

Slave Filter

type 5888

USES:

- Filtering of the compressor feedback signal for regulation of the vibration level using the excitation frequency only
- Filtering of the frequency response signal for accurate measurement of the amplitude and phase
- Filtering of the force and response signals for optimum performance of the Resonance Dwell Unit Type 5885
- Filtering of control signals for system performance optimization

FEATURES:

- Two parallel frequency tracking channels
- Selectable constant percentage bandwidths of 3, 10 and 30%
- Remote control of bandwidth selection from Vibration Exciter Control Type 1050
- Direct frequency tuning from the Type 1050
- No phase shift of the filtered signals
- Overload indication

In general it is important that all control and measurement signals are as free from noise and harmonics as possible. In vibration testing this is particularly important for swept sine testing, resonance dwell testing and other tests which require highly accurate control of the vibration level.

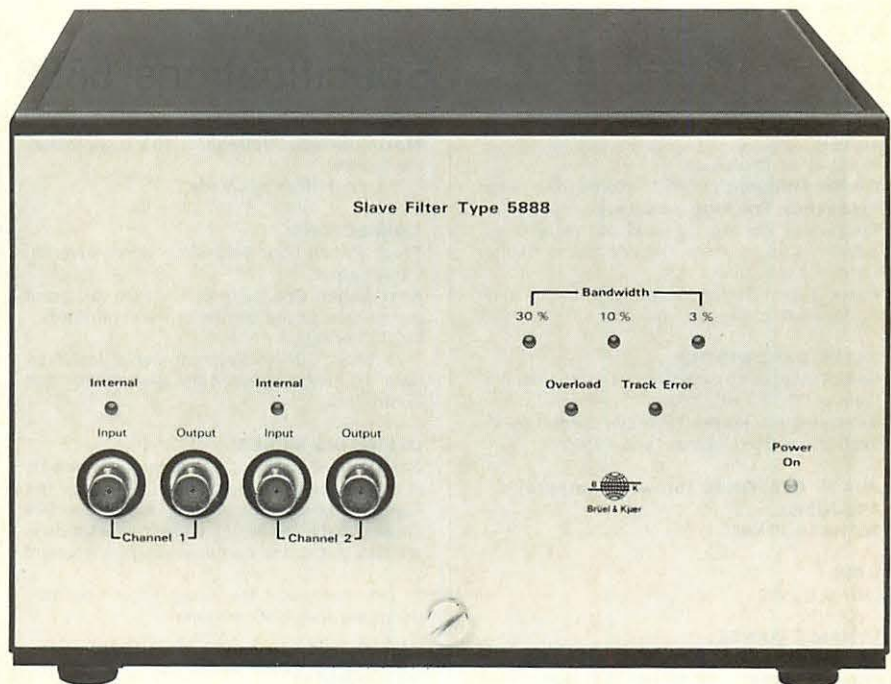
General Description

The Slave Filter Type 5888 is a tracking filter which enables simultaneous filtering of two signals. The instrument is specifically designed for use with the Vibration Exciter Control Type 1050 which selects the constant percentage band pass filter bandwidth of 3, 10 or 30% by remote control.

Examples of Use

In order to maintain a constant level of vibration from a vibration exciter system, it is common to use a controller having a compressor to regulate the excitation signal. Erroneous regulation can be caused by harmonics of the generated frequency and by noise. Use of the Slave Filter with the Vibration Exciter Control Type 1050 ensures that the regulation signal is controlled using the excitation frequency alone.

The Slave Filter can also be used to filter measured response signals for



use by the Level Recorder Type 2307 or the X-Y Recorder Type 2308. This will ensure accurate frequency response hard copy.

It is advantageous to filter all control signals for optimum system performance. For example in resonance dwell testing, the Resonance Dwell Unit Type 5885 determines the generator frequency of the controller by

tracking the resonance frequency. It uses the force and response signals and measures the phase angle between them. For accurate system performance the force and response signals should be free from distortion. Use of the Slave Filter Type 5888 will eliminate phase distortion caused by the noise and harmonics generated in the system. Consequently, optimum system operation can be achieved.

Accurate Phase Measurement

The Slave Filter Type 5888 has extremely well matched filter characteristics between the two channels. Consequently, the Slave Filter can be used for filtering the input force and response acceleration signals when accurate phase measurement is required. The constant voltage sine and cosine outputs of the controller can be used to produce the real and imaginary parts of each of these signals from which the phase response can be found.

