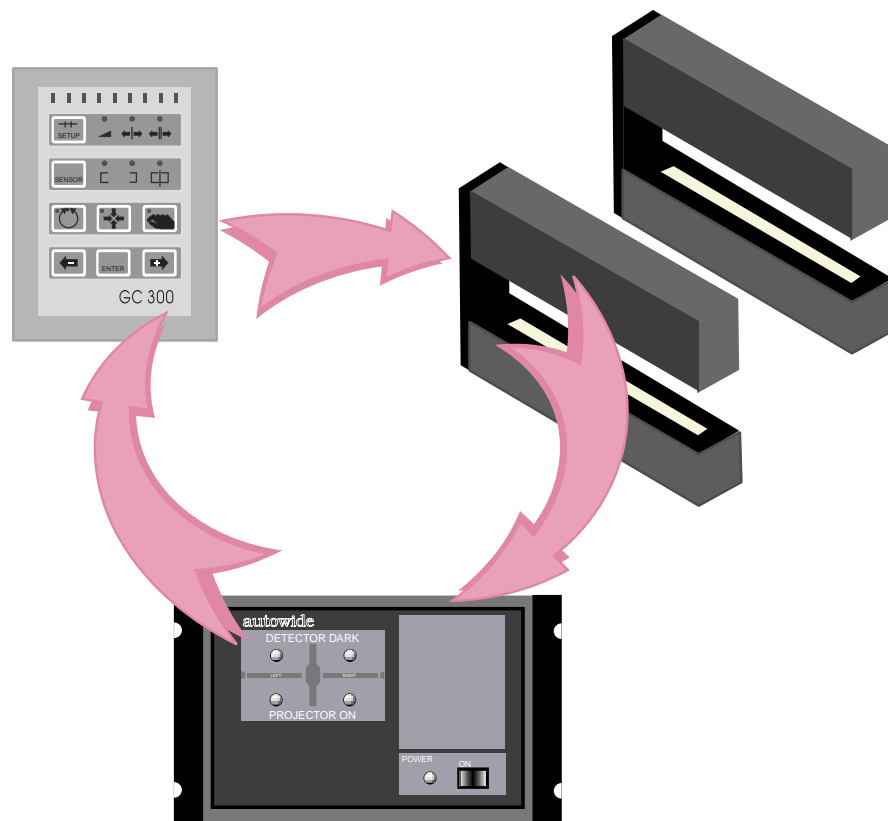


# nexen™

*formerly Horton Industrial Products*

## WEB GUIDE SENSOR SYSTEM with GC300 Web Guide Controller AWL280 Sensors AS10-D Amplifier

### INSTALLATION, OPERATION AND MAINTENANCE GUIDE



**"Web Controls"**

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

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**ISO 9001 Certified**



# CAUTION

Read this manual carefully before installation and operation.

Follow Nexen's instructions and integrate this unit into your system with care.

This unit should be installed, operated and maintained by qualified personnel ONLY.

Improper installation can cause an interruption in service.

Comply with all applicable codes.



