160 SERIES COMPRESSOR/LIMITERS

dbx

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160X

The Model 160X compressor/limiter provides the studio operator, broadcaster, or sound reinforcement specialist with outstanding performance and operational flexibility in a slim-line rack mount package. The 160X has all the features of our famous Model 160, and more. It is the only compressor/limiter that offers you the choice of Over Easy® or hard-knee operation—regardless of compression ratio selected. There's also a precision dual-display system with an expanded range for continuously monitoring gain reduction as well as input or output levels—a dbx exclusive.

☐☐ Switch selectable Over Easy or classic 160 hard-knee curve. ☐☐ Dual true RMS display system: 19-LED display monitors input or output signal level over a 60dB range; 12-LED display indicates the amount of gain reduction over a 40dB range. ☐☐ Two units can be strapped for dual-channel tracking compression. ☐☐ Input and output connections via convenient tip-ring-sleeve phone jacks as well as barrier strip connector. ☐☐ Infinity + ™ compression provides negative gain control for "dynamic reversal" effects. ☐☐ Compression ratio continuously variable from 1:1 to ∞:1 to −1:1. ☐☐ Separate detector input allows compression pre-emphasis and other effects. ☐☐ +24dBm input/output capability. ☐☐ Active balanced input provides hum and RF rejection. ☐☐ Provision for transformer or active balancing of output.

163/RM-163

The Model 163 (and dual-version RM-163) is the most easily operated compressor/limiter on the market today—at a modest price. It lets you use a single front panel control to raise or lower the compression threshold, while the output gain is automatically adjusted to maintain a consistent output level. The 163 also automatically adjusts attack and release times, as well as compression ratio, based on the input signal. And the dbx Over Easy compression curve provides inaudible transition into compression. The 163's high level of performance and exceptional value make the perfect choice for the studio, church audio system, or PA system operated on a limited budget.

☐☐ Automatic control of attack and release times, compression ratio and output gain, plus single-knob simplicity for ease of setup and operation. ☐☐ 12-LED display shows precise amount of gain reduction taking place. ☐☐ Phono connectors on input and output permit easy interface with associated equipment. ☐☐ Kits are available for adapting the half-rack design of the 163 to a standard 19" rack, or for rack mounting two 163s together. (The RM-163 fits a standard rack.)

