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# WDL II™

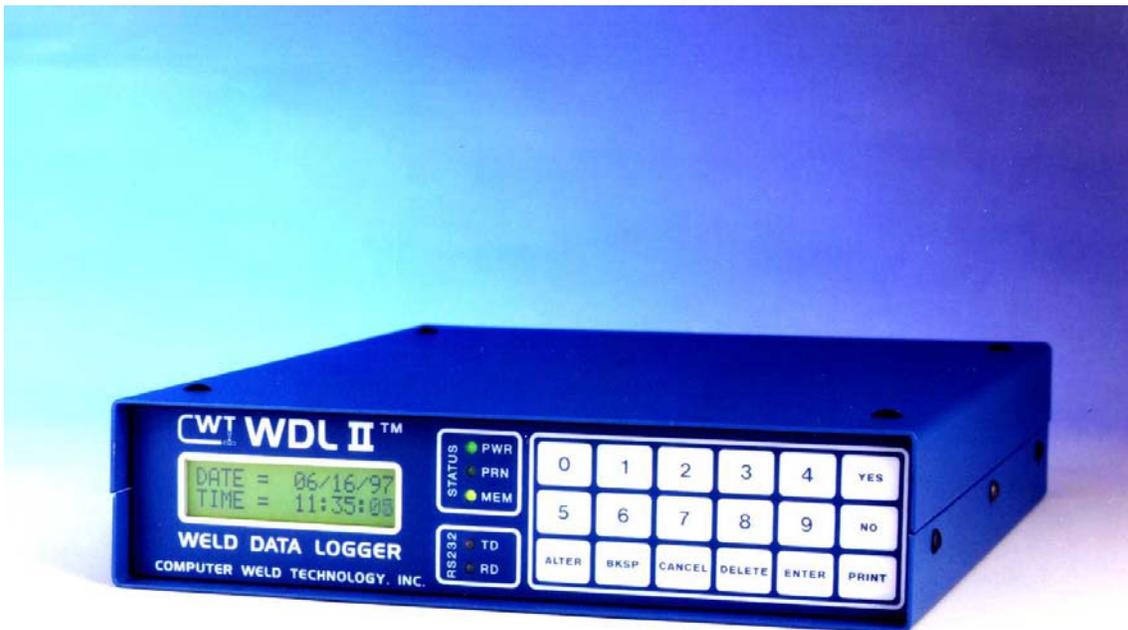
## WELD DATA LOGGER MODEL II

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### Operation / Installation Manual

Manual Part Number: A8M5011

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## 1.0 GENERAL DESCRIPTION

The WDL II™ Weld Data Logger is an arc welding data collection system, which can be used to monitor all arc welding processes. The Weld Data Logger will monitor the following welding parameters:

PARAMETER	RANGE	ACCURACY	RESOLUTION
Weld Time	0.1-6566.7 sec	±0.1 sec	0.1 sec
Arc Voltage	1.0 – 100.0 vdc	± 1% of full scale	01. vdc
Arc Current	1 – 1000 adc	±1% of full scale	1 adc
Wire Feed Speed*	10 – 1000 ipm	±3% of full scale	1 ipm
Travel Speed*	1.0 – 100.0 ipm	±3% of full scale	0.1 ipm
Gas Flow*	5 – 255 cfh	±3% full scale	1 cfh
Temperature*	1-1000 ° f	Depends on sensor	1 °

Note: \* Indicates option sensor required

The WDL II™ Weld Data Logger has a two-line 16-character alphanumeric display, which is used to display the welding parameters and to configure the operational functions. An 18-key tactile keypad is provided for operational programming and data entry. The following is a description of the keypad function.

**KEY:      FUNCTION:**

0-9: *Numeric keys used for data entry during alter limits function. Selects parameter to be displayed during welding.*

- # 0 = *Return To Auto Scan*
- # 1 = *Gas*
- # 2 = *Travel*
- # 3 = *Wire*
- # 4 = *Volts*
- # 5 = *Current*
- # 6 = *Heat*
- # 7 = *Temperature*
- # 8 = *Not Used*
- # 9 = *Not Used*

ALTER *Permits Entry / Exit to and from system menu screens.*

YES *Used to select menu options and to enter "YES" response to options.*

NO *Used to scroll forward through menu screens and to enter "NO" response to options.*

BKSP *Used to scroll backward through menu screens.*

CANCEL *Used to cancel the current operation or entry when in the alter menu.*

DELETE *Used to delete entered data when in the alter menu.*

ENTER *Used to enter data when in the alter menu and to reset weld accumulator and select print stored weld data.*

PRINT *Enable / Disable printer*

During welding the WDL II will display the welding parameters that the user has enabled and will scroll through the activated parameters at a rate specified by the user. The WDL can also print the welding data on any IBM compatible parallel printer connected to the Weld Data Logger printer port.

The Weld Data Logger samples the welding input sensors at 400 times a second (maximum) and will accumulate all welding data, at the user specified rate, until the ENTER function key is pressed. The WDL will calculate and save the average value for each of the enabled sensors. If the travel speed sensor is disabled, the WDL will prompt the user for the weld length and will use the total arc time, weld length, average current and average voltage to calculate the average heat input based on the following equation:

$$\text{Heat Input (kj/in)} = [V_{AVE} * I_{AVE}] / [(W_{LG} / T_{TOT}) * 1000]$$

Where:  $V_{AVE}$  = Average Welding Voltage  
 $I_{AVE}$  = Average Welding Current  
 $W_{LG}$  = Total Weld Length in inches  
 $T_{TOT}$  = Total Arc time in seconds

If travel speed transducer is installed and enabled the WDL will calculate the average heat input based on the average travel speed. After calculating the average values the WDL will store the average parameters in battery backup RAM for later use, clear the data accumulators and will begin collecting new welding data.

The WDL can also be used to save live weld data in memory that can be played back at a later time, printed or uploaded to a PC using the WeldLog Plus™ software. The WDL can also be configured to save weld-averaged data in memory. The WDL can store up to 150 totalized welds and 150 summary weld samples in memory. This data can then be printed out at a latter time from memory.

During the idle time the WDL II will display the summary values for the enabled sensors. To display a specific parameter press the associated "1-7" for the desired parameter. To select a different parameter press the desired "1-7" numeric key. To return to the idle screen press the "0" key. If the Travel speed sensor is disabled and a weld length has been entered the calculated travel speed and heat input will be calculated based on the summary volt, amp and arc time values. To display the summary values press the associate numeric keys "1-7".

## 2.0 INSTALLATION

This section contains the following information on the installation of the portable WDL II system:

Power-up testing

Installation of system transducers and sensors

Printer installation

### 2.1 POWER-UP TESTING PROCEDURE

Begin the installation of a WDL II system by performing this testing procedure.

1. Carefully unpack the unit and associated transducers, sensors, and cables. Inspect the items for possible shipping damage and report any damage to the carrier.
2. Locate the power cable assembly and insert the cable connector into the receptacle on the rear panel of the unit. Plug the power cable into a suitable power source.

**NOTE:** *The WDL unit is capable of operating from either 115 VAC or 220 VAC 50/60 HZ.*

4. Apply AC power to the unit.
5. Power up the unit by pressing the power switch on the rear panel. The unit responds as follows:

During the power up self-test routine the WDL displays the software model and version number for about 1.5 seconds. The following message is displayed:

```
*** WDL II ***  
A5I0013 VER #.##
```

Where: #.## is the current software version.

The WDL will then perform an internal diagnostic test. If the test is successful the following message will be displayed:

```
POWER UP TEST  
RAM/SYSTEM PASS
```

If the test is not successful the following message will be displayed:

```
ERROR – MEM FAIL  
LOADING DEFAULTS
```

Once the internal diagnostic tests have been performed and successfully completed, the following message is displayed:

```
DATE = mm/dd/yr  
TIME = hh/mm/ss
```

Where: mm = Current Month; dd = Current Day; yr = Current Year

Where: hh = Current Hour; mm = Current Minute; ss = Current Second

When the unit passes the power-up testing, turn off the power and proceed with the installation.

## 2.2 CURRENT SENSOR INSTALLATION

The Current Sensor assembly consists of a Hall-Effect clamp on device and a cable assembly for connection to the unit. **The Current Sensor must be installed around the negative welding cable lead from the power supply. The two “RED DOTS” on the sensor must be oriented toward the most positive potential.** The location of the sensor is not critical and the welding cables may be as long as required for the application.

### 2.2.1 CURRENT SENSOR CABLE INSTALLATION

The Current Sensor is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **BLUE** connector labeled “**CURRENT**” on the rear of the unit chassis. Plug the **BLUE** snap lock plug into the **BLUE “CURRENT”** connector.

## 2.3 VOLTAGE SENSOR INSTALLATION

The Voltage Sensor assembly consists of a probe device and a cable assembly for connection to the unit.

The in-line arc Voltage probe has two permanently attached leads, one **RED** and one **BLACK**, to facilitate the connection of the sensor to the welding system. Connect the **RED / BLACK** leads as close to the welding torch as possible in order to assure proper measurement. Connect the leads to the appropriate location indicated in the table below. If the connections provided on the leads are not suitable, any appropriate connector can be used. If the lead lengths are not the required length, they may be shortened or lengthened using the appropriate wire type.

<b>APPLICATION</b>	<b>RED (+) LEAD</b>	<b>BLACK (-) Lead</b>
GMAW	Electrode	Work
P-GMAW	Electrode	Work
GTAW	Work	Electrode
P-GTAW	Work	Electrode
SMAW (Rev. Pol)	Electrode	Work
SMAW (St. Pol.)	Work	Electrode
FCAW	Electrode	Work
PAW	Work	Electrode
P-PAW	Work	Electrode
SAW	Electrode	Work

### 2.3.1 VOLTAGE SENSOR CABLE INSTALLATION

The Voltage Sensor is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **GRAY** connector labeled “**VOLTAGE**” on the rear of the unit chassis. Plug the **GRAY** snap lock plug into the **GRAY “VOLTAGE”** connector.