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## -NOTES-

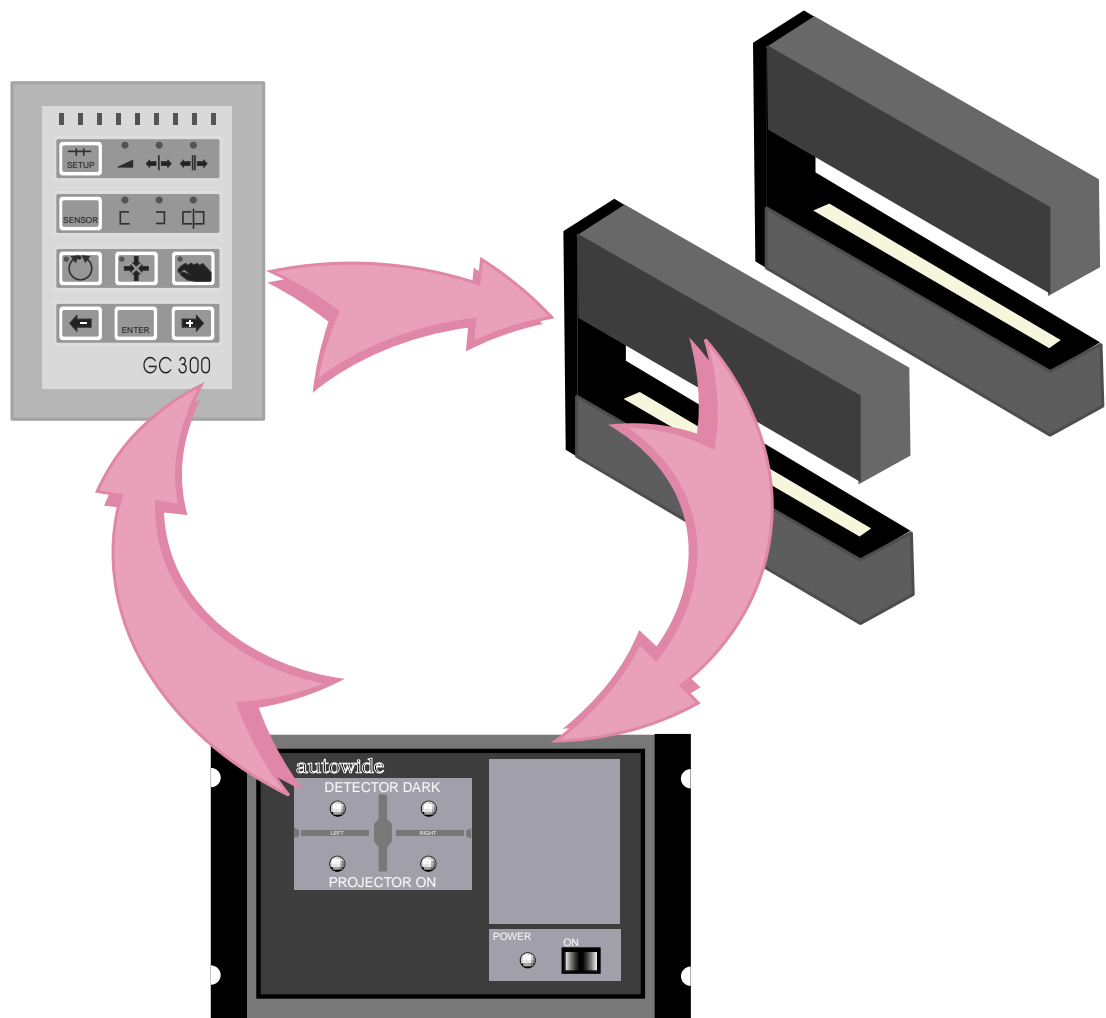
## INTRODUCTION

Nexen's Web Guide Sensor System is used for web control applications. The Web Guide Sensor System consists of two AWL280 Sensors, an AS10-D Amplifier and a GC300 Web Controller.

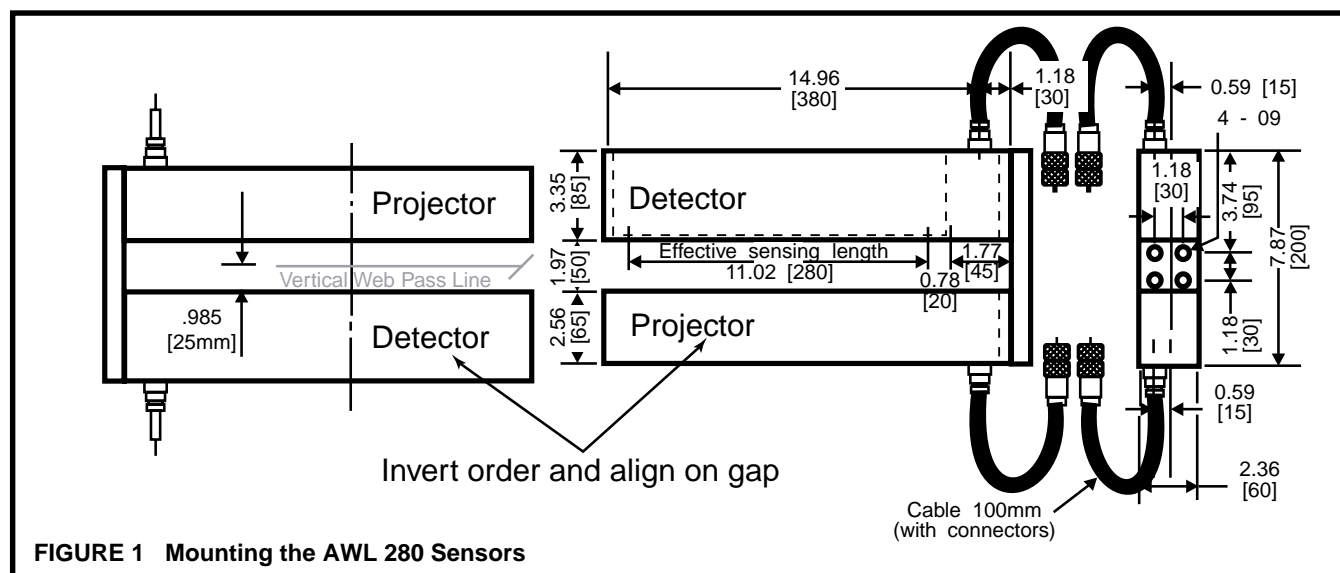
The AWL280 Sensors are placed at opposite edges of the web and work in tandem to track the position of the web. The AWL280 Sensors send an infrared light from the projector housing across a gap to the detector housing. A web passing through the gap blocks the light. The electrical output signal from the sensor to the AS10-D Amplifier will change in response to the changes in the infrared light.

The ASD10-D Amplifier is the excitation signal for the sensors. The ASD10-D Amplifier also conditions the sensor output for transmission to the GC300 Web Guide Controller. The sensors transmit data to the GC300 Web Guide Controller which in turn, generates a control output signal. This control output signal moves a mechanical element (e.g., roll stand, guide roll steering mechanism) which keeps the center of the web at the center line of the machine. This type of closed-loop web guiding is called "Center Guiding" or "Center Position Control" (CPC).

**NOTE:** The AS10-D amplifier's output voltage is designed specifically to match the inputs to Nexen's GC300 Web Guide Controller. If you use a controller other than the GC300 Web Guide Controller, please verify that your controller matches the AS10-D Amplifier's output voltage range of 0-200mVDC.

