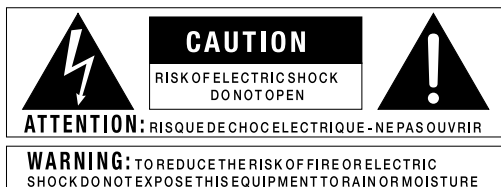


MODEL 1066

OPERATION MANUAL



IMPORTANT SAFETY INFORMATION



The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE SHALL BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTHING CONNECTION.

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal marked N or coloured black.
- The core which is coloured brown must be connected to the terminal marked L or coloured red.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the units chassis.

CONDUCTOR		WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN/ YEL	GREEN

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

WARNING FOR YOUR PROTECTION READ THE FOLLOWING:

KEEP THESE INSTRUCTIONS

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

THE APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING LIQUID AND NO OBJECT FILLED WITH LIQUID, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.

CLEAN ONLY WITH A DRY CLOTH.

DO NOT BLOCK ANY OF THE VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES, OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT.

ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

Use only with the cart stand, tripod bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

POWER ON/OFF SWITCH: If the equipment has a Power switch, the Power switch used in this piece of equipment DOES NOT break the connection from the mains.

MAINS DISCONNECT: The plug shall remain readily operable. For rack-mount or installation where plug is not accessible, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated into the electrical installation of the rack or building.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

MULTIPLE-INPUT VOLTAGE: This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent.

If connected to 240V supply, a suitable CSA/UL certified power cord shall be used for this supply.

IMPORTANT SAFETY INFORMATION

ELECTROMAGNETIC COMPATIBILITY

This unit conforms to the Product Specifications noted on the **Declaration of Conformity**. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting cables.

U.K. MAINS PLUG WARNING

A molded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility.

NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET.

Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and **MUST** be ASTA approved to BS1362.



If you want to dispose this product, do not mix it with general household waste. There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling.

Private household in the 25 member states of the EU, in Switzerland and Norway may return their used electronic products free of charge to designated collection facilities or to a retailer (if you purchase a similar new one).

For Countries not mentioned above, please contact your local authorities for a correct method of disposal.

By doing so you will ensure that your disposed product undergoes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health.

DECLARATION OF CONFORMITY

Manufacturer's Name: dbx Professional Products
Manufacturer's Address: 8760 S. Sandy Parkway
Sandy, Utah 84070, USA

declares that the product:

Product name: dbx 1066
Note: Product name may be suffixed by the letters-EU.

Product option: None

conforms to the following Product Specifications:

Safety: IEC 60065 -01+Amd 1

EMC: EN 55022:2006 (N/A; Analog Product)
IEC61000-4-2
IEC61000-4-3
IEC61000-4-4
IEC61000-4-5
IEC61000-4-6
IEC61000-4-8
IEC61000-4-11

Supplementary Information:

The product herewith complies with the requirements of the:

Low Voltage Directive 2006/95/EC

EMC Directive 2004/108/EC.

RoHS Directive 2002/95/EC

WEEE Directive 2002/96/EC

With regard to Directive 2005/32/EC and EC Regulation 1275/2008 of 17 December 2008, this product is designed, produced, and classified as Professional Audio Equipment and thus is exempt from this Directive.

European Contact: Your local dbx Sales and Service Office or

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Introduction

Congratulations and thank you for your purchase of the dbx 1066 Compressor. The dbx 1066 is a high performance multifunctional unit designed to deliver all the flexibility and power that a professional user demands. The dbx 1066 incorporates the new advanced dbx V2™ VCA for high system performance. We recommend you take a moment to read through this Operation manual. It provides information that will assist you in system set-up.

Inspection

Verify that the 1066's package contains the following:

- 1066 Unit (according to Model number marked on package)
- AC Power Cord
- Operation Manual
- Registration Card
- 4 Rack Mount Screws and Washers

If any of these items are missing, contact dbx customer service at (801) 568-7660.

Warranty

1. The warranty registration card that accompanies this product must be mailed within 30 days after purchase date to validate this warranty. Proof-of-purchase is considered to be the burden of the consumer.
2. dbx warrants this product, when bought and used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.
3. dbx liability under this warranty is limited to repairing or, at our discretion, replacing defective materials that show evidence of defect, provided the product is returned to dbx WITH RETURN AUTHORIZATION from the factory, where all parts and labor will be covered up to a period of two years. A Return Authorization number must be obtained from dbx by telephone. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.
4. dbx reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same additions or improvements on products previously manufactured.
5. The foregoing is in lieu of all other warranties, expressed or implied, and dbx neither assumes nor authorizes any person to assume on its behalf any obligation or liability in connection with the sale of this product. In no event shall dbx or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

Connecting the 1066 to your system

To connect the 1066 to your system, refer to the following steps:

- **Turn off all equipment before making any connections.**

- **Mount the 1066 in a rack**

Install the 1066 in a rack with the rack screws provided. It can be mounted above or below anything that does not generate excessive heat. Ambient temperatures should not exceed 113° F (45° C) when equipment is in use. Although the unit is shielded against radio frequency and electromagnetic interference, extremely high fields of RF and EMI should be avoided.

