

255-100

User Manual

255-100

Analog Output Evaporation Gauge



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Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

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1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **255-100 Analog Output Evaporation Gauge** is designed to accurately measure water level in an evaporation pan. As water evaporates from the pan or precipitation fills the pan, a float mechanism turns a precision potentiometer which can be monitored by a data logger to record the change.

The range of the potentiometer is zero to 1000 ohms. The potentiometer requires a regulated excitation voltage, typically 5 Vdc. The output signal is wired to produce a decreasing voltage as the water level decreases. The effective range is 0 to 9.444 inches (0-239.9 mm) of water.

The **255-100C-4N 4-20 mA Current Loop Signal Converter** (sold separately) can be used in situations where a long cable run would otherwise introduce error in the resistance measurement. The signal converter is housed in a NEMA enclosure and can be pole mounted or strapped to the body of the evaporation gauge.

The evaporation gauge is designed to mount beside a Class A National Weather Service Evaporation Pan (NovaLynx 255-200). The gauge is coupled to the pan by a stainless steel tube, so that the water level in the pan is equal to the level in the base of the gauge. This arrangement reduces the influence of the gauge on the evaporation pan, and provides a stilling well for the float mechanism.

Note: All water must be removed from the evaporation gauge in freezing weather to prevent damage caused by expanding ice.

Accessories such as plumbing, automatic refill timers, and dedicated loggers are available for a complete monitoring system.

255-200	Class A Stainless Steel Evaporation Pan
255-100P/F-S	Stainless steel pipe and fittings, 6"
255-100P/F	Stainless steel pipe and fittings, 72"
255-620-A	Automatic Refill System
255-100C-4N	Signal Conditioning, 4-20mA with enclosure
255-704-B	Evaporation Logger
255-100-B	Evaporation Gauge Tester, inches
255-100M-B	Evaporation Gauge Tester, millimeters

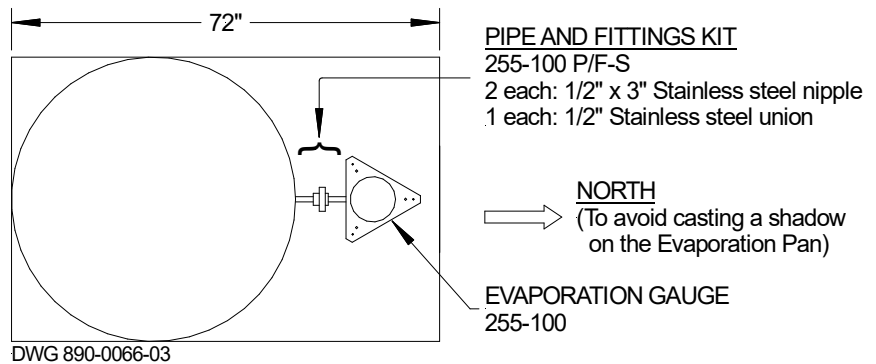
3 SPECIFICATIONS

Potentiometer Specification	
Linearity	± 0.25% (10°-160°), ± 1% (0°-10°, 160°-340°)
Rotation	360° continuous
Electrical angle	340° ± 1°
Resistance	1,000 ohms ± 10%
Wiper Contact Current	10 mA max
Potentiometer operating temperature range	-40° to +140° F (-40° to +60°C) <i>See note below.</i>
Mechanical range	0 to 10 inches (0-254 mm)
Electrical range	0 to 9.444 inches (0-239.9 mm)
General	
Water inlet port	1/2" NPT female coupler
Cable	50' (15 m) 24 AWG, 3 conductor, shielded
Body dimensions	8" Dia x 27.5" Tall (20 cm Dia x 70 cm Tall)
Base dimension	16" (41 cm) Triangle, with levelling bolts
Weight	7.5 lbs (3.4 kg)
Shipping Weight	15 lbs (6.8 kg)

4 SITE SELECTION

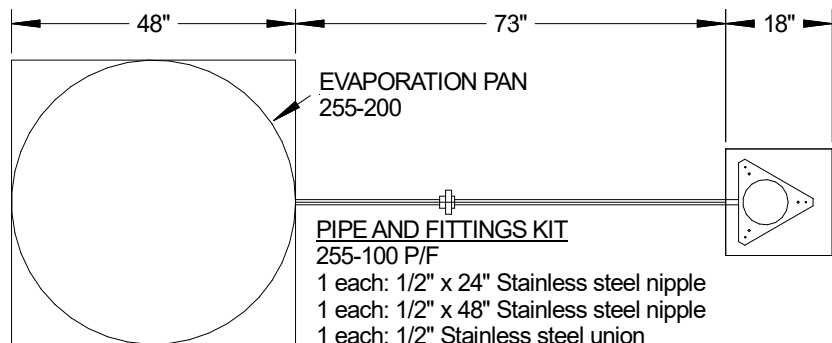
Please refer to the **255-200 Evaporation Pan and Accessories User Manual** for complete instructions on installing your evaporation pan. The manual includes a reference design for the pan support platform. The platform is made of pressure treated wood and provides an air gap under the pan.

When using the short pipe fittings kit, the platform can be extended for mounting the Evaporation Gauge. Make sure the Gauge does not cast a shadow on the water in the pan.



If the long pipe fittings kit is used, the Evaporation Gauge should be mounted on a separate platform.