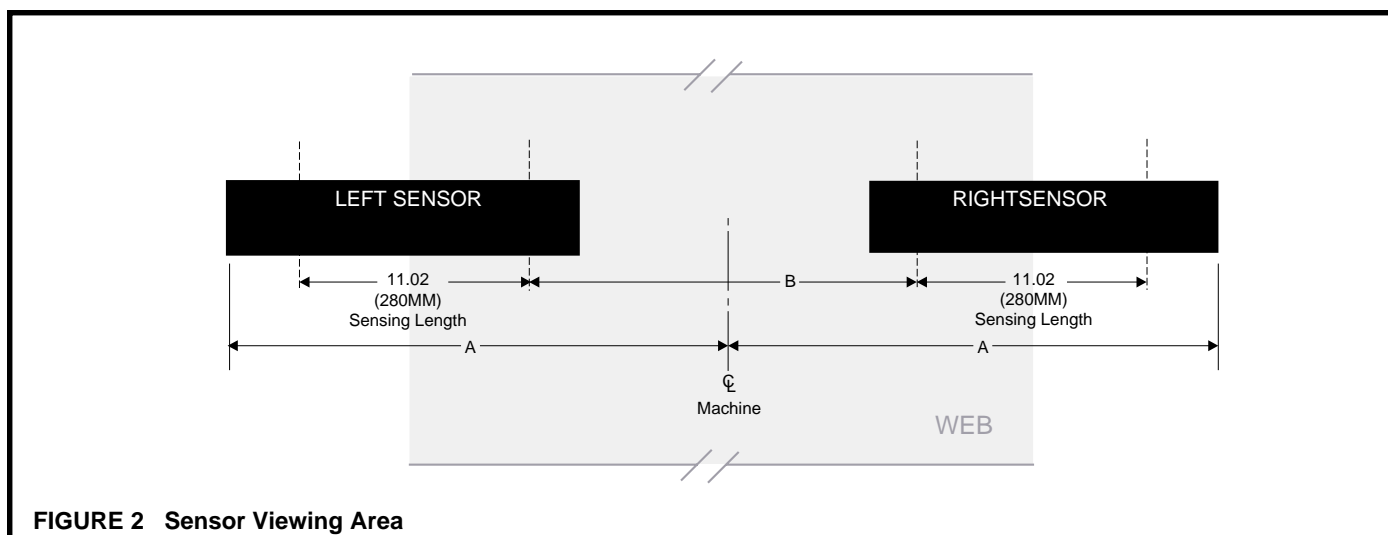


## SENSOR INSTALLATION



NOTE: Refer to Figures 1 and 2.

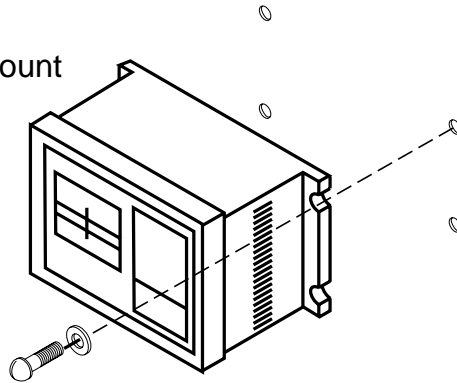
1. Install the two AWL280 Sensors in inverted order to each other; one sensor with the projector side up and one sensor with the detector side up. Because the detector housing is larger (3.35 inches / 85 mm) than the projector housing (2.56 inches/ 65 mm), the sensor with the detector side up will sit higher than the sensor with the projector side up.
2. The web must be centered on both the vertical and horizontal plane. Center the web on the vertical plane at the vertical web pass line between the projector and detector (.985 inch [25 mm]). Center the web on the horizontal plane between the left and right sensor.
3. The projector and detector housings may be removed from the steel bar and mounted separately if your application requires a gap that is wider than 1.978 [50] or if the sides must be open. The housings must be aligned both vertically and horizontally when mounted separately. The gap from the projector lens to the detector lens must not exceed 10 inches [250 mm].
4. The sensing length in the sensor window measures 11.02 inches [280 mm]. This sensing length is indicated by arrows that are located on either side of the sensor window. However, for the most effective use of this sensing area, the web should not extend to the full outer edge of the sensing length. The optimum width of the web is 1/2 of the total sensing area of 22.04 inches plus "B" ( which is 11.02 inches [280 mm] plus "B"). The web width should not exceed 22.04 inches plus "B" nor should the web width fall below the width of "B". Mount the sensors so that the maximum and minimum web widths fall within this range. In addition, mount each sensor an equal distance (A) from the center line of the machine.



