

## Test Lab Capabilities

Advanced Energy's independent motors and drives test lab is continually expanding testing services and capabilities to help clients meet new demands and challenges. From product development testing and motor design services to performance and endurance testing, we are your trusted partner for customized testing of motors and drives.

Our motor systems engineers work with you to design test plans targeted at identifying desired characteristics at a high level of accuracy. Combined, we offer more than 100 years of engineering experience and have performed detailed tests on more than 3,600 motors, drives and generators in our lab – the only independent motor lab in North America to receive accreditation by the National Voluntary Laboratory Accreditation Program (Lab Code: 200081-0).

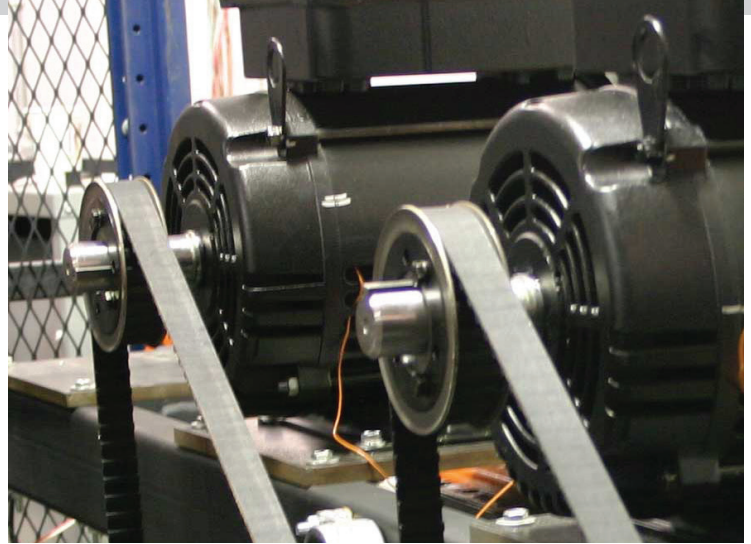
### PRECISION POWER ANALYZERS

- Yokogawa DL850 Scopecorder: provides the ability to capture 10 channels of high-speed, high-resolution waveforms and to see events in real time.
- Two Yokogawa WT3000s: allows for testing and measuring DC and high AC frequency ranges, as well as measuring input and output simultaneously; shows voltage and current waveforms, harmonics and validation of total harmonic distortion.
- Yokogawa WT5000: similar to our WT3000s, our WT5000 is the 6-element version that allows for testing three-phase drive input and output simultaneously at very high accuracy.

### POWER SYSTEMS

Two AC power systems with independent phase voltage control

- Single- or three-phase closed loop voltage control
- 0-600V; 320A max continuous, 2000A max short intervals
- Clean power [in-line isolation transformer]
- AC variable frequency PWM drives: 1-500Hp, 230/460V
- Testing of 50 and 60 Hz



### RELIABILITY TESTING

¼-20Hp with auxiliary air cooling for higher cycling rate and quicker results. Methods include:

- Start-stop cycling
- DC injection braking for single-phase system endurance
- Plug reversal testing for three-phase motors
- Bearing load durability testing
- Elevated ambient for thermal aging
- Motor and drive thermal mapping
- Comparison testing for vendor evaluations
- Reliability rig test
- Conduct side-by-side tests featuring incumbent and challenger motors, including temperature, load and frequency
- Provides flexible testing conditions

### DC POWER SYSTEM WITH VOLTAGE CONTROL

- 0-500V; 510A max continuous, 770A max short intervals [max 200kW]
- Configurable to provide 100kW continuous at 240-500V

## HIGH-SPEED DATA ACQUISITION AND CONTROL

Simultaneous acquisition of voltage, current, power, torque, speed, temperature and other device outputs

- 32 single-ended [16 differential] analog input channels with 16 bit resolution [ $\pm 0.0015\%$  of full scale] at a max of 1MHz scan rate
- Four analog output channels with 16 bit resolution at 1.25MHz

Capture of waveforms distorted by power semiconductor devices and other short-duration transients

- Additional simultaneous acquisition on 10 channels of voltage [max 1kV]. Current acquisition [max 150A, 0-10MHz]. All channels with true 12 bit resolution at up to 100MS/s.

## CENTRAL DATA ACQUISITION AND CONTROL

- All measurements coordinated by centralized data acquisition and control system permitting real-time simultaneous readings from all metering sources
- Acquisition for high-speed recording initiated by either an external trigger or a threshold based on any measured parameter
- Available I/O channels permit control of any device under test and/or test apparatus for coordinated initiation and acquisition of transient phenomenon
- Real-time data processing facilitates adjustments to the test plan during the test
- Custom LabView programming

## DYNAMOMETER CAPACITY

- Constant torque, high load inertia: 1200Nm [800lb-ft], 0-3600RPM, 300Hp max
- Variable torque, low load inertia: 1200Nm [880lb-ft], 0-8000RPM, 250Hp max
- Small motor capability down to sub-fractional Hp

## SHAFT POWER MEASUREMENT

- 0.5-1200Nm [0.4-880lb-ft] torque for 0-8000RPM at  $\pm 0.2\%$  of full scale
- Speed measurement 0-15000RPM at  $\pm 0.1$ RPM

## PRECISION ELECTRICAL MEASUREMENTS

- True RMS AC or DC voltage [0-1000V] and AC current [0-1000A] on individual phases, 0.1Hz-1MHz
- True RMS one- or three-phase power for three- or four-wire delta or wye configurations with basic power accuracy 0.02% of reading
- DC current measurement [0-500A] at  $\pm 0.3\%$  of full scale 1200A short duration
- Danisense 200ID Current Transformers (3): Closed-loop fluxgate current transformers for testing below 60Hz, vital to accurately measuring current between drive and motor

## VIBRATION TESTING

- NEMA frames 42 thru 449 per NEMA MG1-2016 [Part 7]

## SOUND TESTING

- ¼-300Hp per NEMA MGI [Part 9] - Test procedure for airborne sound measurements on rotating electrical machinery

## INSULATION RESISTANCE TESTING

- Fluke 1587 Insulation Multimeter with test capabilities from 50-1000V

## VOLTAGE SAG TOLERANCE TESTING

- Omniverter VSG3P-60K: rated for 480V and 60A and capable of testing sag tolerance on both single- and three-phase equipment from 30 - 125% of rated voltage at durations from 1/4 cycle (~4ms) to 10 seconds

## FOR MORE INFORMATION

[www.advancedenergy.org/mad](http://www.advancedenergy.org/mad)

## CONTACT

Kitt Butler | 919.857.9017

[kbutler@advancedenergy.org](mailto:kbutler@advancedenergy.org)

