Model 3944 - 3Hz to 2MHz

24dB/Octave 4-Ch LP/HP Butterworth/Bessel Progr. Filter

CE

3Hz to 2MHz

4-Channel LP/HP/BP/BR
Butterworth and Bessel
GPIB/Manual

Tunable Active Filter

Features

Four Independent Channels
Filter Types: Butterworth or Bessel
Attenuation Slope: 24dB/Octave/Channel
Frequency Range: 3Hz to 2MHz
Input Gain: 0dB or 20dB
Output Gain: 0dB or 20dB
Stopband Attenuation: >95dB

Options

020: Lower frequency cutoff range to 0.3Hz to 200kHz.
Rack Mount Kit: Part No. RK-37, permits installation of the Model 3944 into a standard 19" rack spacing.
Extended 1 Year Warranty: Part No. EW3944.

Related Models

3900 - LP - 1Hz to 99kHz - 2-Ch Elliptical
3901 - LP/HP/BP/BR - 1Hz to 99kHz - 2-Ch Elliptical
3940 - LP/HP/BP/BR - 3Hz to 2MHz - 2-Ch Butterworth & Bessel
> 3944 - LP/HP/BP/BR - 3Hz to 2MHz - 4-Ch Butterworth & Bessel
3945 - LP/HP/BP/BR - 3Hz to 25.6MHz - 3-Ch Butterworth & Bessel
3955 - LP - 170Hz to 25.6MHz - 2-Ch Butterworth or Bessel
3988 - LP/HP/BP/BR - 0.03Hz to 1MHz - 2-Ch Butterworth & Bessel

DESCRIPTION

The Krohn-Hite Model 3944 is a 4-channel, Butterworth/Bessel filter offers a programmable or bench top filter covering a cutoff frequency range from 3Hz to 2MHz, with a frequency response characteristic of maximally flat (Butterworth) for clean filtering in the frequency domain, or linear phase (Bessel) to provide superior pulse or complex signal filtering. The passband gain is unity, and the attenuation slope is 24dB/octave per channel. The 3944 will accept input signals of ±4.5V peak and provides input and output gains of 0dB or 20dB which can be selected via the front panel keyboard or over the GPIB bus.

CONFIGURATIONS

The filter can be programmed to operate in any combination of four channels of high-pass or low-pass; two channels of any combination of band-pass or band-reject; or one channel of band-pass or band-reject and two channels of any combination of high-pass or low-pass. The four channels can be connected to achieve 96dB/octave of high-pass or low-pass.

STORING SET-UPS

The Model 3944 offers to the user 99 groups of non-volatile memory for storage of front panel set-ups, which are stored in battery-backed CMOS. Set-ups can then be recalled with a simple command.

The 3944 also provides a self-test diagnostics upon power-up of its internal memory to insure the unit is operating properly. If a failure occurs, the display will indicate which ROM or RAM has failed.

APPLICATIONS

Applications for the Model 3940 are anti-aliasing, random noise testing, sound measurements, sound recording, suppressing interference in audio communications circuits and many more.

SPECIFICATIONS

FUNCTIONS

Four independent channels of low-pass, high-pass or by-pass two channels of band-pass or band-reject.

FILTER CHARACTERISTICS (Each Channel)

Type: 4-pole Butterworth (maximally flat) or Bessel (linear phase).

Frequency Range (f_c): 3Hz to 2MHz.

Frequency Control: Keypad entry or increment and decrement keys.

Frequency Resolution: 1Hz from 3Hz to 1kHz; 10Hz to 2kHz 100Hz to 100kHz; 1kHz to 1MHz; 10kHz to 2MHz.
Frequency Accuracy (f_c): ±2% or least significant digit (which ever is greater) 20Hz to 500kHz; ±5% to 2MHz.

Relative Gain at f_c: Butterworth, –3dB; Bessel, –7.58dB.

Bandwidth: dc to f_c, dc coupled; 0.2Hz to f_c, ac coupled (low-pass); f_c to 10MHz (high-pass).

Attenuation: 24dB/octave per channel.
Stopband Attenuation: >80dB.
Insertion Loss (0dB Input/ Output gain): ±0.5dB to 2MHz.

INPUT CHARACTERISTICS

Gain (pre-filter): 0dB or 20dB ±0.2dB.
Coupling: ac or dc.
Impedance: 1M ohm in parallel with 100pf.
Maximum Signal (at 0dB gain): ±4.5V peak at f_c <1MHz; ±4V peak at 2MHz.
Maximum DC Component: ±200V in ac coupled mode.

OUTPUT CHARACTERISTICS

Impedance: 50 ohms.
Gain (post-filter): 0dB or 20dB ±0.2dB.
Maximum Voltage: ±6.5V peak into ³ 500 ohms; ±1.3V peak into ³ 50 ohms.
Maximum Current: ±25mA.
Distortion: –80dB at 1kHz at 1Vrms.
Noise: <200µV with 2MHz bandwidth detector.
DC Offset: adjustable to 0V.
DC Stability: ±0.5mV/°C typical; ±1mV/°C max.

GENERAL

Memory: 99 selectable groups; memory is non-volatile battery-backed CMOS.
Self-Test Diagnostics: MPU checks unit upon power-up. Display indicates failure mode.
Displays: 7 segment, green, LED; 0.3" high.
Remote Programming: IEEE-488.1 interface. Subsets: SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT0, C0, E1.
Operating Temperature: 0°C to 50°C.
Isolation to Chassis: ±200Vdc.
Storage Temperature: –20°C to 70°C.
Input/Output Connectors: BNC, front and rear.
Power Requirements: 90-132/180-264 volts ac, 50Hz-400Hz, 40 watts.
Dimensions and Weights: 3.5" (9cm) high, 8.5" (21.8cm) wide, 18" (46.2cm) deep;
2 lbs (5.4kg) net; 14 (6.3kg) lbs shipping.
Accessories: 6 foot, 3 terminal line cord, operating manual.

