DESCRIPTION

The Model 380H2 Dual Filter consists of two separate low-pass filter circuits and two power sources for 2-wire transmitters. The purpose of each filter circuit is to reduce noise and to smooth out sharp variations that may be present in a given process signal. The two power sources are current limited and are provided to power 2-wire transmitters that are commonly used in many installations. A block diagram of this device is shown in Figure 1.

Typically, the device accepts a 1 to 5 Volt signal, passes it through a low-pass filter that has four selectable corner frequencies, and converts it to a proportional 4 to 20 mA output current. Refer to the SPECIFICATIONS section for the exact adjustment parameters and operating limitations.

The Dual Filter is designed to be plugged into a Model Series 380 Card Cage Enclosure equipped with a common power supply (see Service Instructions SD3801).

FIGURE 1 Block Diagram

MOORE PRODUCTS CO., Spring House, Pa. 19477
SPECIFICATIONS
(For Each Channel)

INPUT
Range ..................... 1 to 5V dc
Span Adjustment ............ ± 5% of output span
Zero Adjustment ............ 0 to 1.2 Volts
Corner Frequency (Time Constant) (Field selectable via JUMPERS)
  a) 0.001 Hz (RC = 159 seconds ± 10%)
  b) 0.01 Hz (RC = 15.9 seconds ± 10%)
  c) 0.1 Hz (RC = 1.59 seconds ± 10%)
  d) 1.0 Hz (RC = 0.159 seconds ± 10%)
Input Impedance ............. 5M ohms (minimum)
Input Isolation ............. Both negative input terminals are common with the cage power supply and the negative output terminals.
Overload ..................... ± 10 Volts (maximum)

<table>
<thead>
<tr>
<th>(120V ac &amp; 48V dc Models)</th>
<th>(24V dc Model)</th>
</tr>
</thead>
</table>

OUTPUT
Range ..................... 4 to 20 mA
Load ..................... 0 to 900 Ohms
Load Effect ................ Less than 0.1% within the allowable load range.
Current Limiting ............ Output will not exceed 150% of full scale when input is overdriven.
Accuracy ..................... ± 0.15% of output span
Repeatability .............. ± 0.25% (for filter time constant)
Response Time ............. 5 input filter time constants to reach 98% span

EXCITATION SUPPLY
(For 2-Wire Transmitters)
Voltage (Nominal) ........ 22V dc
Current (Maximum) ........ 30 mA

INSTALLATION
The Dual Filter Module must be installed in the Card Cage Enclosure. It can be plugged into any of the slots in the enclosure. Refer to your drawings for the designated slot or assign a convenient slot for it. The safety keys in the Card Cage Enclosure must be set before the module is plugged in. Service Instructions SD3801 identifies these safety keys and gives the procedure for setting them. The positions of the keys for the Dual Filter Module are as follows:

  Left Key: V (vertical)
  Right Key: V (Vertical)

The input and output connections are made to the terminal strips provided at the front or the rear (depending on model) of the Card Cage Enclosure. Each terminal strip is numbered to match the corresponding slot number. Refer to the Connection Diagram (Figure 2) in this bulletin and to Service Instructions SD3801.

Note that all the plug-in modules in the card cage share the same power supply, thus their positive and negative (signal common) lines are all interconnected.

To convert a current signal to a voltage signal, select an appropriate conditioning resistor listed below, and connect it across the required input or output terminals.

<table>
<thead>
<tr>
<th>Current Signal</th>
<th>Conditioning Resistor (For 1 to 5 Volts)</th>
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</thead>
<tbody>
<tr>
<td>1 to 5 mA</td>
<td>1000 Ohms ± 0.1%</td>
</tr>
<tr>
<td>4 to 20 mA</td>
<td>250 Ohms ± 0.1%</td>
</tr>
<tr>
<td>10 to 50 mA</td>
<td>100 Ohms ± 0.1%</td>
</tr>
</tbody>
</table>

CALIBRATION
The Dual Filter Module is normally shipped pre-calibrated for the required range. When performing periodic calibration checks or a complete re-calibration, the following procedure is recommended.

1. Obtain an adjustable input signal source. It can be any of the following or similar devices:
   a) Voltage Source — typically 0 to 5V dc.
   b) Current Source — typically 0 to 20 mA.
   c) Transmitter — adjustable over required range.
   These devices must be adjustable to an accuracy of 0.1% or better.

2. Connect the above signal source to the input terminals of the channel to be calibrated. (See the Connection Diagram in Figure 2). If the input signal is a current, be sure to use an appropriate conditioning resistor across the input terminals.

3. Connect an output measuring device to the output terminals of the same channel (see Figure 2). This device must be capable of measuring current or voltage to an accuracy of 0.1% or better. Refer to the SPECIFICATIONS section for detailed output signal description. Use an appropriate conditioning resistor across the output terminals if a voltage measuring device is utilized.

4. Place the filter corner frequency jumper into the 1.0 Hz position. This will permit the output signal to settle more quickly.

5. Adjust the input source to the minimum range setting (typically +1.0 Volts). Wait for the output signal to settle. Then, adjust the ZERO trimpot to obtain the minimum range setting of the output (typically 4.0 mA).

6. Adjust the input source to the maximum range setting (typically +5.0 Volts). Wait for the output signal to settle. Then, adjust the SPAN trimpot to obtain the maximum range setting of the output (typically 20 mA).

7. Repeat steps 5 and 6 several times until the ZERO and SPAN readings are as required. There is some interaction between these two controls.
8. Determine which input corner frequency is required in your application. Place the jumper of the appropriate channel into one of the jacks listed below.
   a) 0.001 Hz (RC = 159 seconds)
   b) 0.01 Hz (RC = 15.9 seconds)
   c) 0.1 Hz (RC = 1.59 seconds)
   d) 1.0 Hz (RC = 0.159 seconds)
   
This completes the calibration procedure. Repeat the same steps to calibrate the second channel.

MAINTENANCE

Except for annual cleaning and periodic calibration checks, the module requires no periodic maintenance.

If the module does not operate properly when initially installed, check the input and output circuit wiring. Most problems in new installations can be traced to wiring mistakes. Also, verify that the equipment associated with the input and output circuits is functioning and is properly calibrated.

If the problem is traced to the module, remove the module and give it a full bench check.

A Part No. 15378-27 Card Extender can be ordered. It extends the module beyond the front of the Card Cage Enclosure providing easy access to both sides of the module’s circuit board for detailed troubleshooting.

RECOMMENDED SPARES

There are no recommended spare parts for the Dual Filter Module.

One spare module is recommended for every 1 to 10 in service.