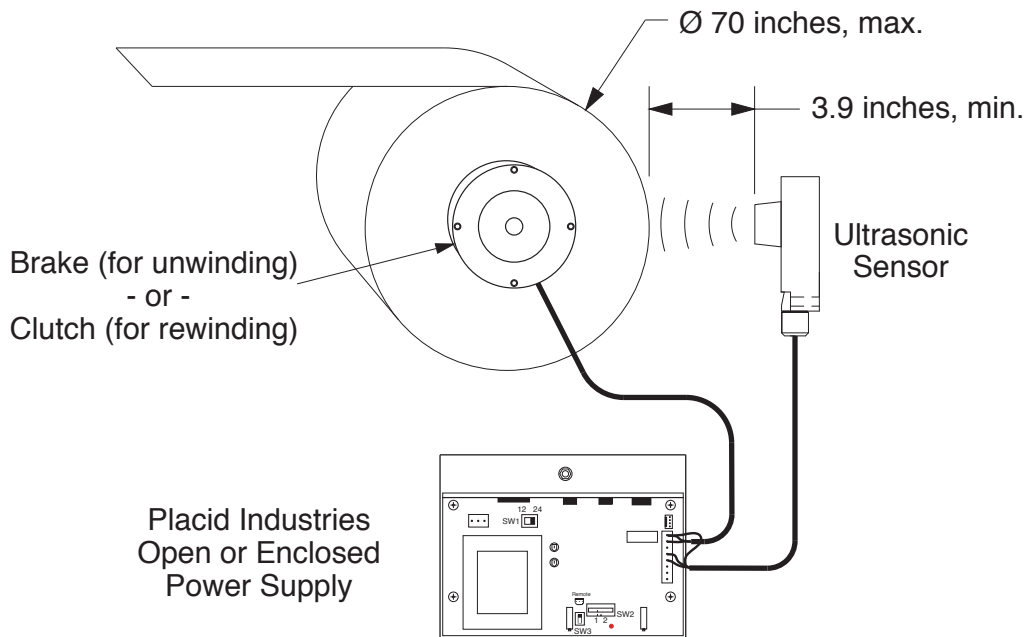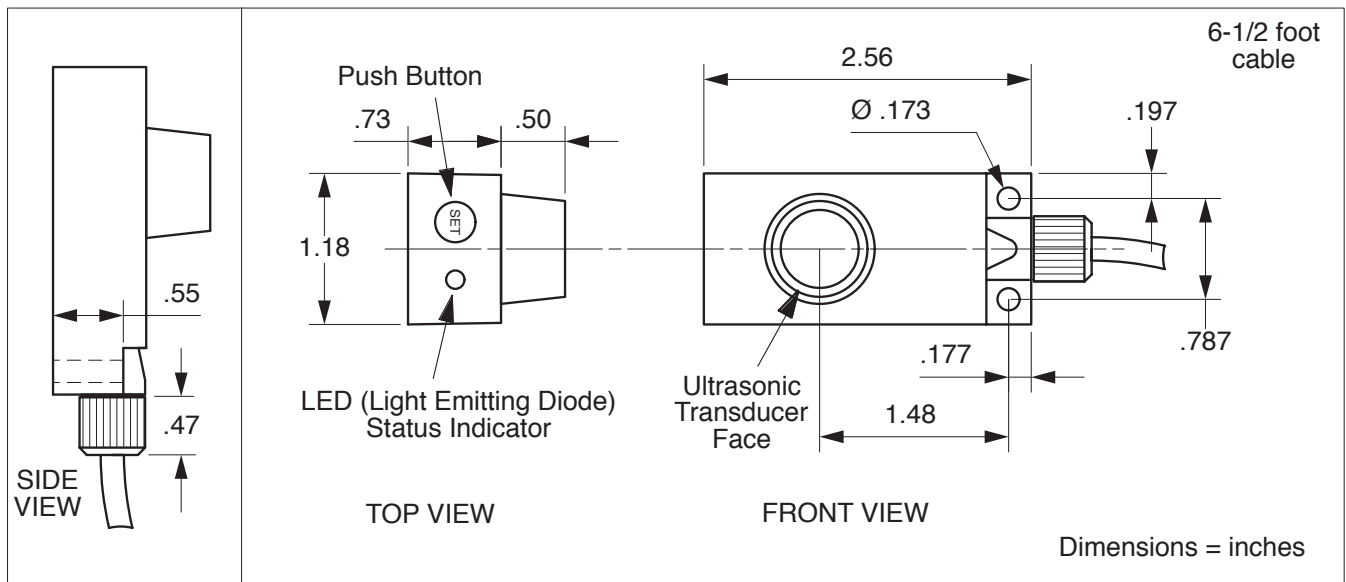# Ultrasonic Sensor U-B