## 2.4 GAS FLOW INSTALLATION

The Gas Flow option consists of a transducer assembly and a sensor cable. The unit is designed to measure gas flows with a maximum inlet pressure of 50 psi. The transducer should be installed

with supplied fittings, in the welding shielding gas lines, on the outlet side of the gas control solenoid valve. The unit should be located as close to the welding torch as practical.

**NOTE:** *To avoid damage to the transducer assembly, do not use any type of pipe dope when making the connection.*

The transducer should be placed as far as possible from any source of high frequency interference, such as a GTAW welding power supply.

#### 2.4.1 GAS FLOW CABLE INSTALLATION

The gas flow transducer is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **YELLOW** connector labeled "**GAS**" on the rear of the unit chassis. Plug the **YELLOW** snap lock plug into the **YELLOW "GAS"** connector.

#### 2.5 WIRE SPEED TRANSDUCER INSTALLATION

The Wire Feed Speed transducer consists of an optical tachometer, a precision drive wheel, a mounting housing, and a control cable. This device is designed to clamp directly on the welding wire. A fixed or stationary mounting of the wire feed speed transducer to the wire feeder is the preferred method of installation. The transducer is electrically isolated from the welding electrode so the transducer can be mounted to any part of the wire feeder.

**NOTE:** *Make sure when permanently mounting the transducer on the wire feeder that the inlet and outlet of the transducer are in line with the wire guides of the wire feeder.*

An optional clip-on wire speed transducer can be purchased and installed by simply clamping it over the welding wire at some point prior to where the wire enters the wire feeder. This device is designed to clamp directly on the welding wire and can be installed without the removal of the welding wire from the wire feeder during installation. To install the wire speed transducer using this method, simply depresses the handle on the top of the transducer, slip the assembly over the wire, and release the handle.

##### 2.5.1 WIRE SPEED INSTALLATION TRANSDUCER CABLE

The Wire Feed Speed transducer is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **RED** connector labeled "**WIRE**" on the rear of the unit chassis. Plug the **RED** snap lock plug into the **RED "WIRE"** connector.

#### 2.6 TRAVEL SPEED TRANSDUCER INSTALLATION

The Travel Speed Transducer assembly consists of a tachometer that measures the travel speed of the welding torch and a control cable. The transducer is a surface contact device supplied with a spring-loaded hinge to ensure proper surface tension. The hinge provides for a +20 to -10 degree movement of the transducer with respect to the drive carriage of the torch. In order to ensure accurate measurement, the transducer must be rigidly mounted on the drive carriage with the drive wheel perpendicular to the drive surface.

The spring-loaded hinge has two tapped 10-32 holes on the upper bracket for mounting purposes and may be located on either side or on top of the transducer housing. To move the hinge to the other side of the transducer housing, follow these steps:

- 1) Remove the hinge bolt and slowly release the spring's tension.

- 2) Loosen the mounting screws and move the lower hinge bracket to the desired location on the transducer housing.
- 3) Secure the bracket to the housing. Using a small piece of ¼-inch tubing to compress the spring, position the spring in the lower bracket and reassemble the hinge.
- 4) Remove the tubing from the end of the spring once the hinge bolt and locknut is installed.

**CAUTION:** BEFORE REMOVING THE HINGE BOLT, MAKE SURE THE TOP BRACKET OF THE HINGE IS SECURED IN ORDER TO PREVENT THE UNCONTROLLED RELEASE OF THE SPRING TENSION.

#### 2.6.1 TRAVEL SPEED TRANSDUCER CABLE INSTALLATION

The Travel Speed Transducer is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **GREEN** connector labeled “**TRAVEL**” on the rear of the unit chassis. Plug the **GREEN** snap lock plug into the **GREEN** “**TRAVEL**” connector.

### 2.7 TEMPERATURE SENSOR INSTALLATION

The Temperature Sensor assemblies, of which there are two, consist of the following options:

#### 2.7.1 Infrared Sensor

An electronics module that process information gathered by the sensor and provides appropriate input to the WDL II. A Sensor assembly to provide temperature measurement. Refer to manufacturer’s manual for installation of this device.

#### 2.7.2 Thermocouple

Consists of an enclosure housing the necessary electronics to convert collected data to a useable signal for input to the WDL and a sensor cable. The user supplies the appropriate contact sensor probe (Type “K”, Type “J”, or Type “T” depending on desired temperature range. The selected “Type” of contact sensor probe must be attached to the point on the work piece from which temperature data is desired.

#### 2.7.3 TEMPERATURE SENSOR CABLE INSTALLATION

To connect the Temperature Sensor to the Weld Data Logger with the supplied 25-foot cable, the following is required:

**INFRARED SENSOR** - Connections on the sensor end of the cable are made to the numbered terminal strip on the electronics module. To connect the sensor cable to the unit locate the **BLACK** connector labeled “**TEMP**” on the rear of the unit chassis. Plug the **BLACK** snap lock plug into the **BLACK** “**TEMP**” connector.

**THERMOCOUPLE** - The Thermocouple Sensor is supplied with a 25-foot cable. To connect the sensor cable to the unit, locate the **BLACK** connector labeled “**TEMP**” on the rear of the unit chassis. Plug the **BLACK** snap lock plug into the **BLACK** “**TEMP**” connector.

## 2.8 PRINTER INSTALLATION

The WDL II™ system is designed for use with any printer that communicates via a Centronics parallel interface. To connect a printer to the system, a printer interface cable is available or an IBM parallel printer cable may be used. This cable uses an Amphenol PN 57-30360 or equivalent 36-circuit connector and an Amphenol PN 117D-DB25S with an Amphenol PN 17-1589-06 2-piece hood. To install an external printer for the system, follow these steps:

Connect the 25 Pin connector end of the interface cable to the connector labeled "PRINTER PORT" on the rear of the unit chassis.

Connect the other end of the cable to the Centronics connector on the printer, referring to the printer manual for the location of the connector if necessary.

Connect the printer to a 115 VAC power source.

**NOTE:** *It may be necessary to consult the printer documentation for any special instructions concerning the Centronics interface. For example, not all printers of this type use the full Centronics handshake or fault signals.*

**NOTE:** *To **Enable** the Print Function you must press the "**PRINT**" button on the front of the WDL II while in the IDLE state. The **PRN** LED should illuminate.*

## 3.0 MONITORING WELDING DATA

The monitoring mode is the normal operational mode for the WDL II unit. This operational mode in fact consists of three distinct functional states:

Idling

Monitoring

Altering

Because the state of the unit determines the contents of displays as well as the functions of individual keys on the front control panel keypad, this section discusses each possible state separately.

### 3.1 THE IDLING STATE

As soon as the power-up procedure has been successfully completed and as long as no welding arc has been detected, the unit maintains an idling state. When the unit is idling, the program displays the following message screen on the display panel.

DATE = mm/dd/yr TIME = hh/mm/ss
------------------------------------

Where: mm = Current Month; dd = Current Day; yr = Current Year

Where: hh = Current Hour; mm = Current Minute; ss = Current Second

When the program is in the idling state, the operator may enter commands through the keypad as follows:

Press "ALTER" to change the unit configuration and enter the parameter menus.

Press "PRINT" to enable or disable the external printer.

Press "1 – 7" to display the last weld average values.

### 3.2 THE MONITORING STATE

Arc monitoring begins when the WDL unit recognizes the start of a welding arc based on the current and voltage inputs. The welding parameters that can be measured and displayed during the weld include:

Arc time (TIME), measured in seconds

Welding gas flow (GAS), measured in cubic feet per hour

Wire feed speed (WIRE), measured in inches per minute

Welding current (AMP), measured in amps

Welding voltage (VOLT), measured in volts

Weld travel speed (TRAVEL), measured in inches per minute

Surface temperature (TEMP), measured in degrees Fahrenheit

Another parameter, welding heat input (HEAT), is not measured. Instead, the HEAT parameter is calculated in K joules/inch based on the voltage, current, and travel speed inputs according to the following formula:

$$\text{HEAT INPUT} = \frac{[(\text{VOLT})(\text{AMP})(60)]}{[(\text{TRAVEL})(1000)]}$$

Each basic welding parameter (with the exception of arc TIME) can be individually enabled/disabled by the operator. Once a welding arc has been detected, the WDL will measure, display and accumulate the various enabled parameters. The Weld Data Logger will sequentially display the welding data with one of seven weld data screen formats. The "ARC TIME" is displayed on the top of all of the data screens. Following are the seven possible weld data screens:

Screen 1 - Gas Flow Rate

ARC TIME= ###.#  
GAS FLOW = ###

Screen 2 - Travel Speed

ARC TIME= ###.#  
TRAVEL = ###.#

Screen 3 - Wire Feed Speed

ARC TIME= ###.#  
WIRE SPEED = #####

Screen 4 - Arc Voltage

ARC TIME= ###.#  
VOLTS = ##.#

Screen 5 - Arc Current

ARC TIME= ###.#  
AMPS = #####

Screen 6 - Heat Input Calculation

ARC TIME= ###.#  
HEAT = ###.##

Screen 7 - Temperature

ARC TIME= ###.#  
TEMP = #####

Where: # is the value for the parameter.

When the program is in the monitoring mode, the operator may enter commands through the keypad as follows:

Press "ALTER" to alter parameter limits or change the unit configuration

Press "0" to enable auto scan of enabled parameter screens

Press "PRINT" to enable or disable the external printer

Press "1" through "7" to disable the auto scan feature and display a single parameter screen.

#### **KEY #   FUNCTION**

- 1   Display Gas flow rate sensor value
- 2   Display Travel speed sensor value
- 3   Display Wire feed speed sensor value
- 4   Display Arc voltage sensor value
- 5   Display Arc current sensor value
- 6   Display Calculated heat input value
- 7   Display Temperature sensor value

The auto scan time may be user defined by selecting the "SCAN TIME" value in the CONFIG SYSTEM menu. If the user presses a numeric key, "1" through "7", the WDL will display that parameter until the user presses another numeric key, "1" through "7", or the "0" key. The auto scan function will always be enabled when an "ARC ON" condition is detected.