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Input impedance	Signal input: 50kΩ, unbalanced; >100kΩ, balanced Detector input: 230kΩ, unbalanced; >460kΩ, balanced	25kΩ, unbalanced
Input level	+24dBm maximum	+17dBm nominal maximum, +24dBm clipping point
Output impedance	22Ω, designed to drive 600Ω or greater	<47Ω (active low-impedance output)
Output level	+24dBm into 600Ω or greater	+18dBm into 2kΩ
Threshold range	Variable from −40 to +20dBm (7.8mV to 7.8V RMS)	Variable −36dBm to +4dBm (12.0mV to 1.2V RMS)
Compression ratio	Over Easy: dependent, affected by THRESHOLD, settings (COMPRESSION RATIO control determines maximum compression ratio), continuously variable from 1:1 to ∞:1 to −1:1 Hard-knee: COMPRESSION RATIO setting defines exact compression ratio, continuously variable from 1:1 to ∞:1 to −1:1	Automatically varies from 1:1 below threshold to ∞:1 above threshold in accordance with Over Easy threshold curve
Maximum compression	>60dB	>50dB
Threshold characteristic	Over Easy or hard-knee (switch selectable)	Over Easy
Attack time[1]	Program dependent: 15ms for 10dB increase in input level (above threshold), 5ms for 20dB, 3ms for 30dB	Program dependent: 15ms for 10dB increase in input level (above threshold), 5ms for 20dB, 3ms for 30dB
Release time	Program dependent: varies automatically from 0-500ms, affected by settings of front panel controls	Program dependent: varies automatically from 0-420 ms, affected by settings of front panel control
Output gain	Variable from −20 to +20dB	Variable from 0 to +40dB depending upon settings of front and rear panel controls
Slew rate	>10V/μs	>10V/μs
Dynamic range[2]	>113dB	>106dB
Equivalent input noise (unweighted)	<−89dBm, 20Hz-20kHz	<−89dBm, 30Hz-20kHz
Frequency response	+0, −1dB, 20Hz-20kHz	+0, −1dB, 30Hz-20kHz, 5kΩ load +0, −3dB, 30Hz-20kHz, 2kΩ load
Distortion below threshold[3]	2nd harmonic 0.07% 3rd harmonic 0.07%	2nd harmonic 0.1% 3rd harmonic 0.1%
Distortion above threshold[4]	2nd harmonic 0.07% 3rd harmonic 0.2%	2nd harmonic 0.1% 3rd harmonic 0.2% (measured at −10dBm nominal level setting)
Metering	19 LED INPUT or OUTPUT display from −40 to +20dB, 12 LED GAIN REDUCTION display from −1 to −40dB	12 LED COMPRESSION display from −2 to −30dB
Meter zero set	−15dBm to +10dBm	Fixed
Indicators	BELOW/threshold/ABOVE (green, yellow, red), INPUT (red), OUTPUT (red), SLAVE (yellow), BYPASS (red)	None
Controls and switches	THRESHOLD, COMPRESSION RATIO, OUTPUT GAIN, DISPLAY function switch, meter zero adjust, BYPASS switch, SLAVE switch, OVER EASY switch	COMPRESSION (front panel), nominal operating level switch, adjust (rear panel)
Connectors	Input/output: TRS phone jacks and barrier terminal Detector: barrier terminal Strapping: TRS phone jack	Input/output: phono jacks
Dimensions	1¾" H x 19" W x 9¼" D (4.4cm x 48.3cm x 18.4cm)	1⅞" H x 9" W x 6⁷⁄₁₆" D (4.8cm x 22.9cm x 16.3cm)
Weight	6.5 lbs (3.0 kg)	2.5 lbs (1.1 kg)
Power requirements	115/220 VAC ± 10%, 50-60Hz, 8W	117 VAC ± 10%, 50-60Hz, 6W
Accessories	AB-1 active balanced output card	RM-18-1 rack mount kit for a single 163, RM-18-2 rack mount kit for two 163s

[1] Measured in the infinite compression region of the threshold curve, time required to reduce signal by 63% of level increase (above threshold)
[2] Defined as the difference between the maximum signal level and the "A" weighted noise floor as measured at the output (signal to noise)
[3] Measured at 1kHz, 0dBm input and output
[4] Figures are typical at infinite compression, 1kHz, 0dBm input and output—2nd harmonic is relatively unaffected by compression ratio, time constants and frequency, while 3rd harmonic decreases with slower time constants, higher frequencies and lower compression ratios

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164

The Model 164 is the stereo version of the Model 163. It is the ideal unit for applications such as dance music systems, or small studio stereo mixdown. Like the 163, it offers the simplicity of single-knob compression control, automatic attack and release times, and the dbx Over Easy compression curve for inaudible transition into compression.

☐☐ Blackmer VCAs assure precise stereo tracking over entire Over Easy curve. ☐☐ Matched RMS detectors eliminate signal summing errors associated with conventional stereo-strapped compressors. ☐☐ Automatic parameter control plus single-knob simplicity for ease of setup and operation. ☐☐ Dual 12-LED displays show precise amount of gain reduction taking place. ☐☐ Phono connectors on inputs/outputs for easy interface with associated equipment.

165

The Model 165 is the top of the line in dbx compressor/limiters. This single-channel unit is strappable for true stereo operation, and offers a choice of manual or automatic attack and release rates for the ultimate in control. With the dbx Over Easy compression curve, the 165 provides a smooth, natural transition into compression.