MAINTAIN CONSTANT TENSION - The ultrasonic sensor is used to maintain constant tension when using a brake for producing unwind (payout) tension, or when using a clutch for rewind tension.
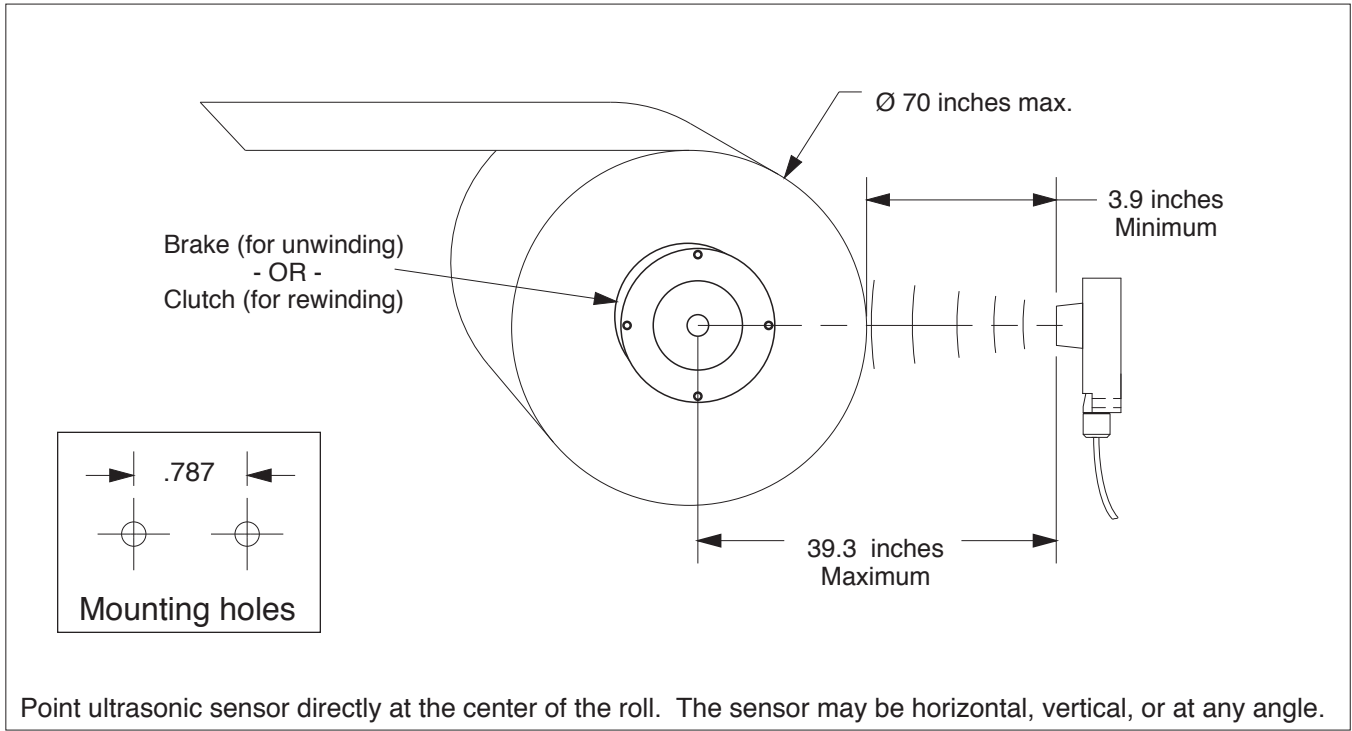
The sensor measures the diameter of the roll & sends a 0-10 VDC signal to the Placid power supply. Torque is automatically varied as roll size changes, to keep tension constant. The sensor measures distances by sending an ultrasonic pulse of sound, and then measuring the time for the return echo pulse.

