

YASKAWA

HV600 AC DRIVE

BUMBLESS TRANSFER TO HAND MODE

CUSTOM SOFTWARE SUPPLEMENT

SOFTWARE NUMBER:

VSEA10010

DRIVE MODELS:

HV60Uxxxxxx



DOCUMENT NUMBER: TM.HV600SW.010

1 Preface and Safety

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◆ Supplemental Information - Applicable Documents

The contents of this supplement apply to the product instructions in [Table 1.1](#).

Table 1.1 Affected Documents

Drive Series	Document
HV600	Installation & Primary Operation (TOEPC71061732)
	Technical Reference (SIEPC71061732)
	Quick Setup Procedure (TOEPC71061774 and TOEPC71061775)

◆ Supplemental Safety Information

Read and understand this manual and the HV600 Installation & Primary Operation manual before you install, operate, or do maintenance on this drive. Install the drive as specified by the HV600 Installation & Primary Operation manual and local codes. Observe all safety messages in this manual and the standard drive manuals.

Refer to the HV600 Installation & Primary Operation and Technical Reference for safety information and start-up instructions.

This supplement describes the effects of the Bumpless Transfer to HAND Mode custom software on the standard drive parameters and functions.

- Custom software adds functionality to a standard AC drive to enhance or enable use in a specific application.
- The software is loaded to the flash ROM area of the control board, and replaces the standard drive software.

◆ Obtaining Support

You must provide the unique part number shown on the drive nameplate when you want Yaskawa support for a drive with custom software.

The custom software described in this supplement is flashed to the control board memory and the operation of parameters, functions, and monitors are different than the standard drive software.

Refer to Yaskawa office locations listed on the back cover of this supplement for contact information.

2 Product Overview

◆ About this Product

This custom software is designed specifically for use in bumpless transfer to HAND Mode applications.

◆ Applicable Models

This custom software is available for the HV600 drive models in [Table 2.1](#).

Table 2.1 Applicable Models

Voltage Class	Models
240 V Three-Phase	HV60U2xxxxxx
480 V Three-Phase	HV60U4xxxxxx

3 HAND MOP and Bumpless Transfer

◆ Overview

This software enables you to change into HAND Mode without changing speeds and use the Up and Down arrow keys to adjust speed. This adjustment is known as Digital Simulated Motor Operated Potentiometer (MOP).

◆ Basic Concepts and Principles

The drive will overwrite the HAND frequency reference with the current soft-starter output frequency when it enters HAND Mode.

◆ Limitations

- If *S5-01 = 3* [*HAND Frequency Reference Source = HAND Ref S5-05 w/MOP*], the Home screen is scroll-locked and you cannot scroll through monitors.
- If *S5-03 = 1* [*HAND Mode PID Selection = Enabled*]:
 - HAND MOP is not allowed.
 - When *S5-02 = 2* [*HAND/AUTO Switchover During Run = Enabled w/ Bumpless Transfer*], Bumpless Transfer is ignored.
- If you de-program *U1-01* [*Frequency Reference*] from the Home screen, HAND MOP is not allowed.
- If you are not on the Home screen, HAND MOP is not allowed.

◆ Related Parameters and Monitors

Table 3.1 Related and Modified Parameters

No. (Hex.)	Name	Description	Default (Range)
C1-01 (0200) RUN	Acceleration Time 1	<p>V/f OLV/PM EZOLV</p> <p>Sets the length of time to accelerate from zero to maximum output frequency.</p>	30.0 s (0.1 - 6000.0 s)
C1-02 (0201) RUN	Deceleration Time 1	<p>V/f OLV/PM EZOLV</p> <p>Sets the length of time to decelerate from maximum output frequency to zero.</p>	30.0 s (0.1 - 6000.0 s)
S5-01 (322F)	HAND Frequency Reference Source	<p>V/f OLV/PM EZOLV</p> <p>Sets the frequency reference source when HAND Mode is active.</p> <p>0 : HAND Analog Input 1 : HAND Ref S5-05 or PID SP S5-06 2 : Set by b1-01 3 : HAND Ref S5-05 w/ MOP</p>	3 (0 - 3)

