


# Customized Test System for Stepper Motors

## FEATURES

- **Complete Test System:** Fully equipped with a custom dynamometer, supporting electronics, stepper motor testing software and computer hardware; all built into a heavy-duty, portable table
- **6 Different Motor Parameters Tested:** Measures holding torque, detent torque, pull-in torque, pull-out torque, angle torque and step response
- **Motor Drive Control:** Provides enable, pulse (step), direction and power relay signals
- **Optional Power Measurement:** With Magtrol's 6510e Single-Phase and/or 6530 Three-Phase Power Analyzer



## COMPONENTS

- **Motor Testing Dynamometer:** Let Magtrol select/design a dynamometer best suited for your stepper motor application.
- **Custom Table:** With T-grooved top and optional stepper wiring breakout box
- **DSP6001 Dynamometer Controller:** Controls loading of the stepper motor and also reads the torque the motor produces
- **POWERED BY SM-TEST 2.0 Motor Testing Software:** Based on Magtrol's state-of-the-art M-TEST 5.0 software, SM-TEST 2.0 is designed specifically for the testing of stepper motors. Generated test data can be stored, displayed and printed in tabular or graphic formats, and can be easily imported into a spreadsheet. 
- **Aluminum Motor Mounting Plates:** Securely hold motor in place while running any test
- **PC, 17" LCD flat screen monitor and keyboard**
- **Optional Power Supply:** Fully integrated with software
- **Optional Power Analyzer:**
  - 6510e Single-Phase: Measures electrical input power to the motor and drive for system efficiency calculation
  - 6530 Three-Phase: Measures electrical input power to the motor only for motor efficiency calculation
- **Calibration Beam and Weights:** verifies calibration



Stepper Patch Board (option)



Aluminum Motor Mounting Plates

## SPECIFICATIONS

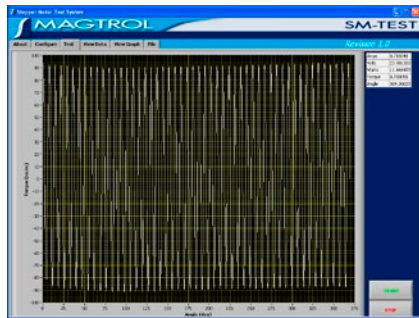
<b>Motor Drive Interface</b>	Optically-isolated open collector
	Signals: • direction • pulse (step) • enable • power relay
	Pulse frequency to 20 kHz

<b>Measurement Accuracy</b>	Torque: <i>Consult factory.</i>
	Angle: $\pm 0.01\%$
<b>Power</b>	120/240 V AC, 50/60 Hz 225 VA

## STATIC TORQUE CHARACTERISTICS

### Holding Torque

*Description:* Maximum static torque during excitation

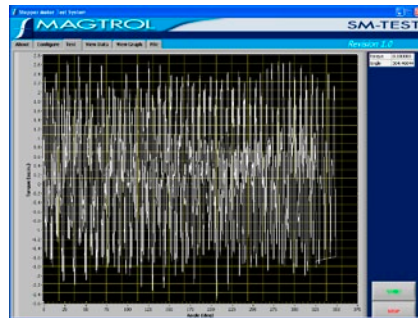


steps while the torque amplitude vs. angle are plotted.

*Procedure:* The UUT is powered on and no step frequency is applied. Both clutches are engaged, the brake is slightly energized and the gear motor is rotating at about 1 rpm. The motor pushes through the

### Detent Torque

*Description:* Holding torque without excitation



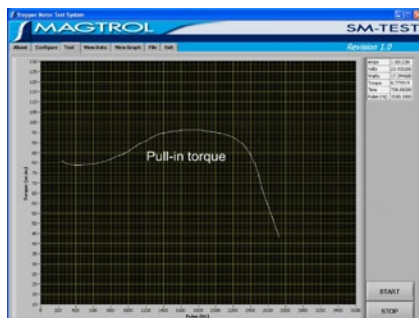
steps while the torque amplitude vs. angle are plotted.

*Procedure:* The UUT is powered off and no step frequency is applied. Both clutches are engaged, the brake is slightly energized and the gear motor is rotating at about 1 rpm. The motor pushes through the

## DYNAMIC TORQUE CHARACTERISTICS

### Pull-In Torque

*Description:* Maximum frequency at which the motor can start instantaneously, with a load applied, without loss of synchronism

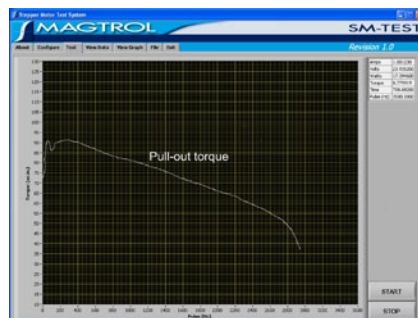


frequency is removed and the brake current increased. The process continues until the UUT does not start. Multiple step frequencies can be tested.

*Procedure:* The motor clutch is disengaged and the encoder clutch is engaged. The UUT is powered on. The brake is set at a current and the first step frequency is applied. If the UUT starts, the step

### Pull-Out Torque

*Description:* Maximum frequency at which the motor can operate without loss of synchronism



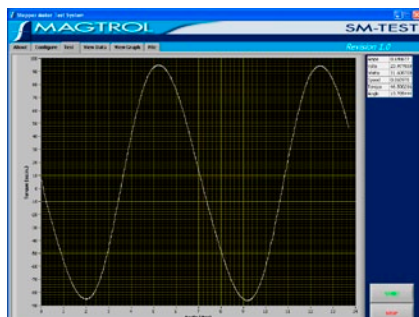
step frequencies can be tested.

*Procedure:* The motor clutch is disengaged and the encoder clutch is engaged. The UUT is powered on and the first step frequency is applied. The brake current is increased until loss of sync. Multiple

## ANGULAR CHARACTERISTICS

### Angle Torque

*Description:* Torque produced at various angles of rotation

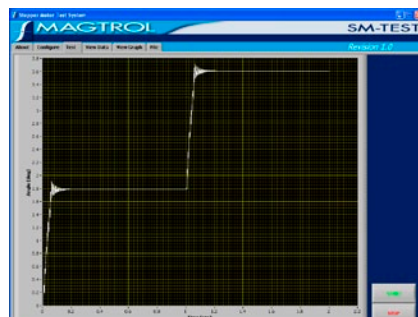


steps while the torque amplitude vs. angle are plotted.

*Procedure:* The UUT is powered on and no step frequency is applied. Both clutches are engaged, the brake is slightly energized and the gear motor is rotating at about 0.06 rpm. The motor pushes through one or two

### Step Response

*Description:* The time it takes the motor shaft to rotate one step angle once the first step pulse is applied



*Procedure:* The motor and encoder clutch are disengaged. The UUT is powered on and the step frequency input is pulsed slowly. The angle and time are measured and displayed.



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