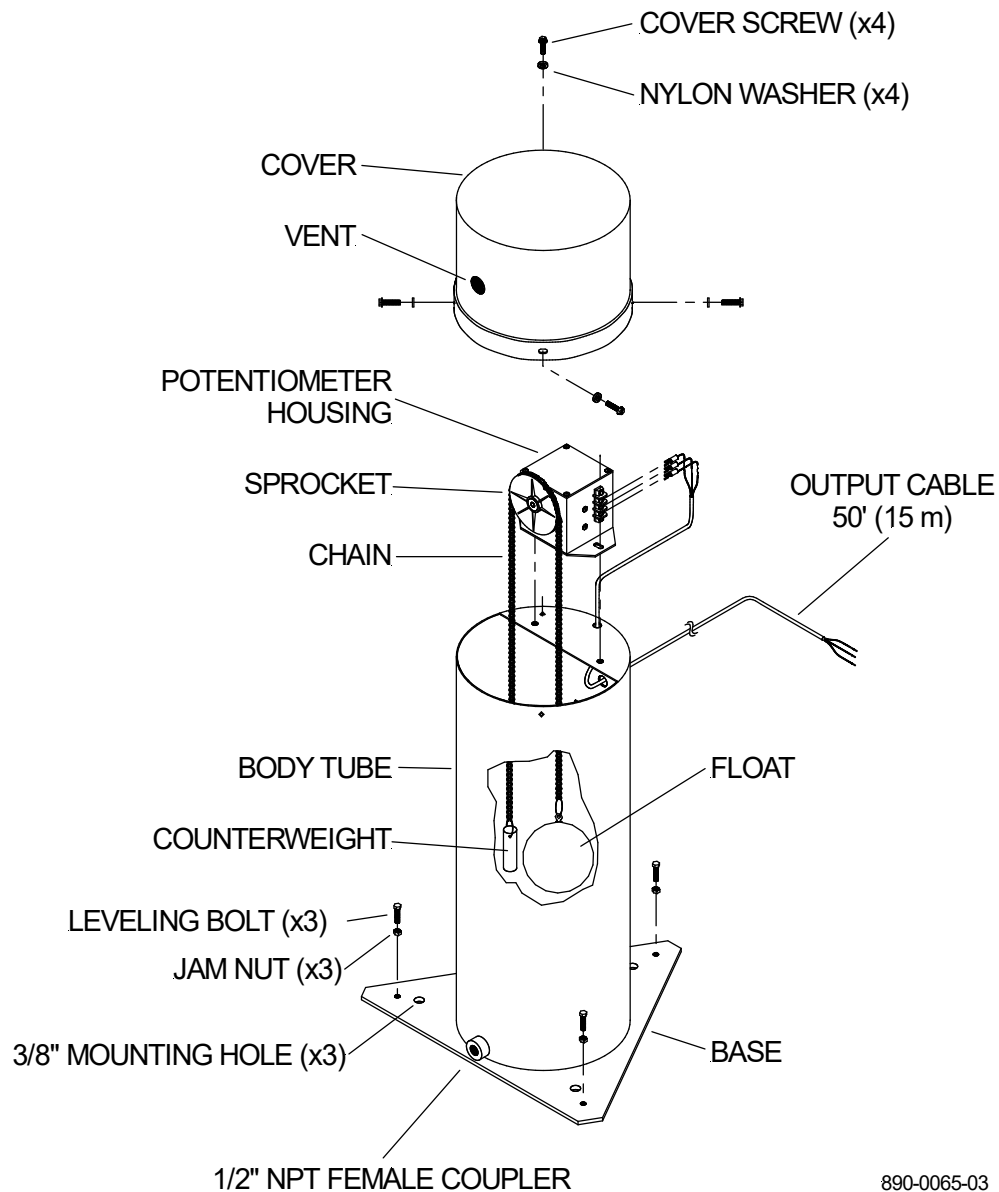
(Measurements are approximate)



5 UNPACKING

Remove the evaporation gauge from the shipping carton and set it on its base. Remove the four cover screws and washers, then lift off the cover. Carefully remove the packing material that is inside the body, taking care not to strike the sprocket as that could damage the potentiometer. Do not attempt to remove the float. Hang the counterweight over the edge outside the body until later assembly.

6 COMPONENTS



7 INSTALLATION

Place the evaporation gauge on your platform with the water inlet coupler facing the evaporation pan. Use a generous amount of plumber's joint compound or Teflon tape to prepare the threads on the pipe fittings. Assemble the pipe fittings, and tighten all joints except the large nut on the union.

There are three leveling bolts on the triangular base of the evaporation gauge. Loosen the jam nuts, then turn the leveling screws until the body of the gauge is vertical (check using a carpenter's level). Tighten the jam nuts.

The 3/8" hole next to each leveling bolt is provided to secure the gauge to the mounting platform. If the platform is wood, use three lag screws (not provided) to secure the base to the platform. If the platform is concrete, either embed j-bolts when pouring the concrete, or drill holes for suitable anchor bolts. It is important to secure the gauge to prevent wind gusts from tipping it over.

After the evaporation gauge is leveled and secured, tighten the large nut on the union fitting to complete installation of the connecting pipe. After the pan is filled with water, check each fitting for leaks.

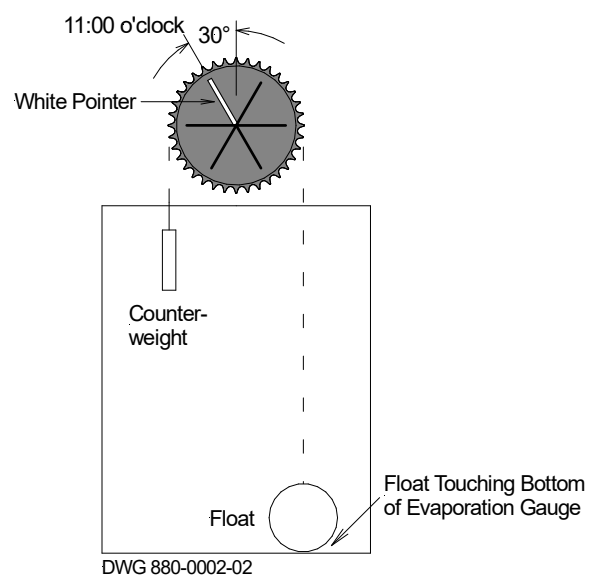
NOTE: Please do not install the analog output gauge inside the evaporation pan. Doing so can lead to corrosion of the base of the gauge due to contact of dissimilar metals.

8 CHAIN ADJUSTMENT

The 255-100 Evaporation Gauge measures water level in the evaporation pan by means of a float and chain that turns a precision potentiometer housed at the top of the gauge. The sprocket and chain must be synchronized so that the full range of the potentiometer is utilized without entering the electrical dead band of the potentiometer.

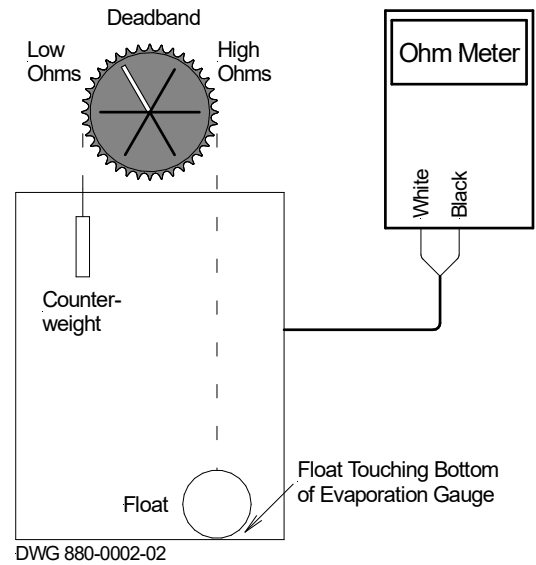
8.1 Chain Installation Using the Pointer

1. Make sure the gauge is empty of water.
2. Turn the sprocket until the white pointer is at the 11:00 o'clock position (30 degrees to left).
3. Lift the chain until all the slack is taken up, but the float is still resting on the bottom of the gauge. Drape the chain over the sprocket so that the float is on the right and the counterweight is on the left.



