

Objective

Drive Setup for Field Weakening

Equipment

590 or 590+ Drive, Field-weakening motor, external speed feedback

NOTE: Field weakening requires external feedback from the motor such as a tachometer generator, wire-ended or Microtach encoder speed feedback.

Procedure

1. Calibrate the motor field current

Note: Calibrate the motor field as described in Chapter 3 (HA352494). Most field-weakened motors give the field current as two values; a minimum and a maximum, indicating the field weakened range of the motor. Calibrate the motor field for the larger of these two values.

2. Change Setup Parameters::Field Control::Field CTRL Mode to Current Control.

3. Verify Setup Parameters::Field Control::Field Enable is Enabled.

4. Change Setup Parameters::Field Control::Fld Current Vars::Fld Weak Vars::Fld Weak Enable to Enabled.

5. Ensure that Setup Parameters::Field Control::Fld Current Vars::Fld Weak Vars::Min Fld Current is set correctly for the motor to reach top speed. Min Fld Current is calculated using the formula below:

Note: Min Fld Current is calculated using the formula: (minimum field current ÷ maximum field current) × 90%. This sets Min Fld Current 10 percent lower than the field calculated to reach full speed. The 10 percent cushion should overcome any inaccuracies in the nameplate data.

6. Verify Setup Parameters::Field Control::Fld Current Vars::Fld Weak Vars::Max Volts is set 100.

Note: Monitor Diagnostics::Terminal Volts to verify that the armature voltage is approximately equal to the value calculated in the previous step.

7. Increase speed above base speed by adjusting the speed potentiometer.

Note: Verify the motor armature volts remain constant while the field gradually decreases.

8. Gradually increase to the maximum speed, while monitoring armature volts at maximum speed.

9. Adjust the speed feedback using the appropriate speed feedback calibration parameters.

Note: Adjust Analog Tach Cal when using analog tachometer generator feedback.

10. For regenerative drives, check the maximum reverse speed.

Note: Correct any asymmetry in a reversing drive by adjusting Setup Parameters::Calibration::Zero Spd::Offset.

11. Stop the drive and SAVE PARAMETERS.

If you have questions, please call the Product Support Group at (704) 588-3246.