape components. An installation enclosure must allow the specified airflow to easily escape the enclosure through the enclosure's exhaust fans or external vents. Use the airflow in the table to determine the minimum exhaust airflow capacity in an installation enclosure.

Component	Airflow
Cinema One (KCINEMA-1, KSYSTEM-120)	15 CFM (26 m ³ /hr)
1U Server (KSERVER-1500)	10 CFM (17 m ³ /hr)
3U Server (KSERVER-5000)	40 CFM (68 m ³ /hr)
5U Server (KSERVER-2500)	30 CFM (50 m ³ /hr)
M700 Disc Vault (KVAULT-M700)	7 CFM (12 m ³ /hr)
M500 Player (KPLAYER-M500)	7 CFM (12 m ³ /hr)
M300 Player (KPLAYER-M300)	6 CFM (10 m ³ /hr)
1080p Player (KPLAYER-6000)	5 CFM (8 m ³ /hr)
1080p Mini Player (KPLAYER-300)	6 CFM (10 m ³ /hr)
Movie Player 2 (KPLAYER-5000)	2.5 CFM (4.2 m ³ /hr)
Movie Player (KPLAYER-2000, KPLAYER-2500)	2.5 CFM (4.2 m ³ /hr)
Music Player (KMUSIC-4000)	2.5 CFM (4.2 m ³ /hr)
Speed Reader (KSPEEDREADER-2)	45 CFM (77 m ³ /hr)
Speed Reader (KSPEEDREADER)	6.2 CFM (11 m ³ /hr)
Reader (KREADER-2000)	2.5 CFM (4.2 m ³ /hr)

Ventilation

Use the following guidelines when installing Kaleidescape components to ensure proper ventilation.

- ▶ Verify proper clearance for ventilation. The rack or other enclosure doors must not reduce the air space around the component below the specified clearance.
 - Maintain 2 in. (5 cm) clearance in back.
 - Maintain 1 in. (2.5 cm) clearance in front and on sides.
- ▶ Maintain proper airflow path for ventilation.
 - Verify adequate cool air intake at front and bottom of component.
 - Verify hot air exhaust at back and top of component.
- ▶ Verify intake and exhaust vents are not obstructed by dust or particles.

The component front panel filters and traps coarse dust and particles. Exhaust vents also accumulate dust. Vents clogged with dust can lead to temperature increase and possible damage. If the component is not installed in an enclosure, the front panel and rear vents should be inspected every 4 months and cleaned if necessary to provide adequate airflow. Refer to the Engineering Bulletin, [Server Cleaning Procedures](#), for detailed cleaning instructions.

Do not operate the component in a dusty environment. In case of sanding or other temporary dust source, turn off the component until the dust source is removed. If the internal surfaces of a component become coated with dust, the component will require servicing by Kaleidescape.

The figure below shows proper ventilation and airflow for components in a rack enclosure. The rack enclosure has a cool air intake at the bottom front and a hot air exhaust at the top.

