

## Model 3364

0.1Hz to 200kHz

### Four Channel 4-Pole Filter

- Four Independent Filter Channels  
Two Independent Band-Pass Channels
- Attenuation: 24dB/Octave
- Functions: High-Pass, Low-Pass, Band-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



#### DESCRIPTION

The Krohn-Hite Model 3364 Four Channel 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 3364 four independent channels provide a tunable 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.

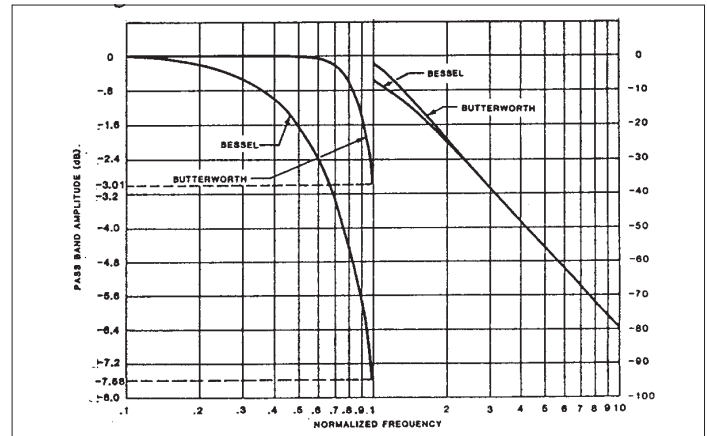
Each channel of the 3364, also offers selectable functions of low-pass and high-pass 4-pole filtering with selectable input gains to 50dB in 10dB steps, and output gains to 20dB selectable in 0.1dB steps. The 3364 will accept input signals to  $\pm 10V$  peak at 0dB gain and has selectable ac or dc coupling. Memory is available for storing a set-up of the instrument which can be recalled with a simple command.

#### BAND-PASS/BAND/REJECT OPERATION

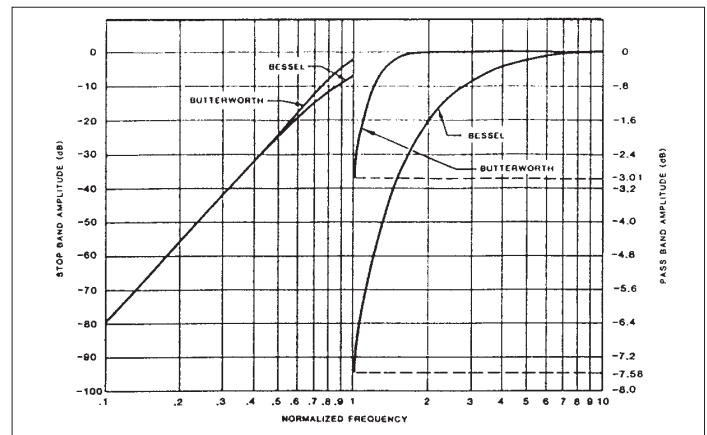
With the Model 3364 the user can simply connect two channels in series to achieve band-pass operation or connect the two in summed parallel for band-reject operation. A total of two band-pass/band-reject channels are available in the 3364.

#### APPLICATIONS

Applications of the Model 3364 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.



Low-Pass Amplitude Response



High-Pass Amplitude Response

**SPECIFICATIONS**

Specifications apply at 25°C, ±5°C.

**FUNCTIONS**

Low-pass filter, high-pass filter. Provides two channel of band-pass or band-reject via external connections.