- **Make audio connections via XLR, 1/4" TRS, or 1/4" TS plugs.**

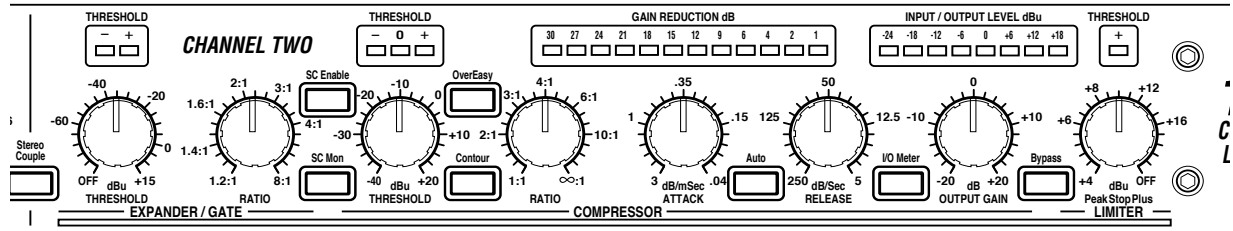
Both types of connectors for the inputs and outputs can be used for balanced or unbalanced connections. The use of more than one connector at a time for the input/output pair could unbalance balanced lines, cause phase cancellations, short a conductor to ground, or cause damage to other equipment connected to the 1066.

- **Apply power to the 1066**

Connect the AC power cord to the AC power receptacle on the back of the unit. Route the AC power cord to a convenient power outlet away from audio lines. The unit may be turned on and off via the 1066 power switch or from a master equipment power switch.

Operating Controls

Front Panel



Stereo Link Switch - This switch changes the 1066 from two independent compressors into a stereo compressor. In stereo mode, Channel 1 is the master and Channel 2 is the slave. Each of the Channel 2 controls and switch functions will be overridden and controlled by the Channel 1 controls and switches, except the Sidechain Monitor, Sidechain Enable, Contour, and Bypass switches. Also, Channel 2's Expander/Gate, Compressor Threshold, and PeakStopPlus™ Threshold meters will be disabled, while both channels' Gain Reduction meters will identically indicate the amount of gain reduction occurring. It is important to note that while Channel 1 is the master as far as the controls go, both channels have equal precedence as far as signal processing is concerned. The dbx 1066 uses True RMS Power Summing™, an extremely accurate and musical way to combine detector outputs in a stereo situation. The switch will light to indicate that the 1066 is in the Stereo Link mode.

Expander/Gate Threshold Control - This control sets the level below which gating/expansion occurs. It has an effective control range of -60 dB to +15 dB. When it is fully counter clockwise to the "off" position, no gating or expansion occurs.

Expander/Gate Threshold Below (-) LED - This LED illuminates when the signal is below the level set by the EXPANDER/GATE THRESHOLD control and indicates that expansion or gating is occurring.

Expander/Gate Threshold Above (+) LED - This LED illuminates when the signal is above the level set by the EXPANDER/GATE THRESHOLD control and indicates that no expansion or gating is occurring.

Expander/Gate Ratio Control - This control sets the expansion ratio and varies from 1:1 to 8:1. It is important to note that as the signal passes below the threshold, the input/output gain relationship does not transition sharply from unity gain (where no expansion is occurring) to the ratio set by the EXPANDER RATIO control. The 1066's expander utilizes a soft-knee OverEasy® threshold circuit analogous to the OverEasy® compressor curve made famous by the 1066's predecessors and employed in the compressor section of the 1066. See Figure 1. This soft knee contributes to the smooth and natural sounding decay of the 1066 expander making its action virtually transparent with low to moderate ratio settings. When hard gating is required, higher ratio settings cause the expander to function like a gate. The expander attack and release times are program-dependent. The detector intelligently senses the need for fast attack for rapidly-changing signals, and slows down for more stable signals.

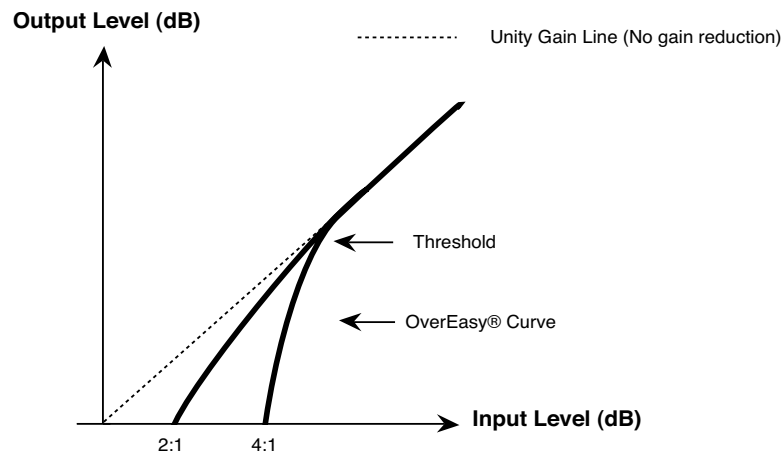


Figure 1: Expander/Gate OverEasy® Threshold Characteristic

Sidechain Enable - This switch enables the in and out connectors of the sidechain, allowing external processing of the detector signal. It has no effect if there is nothing plugged into the sidechain loop; however the switch will still light indicating the sidechain is enabled.

Sidechain Monitor Switch - This switch connects the sidechain return signal to the 1066's output. This allows monitoring of any signal processing that is inserted into the sidechain loop to assist in setup. The switch will light to indicate the sidechain is being monitored and the main signal path is bypassed.

Compressor Threshold Control - This control sets the level above which compression occurs, and has a 60 dB range.

Compressor Threshold Below (-) LED - This LED illuminates when the signal is below the level set by the COMPRESSOR THRESHOLD control. This indicates that the compressor is not compressing and is operating in its linear region.

Compressor Threshold OverEasy® (0) LED - This LED illuminates when the signal is in the OverEasy® portion of the compression curve. In this region the ratio varies as a function of signal level between 1:1 and the ratio set by the RATIO control. This LED is defeated when the OverEasy® function is disabled.

Compressor Threshold Above (+) LED - This LED illuminates when the signal is above the OverEasy® portion of the compression curve and indicates that the full value set by the RATIO control has been reached. If OverEasy® is disabled, this LED indicates the signal is above the level set by the COMPRESSOR THRESHOLD control and dynamic range compression is occurring.

