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Universal Life Cycle Tester

Operating Instructions
(w/Nematron Interface)

Section

1

Main Control Panel

The following are descriptions of the various controls located on the front panel of the tester:

POWER On / Off

This is a combination ON/OFF switch, Pilot Light, and Circuit Breaker. Putting the switch in the ON position enables the machine for use. When the tester is first turned on, all of the pilot lights are turned on for 3 seconds as a lamp test.

POWER SUPPLY

Most of the testers utilize a Sorenson adjustable power supply, although a few of the older testers were supplied with other brands of power supplies. The power supply must be turned on for the tester to operate properly. Set the voltage adjustment to the desired test voltage using the **VOLTAGE** adjustment knob. The **CURRENT** adjustment knob should be set to the fully **CLOCKWISE** position. If this knob is not set fully clockwise, the power supply will limit the current output.

CYCLE COMPLETE LIGHT

This is a green pilot light that indicates the tester has completed the desired number of cycles successfully.

CYCLE START PUSHBUTTON / LIGHT

This is a green lighted pushbutton that is used to start an automatic test sequence. The light indicates that a cycle is currently in progress. The tester will drop out of **CYCLE START** mode three different ways:

1. The desired number of cycles has been complete
2. The **CYCLE STOP** pushbutton is pressed
3. A **FAULT** occurs and **STOP on FAULTS** is set ON.

CYCLE STOP PUSHBUTTON

This is a red mushroom head pushbutton that is used to stop or temporarily interrupt an existing test cycle. Pressing this button drops the tester out of **CYCLE START** mode. When a test is interrupted, the number of completed cycles is maintained on the operator interface display.

FAULT LIGHT

This is a red pilot light that is used to indicate that a fault has occurred during the operation of a test cycle. When the FAULT LIGHT illuminates, a fault MESSAGE will also be displayed on the operator interface that will further define the cause of the fault.

- If **STOP on FAULTS** is **ON**, then when this light illuminates, the cycle will stop.
- If **STOP on FAULTS** is **OFF**, the cycle will NOT be interrupted. The light will illuminate, a fault message will be displayed, and the cycle will continue.

JOG SELECTOR SWITCHES

These switches are used to manually jog channels 1,2,3 or 4 forward and reverse. These switches are disabled while in **CYCLE START** mode. On versions that have air valves, these selector switches will also jog the cylinders connected to the air valves forward and reverse.

CURRENT METERS

These meters are used for indicating the positive (+) and negative (-) current draw of channels 1, 2, 3, and 4. The meters also have adjustable setpoints. The setpoints are used to determine the stall current at the end of travel. When **CURRENT MODE** is selected, the current trip point starts the **STALL TIMER** timing for that step. After the stall timer has timed out, the step is complete.

CURRENT MONITOR JACKS

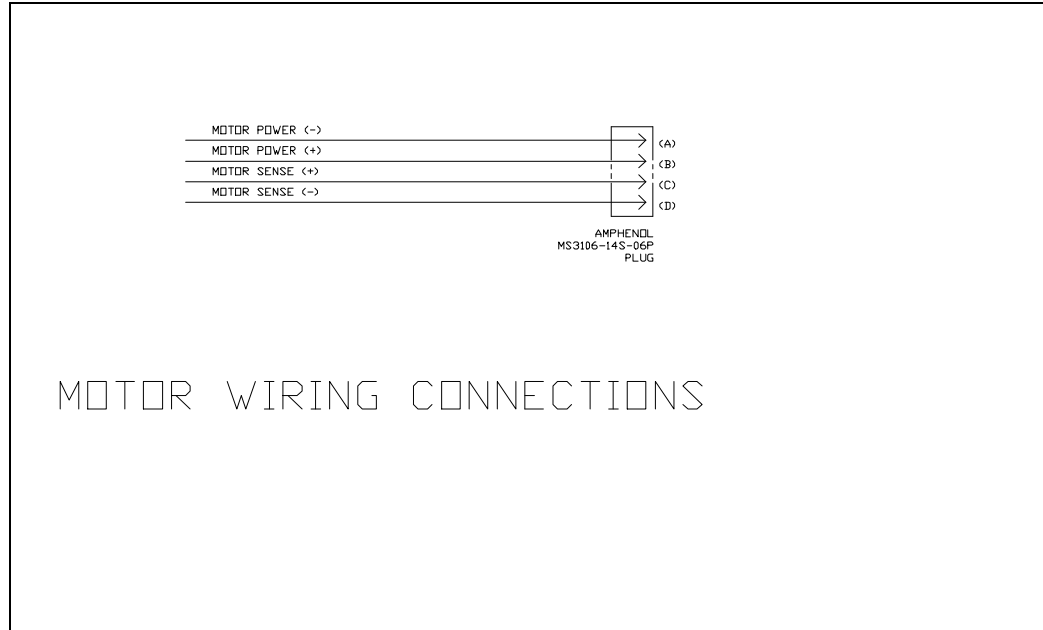
These jacks are used for attaching monitoring equipment for the purpose of measuring the motor currents for each of the (4) channels. The voltage read from these jacks is a millivolt level signal. For a motor current draw of 25 Amps the voltage at the monitor jack will be 50mV.