**FILTER CHARACTERISTICS**

**Type:** 4-pole, selectable Butterworth and Bessel.

**Attenuation Slope:** 24dB/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:** ±3%.

**Relative Gain at fc:** -3dB, Butterworth; -7.58dB, Bessel.

**High-Pass Bandwidth (0dB Gain):** >2MHz.

**Stopband Attenuation:** >80dB.

**Wideband Noise (2MHz bandwidth detector):** 0dB gain, <400µVrms. Max. gain, <25µVrms RTI.

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

**DC Stability:** Typically ±1mV/°C.

**Input:** Differential or single-ended.

**Pre-Filter Gain:** 0dB, 10dB, 20dB, 30dB, 40dB, 50dB, ±0.2dB.

**Impedance:** 1 megohm in parallel with 25pf.

**Maximum Input:** ±10V peak at 0dB gain, reduced in proportion to gain setting.

**CMRR:** >60dB to 10kHz; >50dB to 100kHz.

**Coupling:** ac (0.16Hz) or dc.

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

**Maximum DC Component:** ±100V in ac coupled mode.

**Output:**

**Post-Filter Gain:** 0dB to 20dB in 0.1dB steps, ±0.2dB.

**Maximum Voltage (open circuit):** ±10V peak.

**Maximum Current:** ±80mA peak.

**Impedance:** 50 ohms.

**DC Offset:** Adjustable to zero volts.

**GENERAL**

**Crosstalk Between Channels ( input source ≤50 ohms):** -80dB for fsig ≤200kHz, -70dB for fsig >200kHz.

**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:** ±200Vdc.

**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 3364 into a standard 19" rack spacing.

**Extended 1 Year Warranty:** Part No. EW3364.

**OPTIONAL ACCESSORIES**

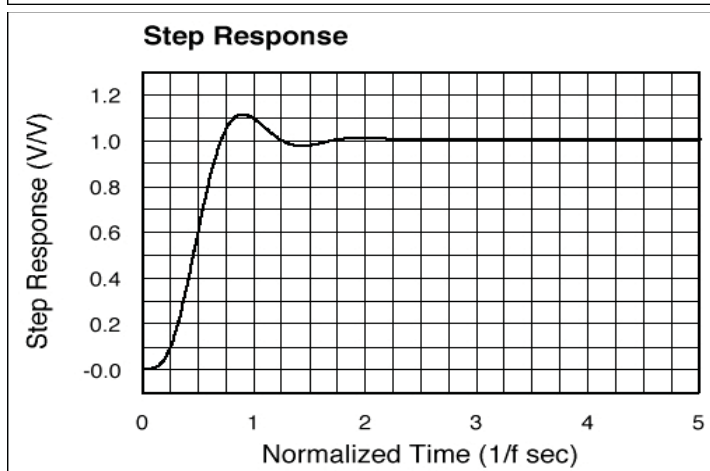
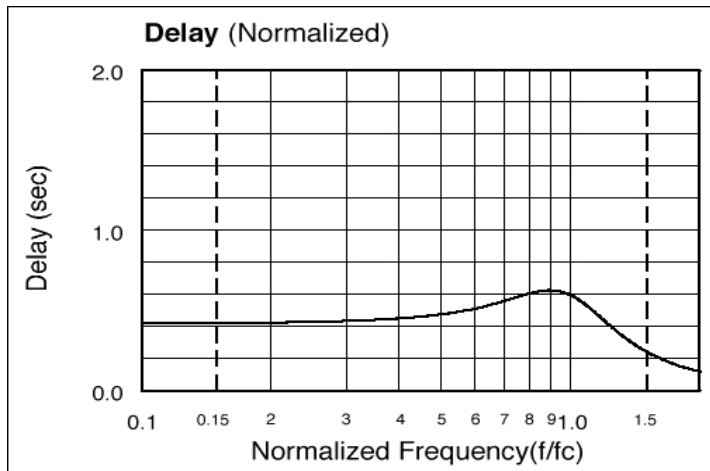
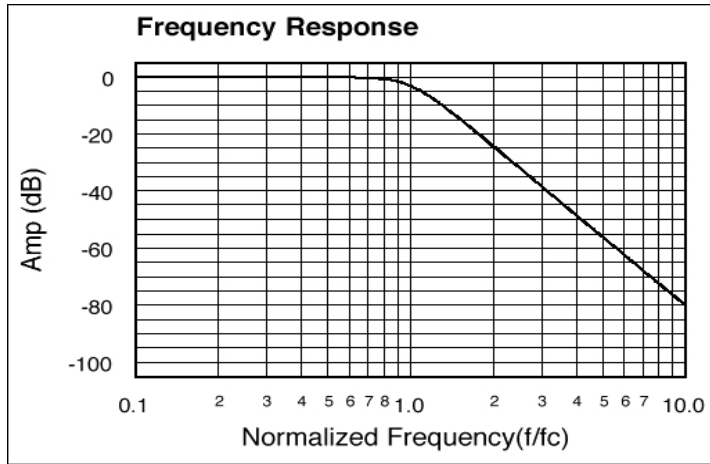
**CAB-025:** Cable, BNC, 3ft, Low Noise