OverEasy® Switch - OverEasy® provides a smooth transition from the compressor's linear region to the compressed region. This smooth transition greatly reduces compression artifacts and allows faster attack times and higher compression ratios while still maintaining the natural characteristics of the signal. The switch lights to indicate OverEasy® processing is enabled. When conventional hard knee processing is desired, disable the OverEasy® function. See Figure 2 on the next page.

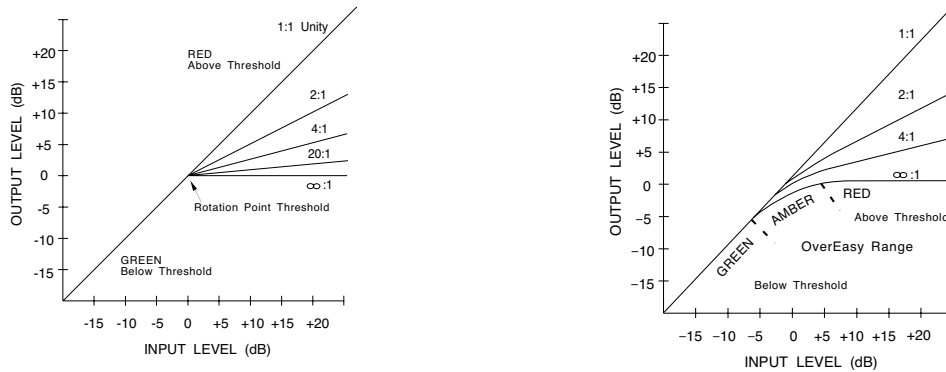


Figure 2: Hard Knee Compression Curve, and OverEasy® Compression Curve, and Threshold LEDs.

Figure 3 shows the effect of 2:1 compression on a signal as it rises above and falls below the threshold. Below the threshold the signal is not affected. Above the threshold, the output signal increases by only half of the increase (in dB) of the input signal level. In other words, with a 2 dB increase in input level, the output increases by only 1 dB, hence the 2:1 compression ratio.

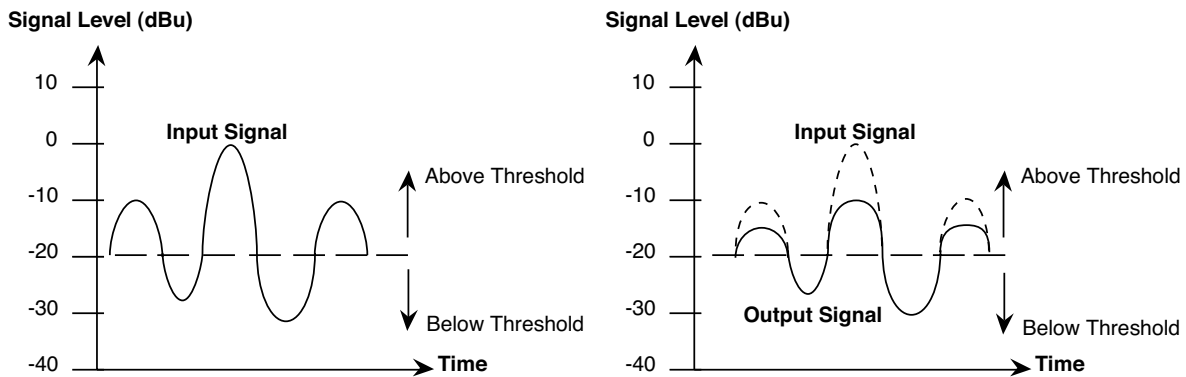


Figure 3: Compression Effect on Signal Level with a 2:1 Ratio at a -20 dBu Threshold

Contour Switch - This switch adds a gentle low frequency de-emphasis into the detector path. This is extremely useful in keeping low frequency program material from “muffling” or “punching holes in” the compressed signal. This feature allows faster attack times and higher compression ratios with less artifacts. The switch will light indicating contouring is activated.

Compressor Ratio Control - This control selects the ratio between input and the output levels for signals above the level set by the COMPRESSION THRESHOLD control. It is adjustable between 1:1 and infinity:1. Note, when OverEasy® processing is selected, the ratio transitions smoothly from the linear to the compressed region. As the signal exceeds the threshold, the ratio approaches the ratio set by the COMPRESSOR RATIO control.

Gain Reduction Meter - This 12 stage meter shows the amount of gain reduction due to compression, expansion/gating, or Intelligent Predictive Limiting™, displaying gain reduction from 0 to 30 dB.

Attack Control - The ATTACK control sets the amount of time it takes the 1066 to begin compressing a signal once the detector has sensed a signal above threshold. The ATTACK range is from 3 dB/msec (for a tighter and more noticeable compression effect with very little overshoot) to .04 dB/msec (for more delayed, gradual compression). A very fast ATTACK setting will cause the 1066 to act like a peak limiter even though RMS detection

circuitry is used. Slower ATTACK settings cause the 1066 to act like an RMS or averaging detecting compressor/limiter.

Release Control - The RELEASE control sets how fast the compression circuit returns the input to its original level. The RELEASE rate is from 250 dB/sec (where compression follows the envelope of the program material very tightly) to 5 dB/sec (for very smooth compression).

Auto Switch - This switch overrides both the ATTACK and RELEASE controls and enables preset program-dependent attack and release times. These times are derived from the input signal and continuously change to match its dynamics. The switch lights indicating the attack and release times are being automatically adjusted in a program-dependent fashion. Enabling this AUTO Function duplicates the “classic dbx sound” of the 1066’s fore-runners which have become standards in the industry.