No. (Hex.)	Name	Description	Default (Range)
S5-02 (3230)	HAND/AUTO Switchover During Run	V/f OLV/PM EZOLV Enables and disables switching between HAND and AUTO Modes during run. 0 : Disabled 1 : Enabled 2 : Enabled w/ Bumpless Transfer	2 (0 - 2)
S5-03 (3231) RUN	HAND Mode PID Selection	V/f OLV/PM EZOLV Enables and disables the PI function when HAND Mode is active. 0 : Disabled 1 : Enabled Note: If <i>b5-01 = 0</i> [PID Mode Setting = Disabled], the drive disables Hand Mode PID.	0 (0, 1)
S5-05 (3233) RUN	HAND Frequency Reference	V/f OLV/PM EZOLV Sets the frequency reference when HAND Mode is active. PID is disabled and <i>S5-01 = 1</i> [HAND Frequency Reference Source = HAND Ref S5-05 or PID SP S5-06].	0.00 Hz (0.00 - 400.00 Hz)

Table 3.2 Related Monitors

No. (Hex.)	Name	Description	MFAO Signal Level
U4-18 (07DA)	Reference Source	V/f OLV/PM EZOLV Shows the selected frequency reference source. The keypad shows the frequency reference source as "XY-nn" as specified by these rules: X: Frequency reference <ul style="list-style-type: none"> • 1: <i>b1-01</i> [Frequency Reference Selection 1] Y-nn: Frequency reference source <ul style="list-style-type: none"> • 0-01: Keypad (<i>dl-01</i> [Reference 1]) • 1-00: Analog input (unassigned) • 1-01: MFAI terminal A1 • 1-02: MFAI terminal A2 • 2-02 to 2-17: Multi-step speed reference (<i>dl-02</i> to <i>dl-17</i> [Reference 2 to 8, Jog Reference]) • 3-01: Serial communications • 4-01: Communication option card • 7-01: DriveWorksEZ • 9-01: Up/Down command • B-00: Hand Reference 1 (Analog) • B-01: Hand Reference 1 (<i>S5-05</i> [HAND Frequency Reference]) 	No signal output available

◆ Function Description

■ HAND Ref S5-05 w/ MOP

To enable HAND MOP and the ability to change the frequency reference using the Up/Down keys directly from the Home screen, set *S5-01 = 3* [HAND Frequency Reference Source = HAND Ref S5-05 w/MOP].

When you press and hold the Up key, the frequency being increased will use *C1-01* [Acceleration Time 1]. When you press and hold the Down key, the frequency being decreased will use *C1-02* [Deceleration Time 1]. The drive will round single keypresses to the nearest 0.10 Hz. Refer to [Figure 3.1](#) for details. The drive will write the final frequency reference to memory 5 seconds after you release the Up/Down key. MOP will step up to the minimum speed when the frequency adjustment starts below the minimum speed.

MOP Upper/Lower Limits

When you use MOP for HAND reference, the upper limit is set by *d2-01* [Frequency Reference Upper Limit]. The lower limit is set by the highest value among *Y1-06* [Minimum Speed], *Y4-12* [Thrust Frequency], and *d2-02* [Frequency Reference Lower Limit].