8.2 Chain Adjustment Using an Ohm Meter

1. Make sure the gauge is empty of water.
2. Set your meter to read 1000 ohms. Connect the meter to the white and black wires.
3. Turn the sprocket until the meter reads 40 to 80 ohms.
4. Lift the chain until all the slack is taken up, but the float is still resting on the bottom of the gauge. Drape the chain over the sprocket so that the float is on the right and the counterweight is on the left.
5. Check the meter to ensure the reading is between 40 to 80 ohms when the float is resting on the bottom of the gauge. If not, lift the chain and rotate the sprocket by one or two teeth.



9 CONNECTIONS

CAUTION: Disconnect power to your monitoring equipment while connecting the evaporation gauge. The resistance through the potentiometer can be very low at one end. If power is applied and the white signal wire accidentally shorts to ground, a high current could flow damaging the potentiometer and possibly the logger.

The evaporation gauge is supplied with 50' of 3-conductor cable. The cable may be extended, but resistance in the cable will affect the readings unless calibrated out.

Red	Power Input	Regulated voltage (2.5Vdc or 5Vdc typical)
White	Evaporation Signal	Ratiometric voltage output
Black	Ground	Analog ground

10 CALIBRATION

The 255-100 Analog Output Evaporation gauge provides a linear resistance output proportional to water level in the evaporation pan. Monitoring instruments usually have a regulated voltage output that can be used as the excitation for the potentiometer, so that the signal on the white output wire will be a voltage proportional to the position of the potentiometer. *Note: If the **255-100C-4N 4-20 mA Current Loop Signal Converter** is connected, the output will be a current proportional to the position of the potentiometer, with a 4mA offset.*

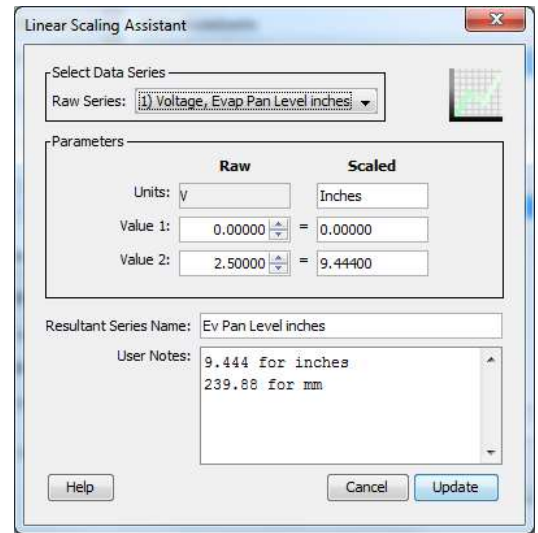
10.1 Theoretical Calibration

The monitoring instrument (logger, display, etc.) can be calibrated from the evaporation gauge specifications, although doing a field calibration may be more accurate.

One full rotation of the sprocket represents 10 inches (254mm) of vertical movement of the float. However, the potentiometer has a 20 degree dead band. We can calculate the linear span of the potentiometer as $10.000'' \times 340/360 = 9.444''$ (239.88mm).

10.1.1 Two Point Calibration

Some loggers can be calibrated by entering two points. For example, the NovaLynx **255-704B Evaporation Logger** is easily configured by entering the values at zero and at full scale, where the excitation voltage output by the logger is 2.5 volts. In this example, 0 to 2.5 Volts = 0 to 9.444 inches.



255-704B Evaporation Logger Calibration

The calibration given above does not take into account the amount of water it takes to lift the float off the bottom of the gauge. Since evaporation is the DIFFERENCE between readings taken (typically once every 24 hours), it isn't necessary to adjust the offset. However, to match the readings to the actual water level, one can add the offset to each scaled measurement in the Linear Scaling Assistant.*

	Raw	Scaled	
Units:	Volts	Inches	
Value 1:	0.00000	1.70000	(1.7" offset added)
Value 2:	2.50000	11.14400	(1.7" offset added)

10.1.2 Slope and Offset Calibration

The NovaLynx **110-WS-25DL** is an example of a logger that is programmed by entering slope(m) and offset(b) calibration parameters. The excitation voltage from the 110-WS-25DL is 5 volts (regulated).

Offset(b) = **0.0** (note below)*

Slope(m) calculation

- Calibration in inches: slope(m) = 9.444 / 5 volts = **1.8888**
- Calibration in millimeters: slope(m) = 239.9 / 5 volts = **47.976**

* The amount of water required to lift the float is about 1.7 inches (varies from unit to unit). To find the actual offset for a particular unit you would need to measure the water level at one point and subtract the logger's reading at that level.

10.1.3 255-100C-4N Current Loop Calibration

Theoretical calibration for the **255-100C-4N 4-20 mA Current Loop Signal Converter**, which is an accessory for the 255-100 Analog Output Evaporation Gauge, is simplified by the fact it is scaled to one full revolution of the sprocket, which equals 10 inches of vertical movement of the float. Therefore 4mA = zero inches, and 20mA = 10 inches of water.

Calibration in inches

- Slope(m) = 10.00 / 16mA = **0.625**
- Offset(b) = $-1 * (0.625 * 4mA) = - 2.50$

Calibration in millimeters:

- Slope(m) = 254.0 / 16mA = **15.875**
- Offset(b) = $-1 * (15.875 * 4mA) = - 63.5$

10.2 Field Calibration

Each new evaporation gauge should be field calibrated with the device (logger) that will take the measurements. Refer to the device's instruction manual for information on connecting and calibrating an input channel.

This procedure will require two measurements of the water level in the evaporation pan. The more accurate the measurements, the better the calibration. The level can be checked with a tape measure, ruler, or hook gauge. Another method is to add known amounts of water to the evaporation pan.

10.2.1 Two Point Field Calibration

The following example relates to the NovaLynx 255-704-B Evaporation Logger. Other loggers may require a different technique to obtain the values needed for calibration.

Connect a computer to the NovaLynx 255-704-B logger, run HOBOWare, then open the Status window. In the Current Readings section, set the Screen Refresh Interval to 1 second.