☐☐ Compression ratio continuously variable from 1:1 to ∞:1. ☐☐ In automatic mode, attack and release times are determined by program material dynamics. In manual mode, adjustment of attack and release rates allows the 165 to be used as a peak, average, or RMS-detected limiter. ☐☐ Separate detector input allows compression pre-emphasis and other effects. ☐☐ Each 165 is equipped with matched RMS detectors for stereo-strapping operation without the signal summing errors associated with conventional stereo-strapped compressors. ☐☐ Analog RMS meter is switchable to read input or output levels, or amount of gain reduction, over a 30dB range. ☐☐ Active balanced input provides hum and RF rejection. ☐☐ +24dBm input/output capability.

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25kΩ, unbalanced	Signal input: >22kΩ, balanced; 11kΩ, unbalanced Detector input: >620kΩ, balanced; 310kΩ, unbalanced
+17dBm nominal maximum, +24dBm clipping point	+24dBm maximum
<47Ω (active low impedance output)	<33Ω (active low impedance output)
+18dBm into 2kΩ	+24dBm into 600Ω or greater
Variable -36dBm to +4dBm (12.0mV to 1.2V RMS)	Variable from -40 to +10dBm (7.8mV to 2.5V RMS)
Automatically varies from 1:1 below threshold to ∞:1 above threshold in accordance with Over Easy threshold curve	Program dependent, affected by THRESHOLD, COMPRESSION RATIO settings (COMPRESSION RATIO control determines maximum compression ratio), continuously variable from 1:1 to ∞:1
>50dB	>60dB
Over Easy	Over Easy
Program dependent: 15ms for 10dB increase in input level (above threshold), 5ms for 20dB, 3ms for 30dB	Manual mode: maximum attack rate variable from 1 to 400dB/ms Automatic mode: program dependent, 15ms for 10dB increase in input level (above threshold), 5ms for 20dB, 3ms for 30dB
Program dependent: varies automatically from 0-420ms, affected by settings of front panel control	Manual mode: maximum release rate variable from 10 to 4000dB/sec Automatic mode: program dependent, varies from 0-500ms, affected by settings of front panel controls
Variable from 0 to +40dB depending upon settings of front and rear panel controls	Variable from -20 to +20dB
>10V/μs	>10V/μs
>106dB	>114dB
<-89dBm, 30Hz-20kHz	<-90dBm, 20Hz-20kHz
+0, -1dB, 30Hz-20kHz, 5kΩ load +0, -3dB, 30Hz-20kHz, 2kΩ load	+0, -1dB, 20Hz-20kHz
2nd harmonic 0.1% 3rd harmonic 0.1%	2nd harmonic 0.05% 3rd harmonic 0.07%
2nd harmonic 0.1% 3rd harmonic 0.2% (measured at -10dBm nominal level setting)	2nd harmonic 0.05% 3rd harmonic 0.2% (auto or manual with attack and release controls centered)
Dual 12 LED COMPRESSION display from -2 to -30dB	Analog meter range of -20 to +10dB, switchable to read INPUT, OUTPUT or GAIN CHANGE
Fixed	-10dBm to +10dBm
None	BELOW/threshold/ABOVE (green, yellow, red), AUTO (yellow), SLAVE (yellow), POWER (red)
COMPRESSION (front panel), nominal operating level switch, adjust (rear panel)	COMPRESSION, THRESHOLD, ATTACK, RELEASE, OUTPUT GAIN, POWER, STEREO COUPLER, AUTO/manual, meter selector (INPUT, OUTPUT, GAIN CHANGE), SYSTEM BYPASS, meter zero adjust
Input/output: phono jacks	Input/output: barrier terminal Detector input: barrier terminal Stereo coupler: 12-pin connector
1¾"H x 19"W x 6⅜"D (4.4cm x 48.3cm x 16.2cm)	3½"H x 19"W x 10⅛"D (8.9cm x 48.3cm x 25.7cm)
5.2 lbs (2.4 kg)	8 lbs (3.6 kg)
117 VAC ± 10%, 50-60Hz, 12W	117 VAC ± 10%, 50-60Hz, 25W
None	CA-165 stereo coupling cable for two 165s

Warranty: dbx products are covered under a limited warranty (parts and labor) for two years from date of original purchase. Specifications subject to change without notice. Manufactured under one or more of the following U.S. patents: 3,681,618; 3,714,462; 3,789,143; 4,101,849; 4,097,767. Other patents pending. dbx® and Over Easy® are registered trademarks of dbx, Incorporated. Infinity + ™ is a trademark of dbx, Incorporated.