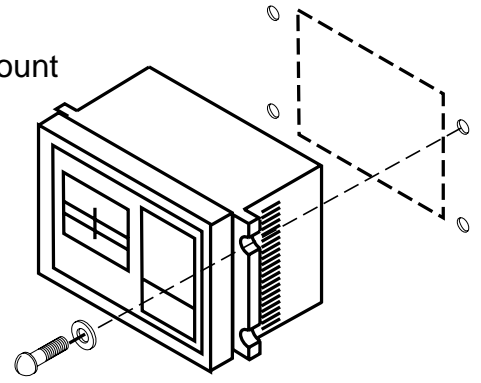


## AMPLIFIER INSTALLATION

Flat Surface Mount



Panel Mount

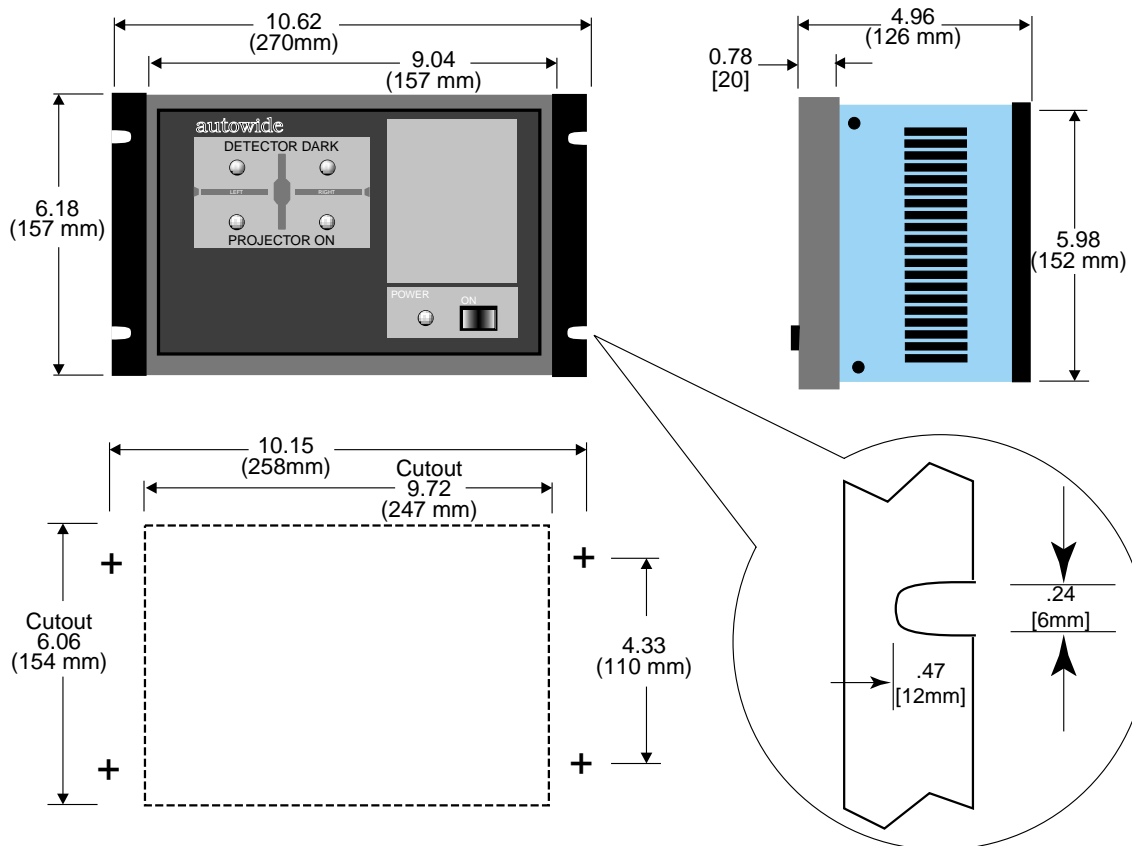


**FIGURE 3 Mounting the AS10-D Amplifier**

1. Mount the AS10-D Amplifier on either a flat surface or in a panel. To mount the AS10-D Amplifier in a panel, position the mounting brackets to the front of the amplifier. To mount the AS10-D Amplifier on a flat surface, position the mounting brackets to the rear of the amplifier (default).

## CAUTION

Mount the AS10-D Amplifier in a dry, dust free, shock and vibration free area with an ambient temperature greater than 32° F [0° C] but less than 122° F [50° C].