Push Button
.73 .50
1.18
.55
.47
SIDE VIEW
LED (Light Emitting Diode) Status Indicator
TOP VIEW

2.56
Ø .173
.197
6-1/2 foot cable
Ultrasonic Transducer Face
.177
1.48
.787
FRONT VIEW
Dimensions = inches

Ø 70 inches, max.
3.9 inches, min.
Ultrasonic Sensor
Brake (for unwinding) - or - Clutch (for rewinding)
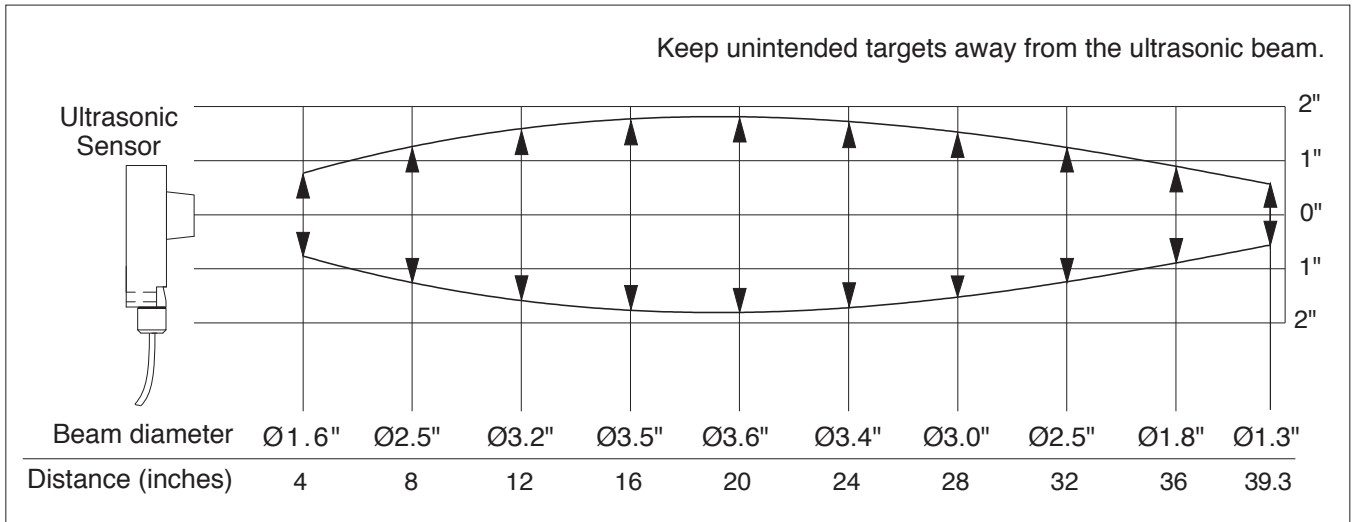Placid Industries Open or Enclosed Power Supply