Input/Output Level Meter - This 8-stage meter directly reads the input and output levels when the rear-panel OPERATING LEVEL SWITCH is in the +4 dBu position. In the -10 dBV position, the input signal is boosted by 11.8 dB (the difference between +4 dBu and -10 dBV) to convert a semi-pro -10 dBV level signal to the professional +4 dBu internal level of the 1066, while the output signal is attenuated by 11.8 dB to convert back to a -10 dBV level. Since the meter is calibrated for +4 dBu operation, it reads about 12 dB higher than the actual input and output signal levels when the OPERATING LEVEL SWITCH is set to -10 dBV.

Input/Output Meter Switch - This switch selects the signal for metering by the INPUT/OUTPUT LEVEL METER. The switch lights indicating the input signal is currently being sent to the meter. When the switch is in the out position, the output signal is selected for metering, and the switch will not be illuminated.

Output Gain Control - This control sets the output gain of the compressor. It can be continuously adjusted between -20 dB and +20 dB. Use this control to compensate for signal level loss due to compression and to adjust the nominal output level of the unit.

Bypass Switch - This switch bypasses the unit completely. A relay “hard-wires” the input directly to the output, and the signal is not processed in any way. The switch will light indicating that the unit is currently bypassed. It is also significant to note that in the event of power failure, the relay will automatically bypass the unit. Upon power-up, the relay provides a turn-on delay of approximately 1.5 seconds.

PeakStopPlus™ Level Control - This control sets the level to which the output signal is reduced whenever it exceeds this level. It can be adjusted between +4 dBu and +22 dBu (OFF). This PeakStopPlus™ limiter uses a dbx two-stage limiting process. The first stage is the Instantaneous Transient Clamp™ which clamps the signal with a soft logarithmic clamp function. This logarithmic function assures that the signal will not exceed the level set by the PeakStopPlus™ LEVEL control by more than 2 dB typically, and that it will not introduce harsh artifacts. The second stage is a unique program limiter featuring Intelligent Predictive Limiting™. Its function is to monitor the input signal and intelligently predict the amount of gain reduction needed to keep the output signal below the ceiling set by the Instantaneous Transient Clamp™. Note, since the PeakStopPlus™ limiter is a fail-safe limiter it must come after the OUTPUT GAIN control. If the OUTPUT GAIN is set too high as compared to the PeakStopPlus™ LEVEL control, continuous limiting can occur. While PeakStopPlus™ is typically used as a protective function, creative effects can be achieved by intentionally driving the signal into heavy PeakStopPlus™ limiting. Great care has gone into the design of the PeakStopPlus™ limiter to keep it acoustically transparent. Appropriate use of it can protect your gear while keeping the signal free of artifacts.

PeakStopPlus™ Threshold (+) LED Indicator - This LED illuminates when the output signal exceeds the level set by the PeakStopPlus™ LEVEL control indicating that PeakStopPlus™ limiting is occurring.

Figure 4 illustrates the protective action of the PeakStopPlus™ limiter. The signal with the thin line weight represents an unaltered input signal. As you can see, peaks of the input signal exceed the clamping level. The signal with the heavier line weight represents the output signal. The peaks of the input signal which exceeded the clamping level are not allowed to exceed this level at the output. This instantaneous protective action is invaluable for driver protection in speaker systems and for digital recording where it is desirable to record as “hot” as possible, while still avoiding the disastrous result of running out of headroom. Following this clamping action, Intelligent Predictive Limiting™ takes over, typically within 5ms, as long as the input signal continues to exceed the PeakStopPlus™ threshold. This program limiter quickly attenuates the input signal to a level safely below the clamping level, typically 2 dB lower than the clamping level. The PeakStopPlus™ level control is calibrated to this lower level, so if an absolute ceiling is required, set the level 2 to 3 dB below the front panel setting.

As implied by the name, the attack and release times of the Instantaneous Transient Clamp™ are zero, while the Intelligent Predictive Limiting™ attack and release times are program-dependent. That is, for larger excursions over the threshold, the attack time speeds up, and for smaller excursions over the threshold, the attack time slows down. Similarly, for large excursions over the threshold which cause more PeakStopPlus™ gain reduction, the release time increases and is roughly proportional to the amount of gain reduction that occurred.

So, as you can see, dbx’s exclusive PeakStopPlus™ is a technically advanced and superior limiting scheme for unrivaled system protection.

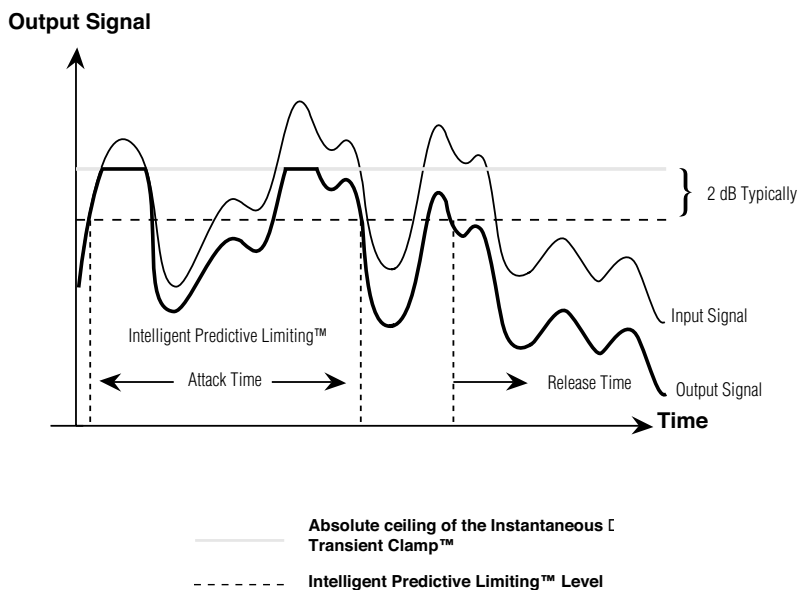
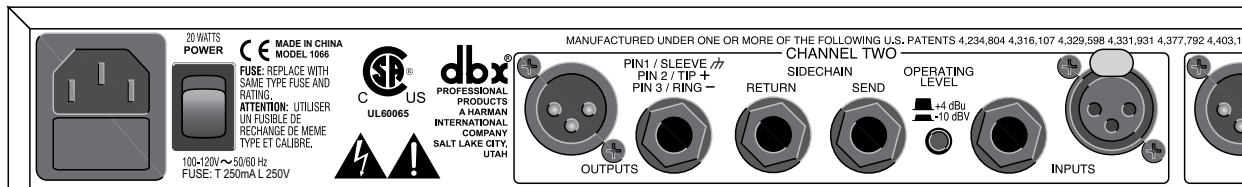