REMOTE VOLTAGE MONITOR JACKS

These jacks are used for attaching monitoring equipment for the purpose of measuring the voltage on the remote sensing leads for the (4) channels. The voltage read from these jacks will be the voltage set on the power supply less any voltage drop through the test leads.

MOTOR CONNECTIONS

The motors of the seat track are connected to the tester through (4) 6-pin Amphenol connectors. **Figure 1** below shows the power and sensing connections. Pay strict attention to these connections. Serious damage could occur to the power supply if the sensing leads are connected wrong.



• Figure 1

LIMIT SWITCH CONNECTIONS

These receptacles are used for connecting end of travel limit switches. In order to utilize this feature, the tester must be set to operate in **LIMIT SWITCH MODE**. These operate at 24Volts D.C. so there is no shock hazard. Any device that provides a hard contact closure may be used

ADJUSTABLE RESISTORS

These resistors are used for simulating wire harness resistance. Some testers have the resistors located inside the rear door, while others have rotary type resistors mounted to the front panel.

The models that have the resistors mounted inside the rear door have two (2) large toggle switches that are used to **ENABLE** or **DISABLE** the resistors. With the switches in the **ENABLE** position, motor current is routed through the resistors. With the switches in the **DISABLE** position, motor current bypasses the resistors. The resistors should **ALWAYS** be **DISABLED** when using **REMOTE** sensing mode.

The models that have the rotary resistors mounted to the front panel are supplied with automatic resistor switching. With this style of tester, selecting **REMOTE** sensing mode automatically disables the resistors. Selecting **LOCAL** sensing mode enables the resistors.

The resistors can be adjusted to the desired resistance by shorting the power leads of the channel being set. Then using the jog switch for that channel, apply power and read the resulting current. The desired resistance is calculated by the following equation:

Resistance = Voltage / Current

For example to obtain 0.2 OHMS harness resistance, set the power supply for 2.0 Volts, short the power leads, and adjust the resistor until a current reading of 10.0 Amps is showing. (0.2 OHMS = 2.0 VOLTS / 10.0 AMPS)

Section 2

Operator Interface

The following are details and descriptions of the various screens available on the operator interface terminal.

General Operation Notes

Changes to any settings on the operator interface are made by pressing **SET** once, then moving the arrow keys to move the cursor to the desired location. For numeric items, enter the new value with the number keys, then press **ENTER**. For Toggle items, press the **SWITCH** key to toggle back and forth between the available choices, then press **ENTER** when the desired choice is showing.

The contrast of the display can be adjusted by holding down the **CONTRAST** key and then pressing the **↑** or **↓** arrow keys.

Pressing **F1** on any screen will display HELP for that screen.

MAIN MENU

Voltage Sensing

The choices available for this option are **LOCAL** and **REMOTE**. In **LOCAL** mode, the power supply voltage is simply set at the adjustment knob of the power supply. Any voltage drops through the wiring harness are NOT compensated for in **LOCAL** mode. In **REMOTE** mode, the supply voltage is still set using the knob on the power supply, however, voltage drops through the wiring harness are compensated. In other words, if the supply voltage is set for 12.5 Volts, in **LOCAL** mode, you may actually see something less than 12.5V at the motors because of voltage drop. In **REMOTE** mode, with 12.5 Volts set at the supply, you will get exactly 12.5V at the motors.