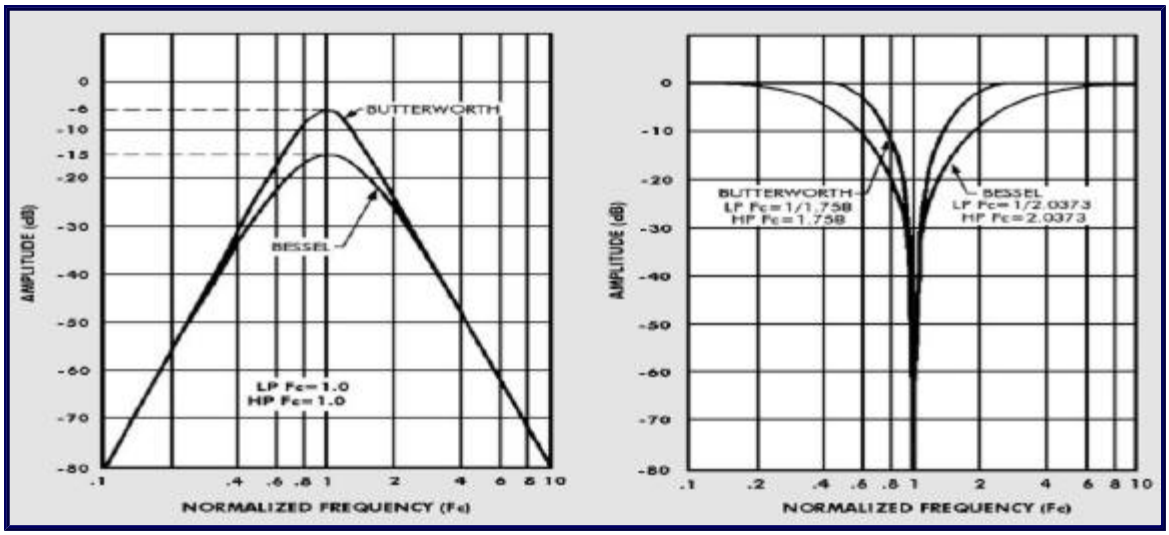
OPTIONS

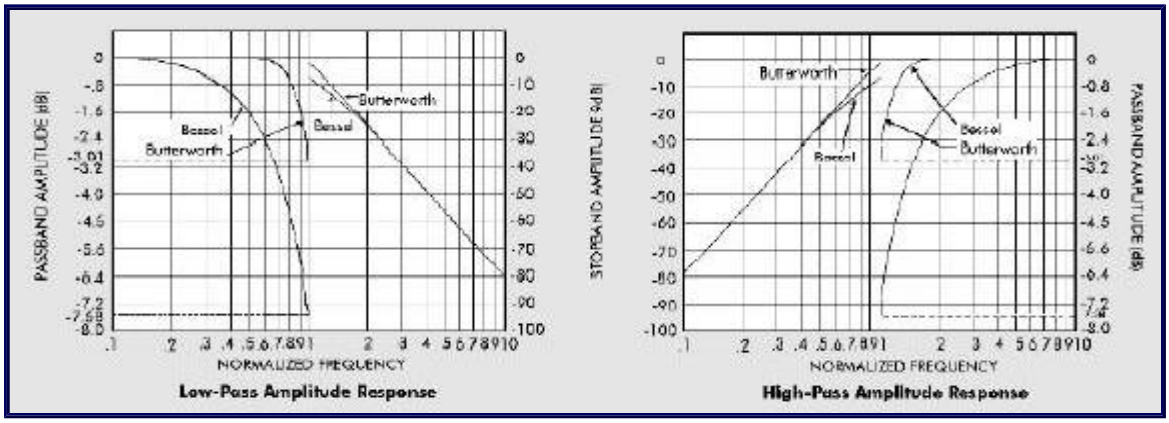
020: Lower frequency cutoff range to 0.3Hz to 200kHz.
Rack Mount Kit: Part No. RK-37, permits installation of the Model 3944 into a standard 19" rack spacing.
Extended 1 Year Warranty: Part No. EW3944.

OPTIONAL ACCESSORIES

CAB-010: GPIB Cable with Connectors, 2-Meters
CAB-011: GPIB Cable with Connectors, 1-Meters
CAB-025: Cable, BNC, 3ft, Low Noise

Specifications apply at 25°C ±5°C.
Specifications subject to change without notice.


BUTTERWORTH
BESSEL
LP Fc=1.0
HP Fc=1.0
AMPLITUDE (dB)
NORMALIZED FREQUENCY (Fc)
BUTTERWORTH
LP Fc=1/1.758
HP Fc=1.758
BESSEL
LP Fc=1/2.0373
HP Fc=2.0373
AMPLITUDE (dB)
NORMALIZED FREQUENCY (Fc)


PASSBAND AMPLITUDE (dB)
Butterworth
Bessel
Bessel
Butterworth
NORMALIZED FREQUENCY
Low-Pass Amplitude Response
STOPBAND AMPLITUDE (dB)
Butterworth
Bessel
Bessel
Butterworth
PASSBAND AMPLITUDE (dB)
NORMALIZED FREQUENCY
High-Pass Amplitude Response