Specifications subject to change without notice.

# 4-Pole Low-Pass Butterworth

## Theoretical Transfer Characteristics

f/fc (Hz)	Amp (dB)	Phase (Deg)	Delay (1) (sec)
0.00	0.000	0.00	0.416
0.10	0.000	-15.00	0.418
0.20	0.000	-30.10	0.423
0.30	0.000	-45.50	0.433
0.40	-0.003	-61.40	0.449
0.50	-0.017	-78.00	0.474
0.60	-0.072	-95.70	0.511
0.70	-0.243	-115	0.558
0.80	-0.674	-136	0.604
0.85	-1.047	-147	0.619
0.90	-1.555	-158	0.622
0.95	-2.210	-169	0.612
1.00	-3.010	-180	0.588
1.10	-4.970	-200	0.513
1.20	-7.240	-217	0.427
1.30	-9.620	-231	0.350
1.40	-12.000	-242	0.289
1.50	-14.300	-252	0.241
1.60	-16.400	-260	0.204
1.70	-18.500	-266	0.175
1.80	-20.500	-272	0.152
1.90	-22.300	-277	0.134
2.00	-24.100	-282	0.119
2.25	-28.200	-291	0.091
2.50	-31.800	-299	0.072
2.75	-35.100	-304	0.059
3.00	-38.200	-309	0.049
3.25	-41.000	-313	0.041
3.50	-43.500	-317	0.035
4.00	-48.200	-322	0.027
5.00	-55.900	-330	0.017
6.00	-62.300	-335	0.012
7.00	-67.600	-339	0.009
8.00	-72.200	-341	0.007
9.00	-76.300	-343	0.005
10.00	-80.000	-345	0.004