Ultrasonic Sensor U-B

The ultrasonic sensor measures the distance to the roll with ultrasonic sound. The sensor sends out a pulse of ultrasonic sound, and then measures the time for the echo pulse to return, to determine distance.
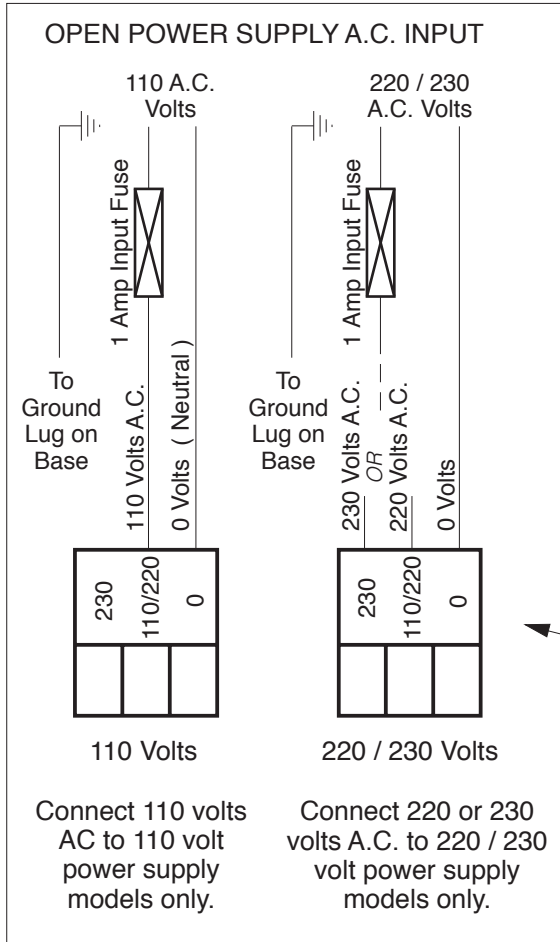
MOUNTING SENSOR

Ø 70 inches max.

Brake (for unwinding)
- OR -
Clutch (for rewinding)

3.9 inches Minimum

.787

Mounting holes

39.3 inches Maximum

Point ultrasonic sensor directly at the center of the roll. The sensor may be horizontal, vertical, or at any angle.

ULTRASONIC BEAM SIZE

Keep unintended targets away from the ultrasonic beam.

Ultrasonic Sensor

2"
1"
0"
1"
2"

Beam diameter	Ø1.6"	Ø2.5"	Ø3.2"	Ø3.5"	Ø3.6"	Ø3.4"	Ø3.0"	Ø2.5"	Ø1.8"	Ø1.3"
Distance (inches)	4	8	12	16	20	24	28	32	36	39.3

Ultrasonic Sensor U-B

OPEN POWER SUPPLY A.C. INPUT

110 A.C. Volts

220 / 230 A.C. Volts

1 Amp Input Fuse

To Ground Lug on Base

110 Volts A.C.

0 Volts (Neutral)

1 Amp Input Fuse

To Ground Lug on Base

230 Volts A.C.
OR
220 Volts A.C.

0 Volts

230	110/220	0

230	110/220	0

110 Volts

220 / 230 Volts

Connect 110 volts AC to 110 volt power supply models only.

Connect 220 or 230 volts A.C. to 220 / 230 volt power supply models only.

Unplug the top portion of input & output connector to attach wires.

ULTRASONIC SENSOR

Brake (or Clutch)

Ground Lug

AC Input

A.C. INPUT CONNECTOR

12   SW1   24

Remote

1 2   SW2

SW3

OUTPUT CONNECTOR

SPAN MAX. potentiometer (to vary tension)

Set to '2'

OPEN POWER SUPPLY

(optional) Remote SPAN MAX. potentiometer (to vary tension). (See separate instruction sheet.)

ULTRASONIC SENSOR

BROWN

BRAKE OR CLUTCH

AMMETER

(for set-up only)

BLACK

BLUE

CONTROL POT	CTRL INPUT		COIL OUTPUT	
	0v	0-10v	−	+

OPEN POWER SUPPLY OUTPUT CONNECTOR

ENCLOSED POWER SUPPLY WIRING

COIL OUTPUT (dc)			CONTROL INPUT		FOLLOWER POT			
+	−	⏚	0-10v	COM	+		−	
						GREEN		

BROWN

BLACK

BLUE

ULTRASONIC SENSOR

BRAKE OR CLUTCH

Ultrasonic Sensor U-B

WIRING A REMOTE TENSION ADJUSTMENT POTENTIOMETER TO AN OPEN POWER SUPPLY

> The web *tension* is varied by adjusting the on-circuit-board Span Max. potentiometer or by a remotely mounted Span Max. potentiometer on the operator's panel.