Current Readings

Screen Refresh Interval: 1 sec

Number	Measurement	Value	Units	Label
1	Voltage	0.16800	V	Evap Pan Level inches
2	Temperature	218.894	°F	Air Temperature
3	Temperature	216.837	°F	Water Temperature
4	Temperature	213.327	°F	
5	Ev Pan Level inches	2.30108	Inches	
6	Logger's Battery Voltage	2.87	V	

Use the calibration chart below to record your measurements:

	Raw	Scaled
Units:	Volts	inch / mm
Value 1:		
Value 2:		

1. **Value 1:**

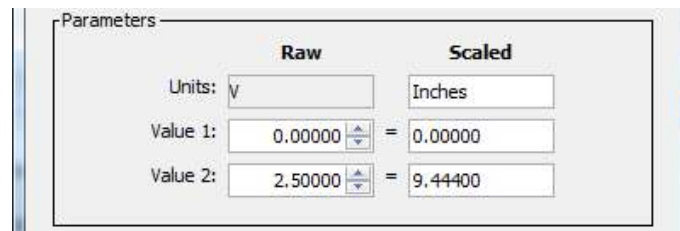
- a. Fill the evaporation pan with approximately 5 inches of water. Allow the water to settle.
- b. Observe the Number 1 Voltage measurement shown in the Current Readings window. Record the voltage.
- c. As accurately as possible, measure the depth of water in the pan. Record the level.

2. **Value 2:**

- a. Add water to the evaporation pan until the water is approximately 8 inches deep. Allow the water to settle.
- b. Record the Number 1 Voltage measurement.
- c. Measure the water depth and record.

3. Close the Status window.

4. Open the Launch Logger window and navigate to the Linear Scaling Assistant window. Enter your measurements in place of the generic parameters.



5. Click "Update" to save your measurements.

6. Return to the Status screen and compare the calibrated result (Number 5 Ev Pan Level) with the Value 2 depth measurement. They should be very close, provided the water level has not changed.

10.2.2 Slope and Offset Field Calibration

1. Connect the evaporation gauge to your device (Section 9).
2. Program the input channel of the logger with slope(m) = 1 and offset(b) = 0.
3. Use the calibration chart below to record your measurements:

	Logger (x-values)	Measured (y-values)
Units	Raw	inch or mm
Value 1		
Value 2		

Value 1:

- a. Fill the evaporation pan with approximately 5 inches of water. Allow the water to settle.
- b. Obtain the raw measurement from the logger and record it.
- c. As accurately as possible, measure the depth of water in the pan. Record the level.

Value 2:

- a. Add water to the evaporation pan until the level is approximately 8 inches. Allow the water to settle.
- b. Obtain the raw measurement from the logger and record it.
- c. Measure the water depth and record.

4. Calculate the Slope(m) and Offset(b) values that will calibrate your logger. Excel formulas are shown in case you want to create your own spreadsheet.

Spreadsheet for Calculating Slope and Offset

	A	B	C
1		Logger (x-values)	Scaled (y-values)
2	Units	Raw	inch or mm
3	Low Water Level Values	1.843	5.000
4	High Water Level Values	3.483	8.000
5			
6			Excel Formulas
7	Slope(m)	1.829	=SLOPE(C3:C4,B3:B4)
8	Offset(b)	1.629	=INTERCEPT(C3:C4,B3:B4)

5. The slope and offset can be found using a calculator and these formulas:

Formulas for Calculating Slope and Offset

Slope(m) = $(y_2 - y_1)/(x_2 - x_1)$ Example: $(8.000 - 5.000) / (3.483 - 1.843) = 1.829$ inch/volt

Offset(b) = $y_1 - (m * x_1)$ Example: $5.000 - (1.829 * 1.843) = 1.629$ inch

6. Program your logger using the calculated slope and offset. Take a reading from the logger and compare it to the water depth in the pan.

11 OPERATION

The evaporation gauge is designed to run unattended once properly installed and calibrated. However, the water level in the pan evaporates, so obviously the pan will need to be refilled periodically, and if the gauge is connected to a logger, the data will need to be downloaded. Visits to the site can be reduced if an Automatic Refill System is included (NovaLynx 255-620-A).

Evaporated water must be replaced. Ideally, the water level should be maintained from 7 to 8 inches deep (175 to 200 mm) in the evaporation pan. In practice, keeping the level between 5 and 8 inches deep (125 to 200 mm) is adequate. Do not overfill because the potentiometer may enter the dead band where the readings would be "floating", resulting in meaningless data.

12 MAINTENANCE

Note: All water must be removed from the evaporation gauge in freezing weather to prevent damage caused by expanding ice.

Maintenance of the system will include keeping debris from accumulating in the pan. Remove any trash and dirt from the pan. Make sure weeds do not grow up and shade the pan. If algae is a problem, consider adding a small amount of algaecide (spa chemicals) if it is certain that animals will not be injured. Copper sulfate can be used as an algaecide where allowed by law.

12.1 Start of Season Inspection

At the beginning of a monitoring season, inspect the following parts of your evaporation gauge:

1. Remove the cover of the gauge and clear out any insects that may be nesting inside.
2. Clean out any debris that may have accumulated in the bottom. It may be necessary to flush out sediment.
3. Ensure the tube that connects to the evaporation pan is clear of debris.
4. Make a mark on the chain and the sprocket for reference later. Lift the chain off of the sprocket and hang the counterweight over the edge of the evaporation gauge.
5. Turn the sprocket slowly by hand to "feel" for any mechanical resistance or lack of smooth operation. The sprocket should spin freely when given a small push. If the sprocket binds it may be nearing end-of-life. The entire sprocket/potentiometer/housing is replaceable (NovaLynx 255-100PHA-1).
6. Perform a Calibration Checkup if needed (Appendix C).
7. Install the chain on the sprocket using your reference marks to position it on the same sprocket teeth as before.
8. Observe the position of the float. It should float near the center of the body tube. If it is contacting the sides then the evaporation gauge may need to be re-leveled.
9. Inspect the output cable. Repair or replace if needed.
10. Check for leaks in the plumbing and around the pan.

12.2 Preparation for Winter

Note: All water must be removed from the evaporation gauge in freezing weather to prevent damage caused by expanding ice.

