FREQUENCY RELAYS

APPLICATION

The BE4 Frequency Relays function on a predetermined value of frequency, either under (U) or over (O); the normal system frequency.

The BE4-81 U Underfrequency Relay guards against underfrequency conditions which adversely affect connected machines and system stability.

The BE4-81 O Overfrequency Relay is used in speed control schemes to protect against generator runaway.

The BE4-81 O/U Over/Under Frequency Relay combines both under (U) and over (O) frequency functions in one compact case.

The BE4 Series Relays are back-of-panel mounted. They install in seconds with standard hardware, or snap onto standard DIN rail.

HOW TO ORDER:

Designate the Model Number followed by the complete Style Number:

BE4-81 U Style Number
BE4-81 O Style Number
BE4-81 O/U Style Number

Complete the Style Number by selecting one feature from each column of the Style Identification Chart and entering its designation, letter or number, in the appropriate square.

Note: The description of a complete relay must include both Model Number and Style Number.

For UL and CSA on selected styles, see bulletin UFX.

STYLE IDENTIFICATION CHART

<table>
<thead>
<tr>
<th>1</th>
<th>A</th>
<th>4</th>
<th>N</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSING TYPE</td>
<td>NOMINAL INPUT</td>
<td>FREQUENCY</td>
<td>EXT. PWR.</td>
<td>OUTPUT TYPE</td>
</tr>
<tr>
<td>1 - Single Phase</td>
<td>A - 120V</td>
<td>2 - 400 Hz</td>
<td>N - None</td>
<td>1 - Energize to trip</td>
</tr>
<tr>
<td></td>
<td>B - 240V</td>
<td>3 - 50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C - 380V</td>
<td>4 - 60 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D - 480V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*S - Special Voltage</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*For other voltage applications, contact the factory.

EXAMPLES

Style Number 1A4N1 would have the following characteristics: It would sense single phase (1) 120 volts (A) at 60 Hertz (4) and energize the output relay to trip (1).
The Basler BE4 Series Frequency Relays will provide a contact transition when the sensed frequency exceeds the relay setting. The following functional block diagram illustrates the relay operation.

The frequency sensing circuit provides a dc voltage proportional to the input frequency to the comparator. The proportional voltage is compared to a reference level. When the frequency signal exceeds the reference level, the comparator output will energize the output relay. The front panel LED indicates the output relay is energized.

SPECIFICATIONS

**Input**
- Nominal Frequency: 50, 60 or 400 Hz
- System Voltage: 120V, 240V, 380V, or 480V
- Voltage Withstand: 1.2 times continuous
- 1.5 times for 10 seconds

**Setpoint**
- Range: 50 Hz: Adjustable 40-60 Hz
  - 60 Hz: Adjustable 50-70 Hz
  - 400 Hz: Adjustable 360 - 440 Hz
- Operating Time: 400 m seconds with 25% nominal change beyond trip setting.
- Repeatability: Better than 0.5%
- Reset Frequency: Adjustable 0.1 - 3 Hz from pickup frequency for 50/60 Hz applications.
- Adjustable 10 - 30 Hz from pickup frequency for 400 Hz applications.

**Output Relay**
- Type: D.P.D.T.
- Rating: ac 240V, 5 A non-inductive
- Mechanical Life: One million operations
- Reset: Automatic

**General**
- Dielectric Test: 2 KV RMS for 1 min.
- Surge Withstand: IEEE 472-1974
- Operating Temperature: 0°C to +40°C *
- Storage Temperature: -20°C to +70°C

**Contact Arrangement**

- BE4-81 U: Contact Set 1
- BE4-81 O: Contact Set 2
- BE4-81 O/U: Contact Set 1 and 2

* 0° to +60°C operating temperature is available on standard product without UL and CSA.

**THEORY OF OPERATION**

The Basler BE4 Series Frequency Relays will provide a contact transition when the sensed frequency exceeds the relay setting. The following functional block diagram illustrates the relay operation.

Note: Relay contacts are shown in the de-energized state.