### 3.3 PRINT ALL WELD DATA

*NOTE: To **Enable** the Print Function you must press the "**PRINT**" button on the front of the WDL II while in the IDLE state. The **PRN** LED should illuminate.*

The print all weld data report prints data continuously. Each print line on the report contains the value for the parameter at that point in time during the weld. In addition to the measured values for each enabled parameter, the following information is contained in the header of each weld data report:

"Date:" - The date that the weld was made based on the WDL Clock

"Time:"- The start time of the weld based on the WDL clock

"WDL II Station Number:"- The station ID number programmed into the WDL

"Weld Number:"- The number of welds since the last reset of the weld counter

The user can program the time between each print cycle by selecting the "PRINT TIME=" function in the SETUP PRINTER menu and entering the desired print cycle time. The minimum print cycle time is 0.1 second.

### 3.4 PRINT SUMMARY WELD DATA

Setting the “PRN SUMMARY” mode to “YES” enables the print summary mode. If this is enabled the WDL will average all of the weld data based on the time specified by the “AVG RATE=” parameter in the “WELD MEMORY” menu. At the end of the weld the data will be averaged and a single record will be printed. In addition to the measured values for each enabled parameter, the following information is contained in the header of each weld data report:

“Weld Start Date:” - The date that the weld was made based on the WDL Clock

“Weld Start Time:”- The start time of the weld based on the WDL clock

“Station Number:”- The station ID number programmed into the WDL

“Weld Number:”- The number of welds since the last reset of the weld counter

Enabling this print function will automatically activate the printer at the end of the weld. The print need not be enabled for this data to be printed. If the “PRINT ALL?” and this option are enabled both reports will be printed. The summary will follow the actual weld data report.

### 3.5 SAVE ACTUAL WELD DATA TO MEMORY

To save run time welding data to memory set the “SAVE ALL?” mode, in the “SETUP MEMEORY?” menu to “YES”. A single sample of the run time welding data will be written to memory at the time specified by the “AVE RATE=” parameter. A new sample will be written at each time interval until the weld ends. Each record is data time stamped at the beginning of the weld. The MEM led indicates the status of the weld memory. As the memory fills the LED will change from GREEN to RED. When the LED is bright RED the memory is full and needs to be played back or cleared. If the memory fills the WDL will stop saving the run time data.

The WDL has 1 MEG of weld memory that provides 83,330 data samples. At the maximum collection rate of 0.1 seconds this represents 138 minutes of continuous arc time. Reducing the sample rate will increase the maximum arc time.

To play back the stored data enable the “PLAY BACK?” mode in the “WELD MEMORY?” menu. The WDL will start at the beginning of memory and play the stored data back. The WDL will display the data as if an actual weld was running. The data can be printed by enabling the “PRINT ALL?” mode and pressing the PRINT key. If the printer is enabled the play back rate will be set by the printers ability to print data. This assures that all data points are printed. If the WDL is connected to a PC and the WeldLog Plus™ program is used the data can be collected to a file and latter graphically and statistically analyzed. The normal play back rate will be set by the “AVE RATE=” parameter in the “WELD MEMORY?” menu.

### 3.6 SAVE WELD SUMMARIES TO MEMORY

To save weld averages to memory enable the “SAVE AVG?” mode in the “WELD MEMORY?” menu. At the end of each weld the averaged data will be saved in memory with a date time stamp and the weld count number. The “SUMMARY CNT=” parameter will be incremented with each saved weld. The WDL can save up to 150 weld averages in memory. If the memory is full the WDL will stop saving data.

To print the stored data while viewing the WDL idle screen, press the ENTER key. The WDL will display the “TOTALIZE WELD?” menu. Press the NO key to display the “PRINT MEMORY?” menu. Press the YES key to select the “PRINT MEMORY?” parameters. The WDL will display

“SUMMARY?” option. Press the YES key to select the option then press the YES key again to enable the summary print. The WDL will display the weld number being printed. The welds will be printed starting with the most recent weld and will continue until all summaries have been printed. The WDL will then reset the “SUMMARY CNT” counter to zero.

**Note: Printing the summary data will reset the summary counter to zero.**

To continue saving data starting with the last weld in memory reset the “SUMMARY CNT?” to the original value before printing the data.

### 3.7 TOTALIZE WELD DATA AND SAVE TO MEMORY

To enable totalized weld data set “TOTALIZE?” to YES. This allows the WDL to accumulate average weld data for multiple welds. The WDL will continue to add new welds to the totalizer until the operator invokes the “TOTAL WELD?” function. To totalize the acquired welds press the ENTER key while viewing the WDL idle screen. The WDL will display the “TOTALIZE WELD?” menu. Press the YES key to select the totalize menu. The “LENGTH = “ parameter will be displayed. If the WDL travel speed sensor is disabled and the default travel speed is set to zero the WDL will use this weld length value and total arc time to determine an average travel speed and heat input for the totalized weld. Press the NO key to display the “TOTAL WELD?” parameter. Press the YES key to totalize the stored welds and to write the data to the totalize memory. The “TOTALIZE CNT=” counter will be incremented to show the total number of totalized welds saved in memory. The WDL can save up to 150 welds in memory. If the memory is full the WDL will stop saving data.

To print the stored totalized data while viewing the WDL idle screen, press the ENTER key. The WDL will display the “TOTALIZE WELD?” menu. Press the NO key to display the “PRINT MEMORY?” menu. Press the YES key to select the “PRINT MEMORY?” parameters. The WDL will display “SUMMARY?” option. Press the NO key to display the “TOTALIZED?” option. Press the YES key to select the option then press the YES key again to enable the totalize print mode. The WDL will display the current weld being printed. The WDL will start with the most recent weld and will continue until all totalized welds have been printed. The WDL will then reset the “TOTALIZE CNT” counter to zero.

**Note: Printing the totalized data will reset the totalize counter to zero.**

To continue saving data starting with the last weld in memory reset the “TOTALIZE CNT?” to the original value before printing the data.

## 4.0 THE ALTER PARAMETER PROGRAM

In order to access all of the programmable functions in the Alter Limits mode the Weld Data Logger employs a four-level menu structure. From these menus the user can ENABLE/DISABLE SENSORS, SETUP PRINTER, WELD MEMORY and CONFIGURE THE SYSTEM. To alter any of these functions, follow these guidelines:

- 1) Press "ALTER" on the control panel keypad. The program responds by displaying the first alter Menu screen:

Menu 1 -           ENABLE SENSOR?

- 2) Press "NO" on the control panel keypad to move to the next alter menu screen The program responds by displaying the second alter Menu screen:

Menu 2 -           SETUP PRINTER?

- 3) Press "NO" on the control panel keypad to move to the next alters menu screen. The program responds by displaying the third alter function screen:

Menu 3 -           WELD MEMORY?

- 4) Press "NO" on the control panel keypad to move to the next alters menu screen. The program responds by displaying the fourth and final alter function screen.

Menu 4 -           CONFIG SYSTEM?

- 5) Press "NO" on the control panel keypad to move to the first alters function screen. The menu will again display the "ENABLE SENSOR?" menu screen.

- 6) Press the "BKSP" key on the control panel keypad to move back to the previous alters menu screen.

- 7) To select a menu screen press the "YES" key while viewing the desired alter menu screen

If a key is not pressed within five seconds the WDL will clear the Alter program menus and return to the normal display screen. When in the Alter menus the WDL will still be collecting welding data.

### 4.1 FUNCTION DESCRIPTION OF ALTER MENU SCREENS

In order to access the alter parameter menus follow these guidelines:

- 1) Press "ALTER" on the control panel keypad. The program responds by displaying the first alter Menu screen

Menu 1 -           ENABLE SENSORS?

- 2) Press "YES" on the control panel keypad to enter the "ENABLE SENSOR" menu. The program responds by displaying the sensor parameter on the lower line of the display

Menu 1 -           ENABLE SENSORS?

Parameter 1 -    VOLTAGE SENSOR? YES

- 3) Press “YES” on the control panel keypad to select the parameter. Press the “YES” or “NO” key to select the desired mode. If the selected parameter requires a numerical value the WDL will display the current value when selected. To change the value press the desired numerical keys then press the “ENTER” key to accept the new value. If an error is made during data entry press the “DELETE” key to erase the entered value or press the “CANCEL” key to restore the original value.
- 4) To move to the next parameter press the “NO” key and the next parameter will be displayed. To back up to the previous parameter press the “BKSP” key. To exit the Alters menu press the “ALTER” key.

#### 4.2 “ENABLE SENSOR” PARAMETERS MENU

The following is a summary of the “ENABLE SENSOR?” parameters:

VOLT SENSOR? - Enable/disable the arc voltage sensor.

AMP SENSOR? - Enable/Disable the arc current sensor.

GAS SENSOR? – Enable/Disable the gas flow sensor.

WFS SENSOR? - Enable/Disable the wire feed sensor.

TVS SENSOR? - Enable/Disable travel speed sensor. **If the TVS is Disabled** and there is no Default Travel speed loaded the WDL will use the Weld Length parameter when calculating average heat input. **If the TVS is Enabled** the WDL will use the information from the connected Travel Speed Sensor or the Default Travel Speed when calculating average heat input. This includes when using the **Totalized Weld** function.

TEMP SENSOR? - Enable/Disable the temperature sensor.

HEAT SENSOR? - Enable/Disable the heat input calculation.

#### 4.3 “SETUP PRINTER” PARAMETER MENU

*NOTE: To **Enable** the Print Function you must press the “**PRINT**” button on the front of the WDL II while in the IDLE state. The **PRN** LED should illuminate.*

The following is a summary of the “SETUP PRINTER?” parameters:

PRINT TIME= - Specifies the time between print cycles when the “PRINT ALL?” mode is enabled. The time is in seconds and the minimum time is 0.1 seconds.

PRINT ALL? – Enables weld data printing at the specified time set in the “PRINT TIME=” parameter. This enables continuous printing of the actual data or weld data played back from memory.

PRN SUMMARY? – Enables weld summary data to be printed at the end of the weld cycle. This will be the average of the weld data for the complete weld. This function will only be available when collecting live welding data. It will not function when using the PLAY BACK mode from memory.

#### 4.4 "WELD MEMORY" PARAMETER MENU

The following is a summary of the "WELD MEMORY?" parameters:

"AVG RATE=" - Specifies the time between weld data samples saved in memory when the "SAVE ALL?" mode is enabled. The time is in seconds and the minimum time is 0.1 seconds.