**FIGURE 4 AS10-D Amplifier Cutout Dimensions**

## ELECTRICAL CONNECTIONS

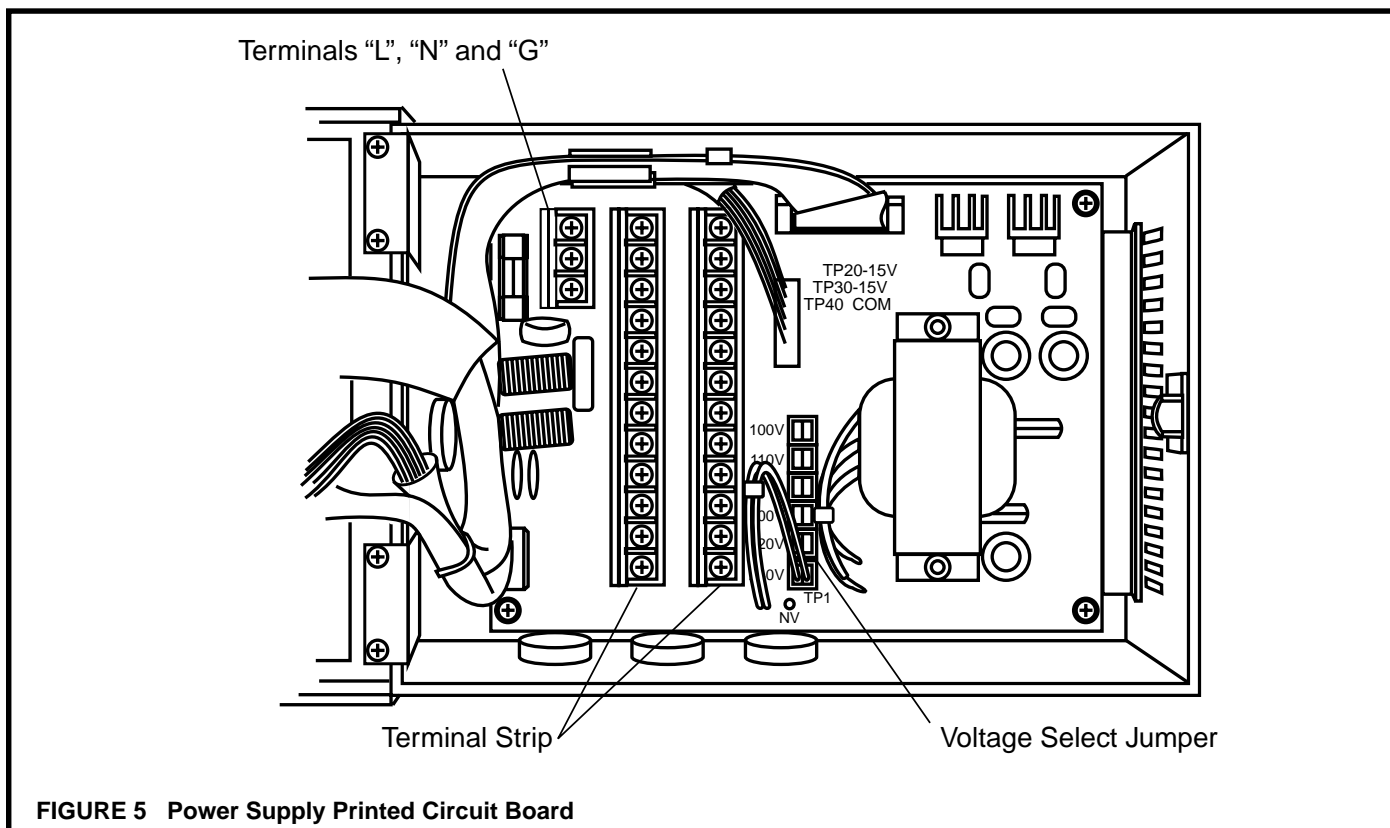


FIGURE 5 Power Supply Printed Circuit Board



### DANGER

Disconnect all power to the units  
BEFORE  
you begin.

### CAUTION

Verify that the voltage select  
jumper on the power supply is set  
to match the voltage supplied to  
Terminals "L" and "N".

**Disconnect all power to the units BEFORE you begin.**

NOTE: Refer to Figures 5 and 6.

1. Use the 16 foot (5 meter) cables that are shipped with the sensors to connect the AWL 280 Sensors to the AS10-D Amplifier. The quick disconnect plugs on the AWL Sensor's Projector and Detector have different connectors. The terminal end of the Projector cable has a six pin connector. The Detector cable has a five pin connector.  
**NOTE: To avoid overlapping or mixing up the left and right cables, Nexen recommends that you connect one side (left or right) at a time.**
2. Connect your 50/60 Hz / Single Phase 100, 110 or 120 volt power source to terminals "L" and "N". A power source that is 50/60 Hz / Single Phase with either 200, 220 or 240 volt will have "L1" and "L2" lines which will connect to terminals "L" and "N". Find the voltage select jumper that is located on the power supply printed circuit board and set the voltage select jumper to match the voltage of your power source. Connect a low resistance earth ground to terminal "G"
3. Connect the AS10-D amplifier terminals "10", "11", "23" and "24" (See Fig. 6) to the GC300 Web Guide Controller (refer to the GC300 Web Guide Controller manual, # 20331).
4. The alarm relay changes state when the sensor lens becomes dirty and needs to be cleaned. Wire the alarm relay terminal "25" for Normally Open (N.O.) and terminal "13" for Normally Closed (N.C.). The contacts are rated at 2 amp at 240 VAC or 2 amp at 24 VDC. Refer to the *Calibration* section to calibrate the sensitivity level of the alarm relay.