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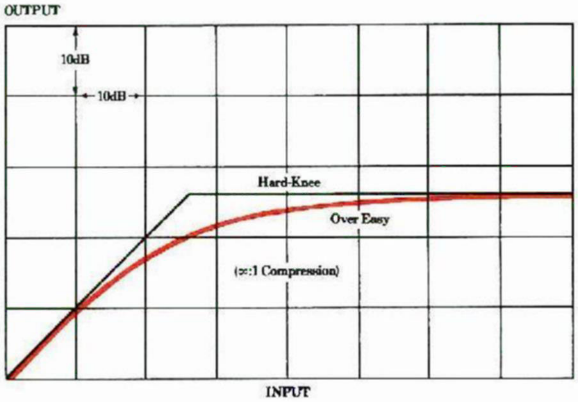
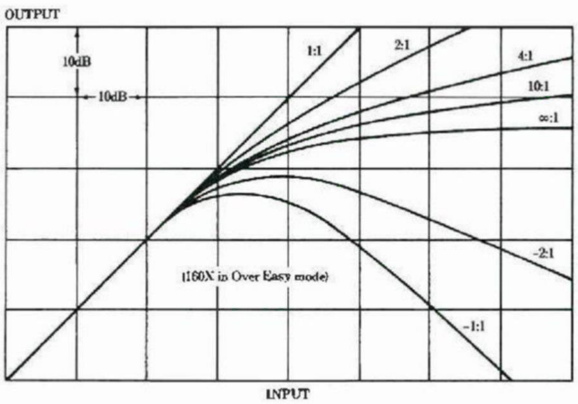
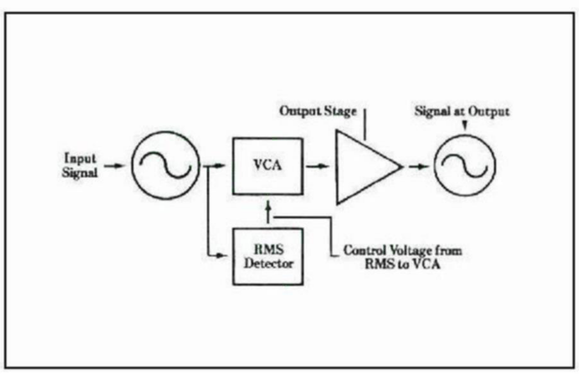
The dbx 160 Series is a complete line of Over Easy® compressor/limiters to suit virtually every budget and every application. Through sophisticated circuit design, the disturbing audio side effects often associated with compressor/limiters have been eliminated.



OVER EASY VS. HARD-KNEE COMPRESSION



TYPICAL OVER EASY COMPRESSION CURVES



OVER EASY COMPRESSION

All models incorporate the dbx Over Easy circuit design that provides inaudible transition into compression, even at high compression ratios.

The Blackmer RMS detector—a patented circuit for detecting true RMS levels—closely simulates the reaction of the human ear to audio signals, providing compression that sounds natural and appropriate to the music. And, because the response of this unique detector accurately correlates to thermal energy developed in loudspeakers, dbx compressor/limiters can provide optimum driver protection in high-power applications.

The 160 Series also features the patented Blackmer VCA (Voltage Controlled Amplifier) which provides precise low distortion control of audio levels over a wide dynamic range. Feed forward gain control allows infinity:1 compression ratios without gain instability. And DC control of all functions eliminates "noisy pot" problems because no audio signals pass through front panel controls.

The dbx 160 Series of compressor/limiters is at the forefront of compressor technology—the logical choice for recording studios, broadcasters and sound contractors who want the most natural sound available today.

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Tel. (617) 964-3210, Telex: 92-2522. Distributed in Canada by BSR (Canada) Ltd., Rexdale, Ontario.

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Printed in U.S.A. 108125M-600187

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