Optidrive Applications Support Library

Application Note	AN-ODE-3-007
Title	**Using the Skip Frequency Function**
Related Products	**Optidrive E3**
Level **1**	1 – Fundamental - No previous experience necessary 2 – Basic – Some Basic drives knowledge recommended 3 – Advanced – Some Basic drives knowledge required 4 – Expert – Good experience in topic of subject matter recommended

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 Centre Point	P-27	Hz / RPM
Skip frequency Band Width	P-26	Hz / RPM

Note that if P-10 > 0, values are displays in RPM, otherwise the values are set in Hz.

The Skip Frequency Centre point Parameter (P-27) specifies the centre point of the skip frequency band and the Skip Frequency Band width (P-26) specifies the width of the skip band.

Example

Skip Frequency = 25Hz (P-27)
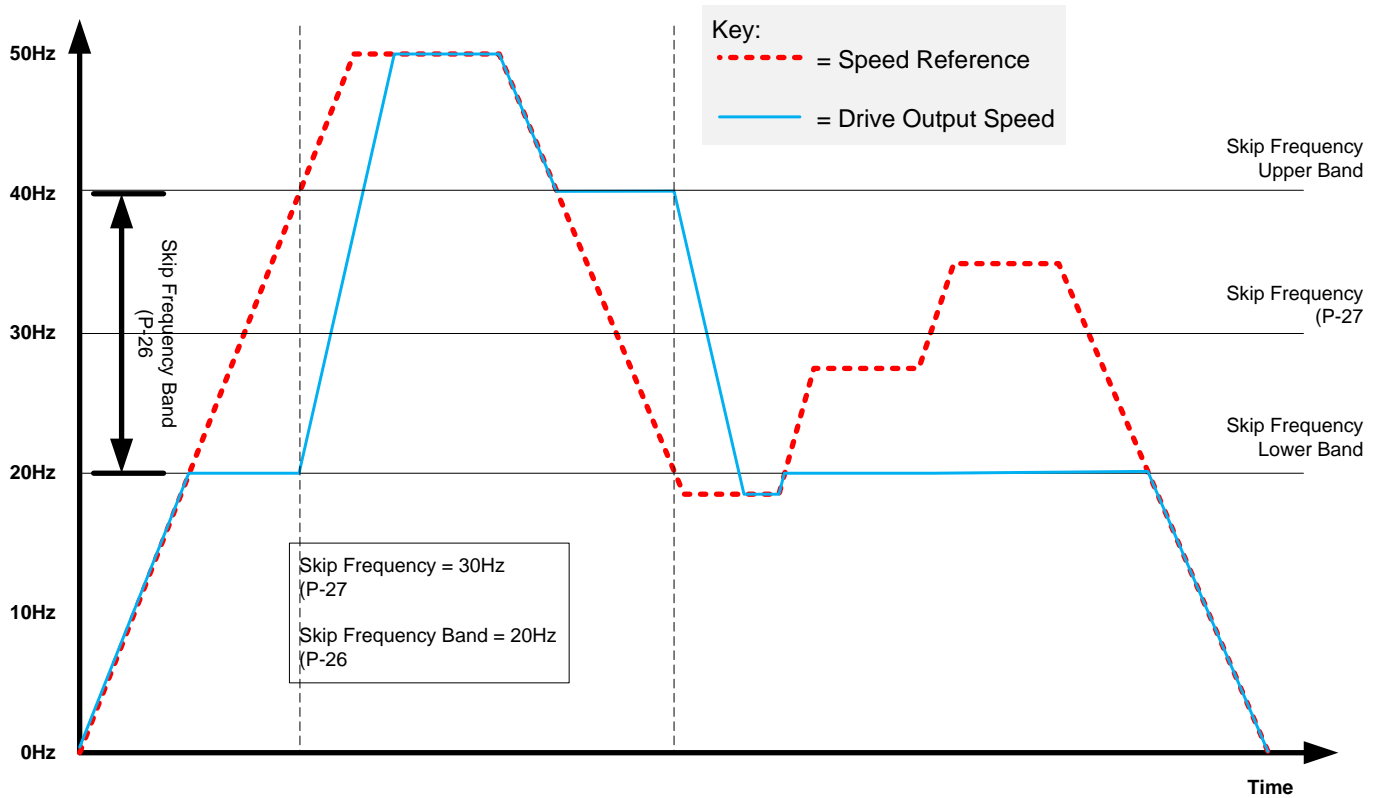
Skip frequency Band = 10Hz, (P-26)
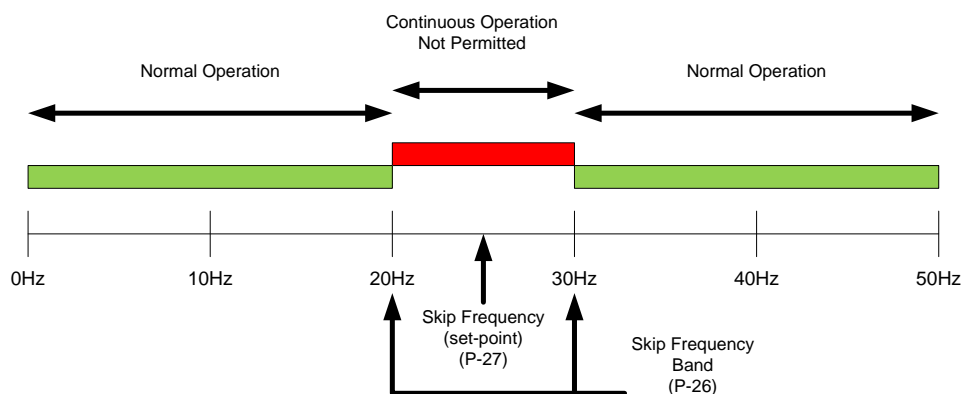
This will give a skip frequency band between 20Hz and 30Hz, centred on 25Hz.

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, centred on -25Hz will also be in place.

Skip Frequency Behaviour:

If the speed reference to the Optidrive E2 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 a changing speed reference (profile) and the response of the Optidrive (output) due to its skip frequency settings.

As the speed reference to the Optidrive 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 Optidrive will ramp through the skip frequency band to the opposite limit at the ramp rate specified with the drive ramps.

Set-up

When the Optidrive E2 is configured for parameter entry and display in RPM (P-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 P-03 and P-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.

	P-27 (Set-Point)	P-26 (Bandwidth)
Maximum Setting	P-01	P-01
Minimum Setting	P-02	0
Default	0	0
Lower Skip Frequency Band Limit	= P-27 − (P-26 / 2)	
Upper Skip Frequency Band Limit	= P-27 + (P-26 / 2)	

Appendix

Revision History			
Issue	Comments	Author	Date
01	Document Creation	KB	07/09/15