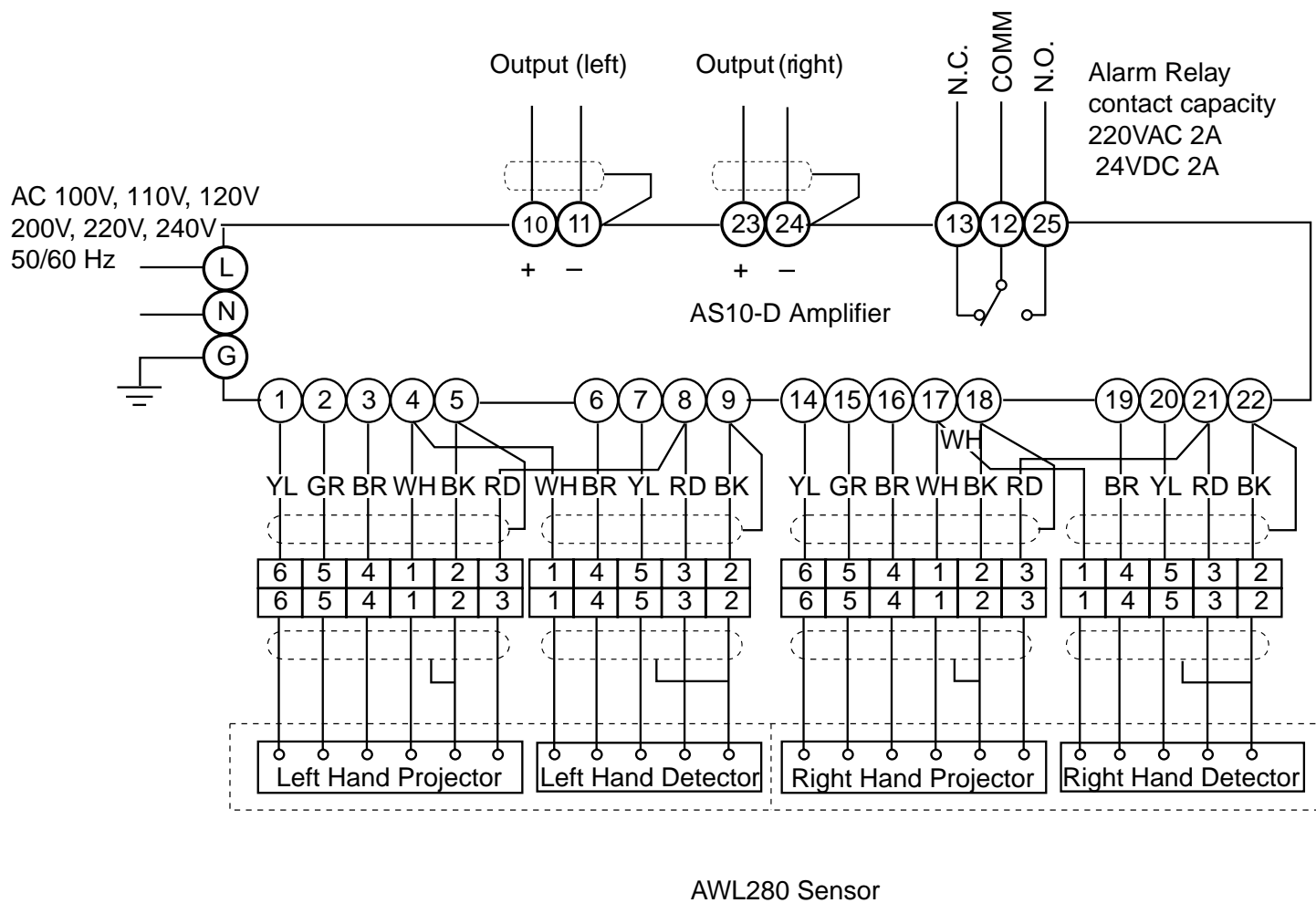
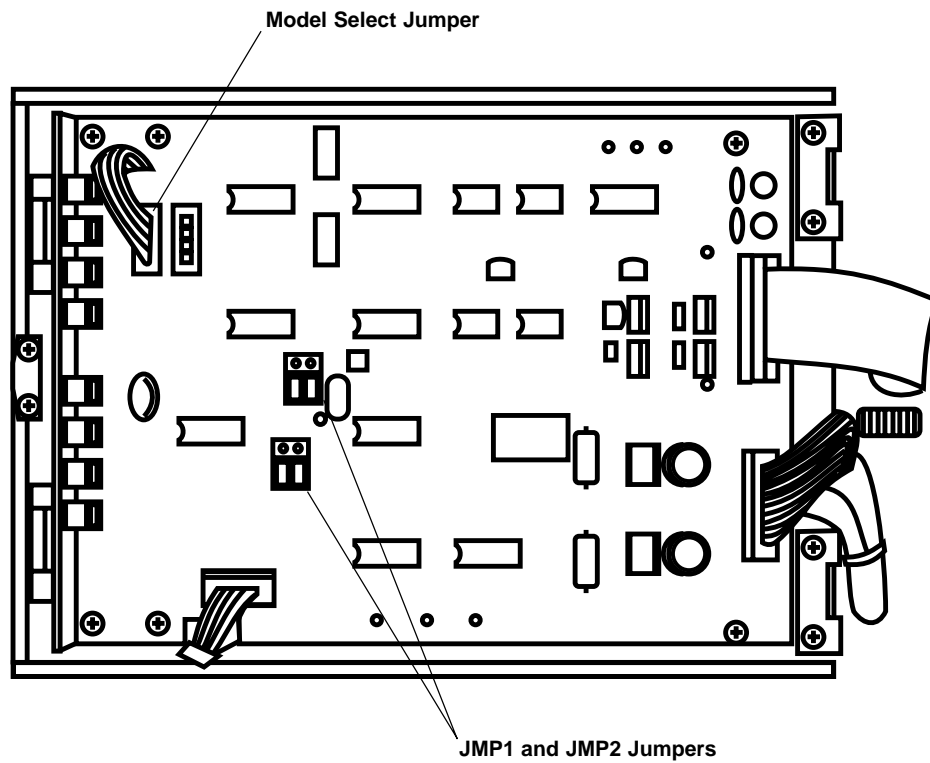


FIGURE 6 AWL280 Sensor Wiring









**FIGURE 7 AS10-D Amplifier Main Printed Circuit Board**

NOTE: Refer to Figure 7

1. Set the model select jumper to left position for the AWL280 sensors.
2. Set jumpers "JMP1" and "JMP2" to the lower position for the AWL280 sensors.

## CALIBRATION

Refer to figures 8, 9, 10 and 11.