Figure 4: Protective Action of the PeakStopPlus™ Limiter

Rear Panel



AC Power Receptacle - Use the supplied AC cable to connect the unit to AC power. The AC receptacle includes an integral pull-out fuse drawer which contains two fuses: the active fuse and a spare fuse. Replace the fuse with the same type and rating only.

AC Power Switch - Use this switch to turn the unit on and off. The 1066 may also be turned on and off via a master equipment power switch.

Audio Inputs - Each channel features both XLR and 1/4" TRS electronically balanced inputs. Inputs may be used in a balanced or unbalanced configuration.

Audio Outputs - Each channel features both XLR and 1/4" TRS servo-balanced outputs. Outputs may be used in a balanced or unbalanced configuration. An output transformer option is available when very long cable distances are required (see "Specifications").

Operating Level Switch - This switch selects between a -10 dBV and +4 dBu nominal operating level. When the switch is in the in position, a -10 dBV operating level is selected. When it is in the out position, +4 dBu is selected.

Sidechain Send Output - Each channel has a balanced 1/4" TRS SIDECHAIN SEND output. This output may be used in a balanced or unbalanced configuration.

Sidechain Return Input - Each channel has an unbalanced 1/4" TS SIDECHAIN RETURN input.

Applications

Fattening Kick Drums and Compressing Other Drums

Weak, flabby kick drums often have too much boom, and not enough slap. To tighten them up, start with the 1066 adjusted for a medium to high RATIO (e.g., 6:1), adjust the THRESHOLD control so that the GAIN REDUCTION meters show 15 dB of gain reduction, then increase the RATIO if necessary. In OverEasy mode, the 1066 takes slightly longer to react than in Hard Knee mode, and will therefore emphasize the slap at the beginning of the note and reduce the boominess of its body. The 1066 also works well for tightening snare drums and tom toms and can be used with drum machines to effectively alter the character of any electronic drum sound.

Cymbals and tom-toms can be effectively compressed (using the 1066's Sidechain) to help prevent tape saturation. Use the SIDECHAIN SEND of the 1066 to send a signal to the input of an equalizer (e.g., dbx's 242 Parametric Equalizer or the 30 Series Graphic Equalizers). Then connect the equalizer's output to the 1066's SIDECHAIN INSERT. The equalizer can be adjusted for boost with a peak at about 5kHz, causing the cymbal to be compressed on a very loud crash, stopping tape saturation at high frequencies, where there is less headroom. However, gentle tapping of a drumstick or brushing of the cymbal will not be affected. Assuming the tom-tom is a lower frequency instrument and can be better tolerated by the tape, it has less need for compression.

Equalization in the Sidechain circuit means that the compressor is not triggered as readily by a loud tom-tom beat as by an equally loud cymbal crash.

For drum kit submixes (e.g., mixing multiple drum tracks to two tracks while using both channels of a 1066 for compression), consider backing off the RATIO on each channel (down to 2:1) to avoid an excess of cymbal “splattering.” In larger multitracking systems, compress the kick and snare separately. A further possibility is to heavily compress a stereo submix of toms and leave the remaining percussives unaffected.

Raising a Signal Out of a Mix

Since reducing dynamic range increases the average signal level by a small amount, a single track can be raised out of a mix by boosting its level slightly and applying compression. Start with a 2:1 RATIO and a relatively low THRESHOLD setting (-20 dB). Adjust both controls as necessary.

Compressors have also been used to bring vocals to the forefront of a mix in volume-restricted studios (e.g. home studios). Start by adding a foam windscreen to the mic (if it doesn't have one). Set the RATIO to 10:1 and the THRESHOLD to -10 dB. With your mouth approximately 2 inches from the mic, sing the vocal part, but with less volume than normal. Use phrasing to give the part some intensity. An equalizer (e.g., a dbx 242 Parametric Equalizer, dbx 30 Series Graphic Equalizers) or a vocal effects device (e.g., reverb, delay, distortion) can be added to further define the performance.

It is also possible to separate certain vocals or instruments from a mono program already mixed: refer to frequency-weighted compression on page 12.

Note: When compressing a stereo program with a 1066, the factors affecting a compression curve and the actual RATIO and THRESHOLD settings, are the same as those previously covered with reference to single channels of program material. However, it will generally be found that large amounts of compression are more audible in a mixed stereo program than they might be on the separate tracks that were mixed to create the program.

Smoothing out microphone levels

When distance is created between the vocalist and the microphone there will be a variation in the signal level. Start with low compression (around 2:1) to smooth out any variations. Limiting also benefits intelligibility by allowing low-level input signals to be reproduced through the system at higher volume.

Smoothing out musical instrument levels

Compression smooths out the variations of loudness among instruments. Using the 1066 can also increase the instruments sustain. Compress the instrument's output with a ratio of about 4:1.

Preventing analog tape saturation

With programs of widely varying levels, compression can prevent recording levels from saturating tape tracks (see Frequency-weighted compression, page 12).