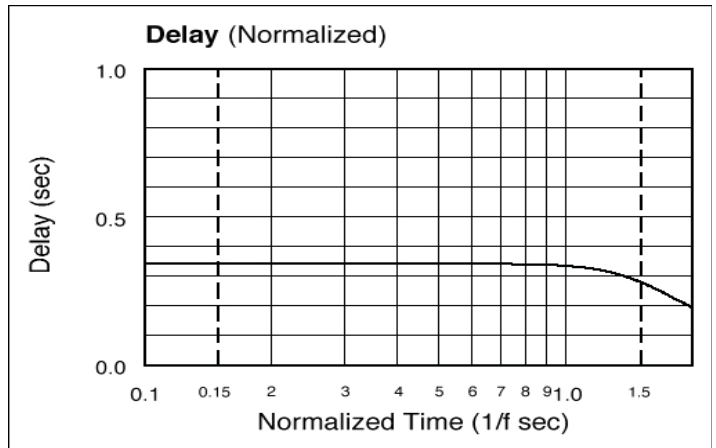
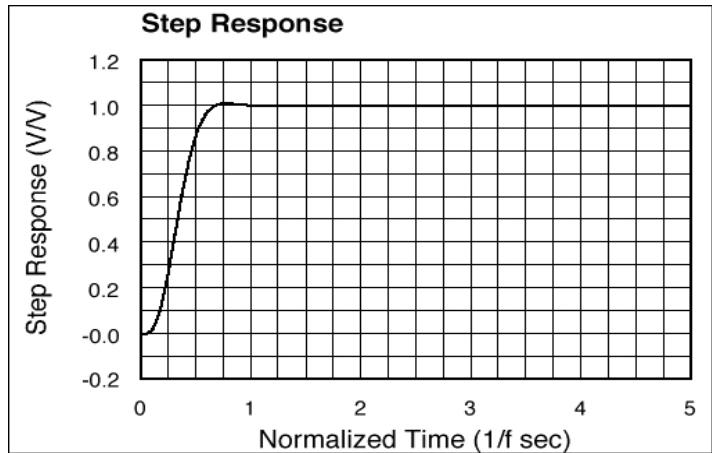
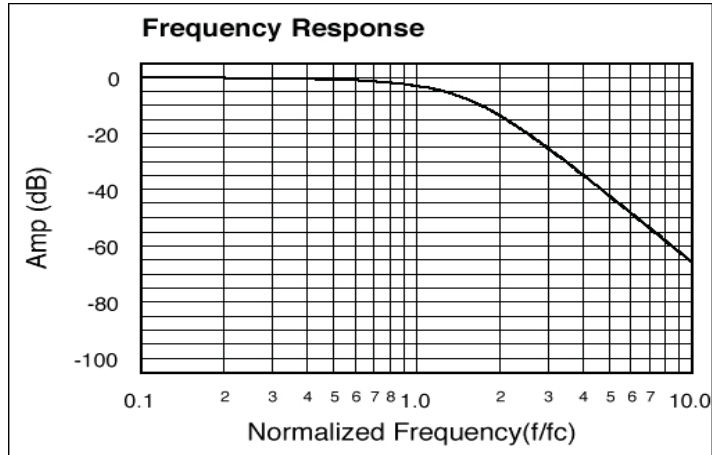
**Note (1)**

**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).

## 4-Pole Low-Pass Bessel

### Theoretical Transfer Characteristics

f/fc (Hz)	Amp (dB)	Phase (Deg)	Delay (1) (sec)
0.00	0.000	0.000	0.336
0.10	-0.028	-12.100	0.336
0.20	-0.111	-24.200	0.336
0.30	-0.251	-36.300	0.336
0.40	-0.448	-48.400	0.336
0.50	-0.705	-60.600	0.336
0.60	-1.020	-72.700	0.336
0.70	-1.410	-84.800	0.336
0.80	-1.860	-96.800	0.335
0.85	-2.110	-103.000	0.334
0.90	-2.400	-109.000	0.333
0.95	-2.690	-115.000	0.332
1.00	-3.010	-121.000	0.330
1.10	-3.710	-133.000	0.325
1.20	-4.510	-144.000	0.318
1.30	-5.390	-156.000	0.308
1.40	-6.370	-166.000	0.295
1.50	-7.420	-177.000	0.280
1.60	-8.540	-187.000	0.263
1.70	-9.710	-195.000	0.246
1.80	-10.900	-204.000	0.228
1.90	-12.200	-212.000	0.211
2.00	-13.400	-219.000	0.194
2.25	-16.500	-235.000	0.158
2.50	-19.500	-248.000	0.129
2.75	-22.400	-259.000	0.107
3.00	-25.100	-267.000	0.089
3.25	-27.600	-275.000	0.076
3.50	-30.000	-281.000	0.065
4.00	-34.400	-291.000	0.049
5.00	-41.900	-305.000	0.031
6.00	-48.100	-315.000	0.021
7.00	-53.400	-321.000	0.016
8.00	-58.000	-326.000	0.012
9.00	-62.000	-330.000	0.009
10.00	-65.700	-333.000	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).