"SAVE ALL?" – Enables weld data sample storage at the specified time set in the "AVG RATE=" - parameter. This enables continuous actual weld data storage at the specified rate in battery back up memory.

"SAVE AVG?" – Enables storage of averaged weld data. This function permits storage of averaged weld data for each arc-on /arc-off period in battery backed up memory.

"TOTALIZE?" - When Enabled, the summary of every weld made will be accumulated until the user presses the enter key and totalizes the weld data. The result will then be stored in the WDL memory. The data can then be printed from weld memory.

"WELD COUNT=" - Counts welds made. This information is saved and printed with the weld summary and actual data. The user can reset this value to any desired number from 0 – 65000.

"SUMMARY CNT=" - Indicates the number of weld summaries that are currently stored in memory. This counter will be reset after printing the saved weld summaries from memory. Maximum number is 150 welds.

"TOTALIZE CNT=" - Indicates the number of totalized welds that are currently stored in memory. This counter will be reset after printing the totalized welds from memory. Maximum number is 150 welds.

"Memory CNT=" – Total number of saved complete welds saved in memory. This counter will be reset after enabling the Play Back stored weld mode from memory. Maximum number is 65000 welds.

"PLAY BACK?" – Enables the WDL to replay the stored weld data from memory. The data will be displayed as if an actual weld was being made. The user can then print the data or using the WeldLog Plus™ PC program upload the data to a Host PC. After all welds are played back the "MEMORY CNT=" will be reset to zero. This function is only allowed when the WDL is not collecting weld data.

"CLEAR WELDS?" – Clears all weld memory and resets all memory counters to zero. When the "ALTER" key is pressed the Clearing Memory message will appear and the status of the clearing process will be displayed.

\*\*\*\*\* The Following Menu is only available on Ver 1.21 or greater \*\*\*\*\*

"LOAD SUMMARY=" – Indicates the weld summary currently loaded to the weld average display. To select a new stored weld summary enter the desire weld summary value then press the "Enter" then the "Alter" then key "1-7" to display the average values for the selected weld summary.

## 4.5 "CONFIG SYSTEM" PARAMETER MENU

The following is a summary of the "CONFIG SYSTEM?" parameters:

"ARCON VOLT=" – The value of arc voltage that must be exceeded to detect when a welding arc is active. The actual welding voltage must be greater than this value and the current must be greater than the "ARCON AMP" for the WDL to detect a valid welding arc. The arc will be off when the voltage drops below this value.

"ARCON AMP=" – The value of arc current that must be exceeded to detect when a welding arc is active. The actual welding current must be greater than this value and the voltage must be greater than the "ARCON VOLT" for the WDL to detect a valid welding arc. The arc will be off when the current drops below this value

"STATION ID=" – A numeric identification number that is used to identify a WDL II. This number is saved and printed with every weld record. The value range is 0 – 65000.

"MANUAL TVS=" – If the Travel speed sensor is disabled the WDL will use this value to calculate heat input values. If the user desires to use the weld length and arc time to calculate heat input for totalized welds this value must be set to zero.

"MIN TIME=" – This value specifies the minimum arc time required to accept the data as a valid weld. If the arc time is less than this value the weld counter will not increment and the data will not be summarized or totaled. This value should be set to a value less than the expected weld time. Setting the value to zero will allow all arc on conditions to increment the weld and summary counter

"TVS SCALE=" - This is a conversion factor that can be used to convert the Travel speed sensor to read actual welding speeds if the sensor can not be driven from the actual weld surface. To calculate the conversion factor use the following equation:  
$$\text{TVS SCALE} = [\text{Diameter of actual Weld}] / [\text{Diameter of measured surface}]$$

"METRIC?" – Enables metric units of measure. This requires that metric sensors be used.

"SET HOUR=" – Sets the Real time clock Hours. Units are in 24-hr format.

"SET MIN =" – Sets the Real time clock minutes.

"SET SEC =" – Sets the Real time clock seconds.

"SET MONTH =" – Sets the Real time clock month.

"SET DAY =" – Sets the Real time clock day.

"SET YEAR =" – Sets the Real time clock year.

"CLEAR CONFIG?" – Enabling this parameter will clear the configuration memory and reload factory default parameters. It will NOT clear the stored welding data.

“SCAN TIME=” – Sets the Weld data display scan rate. The values are in 0.1-second increments. The Range is from 0.1 – 1000.0 seconds. This is the time for which an enabled sensor will be displayed prior to incrementing to the next parameter during an actual weld or a play back from memory.

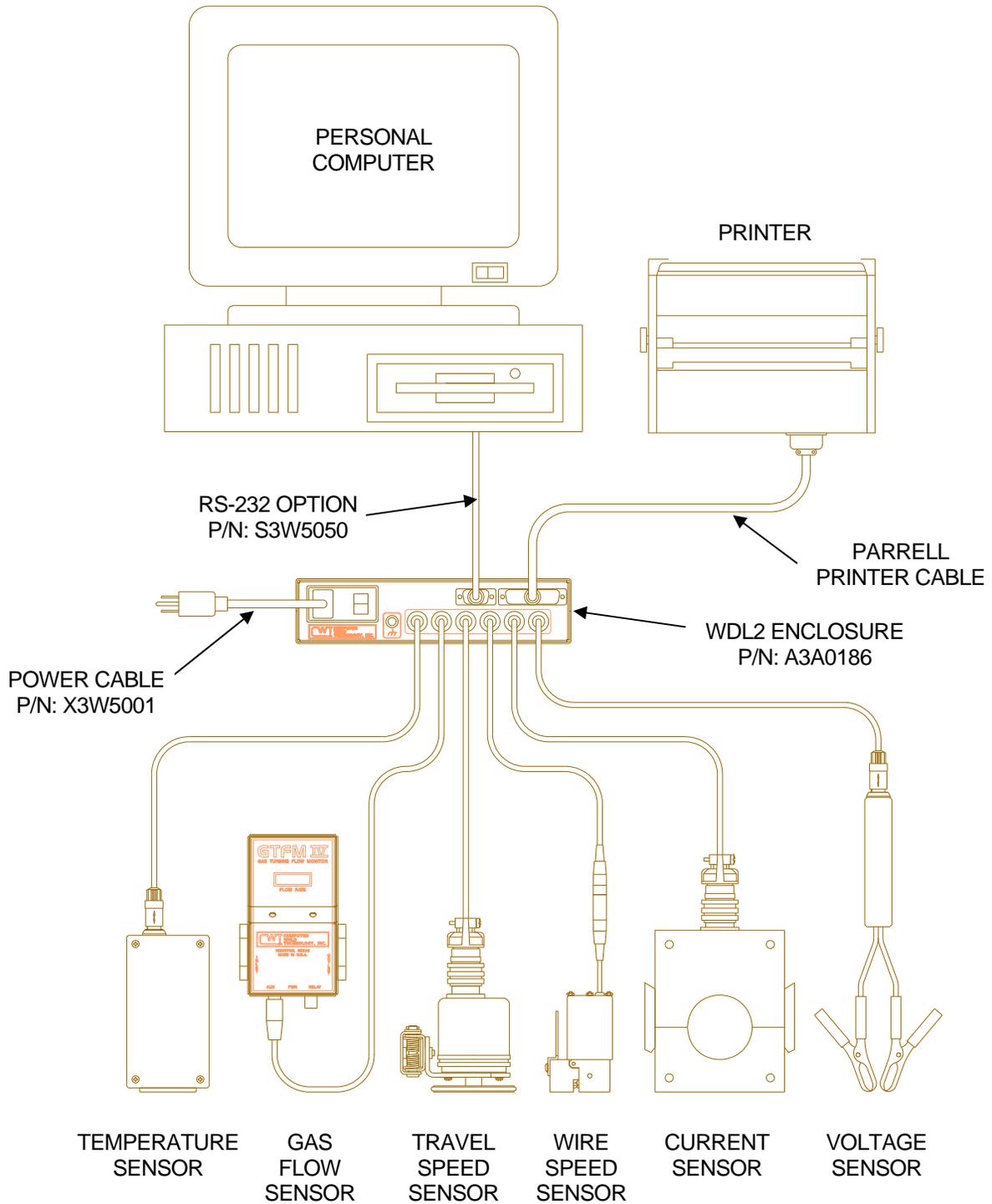
\*\*\*\*\* The Following Menus are only available on Ver 1.21 or greater \*\*\*\*\*

“AC SENSOR?” - Enable/Disable the AC sensor option. This function is only available when the WDL is ordered with the AC option. The Standard WDL II will not display this option

“DISPLAY DEG” - Enables continuous display of the actual temperature sensor value when the arc is off. Press “0” to cancel the display and redisplay the idle screen.