Speaker protection

Limiting is frequently used to prevent excessive program levels from distorting power amps and damaging drivers in a sound-reinforcement system. To use the 1066 for speaker protection, set the 1066 for limiting (OverEasy button disengaged, RATIO set to 10:1 or greater, AUTO button engaged) then set the THRESHOLD to +20. Adjust the system for the desired amount of level while ensuring the amplifier doesn't clip. Once set, lower the 1066's THRESHOLD until gain reduction just begins to occur, then raise the THRESHOLD slightly so that the signal is just beneath the point where gain reduction occurs.

Note: It is possible for momentary peaks to slip through before the limiter has time to react. Additional protection can be achieved by using the PeakStopPlus™ Limiter instead of the 1066's compression circuit

to apply limiting. You can use the same technique previously mentioned to set this up — just use the PeakStopPlus control rather than the compression THRESHOLD control. PeakStopPlus limiting can typically limit overshoots to a maximum of 2 dB, but may soften transients ever so slightly.

Preventing digital recording overload

Some digital recorders and samplers produce audible distortion when they exceed their headroom (i.e., the range above their maximum operating level). The 1066 effectively ensures that audio input does not overload a digital recorder's A/D (analog-to-digital) converters. The 1066 can perform this function quietly enough for all digital media. To use the 1066 so that no changes in gain occur unless an emergency arises (wildly excessive levels), set Hard Knee mode On, the RATIO to $\infty:1$, and the THRESHOLD to the highest permissible level.

Note: PeakStopPlus™ limiting can also be used to prevent raucous-sounding digital overload.

Gating Dry Percussive Sounds (e.g., Snare Drum, Kick Drum)

To effectively gate percussive sounds with a high level transient, you need to set the 1066's gate controls to ensure that the gate is less sensitive to nearby signals that would cause the gate to open or "false trigger."

Set the Expander/Gate ratio setting high enough to enable the gate to close abruptly as the signal decays below the THRESHOLD.

Note: Fast expansion of sustained low frequency signals can result in "chattering." Because the 1066 is capable of extremely fast expansion, make sure the ratio is not set too high in these applications. The proper THRESHOLD setting will also minimize false triggering and "chattering."

These types of settings are most useful for tightening up drum tracks, removing the "ring" from some drums, or gating out the leakage of one drum through another's mic.

Gating Sounds That Have Longer Decay (e.g., Cymbal, Piano)

To effectively gate sounds which have more decay after the initial transient, set the RATIO control low enough to allow the gate to remain open and capture the signal's entire envelope.

Changing Sound Quality

The 1066's expander/gate can effectively change the sonic character of a sound because it can reduce or otherwise alter the quality of instrumental ambience and reverb. For example, as an instrument stops, its reverberation level will fall through the 1066's THRESHOLD setting. It can now be made to die out more quickly - faster than the natural delay (of the sound). Experiment with different THRESHOLD and RATIO settings to change the "tail" of the sound; a HIGH RATIO setting will nearly eliminate reverb.

Keyed Gating

Keyed gating, that is, controlling the gating of one signal by another, can be used to add dynamics to a sound (e.g., creating perfectly in-sync playing and overdubbing among individual instruments or "fattening" a dynamically weak track).

To create two distinct channels of bass guitar for your mix (by splitting the bass signal into two channels and synchronizing one channel of bass guitar with the kick drum), start by feeding one channel of bass directly into the mix and the other into the gate's INPUT. Then key the gate with a signal from the kick drum (connected to the SIDECHAIN INPUT - adjust controls as needed). The gated bass track will now open with each kick, adding punch and dynamics. This can really tighten up the tracks and add life to the mix.

Another example of keyed gating is using the drum signal to key an oscillator which is set to an appropriate frequency to "tune" and "punch up" the drum sound.

Note: For all keyed gating applications, be aware to adjust the compressor accordingly or bypass it by setting the Compressor RATIO fully counterclockwise to 1:1

Frequency-Sensitive Gating

Frequency-sensitive gating lets you use the SIDECHAIN INPUT to tune the response of the gating action. For example, if you're gating a kick drum in a track with lots of leakage, you can tune in to the frequency of the kick with an outboard EQ and the gate will respond only to that drum. Feed the kick drum signal both directly into the gate and also through an equalizer which is connected to the SIDECHAIN INPUT. With the equalizer adjusted so that only the desired signal is emphasized at the SIDECHAIN INPUT, the gate becomes even more selective in opening.

Frequency-weighted compression

It is possible to separate certain vocals and instruments from a mix by frequency-weighted compression. With an equalizer inserted ahead of the detector input (in the sidechain, not the audio path), the equalization settings do not shift the timbre of frequency response of the audio signal. They merely alter the threshold response of the compressor on a "frequency-weighted" basis. With this arrangement, raising certain frequencies on the equalizer causes them to be suppressed in the audio signal. A relatively high threshold setting can allow normal sounds to be unaffected while solo and very loud sounds are held back. (Of course, when compression does occur, the level of the entire program is affected.) Depending on the threshold setting, lower level fundamentals or harmonics will not cause compression, and the program is not subject to the phase shift normally caused by program equalization.

During the recording of cymbals and tom-toms, a compressor with an equalizer in the detector path can help prevent tape saturation. The equalizer can be adjusted for boost with a peak of about 5kHz, causing the cymbal to be compressed on a very loud crash, stopping tape saturation or digital overload at high frequencies, where there is less headroom. However, gentle tapping of a drumstick or brushing of the cymbal will not be held back. Assuming the tom-tom is a lower frequency instrument and can be better tolerated by the tape, it has less need for compression. The equalization in the detector circuit means that the compressor is not triggered as readily by a loud tom-tom beat as by an equally loud cymbal crash.

The converse of the above EQ technique can be used: dipping the equalizer bands causes any sound with dominant energy in the affected register to pull the level up because the 1066 will detect a need for less compression.

