

# YASKAWA

## YASKAWA AC Drive P1000 Output Voltage PID Custom Software Supplement

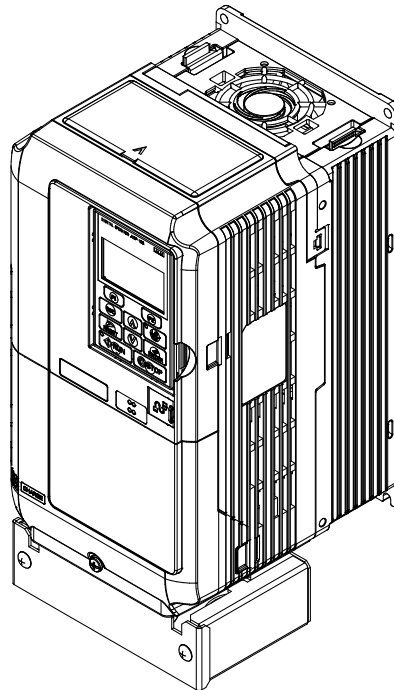
Type: CIMR-PU

Models: 200 V Class: 3/4 to 175 HP ND

400 V Class: 3/4 to 550 HP ND

600 V Class: 1 to 250 HP ND

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.



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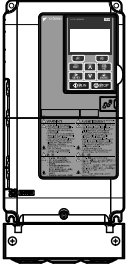
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# 1 Preface and Safety

Yaskawa manufactures products used as components in a wide variety of industrial systems and equipment. The selection and application of Yaskawa products remain the responsibility of the equipment manufacturer or end user. Yaskawa accepts no responsibility for the way its products are incorporated into the final system design. Under no circumstances should any Yaskawa product be incorporated into any product or design as the exclusive or sole safety control. Without exception, all controls should be designed to detect faults dynamically and fail safely under all circumstances. All systems or equipment designed to incorporate a product manufactured by Yaskawa must be supplied to the end user with appropriate warnings and instructions as to the safe use and operation of that part. Any warnings provided by Yaskawa must be promptly provided to the end user. Yaskawa offers an express warranty only as to the quality of its products in conforming to standards and specifications published in the Yaskawa manual. **NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS OFFERED.** Yaskawa assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

### ◆ Applicable Documentation

The following manuals are available for the P1000 drive:

	Output Voltage Adjust P1000 Custom Software Supplement (TM.P1000SW.020)
	Read this manual first. This supplement is an addendum to the P1000 Quick Start Guide and Technical Manual. It lists the effects of this custom software on the parameters in the drive and function descriptions in the manual. To obtain the supplement access this site: U.S: <a href="http://www.yaskawa.com">http://www.yaskawa.com</a> .
	P1000 Series AC Drive Quick Start Guide (TOEPYAIP1U01)
	This guide is packaged together with the product and contains basic information required to install and wire the drive. It also gives an overview of fault diagnostics, maintenance, and parameter settings. The purpose of this guide is to prepare the drive for a trial run with an application and for basic operation. This manual is available for download on our documentation website, <a href="http://www.yaskawa.com">www.yaskawa.com</a> .
	P1000 Series AC Drive Technical Manual (SIEPYAIP1U01)
This manual provides detailed information on parameter settings, drive functions, and MEMOBUS/Modbus specifications. Use this manual to expand drive functionality and to take advantage of higher performance features. This manual is available for download on our documentation website, <a href="http://www.yaskawa.com">www.yaskawa.com</a> .	

### ◆ Supplemental Safety Information

Read and understand this manual and the P1000 Quick Start Guide before installing, operating, or servicing this option unit. Install the drive according to the P1000 Quick Start Guide and local codes. Observe all cautions and warnings in this document and the standard drive technical manuals.

Refer to the P1000 Quick Start Guide and Technical Manual for safety information and to install and start-up the drive. This document is a supplement to the standard drive technical manual. It describes the effects on the drive parameters and functions with the software installed.

- Custom software is provided to add functionality to a standard 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

When seeking support for a drive with custom software, it is imperative to provide the unique part number shown on the drive nameplate. The software is flashed to the control board memory and the operation of parameters, functions, and monitors are different than the standard drive software, as described herein.

Refer to Yaskawa office locations listed on the back cover of this manual.

## 2 Output Voltage Adjust

### ◆ Overview

This software provides the ability to change the output voltage (V/f pattern) while the drive is running.

### ◆ Applicable Models

This Output Voltage Adjust software can be used with the drive models in [Table 1](#).

**Table 1 Applicable Models**

Drive Series	Drive Model Number	Software Version
P1000	CIMR-PU2A□□□□	PRG: 8500 and later
	CIMR-PU4A0002 to 4A0675	
	CIMR-PU5A□□□□	

### ◆ Basic Concepts and Principles

Parameters were added to adjust the base voltage bias and maximum voltage bias.