## 5.0 INSTALLATION DRAWINGS AND PARTS LISTS

### 5.1 WDL2 SYSTEM CONFIGURATION



<b>CURRENT SENSOR ASSEMBLY P/N: A0A0041 CONTAINS THE FOLLOWING:</b>		
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	X3Q5010	CURRENT SENSOR
1	A3W0267	CURRENT CABLE

<b>VOLTAGE SENSOR ASSEMBLY P/N: A0A0042 CONTAINS THE FOLLOWING:</b>		
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0193	VOLTAGE PROBE
1	A3W0268	VOLTAGE CABLE

<b>WIRE SPEED SENSOR ASSEMBLY P/N: A0A0043 CONTAINS THE FOLLOWING:</b>		
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0051	WIRE SPEED SENSOR
1	A3W0269	WIRE SPEED CABLE

<b>TRAVEL SPEED SENSOR ASSEMBLY P/N: A0A0044 CONTAINS THE FOLLOWING:</b>		
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0112	TRAVEL SPEED SENSOR
1	A3W0270	TRAVEL SPEED CABLE

<b>GAS FLOW SENSOR ASSEMBLY P/N: A0A0045 CONTAINS THE FOLLOWING:</b>		
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0179	GTFM4 ENCLOSURE
1	A3W0271	GAS FLOW CABLE
1	A3E0104	GTFM4 MOUNTING BAR
2		#10-32 x 1/2" LG. SOCKET FLAT HEAD SCREW
2	X6F5093	ADAPTOR FITTING
2	X6F5094	BARBED FITTING
2	X6F5095	"B" SIZE NUT

<b>TEMPERATURE SENSOR CLASSIFICATIONS</b>
-------------------------------------------

<b>THERMOCOUPLE "K" SENSOR ASSEMBLY P/N: A0A0046 CONTAINS THE FOLLOWING:</b>
------------------------------------------------------------------------------

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0137	"K" SENSOR BOX
1	A3W0272	THERMOCOUPLE CABLE

<b>THERMOCOUPLE "J" SENSOR ASSEMBLY P/N: A0A0047 CONTAINS THE FOLLOWING:</b>
------------------------------------------------------------------------------

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0138	"J" SENSOR BOX
1	A3W0272	THERMOCOUPLE CABLE

<b>THERMOCOUPLE "T" SENSOR ASSEMBLY P/N: A0A0048 CONTAINS THE FOLLOWING:</b>
------------------------------------------------------------------------------

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	A3A0139	"T" SENSOR BOX
1	A3W0272	THERMOCOUPLE CABLE

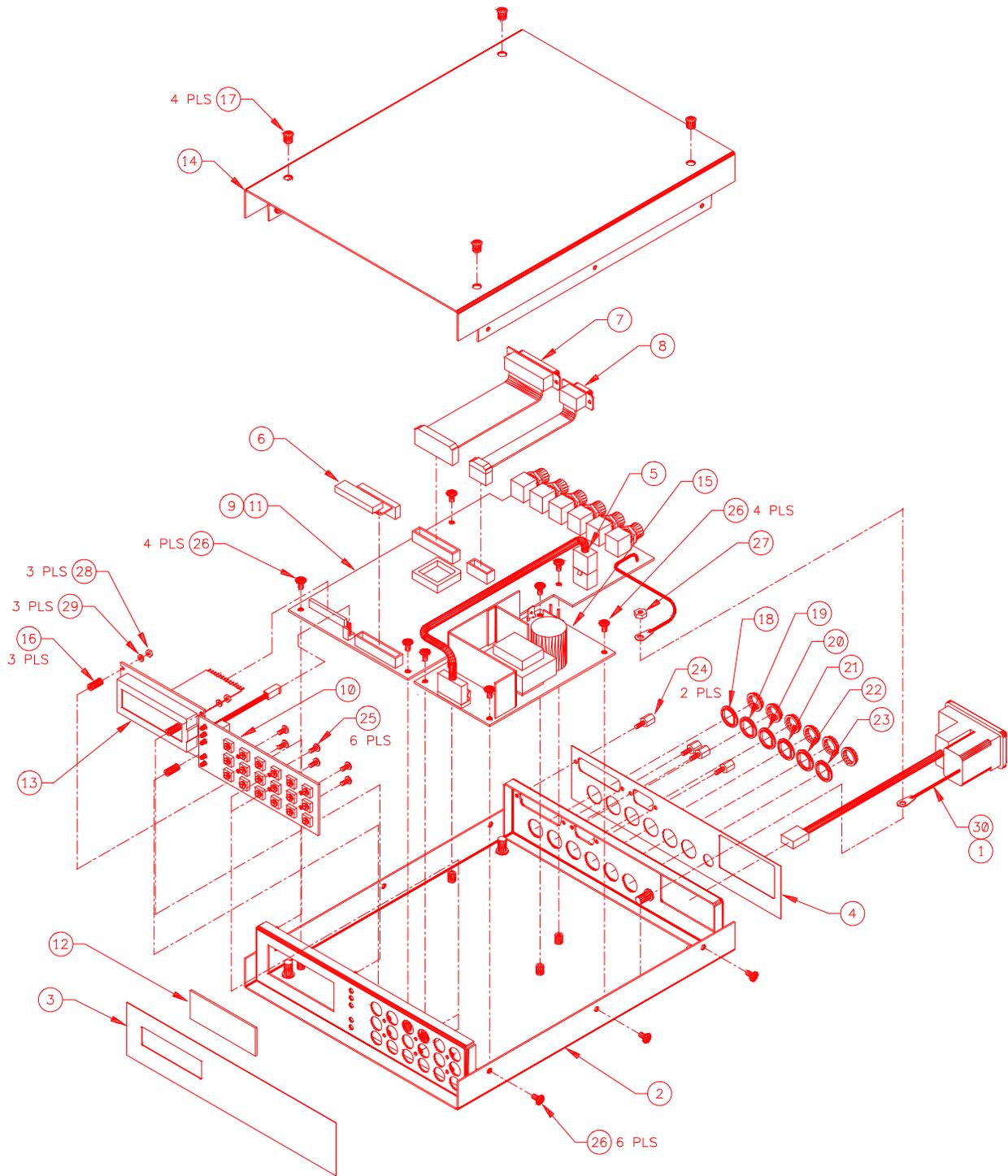
<b>0-500 F INFRARED SENSOR ASSEMBLY P/N: A0A0049 CONTAINS THE FOLLOWING:</b>
------------------------------------------------------------------------------

<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	X3Q5007	SENSOR BOX
1	A3W0273	INFRARED CABLE

<b>200-1000 F INFRARED SENSOR ASSEMBLY P/N: A0A0050 CONTAINS THE FOLLOWING:</b>
---------------------------------------------------------------------------------

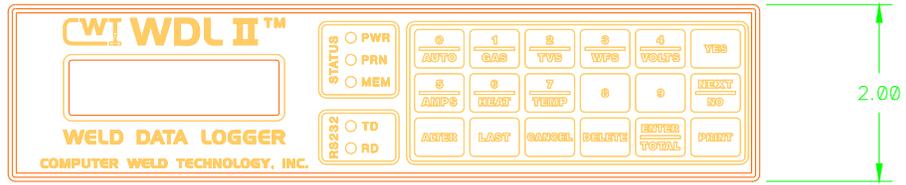
<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	X3Q5009	SENSOR BOX
1	A3W0273	INFRARED CABLE