Open Power Supply, Top View
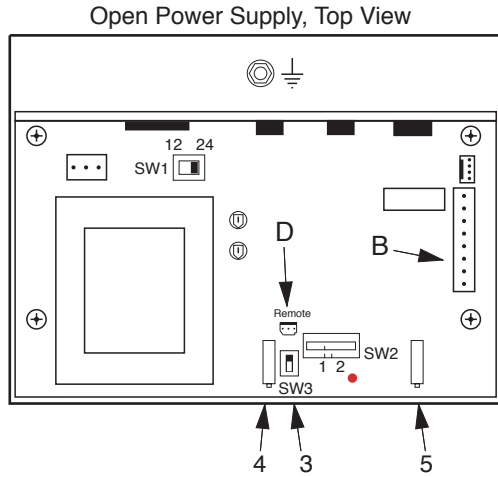
B. OUTPUT CONNECTOR
D. PLUG, 3 prong, - for a remote Span Max. Potentiometer, (for conveniently making tension adjustments when using the Follower Arm Potentiometer or Ultrasonic Sensor)
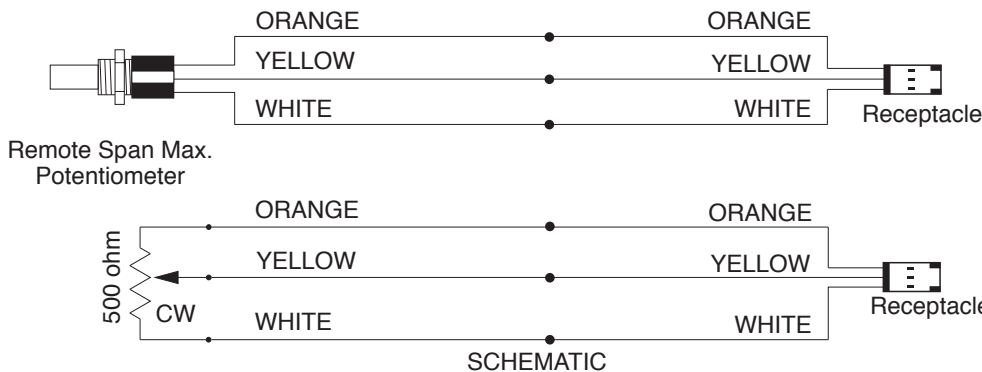
_____

3. SWITCH SW3 - to select either the on-circuit-board Span Max. pot. or remote Span Max. potentiometer
4. SPAN MAX. potentiometer - (for tension adjustments)
5. SPAN MIN. potentiometer - When using an ultrasonic sensor, set fully counter-clockwise, (10+ turns, until it clicks)

WIRING THE POTENTIOMETER FOR REMOTE TENSION ADJUSTMENTS

The web tension is varied by adjusting the on-circuit-board Span Max. Pot or by a remotely mounted Span Max pot on the operator's panel. Slide switch SW3 towards the 'Remote' plug, to select the remote pot.

The same 500 ohm potentiometer that is used as the % Rated Current Pot in Manual Mode, can be used as the remote Span Max. pot.
Disconnect the % Rated Current Pot from the Output Connector. Then connect the 3 wires from the pot to the 3 contact receptacle, as shown below. Plug the receptacle into 'D', marked 'Remote' on the power supply circuit board.


Connect the 3 contact receptacle, to 'D', (marked 'Remote') on power supply circuit board.

PLACID INDUSTRIES

Magnetic Particle Brakes & Clutches
Hysteresis Brakes & Controls

1580 Lake Street • Elmira, NY 14901 • USA
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Ultrasonic Sensor U-B

The ultrasonic sensor is programmed by pressing the 'SET' button, while viewing the LED Status Indicator'.

Push Button

LED Status Indicator

TOP VIEW

SET
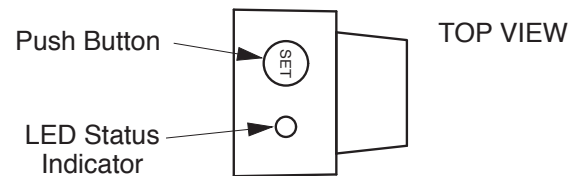
1) Set the ROLL CENTER

Remove the roll, and place an temporary target (a piece of cardboard works well), at the roll centerline, (or about 10% farther away from the sensor, to compensate for the non-linear torque curve of the brake or clutch).

