

## **Uninterruptible Power Supply (UPS) Information Involving MTS Test Systems**

**A loss of power to the MTS Test System Controllers may cause injury to personnel in the test area as well as damage to test specimens, test equipment or facilities, including possible destruction of the test specimen and test equipment. MTS highly recommends the use of a UPS to supply power to MTS Test Systems Controllers to minimize the risk of loss of power to the system.**

### **Purpose**

The purpose of this document is to alert our customers as to the importance of properly incorporating a UPS in MTS Test Systems controlled by MTS Controllers. MTS highly recommends a UPS to supply power to MTS Test System Controllers to reduce the likelihood of loss of power from the facility power supply. Proper incorporation of a UPS may minimize the likelihood of a loss of power event to the system. A loss of power to the system results in a loss of data and causes unintended motion of the system. The unintended motion may cause injury to personnel in the test area as well as damage to test specimens, test equipment or facilities, including possible destruction of the test specimen and test equipment.

The UPS should be wired to provide power to the servo controller and any peripheral equipment that is instrumental in safe system shut-down. The European Machinery Directive also recommends the use of an acceptable UPS in test systems.

### **UPS Hardware Requirements**

The UPS should be sized to provide adequate electrical power for a minimum of three minutes after loss of input power. Please note that MTS recommends that the UPS provide at least ten minutes of electrical power after loss of input power.

#### **Requirements of the UPS hardware:**

1. AC fail detection with relay contact output (mandatory)
2. Low battery detection with relay contact output (recommended)
3. Sine wave output
4. Operating Temperature range of 5-40° C
5. Operating Humidity range of 5- 85% non-condensing
6. Output Voltage Range of 100-240VAC single phase
7. Input Frequency Range of 50Hz/60Hz
8. Output load regulation of +/-5% nominal operating voltage, both in battery and normal operation mode
9. Switch overtime to Battery on power loss to occur within 6 msec
10. CE certification
11. Strain-relief recommended on UPS input power (twist-lock plug or equivalent)
12. Strain-relief on UPS output power (twist-lock plug or equivalent)
13. UPS power capacity to be adequate to power the servo controller, the PC and monitor, and the peripheral electronic equipment.

Controller Power Consumption Ratings. (Add to this the power consumption of all other items being powered to size the UPS Power Rating for a minimum of three minutes, 10 minutes is recommended, of power delivery.)

- FlexTest 40 1200 watt
- FlexTest 60 1800 watt
- FlexTest 100 2500 watt
- FlexTest 200 3500 watt
- FlexTest SE 1200 watt
- FlexTest GT 2500 watt
- Aero ST 3500 watt

## **Two UPS Discrete Output Signals to Controller**

An ACFAIL relay contact output wired to the Controller will provide a mechanism for the Controller to identify that the UPS has switched over to battery power due to a detected AC power fault condition from the facility's power grid. This fault signal from the UPS can be used by the Controller (if configured) to automatically start a safe shutdown sequence, ramp commands to safe states, and shut off the power source. Please contact MTS Technical Support for interface information.

The addition of a low battery warning relay contact output from the UPS will provide additional system safety protection by informing the Controller that the UPS battery is low. Please contact MTS Technical Support for interface information.

**NOTE:** For the FlexTest SE and FlexTest 40 (with 494.41 System IO board installed in the FlexTest 40), two of the general-use Digital Inputs must be set up and dedicated for the UPS input power-loss detection and electrical power-loss signals. A FlexTest 40 with either a 494.42 Single Station System IO Board or a 494.44 Dual Station System IO board installed does not require the use of two general-use Digital Inputs for UPS connection as these products have two dedicated UPS Digital Inputs which are separate from the general-use Digital Inputs. Please contact MTS Technical Support for interface information.

## **MTS Controller Software Configuration**

Please see MTS manual, 100-147-132 section titled, "Uninterruptible Power Supplies (UPS)," to configure the digital inputs to allow the critical signals described above to be read by the control system.

To direct the test system's actions at the detected loss of power, please see MTS manual, 100-147-130, section 6.14 "UPS Options," for descriptions of the actions.

**NOTE:** *The appropriate actions and configuration depend on the type of Test System and the type of specimen. For some Test Systems, incorrect software configuration may damage the system. If you are unsure, please consult MTS Technical Support and ask for a MTS product technical specialist for the type of Test System that is being configured.*

### **Test Initially and Periodically!**

Perform this simple test prior to initial use of the Test System to test specimens *and every three months* thereafter with all test specimens removed and with the UPS and controller configured to capture power loss event:

1. Power the system normally;
2. Operate the system normally;
3. Remove input power to the UPS; and
4. Verify the control system with UPS has indeed stayed powered and is taking the actions expected from the configuration steps above.

**MTS cannot guarantee that use of the UPS will avoid a loss of power to the Test System in the event of a loss of input power.** However, if the actions above are taken, and occur each three months, the Test System's UPS functions are validated as properly incorporated and the likelihood of the risks set forth above occurring is reduced.