
# Crossover Guide

## Unimotor fm E2/U2 to Unimotor fm E3/U3

Class-leading servo motor performance

EMERSON™
Industrial Automation

# Unimotor fm Servo Motors - E2/U2 migration to E3/U3 models

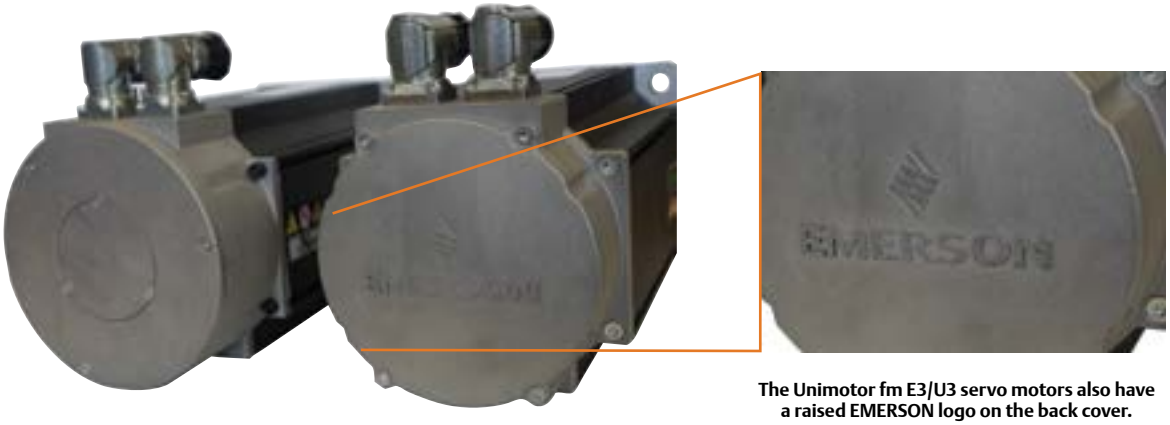
## INTRODUCTION

The Unimotor fm servo motor family has recently been redesigned to utilize Emerson Industrial Automation's latest manufacturing and component design improvements. This redesign provides improved performance in a shorter length frame as compared to the previous design.

The following provides information to help identify these design improvements for those times when replacement of the previous design is necessary. Note that there are 100% mechanical mounting replacements for any existing field installed models. All previous order code information regarding bolt circle diameter, pilot diameter and shaft diameter are available in the new design's order string.

You will also see in the following information that there are higher performance specifications listed for most frames and lengths. Electrical parameters like, Kt (torque constant) and Ke (voltage constant) remained the same for the new models. This will allow for direct replacement into existing applications with no need to change motor parameters to maintain the existing performance levels. Only instances where increased motor performance levels are desired would changes to drive parameters be needed.

**Unimotor fm E2/U2** **Unimotor fm E3/U3**




**The Unimotor fm E3/U3 servo motors also have a raised EMERSON logo on the back cover.**

Application specifics should be reviewed by an Emerson Application Engineer. For additional assistance call 1 800 893 2321.

# Unimotor fm Servo Motors - E2/U2 migration to E3/U3 models

## Crossover Reference Table

| 230 V E2 | | 230 V E3 | |
|---|---|---|---|
| Stall Torque (Nm) | Order Code | Order Code | Stall Torque (Nm) |
| 2.2 | 075E2B400BACAA075110 | 075E3B400BACAA075110 | 2.7 |
| 4.3 | 095E2B300BACAA100190 | 095E3B300BACAA100190 | 4.5 |
| 4.3 | 095E2B400BACAA100190 | 095E3B400BACAA100190 | 4.5 |
| 7.5 | 095E2D300BACAA100190 | 095E3D300BACAA100190 | 7.9 |
| 7.5 | 095E2D400BACAA100190 | 095E3D400BACAA100190 | 7.9 |
| 9.4 | 115E2C300BACAA115190 | 115E3C300BACAA115190 | 10.8 |
| 12.4 | 115E2D300BACAA115240 | 115E3D300BACAA115240 | 13.7 |
| 15.3 | 115E2E300BACAA115240 | 115E3E300BACAA115240 | 23.4 |
| 460 V U2 | | 460 V U3 | |
| 2.2 | 075U2B300BACAA075140 | 075U3B300BACAA075140 | 2.7 |
| 2.2 | 075U2B400BACAA075140 | 075U3B400BACAA075140 | 2.7 |
| 3.9 | 075U2D300BACAA075140 | 075U3D300BACAA075140 | 4.7 |
| 4.3 | 095U2B300BACAA100190 | 095U3B300BACAA100190 | 4.5 |
| 4.3 | 095U2B400BACAA100190 | 095U3B400BACAA100190 | 4.5 |
| 7.5 | 095U2D300BACAA100190 | 095U3D300BACAA100190 | 7.9 |
| 9 | 095U2E400BACAA100190 | 095U3E400BACAA100190 | 9.3 |
| 6.6 | 115U2B300BACAA115190 | 115U3B300BACAA115190 | 7.4 |
| 9.4 | 115U2C300BACAA115190 | 115U3C300BACAA115190 | 10.8 |
| 12.4 | 115U2D300BACAA115190 | 115U3D300BACAA115190 | 13.7 |
| 15.3 | 115U2E300BACAA115190 | 115U3E300BACAA115190 | 16.0 |
| 15.3 | 142U2C300BACAA165240 | 142U3C300BACAA165240 | 15.7 |
| 19.8 | 142U2D300BACAA165240 | 142U3D300BACAA165240 | 20.5 |
| 23.4 | 142U2E300BACAA165240 | 142U3E300BACAA165240 | 25.0 |
| 41.1 | 190U2D300BACAA215320 | *190U3D300BACAA215320-SREL | 44.5 |