Frequency-weighted compression for Multi-way Speaker Systems

If a single compressor is to be used with a multi-way speaker system (i.e., before the crossover, after EQ), the system operator is faced with the problem of keeping levels below the point of destruction of the most sensitive part of the system. If, for example, mid-range drivers are frequently damaged, the whole system must be operated at a lower sound-pressure level, or additional mid-range drivers must be added. But inserting an equalizer in the detector path (sidechain) of the 1066, it can be made more sensitive to frequencies in the range handled by the sensitive drivers. The system can then be run at higher levels and will only be dropped back when damaging signals are present.

Pre-emphasis for broadcast applications

By inserting a pre-emphasis filter network in the detector path of a 1066 processing pre-emphasized audio, higher levels can be run within the headroom limitations of the broadcast chain.

Anticipated compression

By feeding the program directly to the 1066's sidechain input and sending the audio signal through a delay line

before the audio input, the unit can “anticipate” the need for a gain change. With some experimentation the effect can be that of “zero,” attack time at any given frequency. Additional signal delays beyond this “zero” time will then cause the compressor to finish reducing the gain before the leading edge of the loud passage even enters the signal input. This will suppress the program material preceding this loud passage. The 1066 will then begin to recover from compression (release) before the loud passage has dropped back down toward the set threshold. This will cause the output level to surge higher as the note or passage should be decaying.

Installation Considerations

Hookups and Cabling: The 1066 is designed for nominal -10 dBV or +4 dBu levels. The 1066 can be used with either balanced or unbalanced sources and the outputs can be used with either balanced or unbalanced loads, provided the proper cabling is used.

A balanced line is defined as two-conductor shielded cable with the two center conductors carrying the same signal but of opposite polarity when referenced to ground. An unbalanced line is generally a single-conductor shielded cable with the center conductor carrying the signal and the shield at ground potential.

Normal Balanced Connections for Inputs and Outputs

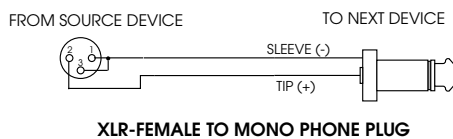
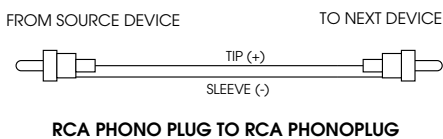
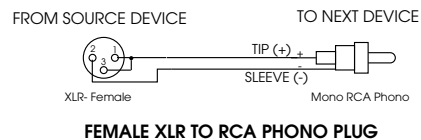
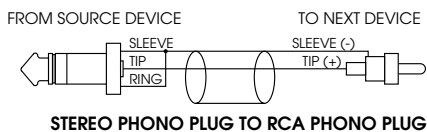
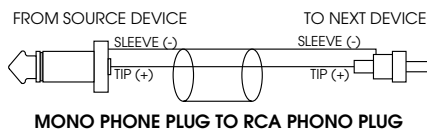
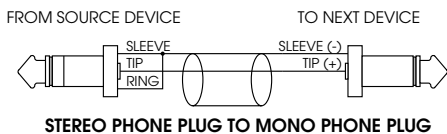
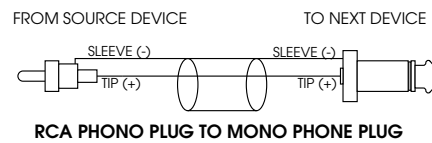
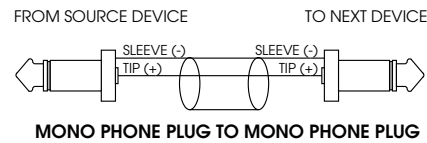
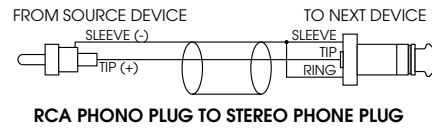
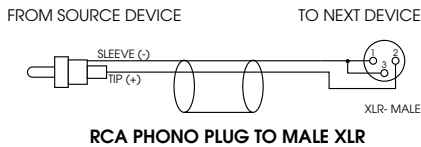
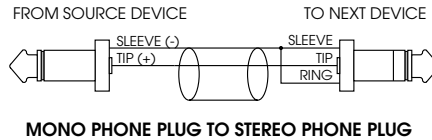
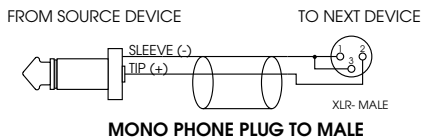
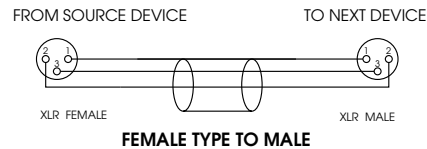
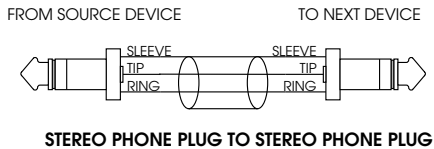
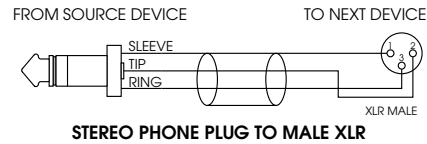
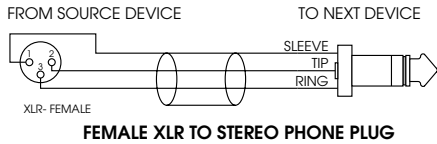
<u>Connection</u>	<u>XLR</u>	<u>TRS 1/4" Jack</u>
Ground:	Pin 1	Sleeve
High:	Pin 2	Tip
Low:	Pin 3	Ring

Normal Unbalanced Connections for Inputs and Outputs

<u>Connection</u>	<u>XLR</u>	<u>TRS 1/4" Jack</u>	<u>TS 1/4" Jack</u>
Ground:	Pin 1	Sleeve	Sleeve
High:	Pin 2	Tip	Tip
Low (ground):	Pin 3	Ring	Sleeve

Tie pin 3 to the ground for unity gain in/out of the 1066 when using unbalanced input connections to balanced output connections or balanced input connections to unbalanced output connections. To do otherwise won't hurt the unit but will result in unmatched input to output levels, and the level control will not be properly calibrated.

