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## APPLICATION NOTE

### Drive Applications Support Library

<b>Application Note</b>	<b>AN-P2-007</b>
<b>Title</b>	<b>Using the Skip Frequency Function</b>
<b>Related Products</b>	<b>P2 Series AC Drives</b>
<b>Level:</b> <b>1</b>	<ul style="list-style-type: none"> <li>1 - Fundamental - No previous experience necessary.</li> <li>2 - Basic - Some basic drives knowledge recommended.</li> <li>3 - Advanced - Some basic drives knowledge required.</li> <li>4 - Expert - Good experience in topic of subject matter recommended.</li> </ul>

### Overview:

The skip frequency parameters are used to set up a frequency band through which the drive output frequency may pass, but never continuously operate in.

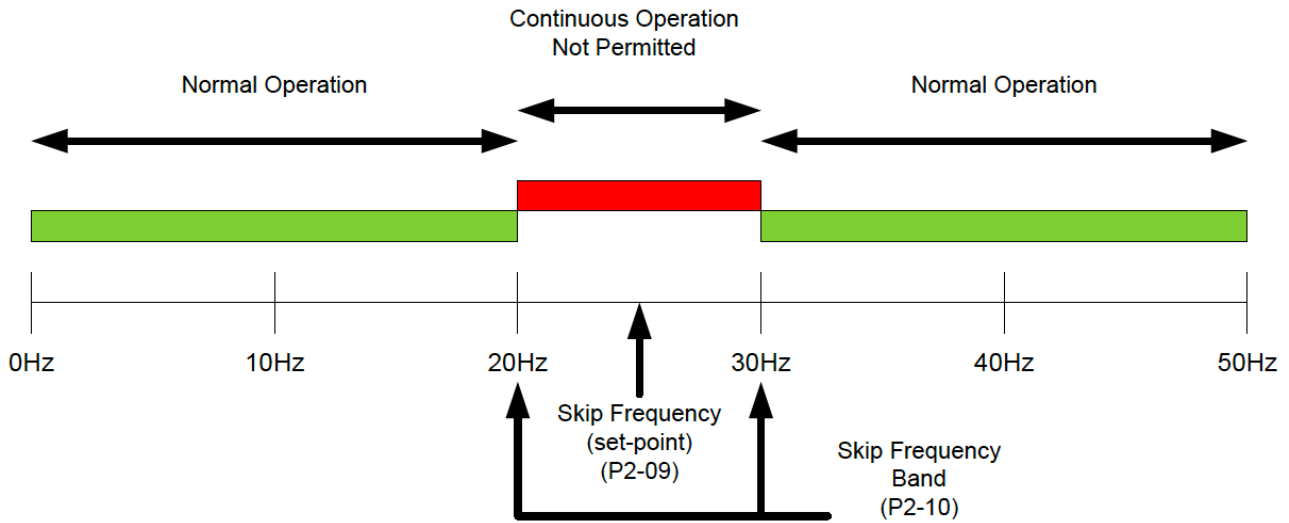
This is used typically to prevent continuous operation close to any frequency at which a mechanical resonance may occur. Such resonance may simply cause excessive acoustic noise or may in some cases cause mechanical stresses that could lead to mechanical failure.

### Parameters:

Parameter Name	Parameter Number	Units
Skip frequency Center Point	P2-09	Hz / RPM
Skip frequency Band Width	P2-10	Hz / RPM

The Skip Frequency Center point Parameter (P2-09) specifies the center point of the skip frequency band and the Skip Frequency Band width (P2-10) specifies the width of the skip band.

