

9 Output Calibration

9.1 Overview

Introduction

This section describes the field calibration procedures for the following types of outputs:

- Current Proportional Output
- Auxiliary Output
- Motor Travel Time Setting for Three Position Step

What's in this section?

The following topics are covered in this section.

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WARNING—SHOCK HAZARD



OUTPUT CALIBRATION MAY REQUIRE ACCESS TO HAZARDOUS LIVE CIRCUITS, AND SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. MORE THAN ONE SWITCH MAY BE REQUIRED TO DE-ENERGIZE UNIT BEFORE CALIBRATION.

9.2 Current Proportional Output Calibration

Introduction

Calibrate the controller so that the output provides the proper amount of current over the desired range. The controller can provide an output current range of from 0 to 21 milliamperes and can be calibrated at 4 mA for 0% of output and 20 mA for 100% of output, or any other values between 0 and 21 mA.

Equipment Needed

You will need a standard shop type milliammeter, with whatever accuracy is required, capable of measuring 0 to 20 milliamps.

Calibrator Connections

Refer to Figure 9-1 and wire the controller according to the procedure given in Table 9-1.

Table 9-1 Set Up Wiring Procedure for Current Proportional Output

Step	Action
1	Apply power and allow the controller to warm up 30 minutes before you calibrate.
2	Set LOCK in the Tuning Set Up group to NONE.
3	Tag and disconnect the field wiring, at the rear of the controller, from terminals 4 (-) and 5 (+). See Figure 9-1.
4	Connect a milliammeter across these terminals.

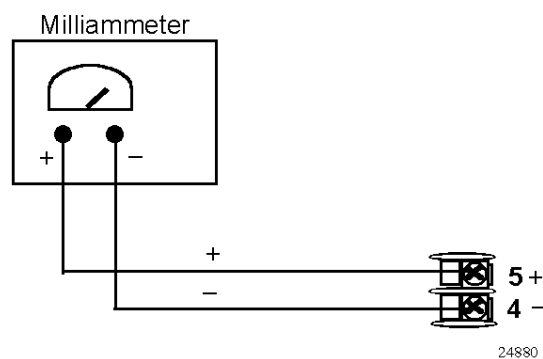


Figure 9-1 Wiring Connections for Calibrating Current Proportional Output

Procedure

The procedure for calibrating the Current Proportional Output is listed in Table 9-2. The numeric codes are also listed. Make sure LOCK in the Tuning Set Up group is set to NONE. (see Configuration)

Table 9-2 Current Proportional Output Calibration Procedure (Numeric Code 30000)

Step	Operation	Press	Result
1	Enter Calibration Mode	SET UP until you see	Upper Display = CAL (- - - -) Lower Display = CURENT (30000)
2	Calibrate 0%	FUNCTION [▲] [▼]	You will see: Upper Display = A Value Lower Display = ZROVAL (30001) Until the desired 0% output is read on the milliammeter, use the values shown below depending on the action of your controller. <ul style="list-style-type: none"> • 0 mA For 0 to 20 mA Direct Action • 4 mA For 4 to 20 mA Direct Action • 20 mA For 4 to 20 mA Reverse Action or 0 to 20 mA Reverse Action
3	Calibrate 100%	FUNCTION [▲] [▼]	This stores the 0% value and you will see: Upper Display = A Value Lower Display = SPNVAL (30002) Until the desired 100% output is read on the milliammeter, use the values shown below depending on the action of your controller. <ul style="list-style-type: none"> • 20 mA For 0 to 20 mA Direct Action • 20 mA For 4 to 20 mA Direct Action • 4 mA For 4 to 20 mA Reverse Action • 0 mA For 0 to 20 mA Reverse Action
4	Exit the Calibration Mode	FUNCTION DISPLAY	The controller stores the span value. To exit the calibration mode.

9.3 Auxiliary Output Calibration

Introduction

Calibrate the controller so that the auxiliary output provides the proper amount of current over the desired range. The controller can provide an auxiliary current output range of from 0 to 20 mA and can be calibrated at 4 mA for 0% of output and 20 mA for 100% of output or any other values between 0 and 21 mA.