### ◆ Related Parameters

#### ■ P: Voltage Adjust

##### P1: Voltage Bias

No. (Addr. Hex)	Name	Description	Values
P1-01 (0600)	Base Voltage Bias	Sets the amount of voltage bias on the V/f pattern when operating at base frequency.	Default: 0.0 VAC Min.: -300.0 Max.: 300.0
P1-02 (0601)	Max Voltage Bias	Sets the amount of voltage bias on the V/f pattern when operating at maximum frequency.	Default: 0.0 VAC Min.: -300.0 Max.: 300.0

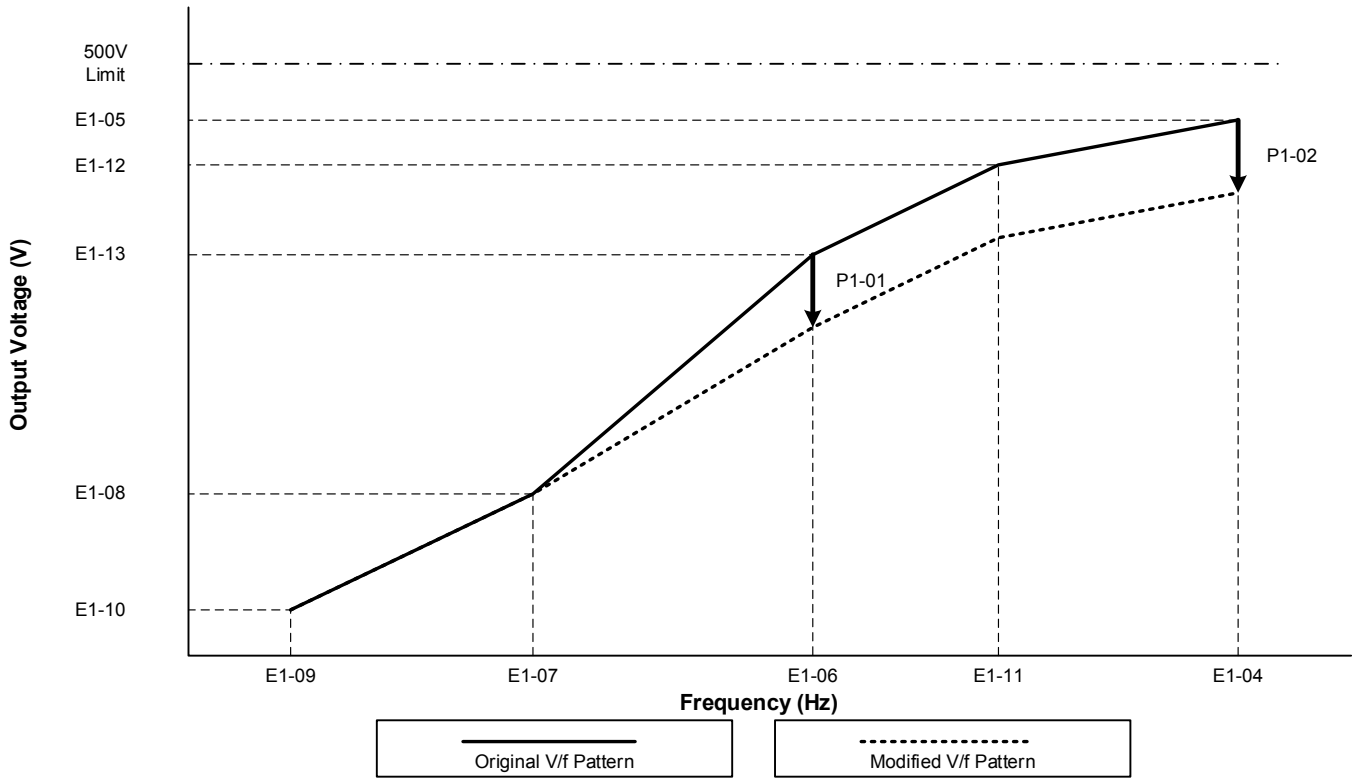
### ◆ Function Description

Parameter P1-01, Base Voltage Bias, will internally add or subtract voltage from the V/f pattern at the Base Frequency set by parameter E1-06. The actual amount of bias applied depends upon the output frequency. At an output frequency equal to the Middle Output Frequency parameter E1-07, no bias is applied. If the output frequency is at the E1-06 value, the entire P1-01 voltage bias will be applied. The applied voltage bias will be linearly interpolated at output frequencies between E1-07 and E1-06, as shown in [Figure 1](#).

Parameter P1-02, Max Voltage Bias, will internally add or subtract voltage from the V/f pattern at the Maximum Output Frequency set by parameter E1-04. As with the Base Voltage Bias, the actual amount of bias applied depends upon the output frequency. The applied voltage bias will be linearly interpolated between the P1-01 and P1-02 bias values at output frequencies between E1-06 and E1-04, respectively.