### Example:



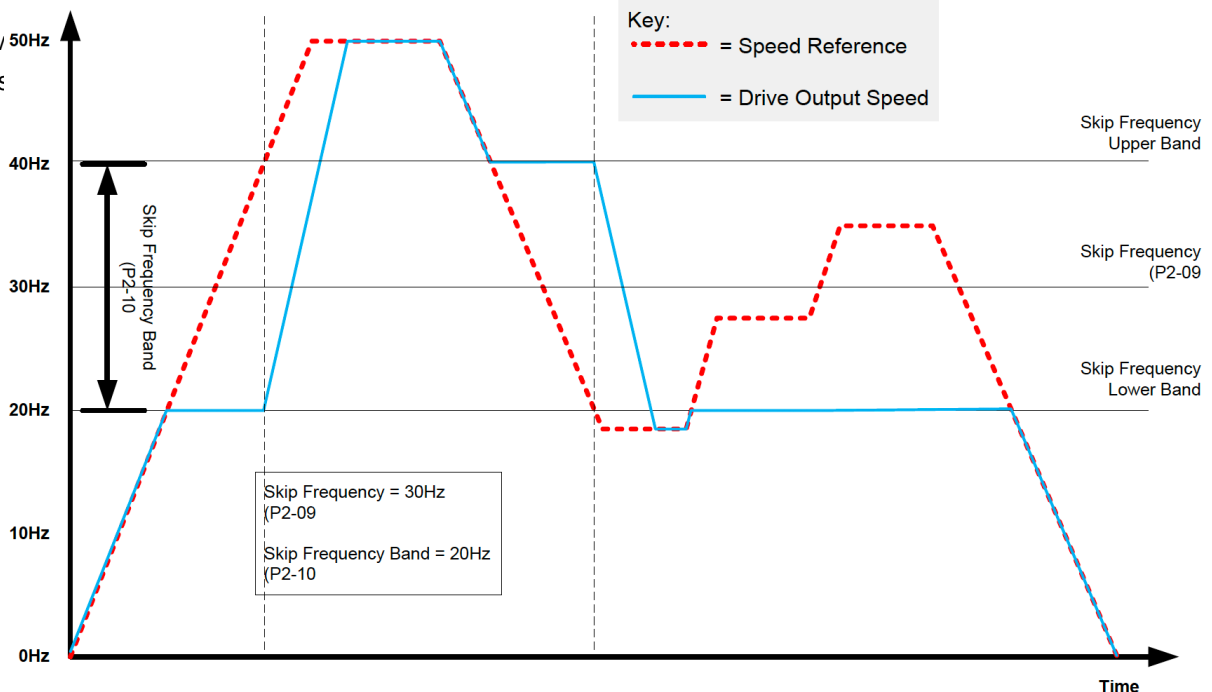
Skip Frequency = 25Hz (P2-09)  
 Skip frequency Band = 10Hz, (P2-10)

This will give a skip frequency band between 20Hz and 30Hz, centered on 25Hz.

If the speed is negative, the skip frequency bands are mirrored. With the same settings as shown above, a skip frequency band between -20Hz and -30Hz, centered on -25Hz will also be in place.

### Skip Frequency Behavior:

If the speed reference to the P2 requests a speed within the skip frequency bandwidth, the speed will change only until the upper or lower frequency band is encountered. The drive output will then remain at this speed until the speed reference becomes higher or low than the opposing frequency band. The drive will then accelerate the output through the skip band to the target speed (outside of the skip band). The diagram below shows



As the speed reference to the drive enters the skip frequency band (either increasing or decreasing speed) the drive output change is frozen at the edge of the skip frequency band until the point that the speed reference crosses the opposing limit. At this point the drive will ramp through the skip frequency band to the opposite limit at the ramp rate specified with the drive ramps.

## Set-up:

When the P2 drive is configured for parameter entry and display in RPM (P1-10 set to motor rated RPM) then Skip Frequency and Skip Frequency Bandwidth will also be required to be entered in RPM.

When the output frequency ramps between the two skip frequency limits, it will do so at the ramp rates set in P1-03 and P1-04.

Note that the skip frequency band will be mirrored for negative speeds and will have exactly the same effect as in the positive direction.

	P2-09 (Set-Point)	P2-10 (Bandwidth)
Maximum Setting	P1-01	P1-01
Minimum Setting	P1-02	0
Default	0	0
Lower Skip Frequency Band Limit	$= P2-09 - (P2-10 / 2)$	
Upper Skip Frequency Band Limit	$= P2-09 + (P2-10 / 2)$	

## Revision History

Version	Comments	Author	Date
1	Document Creation	JP	02/10/12

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