

Model 3381

0.1Hz to 200kHz

Single Channel 8-Pole Filter



- Attenuation: 48dB/Octave
- Filter Modes: Low-Pass and High-Pass
- Response: Butterworth and Bessel
- Input: Differential and Single-Ended
- Input Gain: 0dB to 50dB in 10dB steps
- Output Gain: 0dB to 20dB in 0.1dB steps
- Battery Operation Option

DESCRIPTION

The Krohn-Hite Model 3381 Filter provides ease of operation and the reliability Krohn-Hite has been known for since 1949; along with a price that will fit any budget.

The 3381 provides a tunable filter with a frequency range from 0.1Hz to 200kHz; and with the 002 option, the range is extended to 0.005Hz. The frequency response characteristic is selectable to either maximally flat (Butterworth) for clean filtering in the frequency domain, or linear phase (Bessel) for complex filtering.

The 3381 is selectable to function as a low-pass or high-pass, 8-pole filter providing a selectable input gain to 50dB, and an output gain to 20dB selectable in 0.1dB steps. The 3381 will accept input signals to $\pm 10V$ peak at 0dB gain and has selectable ac or dc coupling. Memory is available for storing a set-up of the instrument which can be recalled with a simple command.

APPLICATIONS

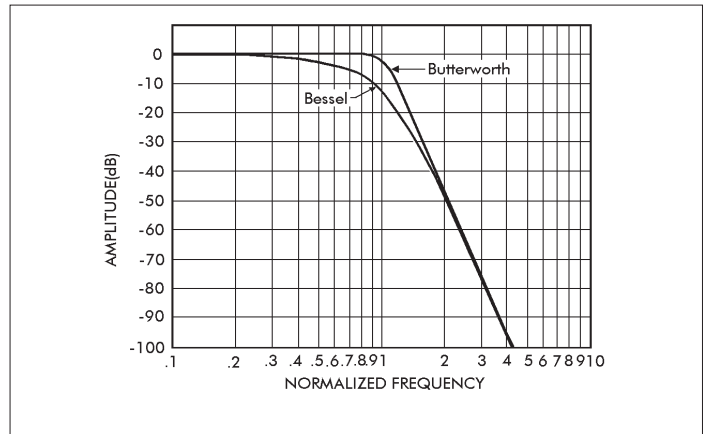
Applications of the Model 3381 are anti-aliasing, ultra-sound measurements, random noise testing, sound recording, suppressing interference in audio communications and related fields of medical, geological, geophysical, oceanographic, military and many more.

SPECIFICATIONS

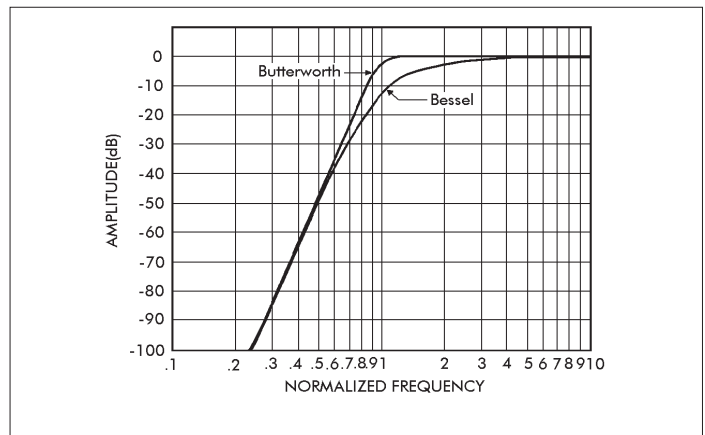
Specifications apply at 25°C, $\pm 5^\circ C$.

FUNCTIONS

Low-pass filter, high-pass filter



Low-Pass Amplitude Response



High-Pass Amplitude Response

FILTER CHARACTERISTICS

Type: 8-pole, selectable Butterworth and Bessel.

Attenuation Slope: 48dB/octave.

Tunable Frequency Range fc: 0.1Hz to 200kHz; (option 002, 0.005Hz).

Frequency Resolution: 0.001Hz, 0.1Hz to 0.999Hz; 3 Digits, 1Hz to 200kHz, (option 002, 0.001Hz from 0.005Hz to 0.1Hz).

Cutoff Frequency Accuracy: $\pm 3\%$.

Relative Gain at fc: -3dB , Butterworth; -12.6dB , Bessel.

High-Pass Bandwidth (0dB Gain): $>2\text{MHz}$.

Stopband Attenuation: $>80\text{dB}$.

Wideband Noise (2MHz bandwidth detector): 0dB gain, $<400\mu\text{Vrms}$. Max. gain, $<25\mu\text{Vrms RTI}$.

Harmonic Distortion (1V input, 0dB gain): -60dB (0.1%) to 10kHz; -50dB (0.3%) to 100kHz.

DC Stability: Typically $\pm 1\text{mV}/^\circ\text{C}$.

Input: Differential or single-ended.

Pre-Filter Gain: 0dB, 10dB, 20dB, 30dB, 40dB, 50dB, $\pm 0.2\text{dB}$.

Impedance: 1 megohm in parallel with 25pf.