## 5.2 WDL2 ENCLOSURE DETAILS

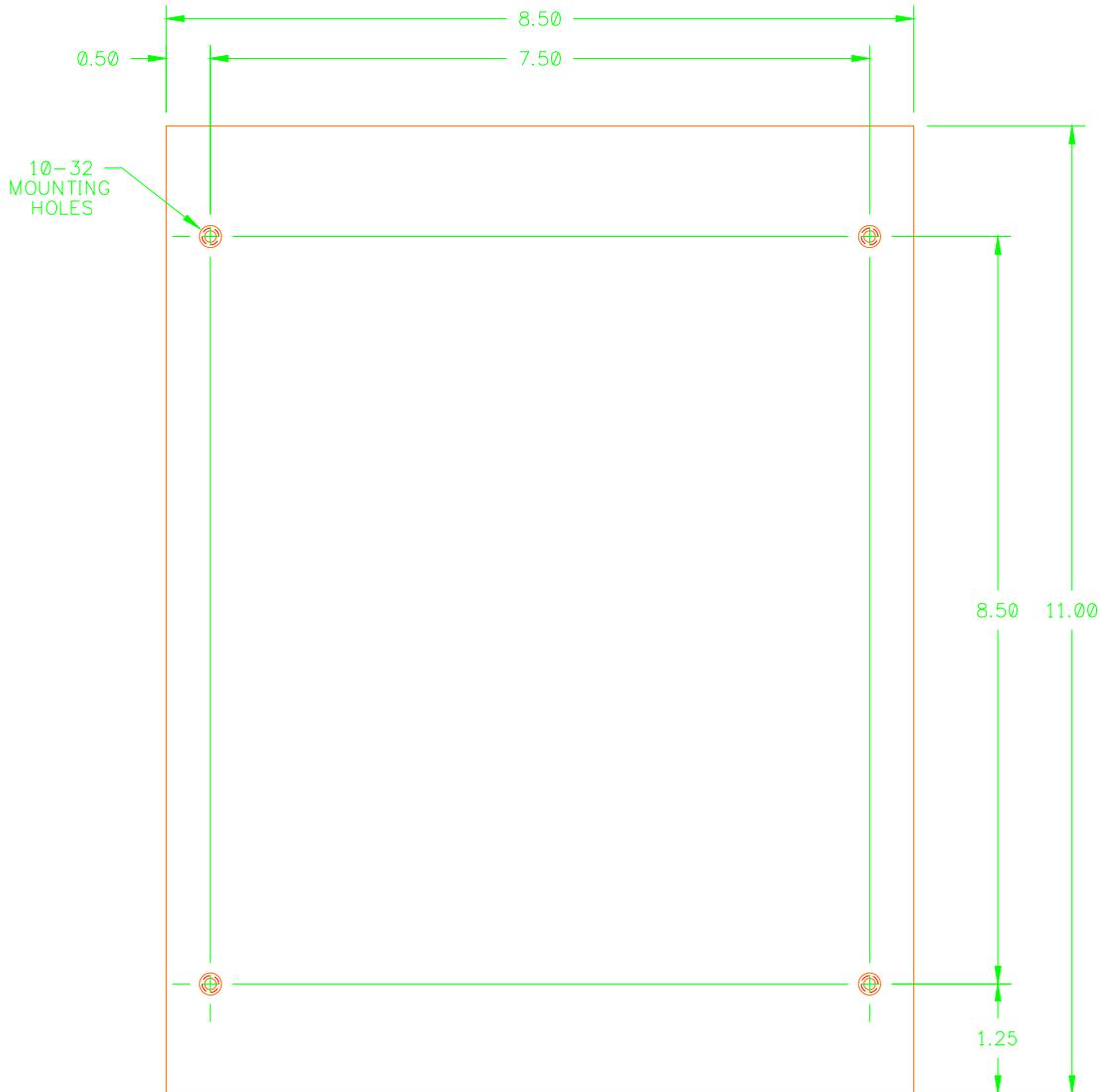


PART NUMBER: A3A0186

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A3A0153	POWER ENTRY ASSEMBLY
2	1	A3E0108	ENCLOSURE
3	1	A3E0109	FRONT OVERLAY
4	1	A3E0110	REAR OVERLAY
5	1	A3W0262	POWER SUPPLY CABLE
6	1	A3W0263	FRONT PANEL CABLE
7	1	A3W0264	PRINTER CABLE
8	1	A3W0265	RS-232 CABLE
9	1	A5A0096	WDL2 CPU PCB ASSEMBLY
10	1	A5A0097	WDL2 FRONT PANEL PCB ASSEMBLY
11	1	A5I0013	WDL2 PROCESSOR
12	1	S2M5087	DISPLAY LENS
13	1	S3A5031	LCD DISPLAY ASSEMBLY
14	1	S3E5044	COVER
15	1	X3T5065	TRIPLE POWER SUPPLY
16	3	X6S5050	NYLON SPACER
17	4	X6Z5071	DOME PLUG
18	1	X3P5711	GRAY WASHER
19	1	X3P5712	BLUE WASHER
20	1	X3P5713	RED WASHER
21	1	X3P5714	GREEN WASHER
22	1	X3P5715	YELLOW WASHER
23	1	X3P5716	BLACK WASHER
24	2	X3Z5027	SCREWLOCK KIT
25	6		#4-40 X 1/4" PHILIPS PAN HEAD SCREW W/ INT LOCK WASHER
26	14		#6-32 X 1/4" PHILIPS PAN HEAD SCREW W/ INT LOCK WASHER
27	1		#6 HEX NUT
28	3		#2-56 HEX NUT
29	3		#2 SPLIT LOCK WASHER
30	1	X3C5014	1 AMP 3AG FUSE

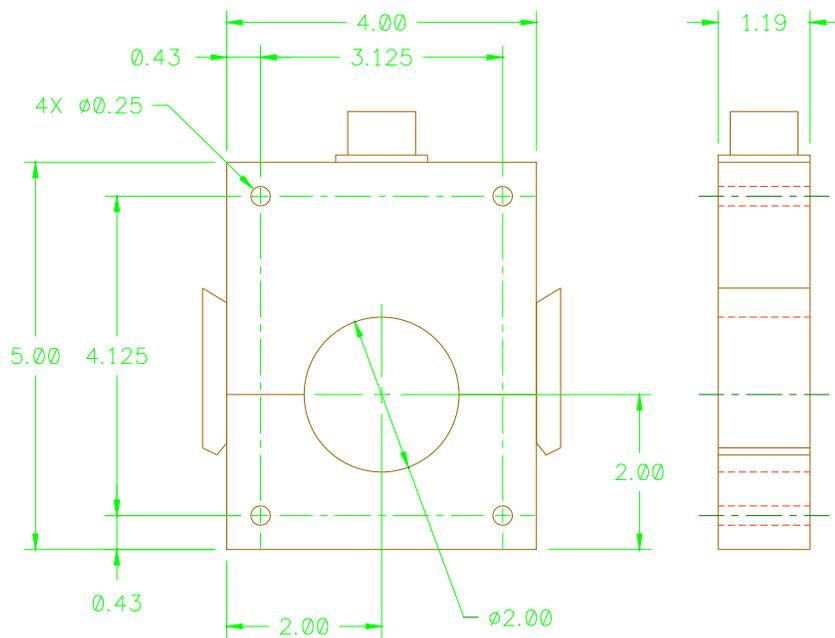
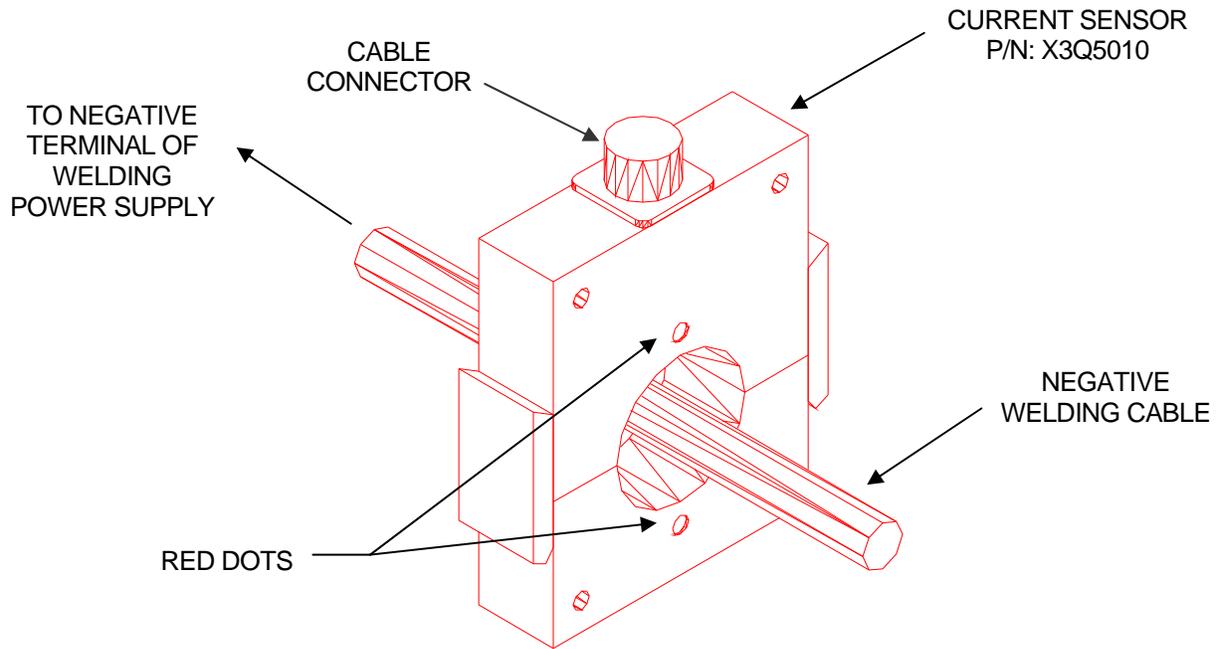