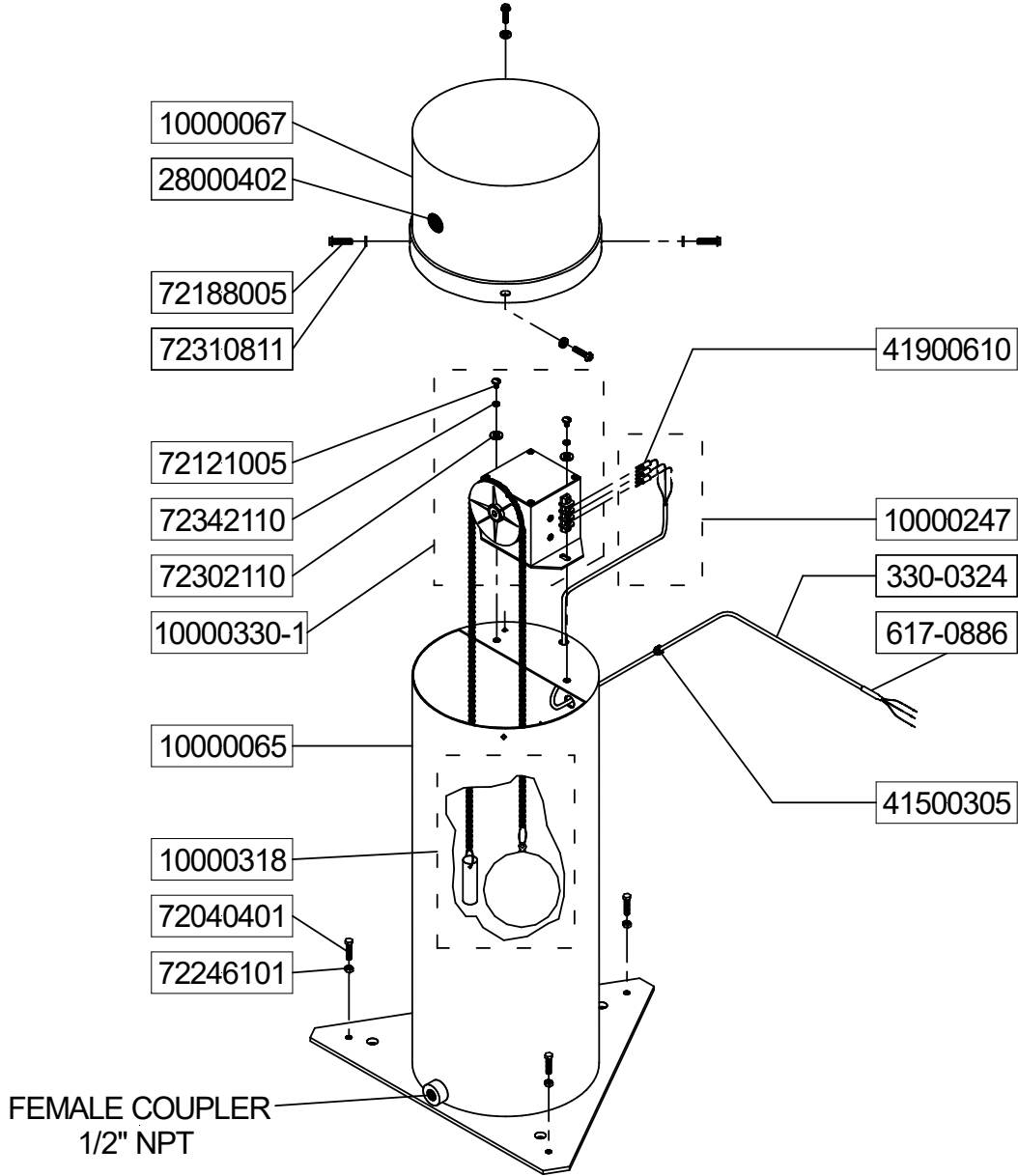
1. Siphon all of the water out of the evaporation pan.
2. Loosen the union fitting that connects the evaporation pan to the evaporation gauge and allow the remaining water to drain.
3. Remove the pipe that connects to the evaporation pan. Bail out the remaining water (do not attempt to lift the pan when there is any significant amount of water in it). Flush out any debris. Consider moving the pan indoors for winter storage.
4. If the pan must be left outdoors, the best solution is to turn it bottom side up and tie it down securely. This will prevent rainwater from accumulating in it, and also prevent wind from blowing it off of the platform.
5. Drain any remaining water from the evaporation gauge and flush out any debris. Don't spray water directly on the potentiometer housing.
6. Before moving the gauge, first lift the chain off of the sprocket. After moving the unit indoors for winter storage, leave the cover off until the interior has dried.

APPENDIX A PARTS LIST

255-100 EVAPORATION GAUGE

QTY	PART #	DESCRIPTION
1	255-100POT	POTENTIOMETER FOR EVAP GAUGE
50	330-0324	CABLE 3C 24 AWG SHIELDED
1	617-0886	SHRINK TUBE EPS200 3/16 B DUAL WALL 3/16" 3:1,W3B2S
1	10000065	EVAP GAUGE BASE (ALUMINUM)
1	10000067	EVAP GAUGE COVER
1	10000247	CABLE ASSY FOR EVAP GAUGE 50' LENGTH BELDEN #9533
1	10000312-1	POT HOUSING EVAP GAUGE
1	10000313	POT HOUSING LID
1	10000317	POT HOUSING BASE PLATE
1	10000318	FLOAT ASSY W/CHAIN & WEIGHT
1	10000330-1	POT HOUSING ASSY INCLUDES POTENTIOMETER
1	10000337	GEAR, SPROCKET CHAIN 255-100
1	16000303	4" POLYSTYRENE FLOAT, 10-32" STD THREAD, SAND-WEIGHTED
1	21050503	BARRIER TERM BLOCK 3-POSITION FEEDTHROUGH
2	28000402	LOCKING VENT PLUG .875 BLACK
1	41500305	STRAIN RELIEF .500 STRAIGHT FOR ROUND CABLE
3	41900610	FLANGED SPADE TERM RED #6
1	71305005	EYEBOLT 5/32" WIRE DIA 304SS
1	71305106-1	CLEVIS PIN 5/8X2-1/4 SS COUNTERWEIGHT 4-OZ
2	71305107-1	COTTER RING SS
3	71305108	EVAP GAUGE CHAIN SS PER FOOT FOR 10000318 ASSY
3	72040401	SCREW 1/4-20X1-1/2 HEXTAP FULLY THREADED
4	72060703	SCREW 6-32X3/8 FLAT SOC SS
2	72082007	SCREW 6-32X5/8 PAN PH SS
4	72082500	SCREW 6-32X7/16 BTN SOC SS
1	72111002	SET SCREW 10-24X3/8 HEX SS
2	72121005	SCREW 10-32X1/2 PAN CMB SS
4	72188005	SCREW 10-32X1/2 HXWSH SL SS
3	72246101	NUT 1/4-20 SS
2	72302110	WASHER #10 FLAT SS
4	72310811	WASHER #10 RETAINING NYLON
2	72342110	LOCK WASHER #10 SS