Left Hand Calibration	
LEFT HAND SENSOR CALIBRATION.	LEFT HAND SENSOR ALARM CIRCUIT ADJUSTMENT.
<p>Use an opaque sheet of material to completely block light projection from the projector to the detector of the left sensor (see Fig 8).</p> <p>Connect the negative lead of a DMM to the "COM" test pin on the main printed circuit board. Connect the positive lead to the "OUT-L" test pin on the main printed circuit board (See Fig. 9).</p>  <p>Adjust the "BIAS-L" trim pot until the DMM indicates <math>+200 \pm 5\text{mV}</math> (See Fig. 11).</p> <p>Remove opaque material.</p>  <p>Adjust the "GAIN-L" trim pot until the DMM indicates <math>0 \pm 5\text{mV}</math> (See Fig. 11).</p> <p>If you can not achieve <math>0 \pm 5\text{mV}</math> DC, then increase the intensity of the projector LEDs by adjusting the LED-L trim pot  clockwise until <math>0 \pm 5\text{mV}</math> is achieved and then recheck the sensor calibration.</p> <p>NOTE: If your web application has required that you increase the gap beyond the standard 1.95 [50 mm], then you may need to increase the intensity of the projector LEDs in order to achieve <math>0 \pm 5\text{mV}</math> DC.</p>	<ul style="list-style-type: none"> <li> Turn the "ALARM-L" trim pot fully counter clockwise. The left LED on AS10-D front panel that is labeled "Detector Dark" will turn "Off"</li> <li> Turn the "ALARM-L" trim pot clockwise until the LED comes "ON".</li> <li> Turn the "ALARM-L" trim pot counter clockwise slowly and stop when the LED goes out.</li> </ul> <p>To test the circuit, insert four or five sheets of clear film about 2 inches [50 mm] wide into the alarm sensor's light path (See Fig. 10). The left LED on AS10-D front panel that is labeled "Detector Dark" will turn "ON".</p>

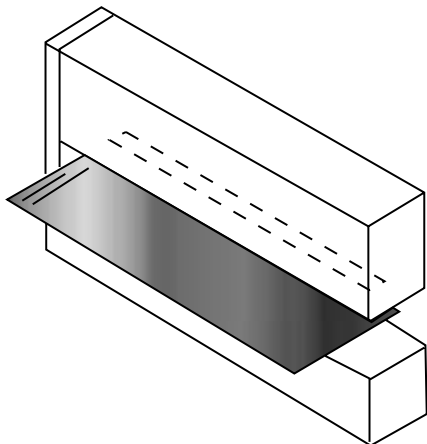


FIGURE 8 Sensor Calibration

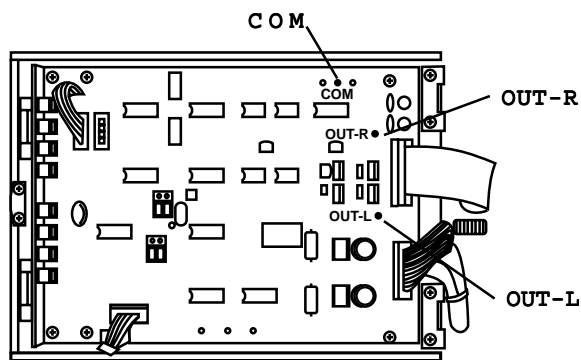


FIGURE 9 AS10-D Amplifier Main Circuit Board

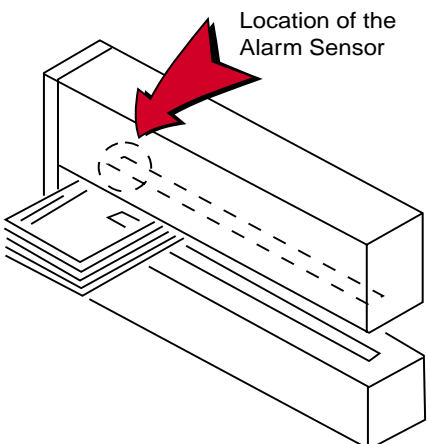


FIGURE 10 Testing the Alarm-L Circuit

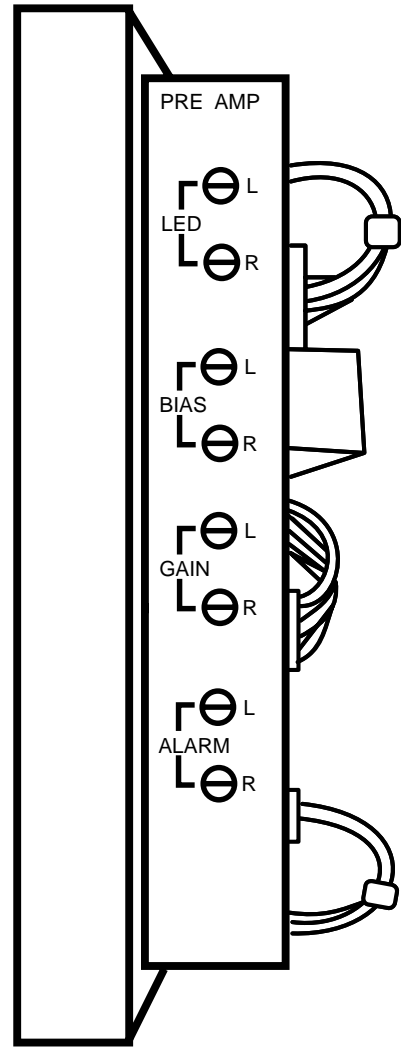




FIGURE 11 AS10-D Amplifier Trim Pots

Refer to figures 8, 9, 10 and 11.