FRONT VIEW



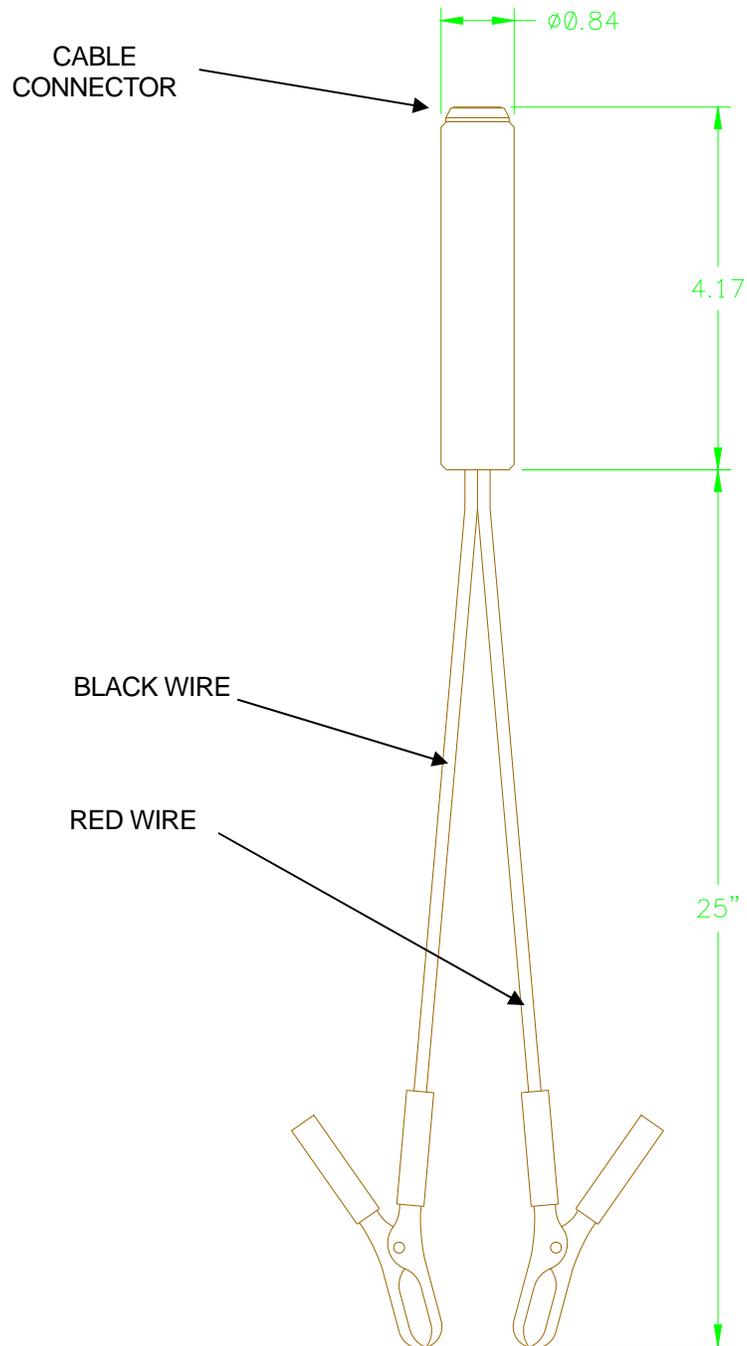
BOTTOM VIEW

### 5.3 CURRENT SENSOR DETAILS



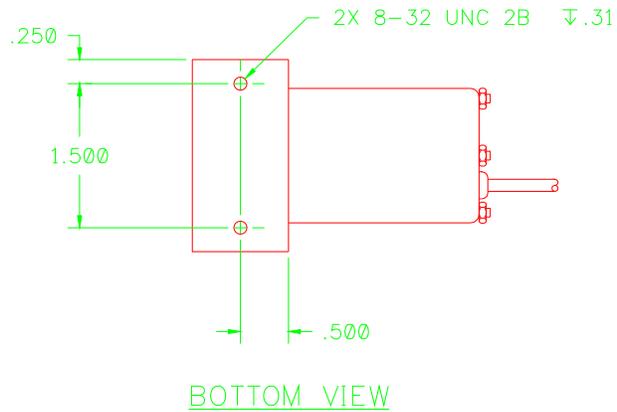
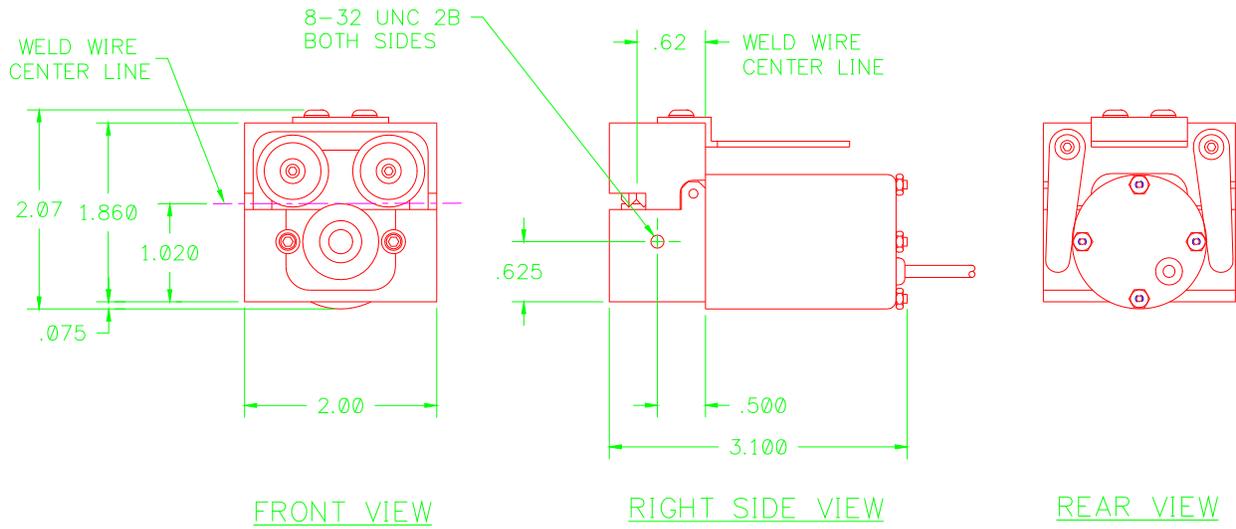
PART NUMBER: X3Q5010

## 5.4 VOLTAGE SENSOR DETAILS

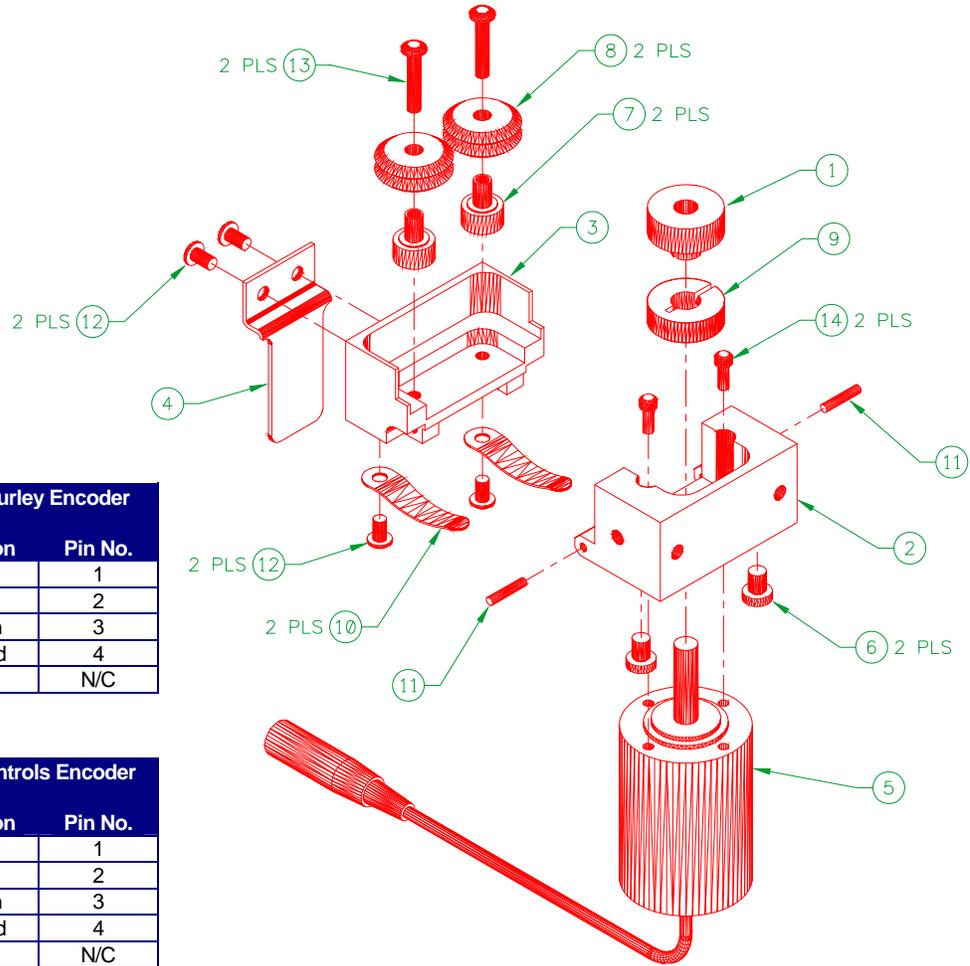


PART NUMBER: A3A0193

## 5.5 WIRE SPEED SENSOR DETAILS



PART NUMBER: A3A0051

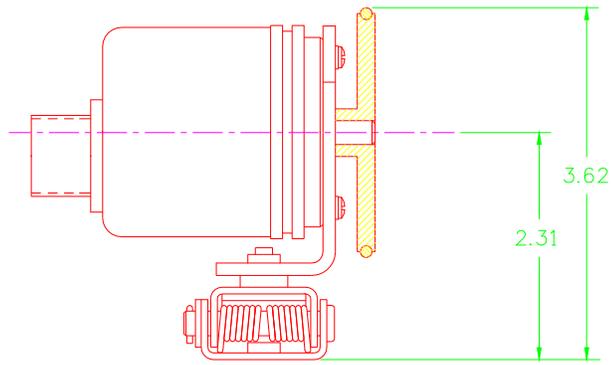


Wire List for Teledyne Gurley Encoder		
Wire Color	Description	Pin No.
Red	+V	1
Green	B	2
Black	Common	3
Gray	Case Gnd	4
Orange	Not B	N/C

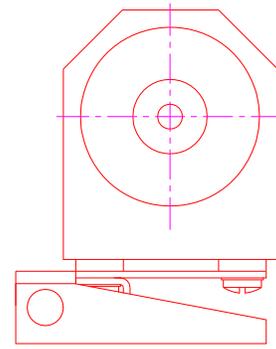
Wire List for Danaher Controls Encoder		
Wire Color	Description	Pin No.
Red	+V	1
Green	Not A	2
Black	Common	3
Shield	Case Gnd	4
White	A	N/C

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A2A0014	DRIVEN WHEEL ASSEMBLY
2	1	A2M0124	ENCODER MOUNTING BLOCK
3	1	A2M0123	GUIDE BLOCK
4	1	A2M0125	HANDLE
5	1	X3M5031	OPTICAL ENCODER
6	2	X6B5055	LOCATOR BUTTON
7	2	X2B5002	BUSHING
8	2	X2P5004	WHEEL
9	1	X6B5054	SHAFT COLLAR
10	2	X2N5007	FLAT SPRING
11	2	X6P5004	DOWEL PIN
12	4		#6-32 X 1/4" LG. BUTTON HD. SCREW
13	2		#6-32 X 3/4" LG. BUTTON HD. SCREW
14	2		#4-40 X 5/16" LG. SOCKET HD. CAP SCREW