The following cable wiring diagrams may to assist you with input and output connections for both balanced and unbalanced connectors.



Specifications

Inputs

Connectors:	Female XLR and 1/4" TRS (Pin 2 and tip hot)
Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	Balanced > 50 k Ω , unbalanced >25 k Ω
Max Input Level:	> +24 dBu balanced or unbalanced
CMRR:	40 dB; Typically >55 dB at 1 kHz

Outputs

Connectors:	Male XLR and 1/4" TRS (Pin 2 and tip hot)
Type:	Servo-balanced/unbalanced, RF filtered
Impedance:	Balanced 120 Ω , unbalanced 60 Ω
Max Output Level:	> +21 dBu, >+20 dBm (600 Ω) balanced/unbalanced

Sidechain Input

Connector:	1/4" TS
Type:	Unbalanced, RF filtered
Impedance:	> 10 k Ω
Max Input Level:	> +24 dBu

Sidechain Output

Connector:	1/4" TRS (tip hot)
Impedance:	Balanced 2 k Ω , unbalanced 1 k Ω
Max Output Level:	> +21 dBu balanced or unbalanced

System Performance

Bandwidth:	20 Hz to 20 kHz, +0/-0.5 dB
Frequency Response:	0.35 Hz to 200 kHz, +0/-3 dB
Noise:	< -95 dBu, unweighted, 22 kHz measurement bandwidth
Dynamic Range:	> 120 dB, unweighted
THD+Noise:	0.008% typical at +4 dBu, 1 kHz unity gain 0.0496% typical at +20 dBu, 1 kHz, unity gain < 0.1% any amount of compression up to 40 dB, 1 kHz
IMD:	< 0.1% SMPTE
Interchannel Crosstalk:	< -100 dB, 20 Hz to 20 kHz
VCA:	dbx V2™
Stereo Coupling:	True RMS Power Summing

Compressor

Threshold Range:	-40 dBu to +20 dBu
Ratio:	1:1 to ∞ :1
Threshold Characteristic:	Selectable OverEasy® or hard knee
Attack/Release Characteristic:	AutoDynamic™
Attack/Release Modes:	Selectable Manual or Auto
Manual Attack Time:	Scalable program-dependent. Typically 3 dB/msec to .04 dB/msec
Manual Release Time:	Scalable program-dependent. Typically 250 dB/sec to 5 dB/sec
Auto Attack Time:	Program-dependent. Typically 15ms for 10 dB, 5ms for 20 dB, and 3ms for 30 dB.
Auto Release Time:	Program-dependent. Typically 125 dB/sec rate. Output Gain: -20 to +20 dB
Output Gain:	-20 to +20 dB

Limiter

Threshold Range:	+4 dBu to >+22 dBu (off)
Ratio:	∞ :1
Limiter Type:	PeakStopPlus™ two-stage limiter
Stage 1:	Instantaneous Transient Clamp™
Attack Time:	Zero
Release Time:	Zero
Stage 2:	Intelligent Predictive Limiting™
Attack Time:	Program-dependent, typically <5 msec
Release Time:	Program-dependent, typically 22 dB/sec

Expander/Gate

Threshold Range:	Off to +15 dBu
Ratio:	1:1 to 8:1
Attack Time:	<100 µsec from maximum depth
Release Time:	Program-dependent

Function Switches

SC Enable	Routes the external sidechain input signal to the detector.
SC Mon:	Routes the sidechain signal to the main output, interrupting the normal audio.
OverEasy®:	Activates the OverEasy® compression function.
Contour:	Activates the frequency-dependent detector function.
Auto:	Activates automatic program-dependent attack and release times, disabling the manual attack and release controls.
I/O Meter:	Switches between monitoring input and output levels on the Input/Output Level meter.
Bypass:	Activates the direct input-to-output hard-wire relay bypass. Relay automatically hard-wire bypasses unit at power-down and provides a power-on delay of 1.5 seconds.
Operating Level (rear panel):	Switches the nominal operating level between -10 dBV and +4 dBu simultaneously for both input and output levels.
Stereo Couple:	Couples both channels for stereo operation. Channel One becomes the master.

Indicators

Gain Reduction	12 LED bar graph at 1,2,4,6,9,12,15,18,21,24,27, and 30 dB.
Input/Output Level	8-segment LED bar graph at -24, -18, -12, -6, 0, +6, +12, and +18 dBu
Compressor Threshold:	3 LED bar graph at Below (-), OverEasy® (O), and Above (+)
Exp./Gate Threshold:	2 LED bar graph at Below (-) and Above (+)
Limiter Threshold:	1 LED to indicate PeakStopPlus™ limiting
Function Switches:	LED indicator for each front-panel switch

Power Supply

Operating Voltage:	Factory selected: 100-120 VAC 50/60 Hz or 200-240 VAC 50/60 Hz
Power Consumption:	25 Watts
Fuse:	100-120 VAC: T 250 mA L 250V 200-240 VAC: T 125 mA L 250V
Mains Connection:	IEC receptacle

Physical

Dimensions:	1.75" H x 19" W x 9" D 44.5 x 483 x 229 mm
Weight:	5.1 lbs. 2.3 kg
Shipping Weight:	7.5 lbs. 3.4 kg

Options

Output Transformer Per Channel:	Jensen® JT-123-dbx or BCI™ RE-123-dbx
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Note: Specifications subject to change.

Notes

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