Right Hand Calibration	
RIGHT HAND SENSOR CALIBRATION.	Right HAND SENSOR ALARM CIRCUIT ADJUSTMENT.
<p>Use an opaque sheet of material to completely block light projection from the projector to the detector of the right sensor (see Fig 8).</p> <p>Connect the negative lead of a DMM to the "COM" test pin on the main printed circuit board. Connect the positive lead to the "OUT-R" test pin on the main printed circuit board (See Fig. 9).</p> <div><p>Adjust the "BIAS-R" trim pot until the DMM indicates <math>+200 \pm 5\text{mV}</math> (See Fig. 11).</p></div> <p>Remove opaque material.</p> <div><p>Adjust the "GAIN-R" trim pot until the DMM indicates <math>0 \pm 5\text{mV}</math> (See Fig. 11).</p></div> <p>If you can not achieve <math>0 \pm 5\text{mV}</math> DC, then increase the intensity of the projector LEDs by adjusting the LED-R trim pot ⤴ clockwise until <math>0 \pm 5\text{mV}</math> is achieved and then recheck the sensor calibration.</p> <p>NOTE: If your web application has required that you increase the gap beyond the standard 1.95 [50 mm], then you may need to increase the intensity of the projector LEDs in order to achieve <math>0 \pm 5\text{mV}</math> DC.</p>	<div><div>⤴</div><p>Turn the "ALARM-R" trim pot fully counter clockwise. The right LED on AS10-D front panel that is labeled "Detector Dark" will turn "Off"</p></div> <div><div>⤴</div><p>Turn the "ALARM-R" trim pot clockwise until the LED comes "ON".</p></div> <div><div>⤴</div><p>Turn the "ALARM-R" trim pot counter clockwise slowly and stop when the LED goes out.</p></div> <p>To test the circuit, insert four or five sheets of clear film about 2 inches [50 mm] wide into the alarm sensor's light path (See Fig. 10). The right LED on AS10-D front panel that is labeled "Detector Dark" will turn "ON".</p>

## MAINTENANCE

### AS10-D Amplifier

The AS10-D Amplifier is shipped with two replacement AGC1, fast blowing, 250V, 1A fuses. The replacement fuses are located to the left of the main printed circuit board (See Fig.12).

### AWL280 Sensors

The sensor's detection sensitivity is reduced when paper dust or other material gathers on the lens of the AWL280 Sensor. The sensor alarm relay changes state and the LED on AS10-D front panel that is labeled "Detector Dark" will turn "ON". Gently wipe the dust from the surface of the lens and take care not to scratch the lens surface. See Figure 6 for wiring information. Refer to the *Calibration* section for setup.

### GC300 Web Guide Controller

Refer to the *GC300 Web Guide Controller* guide.

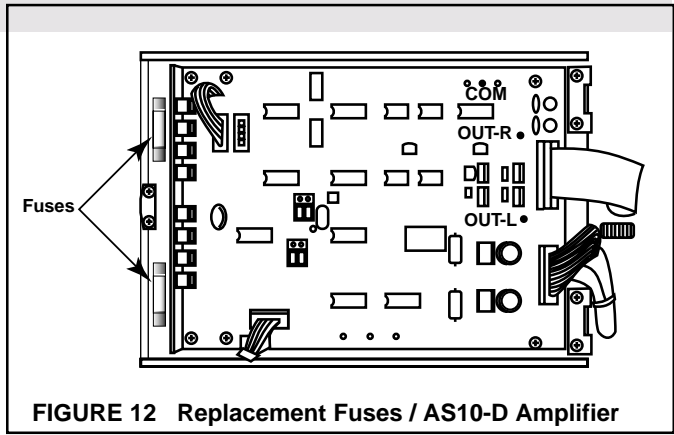


FIGURE 12 Replacement Fuses / AS10-D Amplifier

## REPLACEMENT PARTS

Detector Cable (AWL280) .....	3559
Projector Cable (AWL280) .....	3560
AWL280 Sensor .....	912662
AS10-D Amplifier .....	912721

## SPECIFICATIONS

Effective Sensing Length .....	11.02 in. [280 mm]
(Each Side)	
Sensor Gap .....	1.87 in. [50 mm]
Light Source .....	Pulsed LED
Wave Length .....	800 nm
Frequency Response .....	15 Hz
Linearity .....	± 1.5% F.S.
AS10-D Output Voltage .....	200m VDC ± 5mV
Power Supply .....	100,110, 120, 200, 220, 240 VAC 50/60 Hz
Power Consumption .....	15 VA
AWL 280 Sensor weight .....	11 lb. [5 Kg]
AS10-D Amplifier weight .....	6.5 lb. [3 Kg]
Warning Relay .....	220 VAC @2A, 24VDC@2A



## **WARRANTY**

Nexen Group, Inc. (Nexen) warrants its product(s) [the Product(s)] will be free from defects in materials and workmanship under normal use and service conditions for a period of 12 months from the date of shipment. NO OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE GIVEN, AND ALL SUCH OTHER WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.

### **Conditions**

This warranty applies only if: (a) the Product has been installed, used, and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused, or used for purposes other than those for which it was intended; and (d) the claimant has complied with the warranty claim procedures set out below in Warranty Claim Procedures.

### **Exclusive Remedy**

The sole and exclusive remedy for a breach of this warrant shall be, at Nexen's sole election, repair or replacement with new, serviceably used or reconditioned Product, or issuance of a credit in the amount of the current Nexen discounted price for the Product.

### **Limitation of Damages**

In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

### **Warranty Claim Procedures**

To make a claim under this warranty, the claimant must give written notice of the alleged defect to Nexen and deliver the Product to Nexen within one year of the date on which the alleged defect first became apparent.

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