*The -SREL suffix indicates a shaft dimension length of 80 mm. For 58 mm shaft length exclude the suffix.

## Order Code Summary

| XXX | X | X | X | XX | X | X | X | XX | X | XXX | XXX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frame size | Motor voltage | Magnet type | Stator length | Rated speed (rpm x100) | Brake (24 V) | Connection type | Output shaft | Feedback device | Inertia + Temperature sensor | PCD | Shaft Diameter (mm) |

Refer to the servo motor product literature for all available options.

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# Unimotor fm Servo Motors - E2/U2 migration to E3/U3 models

## Order Code Changes

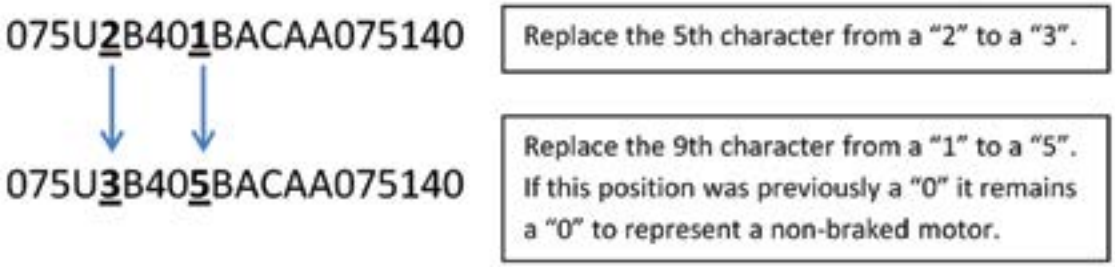
**Unimotor fm frame sizes 075 mm, 095 mm, 115 mm, 142 mm**

Use the following information as a guide to cross an existing Unimotor fm E2/U2 order code to the new E3/U3 order codes.

For motor frames 075, 095, 115 and 142 the new E3/U3 model string can be created simply by replacing the 5th character from the left from a "2" to a "3".

For motor models provided with a holding brake, identified with a "1" in the 9th character, the new holding brake order code is now "5".

**Here is an example of these order code changes:**

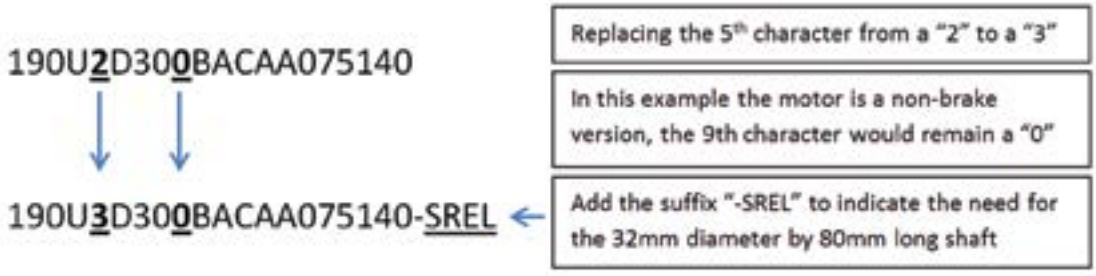



All other order code positions would remain the same when ordering a replacement motor in these frames.

**Unimotor fm frame size 190 mm**

For the 190 frame motor the same applies as shown for the 075-142 models. In addition to these changes a "-SREL" suffix is required to indicate the required shaft length. The standard shaft on all Unimotor fm 190 E3/U3 frame lengths is now 32 mm diameter by 58 mm long. When replacing an existing Unimotor fm 190 E2/U2 model use the suffix "-SREL" on the order string to indicate the 32 mm diameter by 80 mm long shaft dimensions associated with the E2/U2 models.

**Here is an example of this order code change:**




All other order code positions would remain the same when ordering a replacement motor in these frames.