Temporary Target
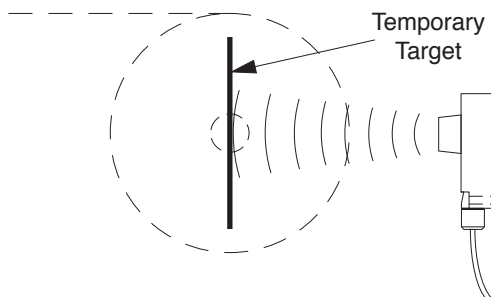
Unlock sensor
    Turn off the power supply for 5 seconds, then turn on again.   *Note: If the SET button is not pressed within 5 minutes, the sensor needs unlocking again.*

Prepare sensor for programming distances:
    Press and hold the 'SET' button for more than 2 seconds but less than 4 seconds, (until the 'LED Status Indicator' flashes alternately yellow and orange). Release the button, and the 'LED Status Indicator' flashes orange.

Set the Roll Center:
    With the temporary target in place, momentarily press the 'SET' button. Then the LED flashes yellow.

2) Set the FULL ROLL SIZE
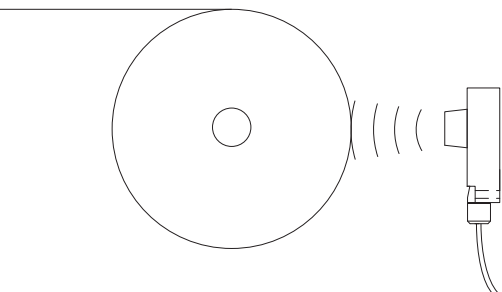
Mount the largest size roll to be used. For convenience, a temporary target may be used instead (a piece of cardboard works well).   Position the temporary target at the full roll diameter, or a little closer to the sensor, just in case some rolls are larger.
*Note: The sensor must be at least 3.9" from the roll.*

Momentarily press the 'SET' button. For 1 second, both the yellow and orange LED are on, then, just the yellow.

If difficulty occurs, or the sensor doesn't respond as expected, turn off the power supply for 5 seconds, and start over.

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Ultrasonic Sensor U-B

After set-up and programming, the 'LED Status Indicator' will be continuously glowing yellow, indicating a target is within range.

Push Button

LED Status Indicator

SET

TOP VIEW
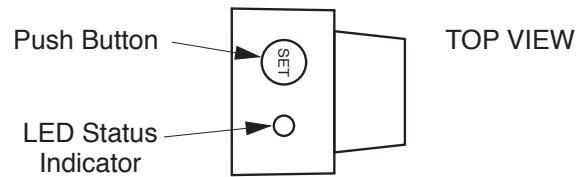
COMMON PROBLEMS

No audible 'buzzing' sounds from sensor
The power is not on, or is connected with reverse polarity. When power is correctly applied, the sensor emits an audible, low volume buzzing sound.

LED Status Indicator - Dark
The power is not on, or is connected with reverse polarity. *-or-*
The target is too close to the sensor, or the target is too far (either out of the programmed range, or out of the maximum possible range).

LED Status Indicator - Doesn't respond when pressing the SET button
The sensor is locked (to prevent accidental reprogramming). The sensor automatically locks if the SET button is not pressed within 5 minutes.
To unlock sensor - Turn off the power supply for 5 seconds, and turn on again.

LED Status Indicator - Flashing
The sensor is in the programming mode. Recheck programming procedure.

LED Status Indicator - Glowing Orange
The sensor detects an object, but is too close.

Output increases as roll diameter decreases
Set the roll center first. Then set the full roll size.