ANALOG OUTPUT EVAPORATION GAUGE PN 255-100



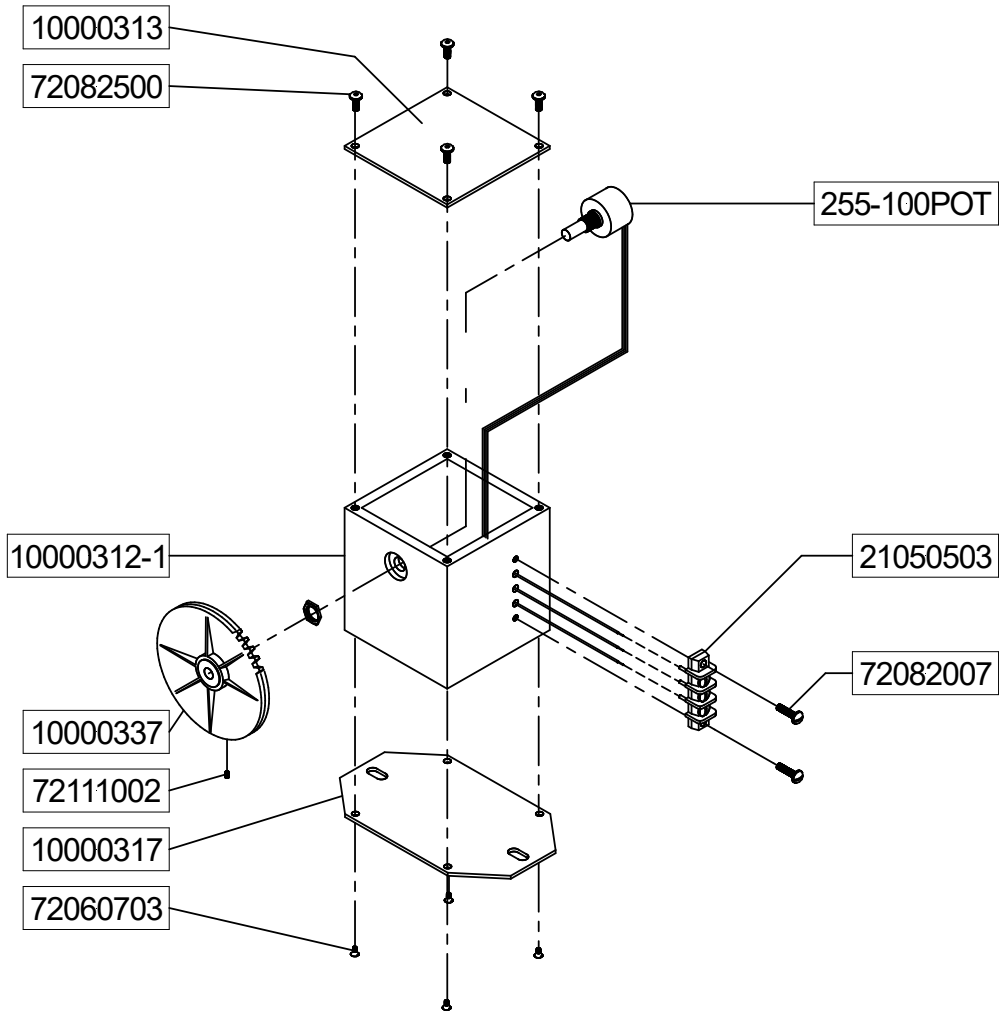
FEMALE COUPLER
1/2" NPT

REF: 255-100 / EVAPORATION GAUGE
 10000247 / CABLE ASSY FOR EVAP GAUGE
 10000318 / FLOAT ASSY W/ CHAIN & WEIGHT
 10000330-1 / POT HOUSING ASSY

NOVALYNX CORPORATION		A
TITLE FINAL ASSY, EVAP GAUGE PN 255-100		
MOD. USAGE	255-100	SHEET 1 OF 1
BY	JDC	SCALE DWG. NO.
DATE	9-22-2021	N/A 800-0139-02

EVAPORATION GAUGE POT HOUSING ASSEMBLY

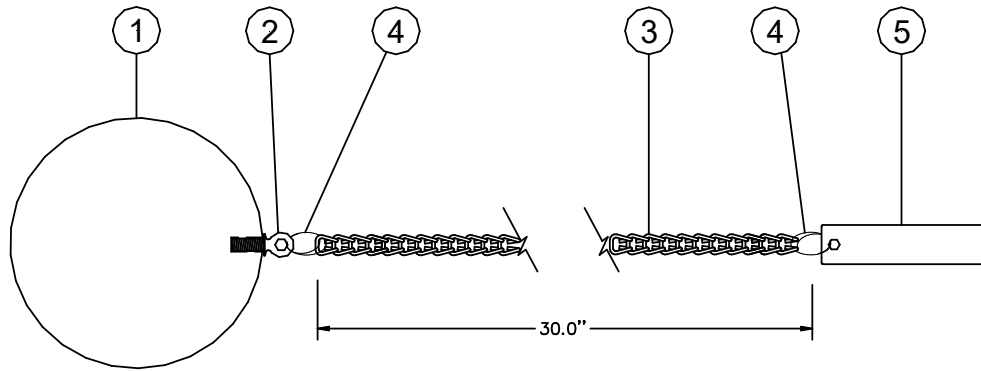
PN 10000330-1



NOVALYNX <small>CORPORATION</small>		A
TITLE ASSY, EVAP GAUGE POT HOUSING, PN 10000330-1		
MOD. USAGE	255-100	SHEET 1 OF 1
BY	JDC	SCALE DWG. NO.
DATE	9-22-2021	1:4 800-0138-02