When either parameter P1-01 or P1-02 is changed, the V/f pattern will be ramped to the new value at a rate of 25 VAC per second.

## 2 Output Voltage Adjust



**Figure 1 Negative Output Voltage Bias Pattern, 460 V Drive**

When the Output Voltage Adjust function is used to increase the output voltage, it may be necessary to set V/f Pattern Selection parameter E1-03 = FF to disable the internal voltage limit. For example, 460 V models have an internal upper limit of 500 V when operating above base frequency E1-06. It will then be possible to set the V/f pattern as high as 810 VAC (E1-05 = 510 VAC, P1-02 = 300 VAC).

**Note:** The maximum output voltage of the drive is limited to the peak value of the voltage present on the input terminals of the drive. For example, an application with an input voltage of 460 V is limited to a peak drive output of  $(460 \text{ V} * \sqrt{2}) = 650 \text{ VAC}$ , although the U1-06 Output Voltage monitor may display up to 810 VAC.

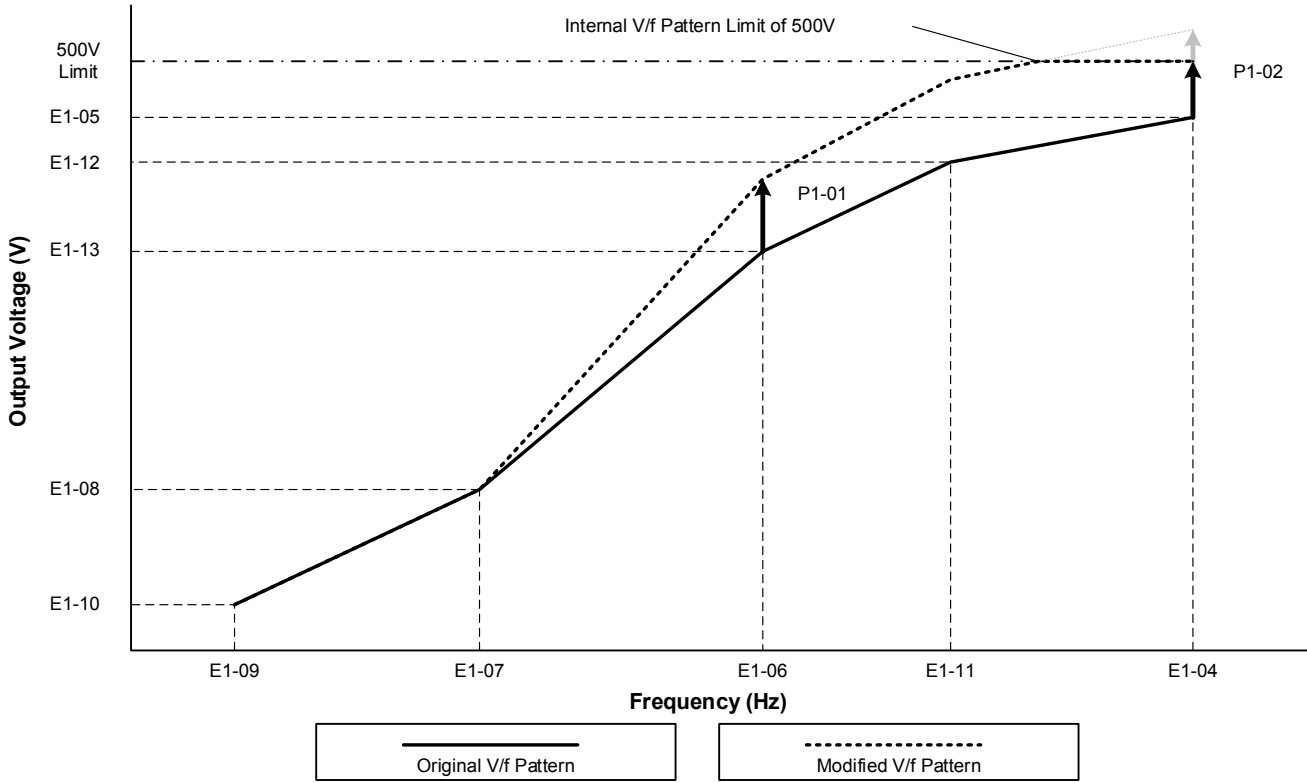


Figure 2 Positive Output Voltage Bias Pattern with E1-03 = F, 460 V Drive

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## Revision History

The revision dates and the numbers of the revised manuals appear on the bottom of the back cover.

Example:

MANUAL NO. TM.P1000SW.020 <0>  
Published in USA April 2018

└─ Revision number  
└─ Date of publication

Date of Publication	Revision Number	Section	Revised Content
April 2018	-	-	First Edition





# YASKAWA AC Drive P1000

Output Voltage PID

Custom Software Supplement

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YASKAWA AMERICA, INC.

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

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TM.P1000SW.020

MANUAL NO. TM.P1000SW.020

Published in USA April 2018