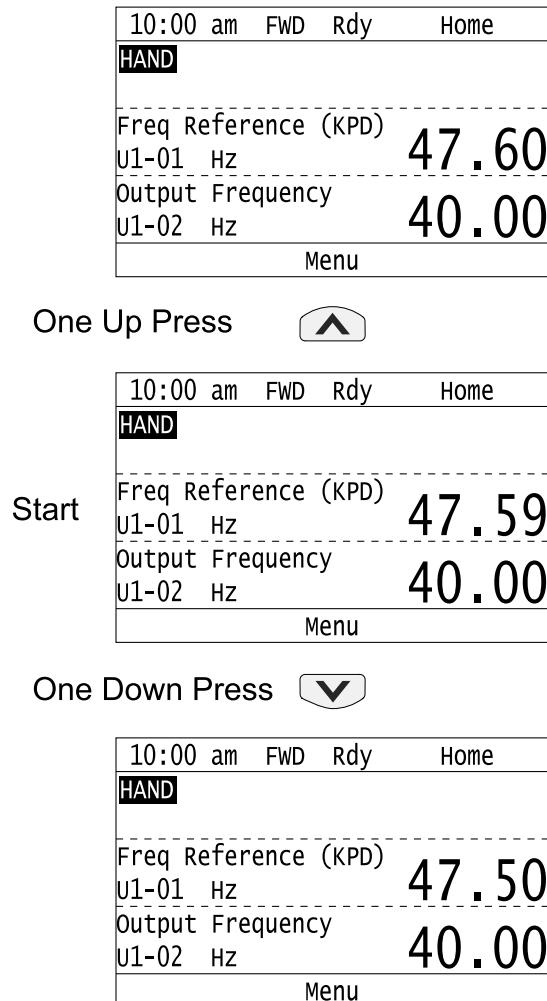


Figure 3.1 Single Keypress Rounding

HAND MOP Internal Limit

The HAND MOP rate of change is controlled by *C1-01* and *C1-02* and will be lower-limited to 10 seconds.

■ Bumpless Transfer

To enable bumpless transfer, set *S5-02* = 2 [*setting HAND/AUTO Switchover During Run = Enabled w/ Bumpless Transfer*].

AUTO to HAND Transition

To prevent changes in speed when transitioning into HAND Mode, the drive will overwrite *S5-05* [*HAND Frequency Reference*] while running with the current soft-starter output frequency.

HAND to AUTO Transition

The drive will return to the selected AUTO frequency reference using the acceleration/deceleration settings.

Drive Baseblocked to HAND Transition

When the drive is stopped or sleeping and you press the HAND key, the drive will use *S5-05* [*HAND Frequency Reference*] and will not Bumpless Transfer.

AUTO – PID

When bumpless transfer is enabled and *b5-01* = 1 [*PID Mode Setting = Standard*], the PID output will be forced to the HAND frequency reference when you transition from HAND to AUTO.

PID Mode

During AUTO mode, drive will operate normally in PID mode. If *S5-03* = 1 [*HAND Mode PID Selection = Enabled*], bumpless transfer will be ignored.

Forward/Reverse Transition

The direction that the drive is running in AUTO Mode will continue when transitioning to HAND Mode. This is standard drive behavior and is not modified for this function.

HAND MFDI

Bumpless transfer can occur when $H1-xx = 6E$ [*Terminal Sx Function Selection = HAND Command*] and $b1-03 = 0$ [*Stopping Method Selection = Ramp to Stop*].

Bumpless Transfer when below Minimum Speed

When bumpless transfer is triggered while the drive is running below minimum speed, the drive will output minimum speed. Parameter $S5-05$ [*HAND Frequency Reference*] will be set to minimum speed.

■ HAND MOP and Bumpless Transfer

You can enable HAND MOP and bumpless transfer at the same time.

Expected Operation Example

1. The drive is running in AUTO Mode at 50.0 Hz set in $d1-01$ [*Reference 1*].
2. You press the HAND key.
3. The drive switches to HAND Mode, continues to run at 50.0 Hz, and sets $S5-05$ [*HAND Frequency Reference*].
4. You hold the Up key to adjust the frequency until the drive is running at 60.0 Hz.
5. You press the AUTO key.
6. The drive switches to AUTO and returns to 50.0 Hz following the deceleration time set in $C1-02$.

Bypass Operation Compatibility

In remote HAND and digital operator HAND reference modes, if there is a bypass connected and $S5-01 = 3$ [*HAND Frequency Reference Source = HAND Ref S5-05 w/ MOP*], the drive HAND frequency reference source will be from the bypass-drive Modbus channel.

Revision History

Date of Publication	Revision Number	Software Number	Revised Content
January 2026	-	VSEA10010	First release.

YASKAWA

HV600 AC DRIVE BUMPLESS TRANSFER TO HAND MODE

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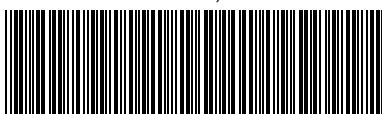
In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

Specifications are subject to change without notice for ongoing product modifications and improvements.

Original Instructions

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TM.HV600SW.010

TM.HV600SW.010
Revision: A <0>-0
January 2026
Published in U.S.A.