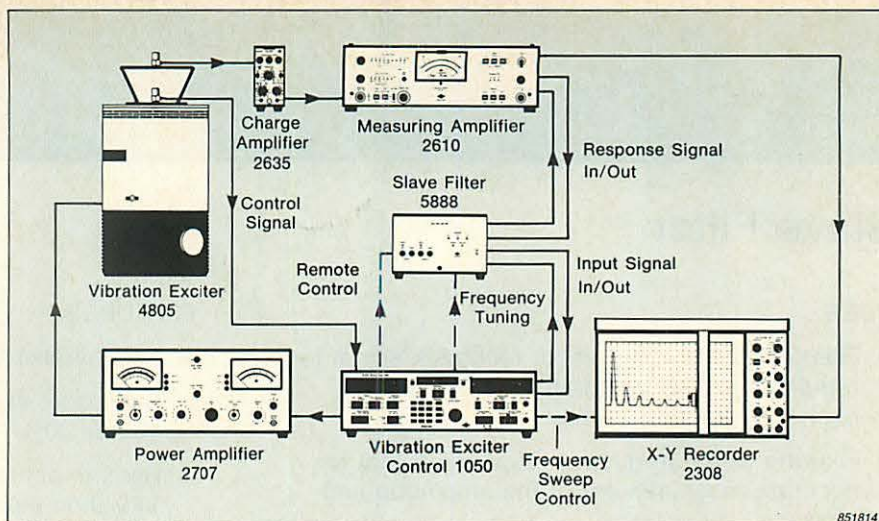


Fig. 1. A frequency response test using the Slave Filter Type 5888 to filter the control and response signals

System Operation

The instrumentation set-up illustrated in Fig. 1 uses the Slave Filter Type 5888 to filter the control signal to the compressor of the Vibration Exciter Control Type 1050 and the response signal to the X-Y Recorder

Type 2308. The control signal is directly supplied to the charge input of the controller and filtered by the Type 5888 before use by the compressor. The Slave Filter also filters the response signal via the Measuring Amplifier Type 2610. This signal is then

used by the Type 2308 for hard copy of the frequency response.

The controller supplies the frequency tuning signals to the Slave Filter from the fixed oscillator and variable oscillator outputs.

Specifications 5888

FILTER:

Number of Channels: 2

Center Frequency: 1 Hz to 10 kHz, one range

Frequency Tracking Accuracy: $\pm 0,5\%$

Frequency Tuning: By fixed and variable oscillator outputs from the Vibration Exciter Control Type 1050

Filter Type: Switch capacity with two pole Butterworth characteristic

FILTER BANDWIDTHS:

Selectable: 3, 10 and 30%, (Q factor equivalents of 33, 10 and 3,3)

Bandwidth Selection: Remote control by Vibration Exciter Control Type 1050

PHASE RESPONSE (between outputs):

1 to 500 Hz: $\pm 2^\circ$

500 Hz to 10 kHz: $\pm 5^\circ$

GAIN:

0 dB $\pm 0,2$ dB

DYNAMIC RANGE:

External Mode: > 46 dB (ref. 10 V peak)

Internal Mode: > 46 dB (ref. 5 V peak)

HARMONIC DISTORTION: $< 10\%$

INPUTS AND OUTPUTS:

Input Impedance: 1 M Ω

Output Impedance: 50 Ω

Maximum Input Voltage: ± 10 V peak (external mode)

± 5 V peak (internal mode)

CONNECTORS:

Front Panel: Four BNC sockets for external input/output.

Rear Panel: One 8-pin DIN socket for direct connection to the controller external filter in/out socket.

Two 6-pin DIN sockets for serial interface data exchange between the Slave Filter and controller.

OPERATING MODES:

Selection of internal or external mode is made by the controller. In internal mode the Slave Filter operates using the 8-pin DIN socket. In this mode, the vibration meter uses channel 1 and the compressor uses channel 2.

In external mode the Slave Filter operates using the four BNC sockets.

INDICATORS:

Input overload

Tracking error indication

POWER REQUIREMENTS:

Power Supply: 100, 115, 127, 200, 220 or

240 V AC $\pm 20\%$, 50/60 Hz

Consumption: 10 VA

Fuse Requirements: 80 mA (200 to 240 V),

160 mA (100 to 127 V)

ENVIRONMENTAL:

Safety: Complies with IEC 348 Safety Class II

Operating Temperature: $+5^\circ\text{C}$ to $+40^\circ\text{C}$

($+41^\circ\text{F}$ to 104°F)

Storage Temperature: -25°C to $+70^\circ\text{C}$

(-13°F to 158°F)

Humidity Range: 90% RH (non condensing at

30°C)

Electromagnetic Compatibility: Complies with requirements for Class B computing device of American FCC (Federal Communication Commission) Rules.

GENERAL:

Height: 133 mm (5,2 in)

Width: 210 mm (8,3 in)

Depth: 223 mm (8,8 in)

Weight: 3,2 kg (7,0 lb)

ACCESSORIES INCLUDED:

1 mains cable..... AN 0020

6 BNC cables..... AO 0087

1 8-pin DIN cable..... AQ 0034

1 6-pin DIN cable..... WL 0658

This system is a development of the Brüel & Kjær Systems Engineering Group and is not a standard production instrument. Specifications can be modified, on a contract basis, to meet individual requirements.

For prices and delivery time, please contact your local representative.