FLOAT ASSEMBLY WITH CHAIN & WEIGHT

PN 1000318



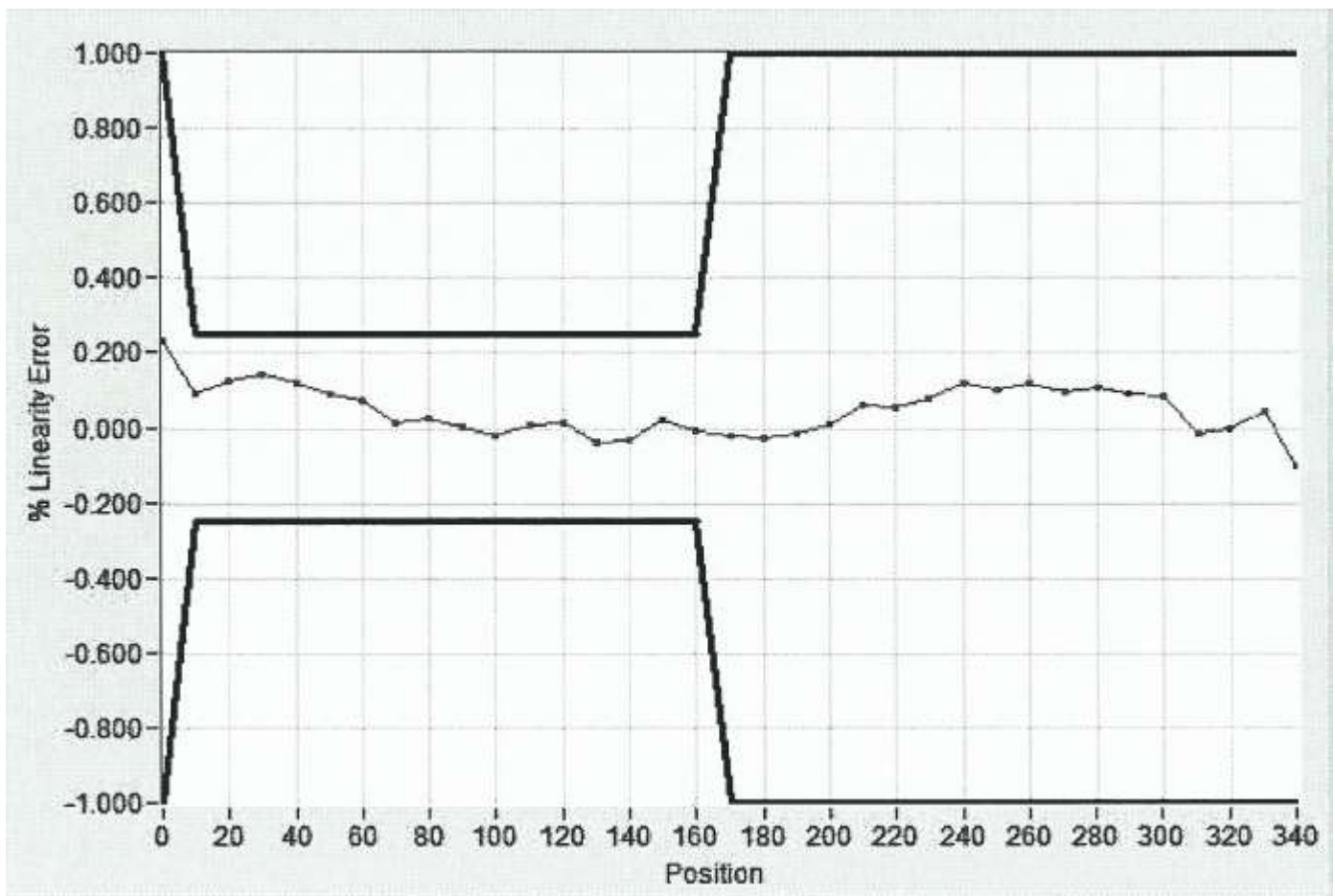
PARTS LIST		
1	16000303	4" POLYSTYRENE FLOAT
2	71305005	EYEBOLT
3	71305108	CHAIN
4	71305107-1	COTTER RING
5	71305106-1	CLEVIS PIN

		A
TITLE ASSY, EVAP FLOAT & CHAIN PN 1000318		
MOD. USAGE	255-100	SHEET 1 OF 1
BY	JDC	SCALE DWG. NO.
DATE	9-22-2021	1:2.5 800-0137-02

APPENDIX B POTENTIOMETER LINEARITY

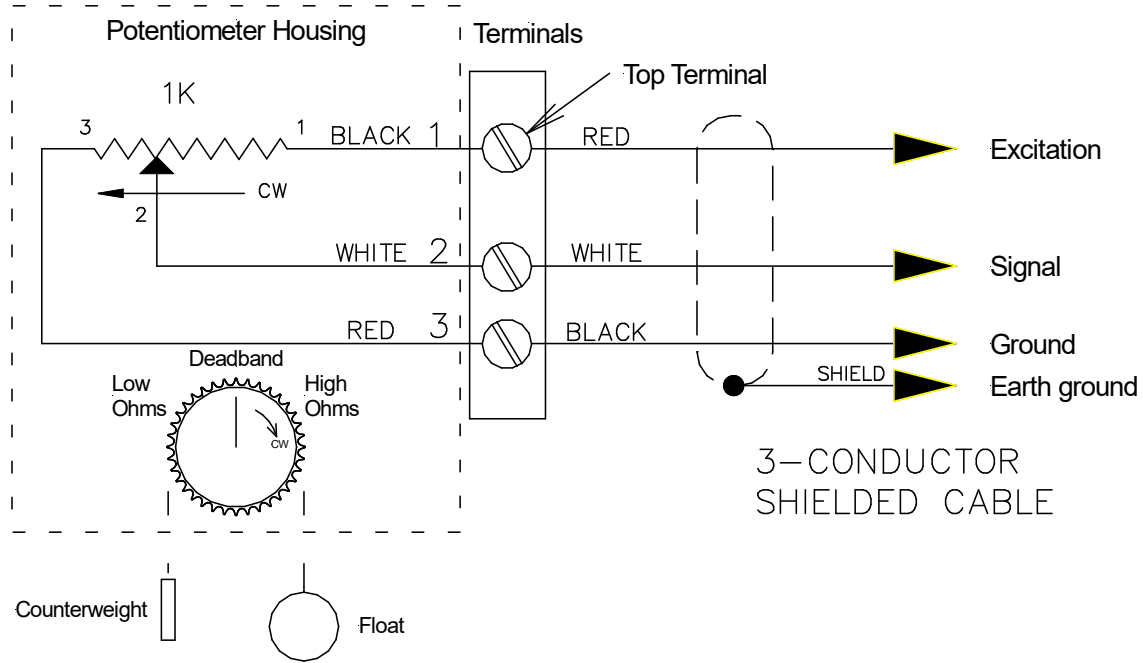
LINEARITY TABLE				
ANGLE (°)		LINEARITY TOLERANCE (%)	RANGE (inches)	RANGE (mm)
FROM	TO			
0	10	± 1%	± 0.094	±2.4
10	160	± 0.25%	± 0.024	±0.60
160	340	± 1%	± 0.094	±2.4

Typical Linearity Plot (individual units vary)



APPENDIX C WIRE DIAGRAM

**255-100 ANALOG OUTPUT EVAPORATION GAUGE
(Gear directly connected to the potentiometer)**



1. Place float on the right, counterweight on the left as shown.
2. As the water level decreases, the float lowers and the gear turns clockwise.
3. The output voltage on the Signal wire will decrease as the water evaporates.