# Unimotor fm Servo Motors - E2/U2 migration to E3/U3 models

## Motor Dimension Changes

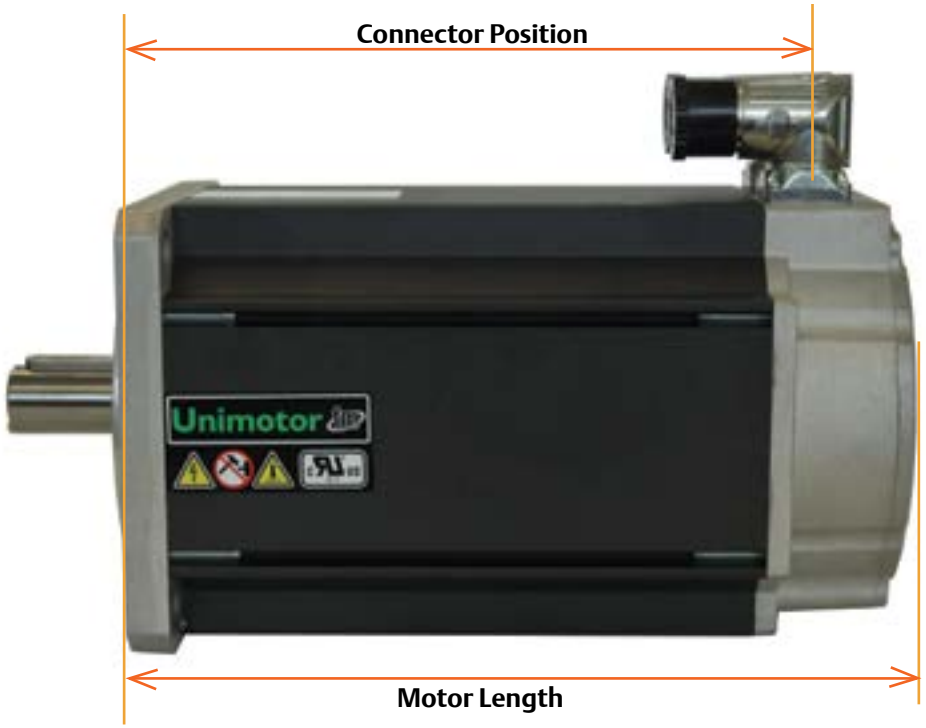
With the new E3/U3 models the motor length decreases on some of the frames. Along with this shorter motor length also comes a difference in the connector position relative to the motor faceplate. With the shorter motor the cable connectors move closer to the motor faceplate.

**Connector Position and Motor Length Differences**

| Unimotor E3/U3 | Connector Position Difference from U2/E2 (mm) | | Motor Length Difference from E2/U2 (mm) | |
|---|---|---|---|---|
| Frame | Non-Brake | Braked | Non-Brake | Braked |
| 075A-D | 0 | -15 | 0 | -15 |
| 095A-E | 0 | -15 | 0 | -15 |
| 115A-E | -8.2 | -23.2 | 1.4 | -13.6 |
| 142A-E | -25 | -10 | -33.4 | -18.4 |
| 190 A | -28.6 | -19.4 | -38 | -28.6 |
| 190B | -25.5 | -16.4 | -34.9 | -25.8 |
| 190C | -22.7 | -13.3 | -31.9 | -22.7 |
| 190D | -19.4 | -10.3 | -28.8 | -19.7 |
| 190E | -16.4 | -7.2 | -25.8 | -16.6 |
| 190F | -13.3 | -4.2 | -22.7 | -13.6 |
| 190G | -10.3 | -1.1 | -19.7 | -10.5 |
| 190H | -7.2 | 1.9 | -16.6 | -7.5 |

**Differences to Note:**

- With the shorter motor the cable connectors move closer to the motor faceplate
- Along with this shorter motor length also comes a difference in the connector position relative to the motor faceplate

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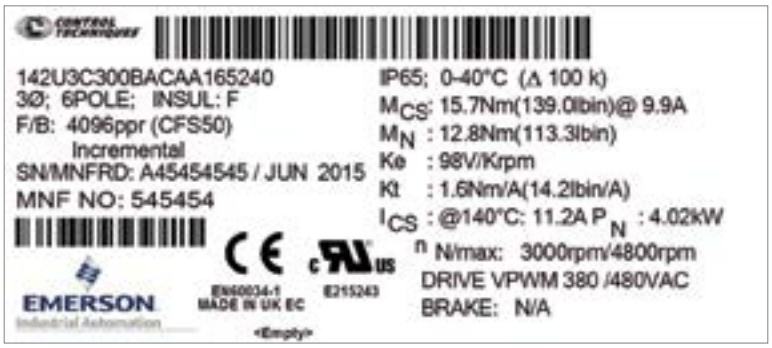
## Motor Parameters

### Higher Torque ratings

The Cross Reference Table (page 3), shows in some cases that the stall torque of the E3/U3 models has increased. Although this higher performance is available, it is not available to the application unless the servo drive has a sufficient current rating and the appropriate drive parameters are set to the new motor data. Keep in mind that if the previous E2/U2 motor was providing the required torque there is no need to change the existing drive settings, the new E3/U3 motor and existing drive will provide the equivalent performance.

If the higher rating is needed use the motor name plate data to determine the information to enter for the new motor parameters.




Use the following three steps to update the drives motor map information.

1. Use the appropriate commissioning software and update the motor information as indicated on the motor nameplate.
2. Verify that the motor feedback device settings in the drive match the motors feedback device.
3. Perform a rotating Autotune de-coupled from the load as described in the appropriate drive product literature.
4. Save the new drive parameters.

## Notes

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