SPECIFICATIONS

Power Input	15-30 VDC @ 35 ma. max.
Range	3.9 - 39.3 inches (100-1000 mm)
Output	0 to 10 volts D.C. 20 mAmps max. Push-Button adjustable end points.
Resolution	0.012 inches (<0.3 mm)
Repeatability	0.02 inches (<0.5 mm)
Temperature	14 to 140 °F (-10 to +60 °C)
Protection class	IP67
Housing material	Polyester

TRANSDUCER

Type	Ultrasonic
Beam Shape	Conical
Beam Angle	10 degrees total

PRECAUTIONS

- Keep sensor away from sources of ultrasonic noise, such as pressurized air nozzles (air guns).

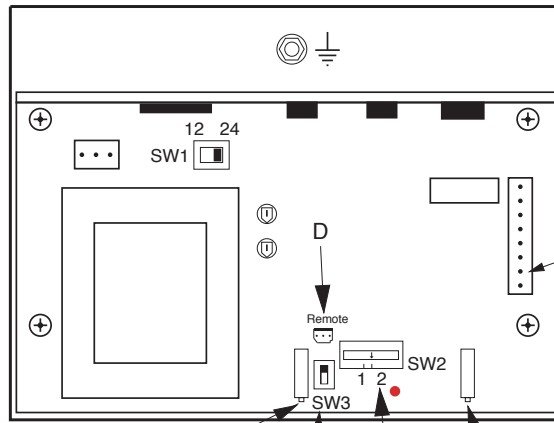- Keep unintended targets from the sensor's field of view. Keep the beam pattern in mind.

TEMPERATURE EFFECTS

At room temperature, a change of 10∞ will result in approximately 1% change (due to changes in the speed of sound).

Ultrasonic Sensor U-B

POWER SUPPLY ADJUSTMENTS

Open
Power Supply

12 24
SW1

D

Remote

1 2 SW2

SW3

Output
Connector

SPAN MIN. POTENTIOMETER -
Important - Set fully counter-clockwise
(15 turns total or until it clicks).

Set switch SW2
to Position 2

TENSION ADJUSTMENT POTENTIOMETER

Web tension is varied by either:

This circuit board mounted SPAN MAX.
potentiometer,   - or -

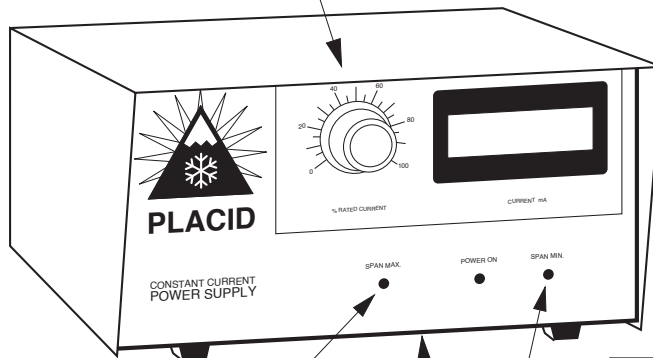a REMOTE SPAN MAX. potentiometer
(which connects at PLUG 'D'.)

SWITCH SW3 TO SELECT -

ON-CIRCUIT BOARD SPAN MAX POTENTIOMETER for tension adjustments:
Set SWITCH SW3 towards the edge of the circuit board.
- OR -
REMOTE SPAN MAX POTENTIOMETER for tension adjustments: Set SWITCH
SW3 towards the middle of the circuit board .
   Note: The Remote Span Max. potentiometer is plugged into 'D'.

Note: Percent Rated Current
Potentiometer has no effect.

Enclosed
Power Supply

40   60
20   80
0   100

% RATED CURRENT   CURRENT mA

PLACID

CONSTANT CURRENT
POWER SUPPLY

SPAN MAX.   POWER ON   SPAN MIN.

SPAN MIN. POTENTIOMETER -
Important - Set fully counter-clockwise
(15 turns total or until it clicks).

**TENSION ADJUSTMENT
POTENTIOMETER**
Web tension is varied by the circuit board
mounted SPAN MAX. potentiometer.

SWITCH (on underside of case)
Set to POSITION 1:
0-10v CONTROL OR
REMOTE FOLLOWER