



# BP/04/N, BP/04/W Band Pass Filter: 04 System

## Fixed frequency band pass filters 1Hz/ 15kHz tuning range

Customised fixed frequency band pass filters, finding application in vibration and noise measurement where specific components of a wideband signal spectrum need be highlighted. Applications include monitoring and quality test procedures relating to fixed speed rotating machinery, enhancing fault diagnosis, or generalising, bandwidth constraint to improve signal/noise or highlight spectral components. Input signal should be steady state or slow varying in the sense that filter transient response is damped oscillatory and therefore colours the output. Inputs derived from rotating plant may vary in frequency due to load factors etc... Filter bandwidth  $f_{max} - f_{min}$  may be extended to compensate, however  $f_{max}/f_{min} > 2$  will introduce  $f_{min}$  harmonics into the pass band.

### IMPLEMENTATION

BP/04 filters are configured as either a stagger tuned triple two pole band pass for overall bandwidth  $< 0.3f_0$  (/N), or as a cascaded 7 pole high/low pass Butterworth pair for bandwidth  $> 0.3f_0$  (/W). Both versions comprise active 2 pole R-C sections but differ conceptually due to variations in tuning requirement. Pass band gain is unity, in the stop band gain rails asymptotically to zero for each type, limited practically by breakthrough. A front panel mounted switch provides a filter bypass facility (DIR).

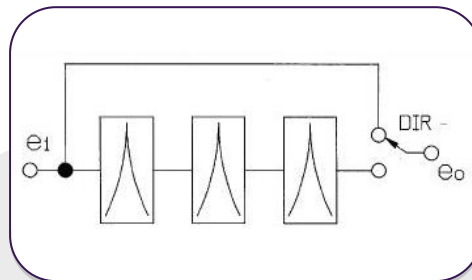
### ORDERING INFORMATION

For BP/04/N, it is sufficient to specify centre frequency ( $f_0$ ) and Q or % bandwidth. For BP/04/W,  $f_{max}$  and  $f_{min}$  (-3dB corner frequencies) should be referenced.

### DEFINITION

- $f_0$ ,  $f_{max}$ ,  $f_{min}$  : centre freq. upper & lower
- -3dB corner freq's
- -3dB bandwidth =  $1/Q = (f_{max} - f_{min})/f_0$ , applicable to /N
- $f_0 = \sqrt{f_{max} \times f_{min}}$

BP/04/N



BP/04/W

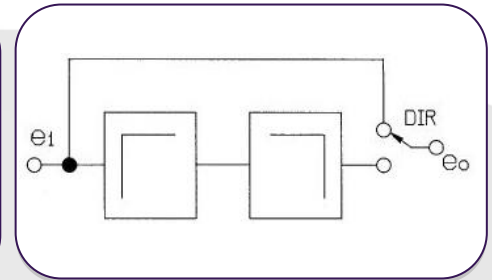
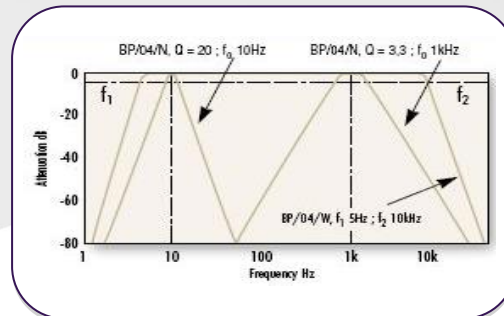


Fig.1 - Frequency Response



	BP/04/N	BP/04/W
Description	3 x stagger tuned 2 pole bandpass	7 pole high pass + 7 pole low pass Butterworth
Max input voltage	Vs-2 volts	Vs-2 volts
Input impedance, k $\Omega$	150	8 min
Output impedance, k $\Omega$	<10	<10
Pass band gain @ $f_0$	X1 $\pm$ 5%	x1 $\pm$ 3%
Tuning range Hz	10/8k	1/15k
%bandwidth( $f_{max}-f_{min}$ )/ $f_0 \times 100\%$	5/30	>30
Stop band breakthrough, dB	-80	-80
Supply voltage Vs, V	$\pm$ 10/15	$\pm$ 10/15
Supply current @ Vs = $\pm$ 15V, mA	$\pm$ 15	$\pm$ 10