REF: 10000246

		A
TITLE SCHEMATIC, EVAP GAUGE 255-100 POTENTIOMETER		
MOD. USAGE	255-100	SHEET 1 OF 1
BY	JDC	SCALE DWG. NO. 1:1 880-0001-01
DATE	5-18-2020	

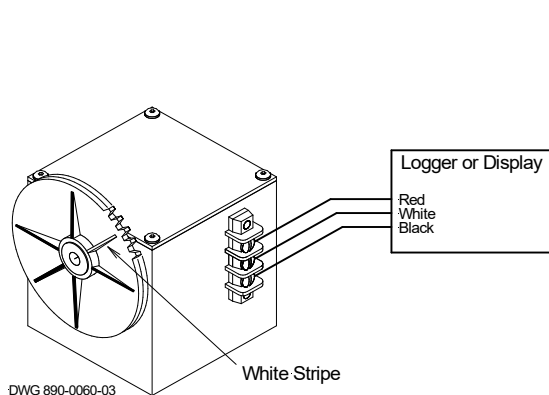
APPENDIX D Calibration Checkup

This procedure is intended to field-check the accuracy of an automated evaporation pan monitoring system. The 255-100 Analog Output Evaporation Gauge should be connected to a logger or display that is calibrated to read out in inches or millimeters. It may be necessary to connect a laptop computer to display real-time readings.

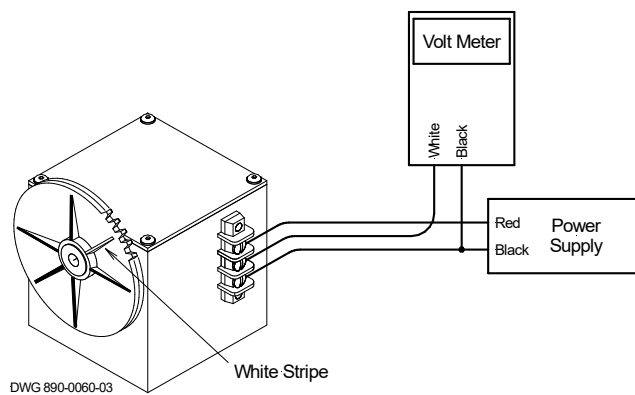
The evaporation gauge accuracy can be checked independently of a monitoring system by means of a quality voltmeter and variable output regulated power supply. We will refer to the logger, display or voltmeter as the DISPLAY for clarity.

Disassembly

1. Remove the four screws holding the evaporation gauge cover and lift the cover off.
2. Remove the float chain from the sprocket by lifting the counterweight. Drape the counterweight and chain over the outside of the gauge. Do not attempt to remove the float.
3. Rotate the sprocket by hand to verify that it turns freely 360° without binding. It should spin freely when given a small push.



Testing with Logger or Display



Testing with Voltmeter/Power Supply

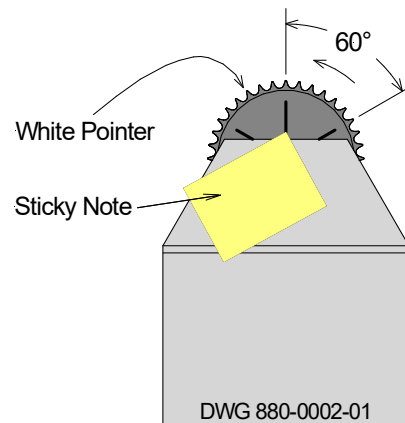
Setup

1. Note that one ridge on the sprocket face has been painted with a white stripe. The other ridges are not painted and are spaced 60° around the face of the sprocket. The back side of the sprocket has similar ridges but none are painted.
2. Connect your DISPLAY to the evaporation gauge and verify that it responds to small movements of the sprocket. If using a power supply and voltmeter, set the power supply voltage correctly before connecting to the potentiometer.

Measurement Units	Power Supply Setting	Multiplier	Max Value
Inches	0.9444 Volts	10	9.444 inch
Millimeters	2.3988 Volts	100	239.88 mm

Procedure

1. Adjust the position of the sprocket until the DISPLAY reads 9.00" or 228.6 mm. The white stripe on the **front** of the sprocket should be at approximately 1 o'clock position as viewed from the front. (If using a voltmeter, multiply the reading by 10 for inches or multiply by 100 for millimeters.)
2. While looking at the **back** of the sprocket, use a sticky-note as a pointer and apply it to the top of the evaporation gauge housing, aligning one corner to point at a rib on the back side of the sprocket.
3. Enter the measured value in the table below as the starting point. **View from Back of Sprocket**
4. Rotate the sprocket 60° counter-clockwise to the next ridge and record the measured value.
5. Continue recording measurements in 60° increments.
6. Compare the actual readings with the expected readings at each measured point, and determine the Pass/Fail status.



Sprocket Position	Expected Value		Measured Value	Acceptable Limit		Pass	Fail
	inches	millimeters		inches	millimeters		
9.00" Starting point	9.000	228.6		±0.03	±0.762		
Rotated 60°	7.333	186.2		±0.03	±0.762		
Rotated 120°	5.666	143.9		±0.03	±0.762		
Rotated 180°	4.000	101.6		±0.03	±0.762		

Remedial Steps

- If the white stripe is not close to 1 o'clock at the starting point (9.00" or 228.6 mm), the **offset** parameter on the DISPLAY may need adjustment.
- If the readings on the DISPLAY are progressively worse the farther the sprocket is turned, then the **slope** parameter on the DISPLAY may be incorrect.
- If successive readings are non-linear then the potentiometer may need to be replaced.
- The measured depth of water and the DISPLAY may not agree exactly when reassembled; this is okay as the amount of evaporation is relative (i.e. the difference of two readings). If precise agreement is desired, adjust the **offset** parameter in the DISPLAY.

Reassembly

Measure the depth of water in the evaporation pan using a tape measure or ruler. Rotate the sprocket until the DISPLAY shows the same measurement. Without turning the sprocket, drape the chain over the sprocket. Move the sprocket back and forth to seat the chain, then compare the reading on your DISPLAY with the actual water depth. Adjust the chain as needed. Replace the cover.