

The following values are the **UTILITIES, AUX OUTPUT** settings and the conversion factors to convert from the output voltage to the Torque, Position, and Velocity units.

+/-5v full scale

Settings	Position	Torque	Speed	Direction
Gain	2876	535	2060	975
Offset	0	0	0	0
Rectify	Unchecked	Unchecked	Unchecked	Unchecked
Full Scale	365 deg	510 ft-lbs	510 deg/sec	CW/CCW

Position (volts/degree)	0.013699
Torque (volts/ft-pound)	0.009804
Velocity (volts/deg/sec)	0.009804
Direction (volts)	0, +5

+/-10v full scale

Settings	Position	Torque	Speed	Direction
Gain	5753	1070	4120	1950
Offset	0	0	0	0
Rectify	Unchecked	Unchecked	Unchecked	Unchecked
Full Scale	365 deg	510 ft-lbs	510 deg/sec	CW/CCW

Position (volts/degree)	0.027397
Torque (volts/ft-pound)	0.019608
Velocity (volts/deg/sec)	0.019608
Direction (volts)	0, +10

Note:

1. The Position and Velocity values are from a digital encoder and do not vary across systems.
2. The Torque value is from strain gauges, and the conversion factor varies across systems, which is why a torque calibration is required. To obtain the correct torque conversion factor for your system:
 - a. From the **UTILITIES, Calibration menu**, click the **VIEW LOG** button.
 - b. Average the ConvFact for Dir 0 and Dir 1.

Date: 5/15/2026	Calibration: Yes	Type: Torque	ConvFact: 0.01624	Dir: 1
Result: PASS	Machine: NORM	Therapist:		
Verify 1:	Verify 2:	Small: 0	Big: 9238	
Baseline:	Adapter: Yes	Dyna: 0	Side: 0	
Date: 5/15/2026	Calibration: Yes	Type: Torque	ConvFact: 0.01624	Dir: 0
Result: PASS	Machine: NORM	Therapist:		
Verify 1:	Verify 2:	Small: 0	Big: 9235	
Baseline:	Adapter: Yes	Dyna: 0	Side: 0	

- c. Adjust your Torque Gain value by the following:

- i.
$$\text{New Gain} = \text{Gain} * \frac{\text{Your ConvFact}}{0.01624}$$

- d. To obtain the Torque value in Newton-Meters, multiply the Full Scale Torque Value in this document by 1.355.
3. You can use the **OFFSET** in the HUMAC or read a resting value with the EMG system to zero out any offset in the analog signals.