Equipment Needed

You will need a calibrating device with whatever accuracy is required, capable of measuring 0 to 20 mA.

Calibrator Connections

Refer to Figure 9-2 and wire the controller according to the procedure given in Table 9-3.

Table 9-3 Set Up Wiring Procedure for Auxiliary Output

Step	Action
1	Apply power and allow the controller to warm up 30 minutes before you calibrate.
2	Set LOCK in the Tuning Set Up group to NONE.
3	Tag and disconnect the field wiring, at the rear of the controller, from terminals 13 (+) and 14 (-). See Figure 9-2.
4	Connect a milliammeter across these terminals.

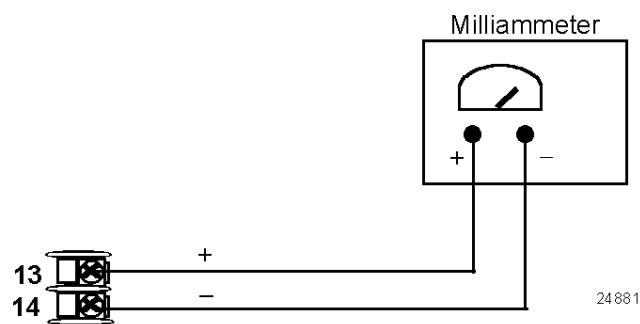


Figure 9-2 Wiring Connections for Calibrating Auxiliary Output

Procedure

The procedure for calibrating the auxiliary output is listed in Table 9-4 Auxiliary Output Calibration Procedure. The numeric codes are also listed.

Make sure “LOCK” in the Tuning Set Up group is set to “NONE” (see *Configuration Section*)

**Table 9-4 Auxiliary Output Calibration Procedure
(Numeric Code 50000)**

Step	Operation	Press	Result
1	Enter Calibration Mode	SET UP until you see	Upper Display = CAL (- - - -) Lower Display = AUXOUT (50000)
2	Calibrate 0%	FUNCTION [▲] [▼]	You will see: Upper Display = A Value Lower Display = ZROVAL (50001) until the desired 0% output is read on the milliammeter, use the values shown below depending on the action of your controller.
3	Calibrate 100%	FUNCTION [▲] [▼]	To store the 0% value you will see: Upper Display = A Value Lower Display = SPNVAL (50002) until the desired 100% output is read on the milliammeter.
4	Exit the Calibration Mode	FUNCTION DISPLAY	The controller stores the span value. To exit the calibration mode.

9.4 Three Position Step Output Calibration

Three position step control

*Three Position Step Control Output Models **without** Motor Position Indication
(Model Numbers 230B-EE-XX-X0, DC230B-AA-XX-X0)*

This model only requires that the “Motor Time” be entered as shown in the calibration procedure.

Equipment needed

None.

Connections

Apply power and allow the controller to warm up 30 minutes before you calibrate. Leave all field wiring connected to the rear terminals.

Procedure

The procedure for calibrating the 3 Position Step control output is listed in Table 9-5.

The numeric codes are also listed. Make sure LOCKOUT in Tuning Set Up group is set to NONE. See *Section 3.5*.

ATTENTION These prompts *only* appear when “TPSC” is selected in the algorithm group function prompt.

**Table 9-5 3 Position Step Output Calibration Procedure
(Numeric Code 40000)**

Step	Description	Press	Action
1	Enter Calibration Mode	SET UP	Until you see Upper Display = CAL (- - - -) Lower Display = TPSC (40000)
2	Set Motor Traverse Time NOTE: This is the time it takes the motor to travel from 0 to 100%.	FUNCTION [▲] [▼]	Until you see Upper Display = a value Lower Display = MTR TI (40001) until the proper motor stroke time is reached (see the motor specs or measure the time) Range of setting = 5 to 1800 Seconds
3	Exit the Calibration Mode	FUNCTION DISPLAY Or SET UP	The controller will store the 100% value. To exit the calibration mode.