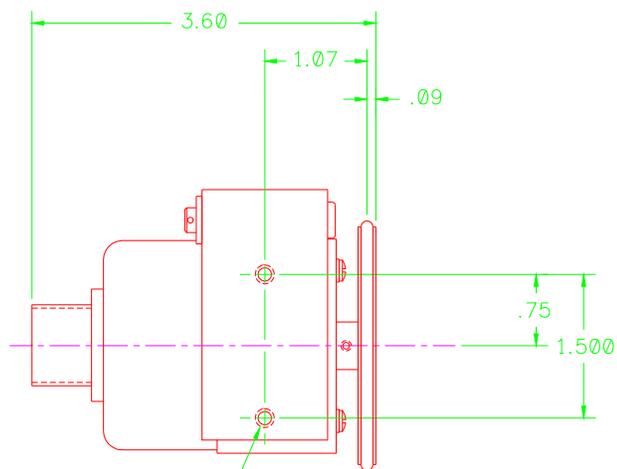
## 5.6 TRAVEL SPEED SENSOR DETAILS



LEFT SIDE VIEW



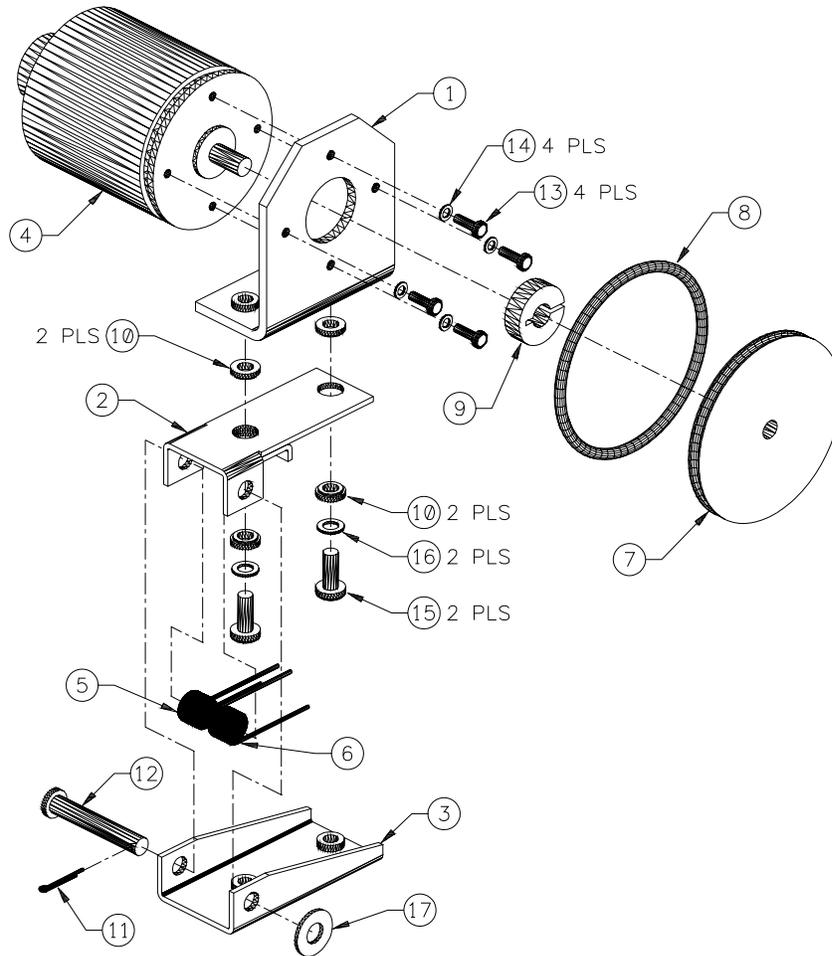
FRONT VIEW



2X 10-32  
MOUNTING HOLES

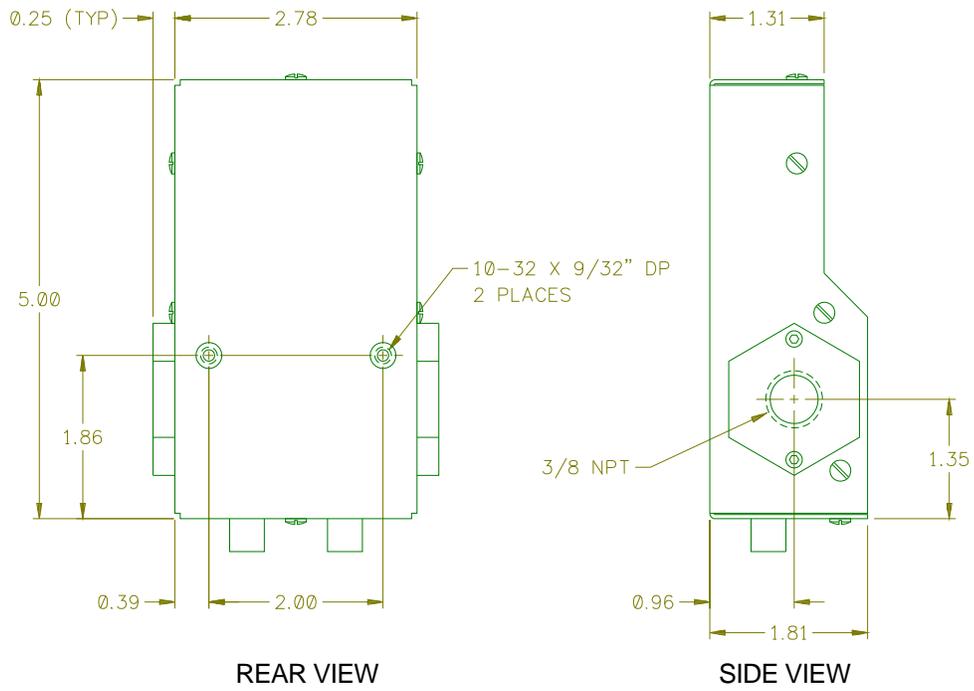
BOTTOM VIEW

PART NUMBER; A3A0112

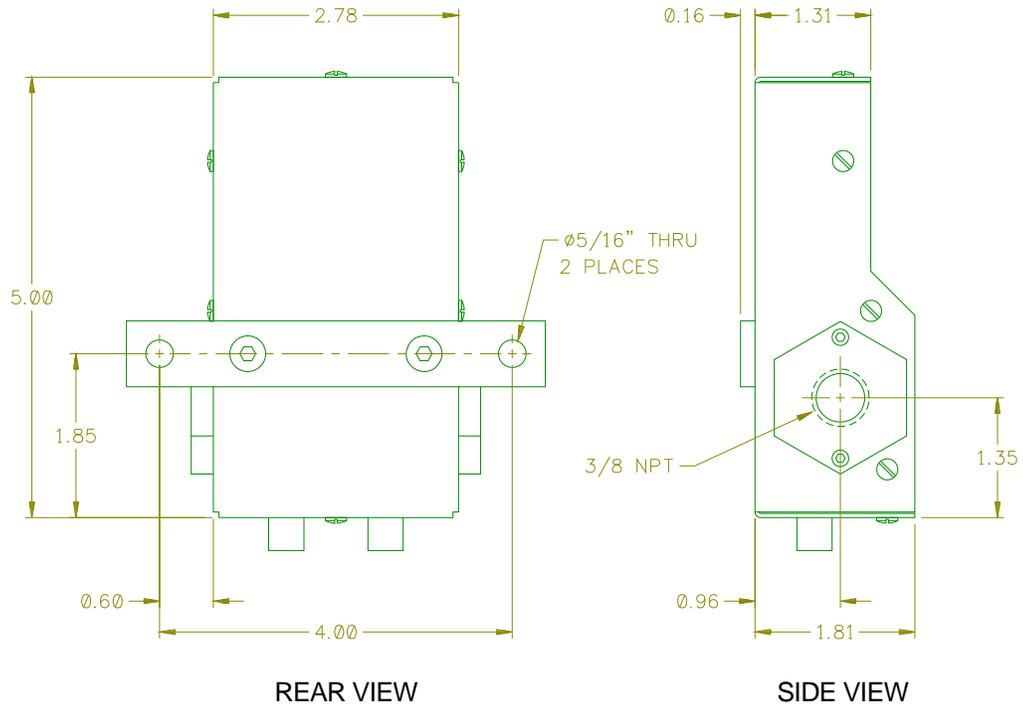


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A2M0153	ENCODER BRACKET
2	1	A2M0130	BOTTOM PLATE
3	1	A2M0131	TOP PLATE
4	1	X3M5027	OPTICAL ENCODER
5	1	X2N5008	TORSION SPRING
6	1	X2N5009	TORSION SPRING
7	1	X2P5003	GROOVED PULLEY
8	1	X4S5007	O-RING
9	1	X6B5054	SHAFT COLLAR
10	4	X6B5158	SHOULDER WASHER
11	1	X6B5150	3/32" DIA X 1/2" LG COTTER PIN
12	1	X6B5151	1/4" DIA X 1-1/2" LG CAD STEEL CLEVIS PIN
13	4		#4-40 X 3/8" LG BINDER HD SCREW
14	4		#4 INTERNAL LOCK WASHER
15	2		#10-32 X 1/2" LG BINDER HD SCREW
16	2		#10 INTERNAL LOCK WASHER
17	1		#1/4 FLAT WASHER

## 5.7 GAS FLOW SENSOR DETAILS

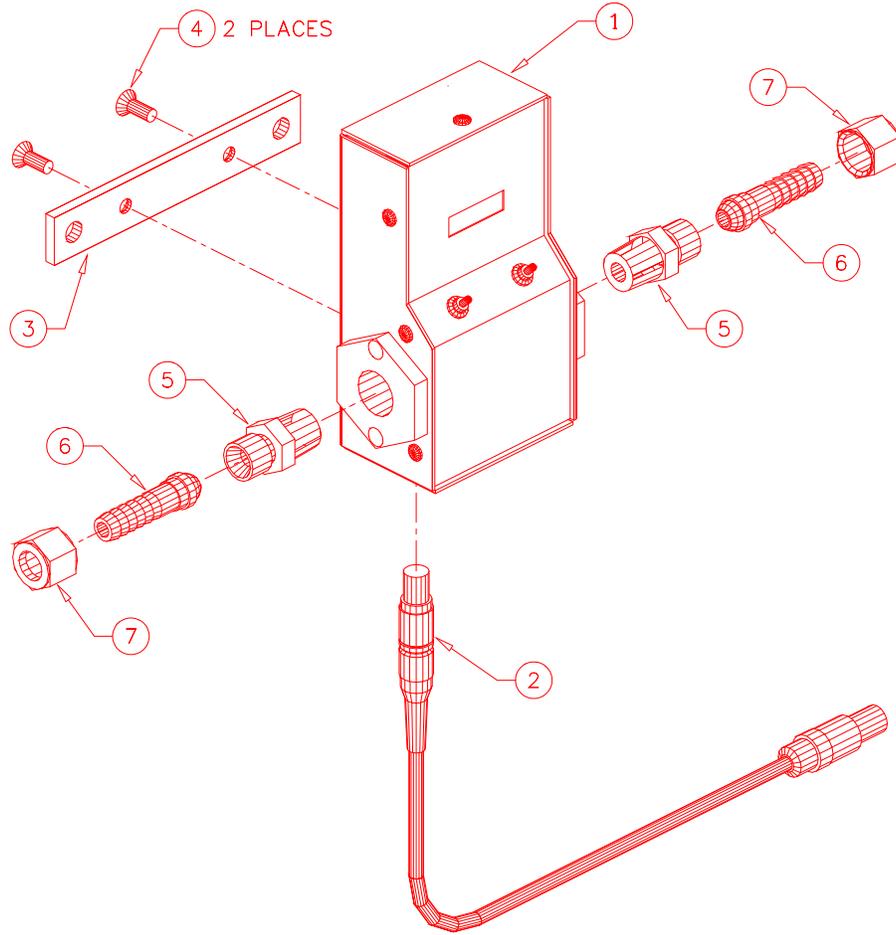


INSTALLATION WITH THREADED INSERTS



INSTALLATION WITH MOUNTING BAR

PART NUMBER: A3A0179



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A3A0179	GTFM4 ENCLOSURE ASSEMBLY
2	1	A3W0271	GAS FLOW CABLE
3	1	A3E0104	GTFM4 MOUNTING BAR
4	2		#10-32 X 1/2" LG. SOCKET FLAT HD. SCREW
5	2	X6F5093	ADAPTOR FITTING
6	2	X6F5094	BARB FITTING
7	2	X6F5094	"B" SIZE NUT