NOTE: In **REMOTE** mode, the power supplies can correct a voltage drop up to 1.5 Volts.

SWITCH MODE

The choices available for this option are **CURRENT**, **L/S**, or **TIME**

In **CURRENT** mode, the current meter setpoints are used to determine the end of the step

In **L/S** mode, Limit Switches plugged into the limit switch receptacles on the front panel are used to determine the end of the step. In this mode, if a current trip point is seen before the limit switch is actuated, the current trip causes the end of the step.

In **TIME** mode, each step simply is controlled by the **MAX TIME** setting for that step.

FAULT STOP

The choices available for this option are **OFF** and **ON**.

When set to **OFF**, a fault can occur during a test cycle and it will NOT stop the test cycle. The **FAULT LIGHT** will illuminate and a fault message will be displayed on the screen, but the test will continue.

When set to **ON**, a fault can occur during a test cycle and it WILL stop the test cycle. The **FAULT LIGHT** will illuminate and a fault message will be displayed on the screen.

TOTAL CYCLE TIME

This time value is the total allowable time for an entire sequence of steps plus the motor cool down period. If this time period is exceeded, a fault is generated and the test cycle is interrupted. If the running speed of the motor(s) changes during the test, the difference is made up in the cooling time making a very predictable completion time for the entire test.

CYCLES DESIRED

This is the desired number of cycles through all of the programmed steps.

CYCLES COMPLETE

This display value indicates the number of cycles that have been completed.

STEP

This display indicates which step of the programmed sequence is currently active.

STEP SCREENS

There are eight (8) step screens. Each step screen has the options for entering settings for two (2) separate channels. A motor number **MUST** be entered in the left-most column. A number can be entered, but is not required in the right side column. Each of the eight step screens has the following setting options:

STEP ON / OFF

This is for enabling or disabling steps. For the settings on a step to be active, this must be set to **ON**. Active steps **MUST** be used in order with no disabled steps in the middle of the sequence. For example, a four (4) step sequence must use steps 1, 2, 3, and 4. The minimum number of steps to create a sequence is two.

MOTOR

This selection is for determining which motor or air valve channel is to be used on this step. Values of 1, 2, 3, or 4 are valid entries. A value of Zero indicates no motor for this step.

FWD / REV

This selection is for determining the direction of the selected channel for this step.

MAX TIME

This value is the maximum allowable time for running a motor in this step. The timer starts when the motor is activated. The timer stops timing depending on the selected **SWITCH MODE**. If this timer reaches the set time value, a fault is generated. This timer is typically used to sense a failed mechanism that will not create a current trip.

CURRENT MODE – In this mode, the **MAX TIME** timer stops timing when the setpoint on the current meter is reached.

L/S MODE – In this mode, the **MAX TIME** timer stops timing when the limit switch for that channel is activated.

TIME MODE – In this mode, the **MAX TIME** timer is actually used to determine the end of the step. In this case, the **MAX TIME** timer is **NOT** used as a fault indication.

MIN TIME

This value is the minimum allowable time for running a motor in this step. The timer starts when the motor is activated. If the selected **SWITCH MODE** activates **BEFORE** this time amount, a fault is generated. This timer is typically used to sense a jammed mechanism.

For example, If the tester is set to **CURRENT MODE**, and this timer is set to 2 seconds, if the setpoint of the current meter is reached in **LESS** than 2 seconds, a fault is generated.

This time value should **ALWAYS** be set greater than the **INRUSH TIME** value.

STALL TIME

This value is the amount of time a motor is held ON AFTER reaching the current trip point on the meter. This timer is only used in **CURRENT MODE**.

INRUSH TIME

This value is the amount of time the tester will IGNORE the current trip point on the meter. This is basically used to allow the tester to ignore the starting current of a motor when it's initially energized. This timer is only used in **CURRENT MODE**.

This time value should *ALWAYS* be set LESS than the **MIN TIME** value.