Maximum Input: $\pm 10\text{V}$ peak at 0dB gain, reduced in proportion to gain setting.

CMRR: $>60\text{dB}$ to 10kHz; $>50\text{dB}$ to 100kHz.

Coupling: ac (0.16Hz) or dc.

Sensitivity: 3mV peak with 70dB total gain for 10V peak output.

Maximum DC Component: $\pm 100\text{V}$ in ac coupled mode.

Output:

Post-Filter Gain: 0dB to 20dB in 0.1dB steps, $\pm 0.2\text{dB}$.

Maximum Voltage (open circuit): $\pm 10\text{V}$ peak.

Maximum Current: $\pm 80\text{mA}$ peak.

Impedance: 50 ohms.

DC Offset: Adjustable to zero volts.

GENERAL

Memory: 9 stored set-ups.

Self-Test Diagnostics: MPU checks unit upon power-up. Display indicates failure mode.

Displays: 7 segment, green, LED; 0.3" high.

Operating Temperature: 0°C to 50°C .

Isolation to Chassis: $\pm 200\text{Vdc}$.

Input/Output Connectors: BNC.

Power Requirements: 90-132/180-264 volts ac, 50Hz-400Hz, 10 watts (3361), 15 watts (3362), 30 watts (3364).

Dimensions and Weights: 3.5" (9cm) high, 14" (36cm) wide, 12.5" (32.13cm) deep; 12 lbs (5.4kg) net, 14 lbs (6.3kg) shipping.

Accessories: 3-terminal line cord; operating manual.

OPTIONS

002: extends low end cutoff to 0.005Hz.

BK-330: Line/battery operation.

Rack Mount Kit: Part No. RK-314, permits installation of the Model 3381 into a standard 19" rack spacing.

Extended 1 Year Warranty: Part No. EW3381.

OPTIONAL ACCESSORIES

CAB-025: Cable, BNC, 3ft, Low Noise

Specifications subject to change without notice.

8-Pole High-Pass Butterworth

Theoretical Transfer Characteristics

f/fc (Hz)	Amp (dB)	Phase (Deg)	Delay (1) (sec)
0.10	-160.00	691.00	0.819
0.20	-112.00	661.00	0.828
0.30	-83.70	631.00	0.843
0.40	-63.70	600.00	0.867
0.50	-48.20	568.00	0.903
0.60	-35.50	535.00	0.956
0.70	-24.80	499.00	1.040
0.80	-15.60	459.00	1.190
0.85	-11.60	437.00	1.290
0.90	-8.060	413.00	1.400
0.95	-5.150	386.00	1.480
1.00	-3.010	360.00	1.460
1.20	-0.229	275.00	0.873
1.40	-0.020	226.00	0.540
1.60	-0.002	194.00	0.380
1.80	0.000	170.00	0.287
2.00	0.000	152.00	0.226
2.50	0.000	120.00	0.139
3.00	0.000	99.20	0.094
4.00	0.000	74.00	0.052
5.00	0.000	59.00	0.033
6.00	0.000	49.00	0.023
7.00	0.000	42.10	0.017
8.00	0.000	36.80	0.013
9.00	0.000	32.70	0.010
10.00	0.000	29.40	0.008

Note (1)

Normalized Group Delay: is normalized to a frequency of 1.0Hz. The actual delay is the normalized delay divided by the actual corner frequency (fc).

8-Pole Low-Pass Bessel

Theoretical Transfer Characteristics

f/fc (Hz)	Amp (dB)	Phase (Deg)	Delay (1) (sec)
0.00	0.000	0.00	0.506
0.10	-0.029	-18.20	0.506
0.20	-0.117	-36.40	0.506
0.30	-0.264	-54.70	0.506
0.40	-0.470	-72.90	0.506
0.50	-0.737	-91.10	0.506
0.60	-1.06	-109	0.506
0.70	-1.45	-128	0.506
0.80	-1.91	-146	0.506
0.85	-2.16	-155	0.506
0.90	-2.42	-164	0.506
0.95	-2.71	-173	0.506
1.00	-3.01	-182	0.506
1.10	-3.67	-200	0.506
1.20	-4.40	-219	0.506
1.30	-5.20	-237	0.506
1.40	-6.10	-255	0.505
1.50	-7.08	-273	0.504
1.60	-8.16	-291	0.502
1.70	-9.36	-309	0.498
1.80	-10.7	-327	0.492
1.90	-12.1	-345	0.482
2.00	-13.7	-362	0.468
2.25	-18.1	-402	0.417
2.50	-23.1	-436	0.352
2.75	-28.3	-465	0.291
3.00	-33.4	-489	0.241
3.25	-38.3	-509	0.201
3.50	-43.1	-526	0.170
4.00	-51.8	-552	0.126
5.00	-66.8	-587	0.077
6.00	-79.2	-610	0.052
7.00	-89.8	-626	0.038
8.00	-99.0	-638	0.029
9.00	-107.0	-647	0.023
10.00	-114.0	-655	0.018

Note (1)

Normalized Group Delay: is normalized to a frequency of 1.0Hz. The actual delay is the normalized delay divided by the actual corner frequency (fc).