

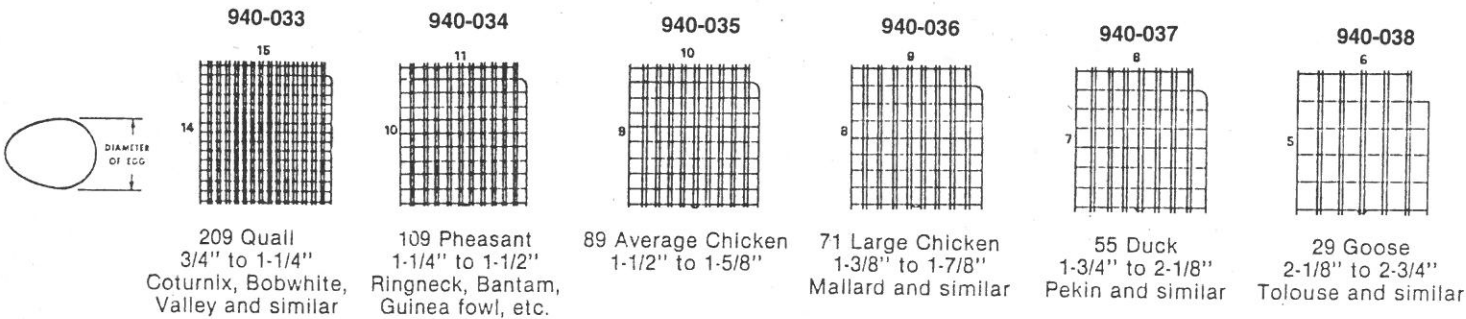
HUMIDITY CALIBRATION

People often get confused by the apparent contradictions in instructions relating to humidity in hatching. This may be because there are two systems of calibrating humidity. Lyon incubators use the "wet bulb thermometer." The wet bulb thermometer consists of a wick that is attached to a thermometer that hangs in the water. The other system gives the true percentage of humidity reading. In order to make the subject matter understood, a chart is provided that shows the difference between the two types of readings when the temperature in the incubator is 100 degrees. For example, a wet bulb reading of 84 means the actual humidity is 50%.

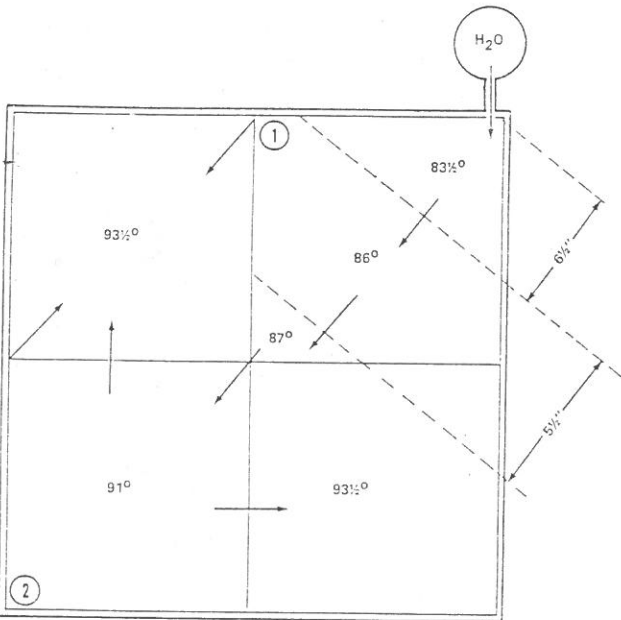
WET BULB READING		PERCENTAGE OF HUMIDITY	BREED	EGG HATCHING TIMES
				HATCH TIME
91	=	70%	Coturnix Quail	16 Days
90	=	68%	Bobwhite	23 Days
89	=	65%	Pheasant	23 Days
88	=	62%	Chukar	23 Days
87	=	59%	Bantam	21 Days
86	=	56%	Chicken	21 Days
85	=	53%	Duck	28 Days
84	=	50%	Turkey	28 Days
83	=	48%		
82	=	46%		

PERCENT OF HUMIDITY SHOWN IS BASED ON INCUBATOR TEMPERATURE OF 100°F.

SIX STANDARD EGG TURNING GRIDS



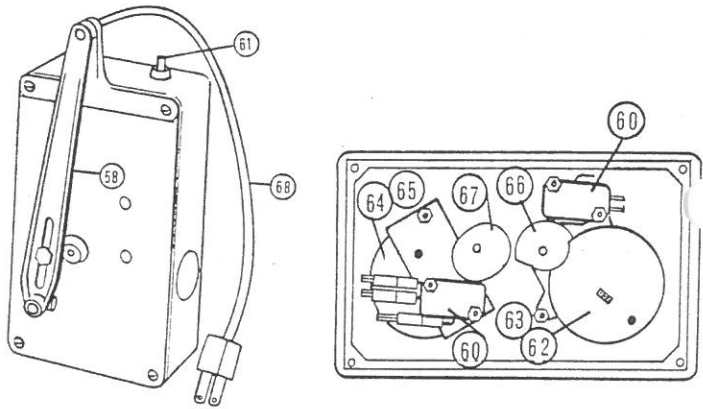
INCUBATOR TEMPERATURE CONSTANT AND STABLE AT 100 F.
(humidity in the environment approximately 30-40 percent)



Looking down on the incubator base.
The above diagram illustrates how various level of flooding can be achieved in the bottom of the unit to produce various wet bulb readings. These wet bulb reading can be converted to humidity readings by the use of the chart above.

AUTOMATIC TURNER PARTS IDENTIFICATION

AUTOMATIC TURNER PARTS			
ITEM	120VAC	230VAC	PART DESCRIPTION
58	125-000	125-000	AT2 Turner Lever Assy.
60	460-020	460-020	Sensitive Snap Switch
61	460-019	460-019	Push Button Switch
62, 63	320-071	320-072	Power Motor
64, 65	320-076	320-077	Timer Motor
66	350-002	350-002	Power Motor Cam
67	350-000	350-000	Timer Motor Cam
68	200-089	200-089	Power Cord



MODELS RX AND RX1 REPLACEMENT PARTS LIST			
CATALOG NUMBER		PART DESCRIPTION	
120VAC	230VAC		
350-004	350-004	Water Fountain Bottle	
500-012	500-012	Thermometer (2 Used)	
350-010	350-010	Dome	
350-012	350-012	Baffle Plate	
320-066	320-067	Fan Motor	
121-000	121-000	Fan Motor Bracket (2 Used)	
320-068	320-068	5" Fan Blade	
350-017	350-017	Fan Guard	
270-010	270-011	Heating Coil	
200-043	200-029	Power Cord	
200-023	200-023	Square Receptacle	
350-013	350-013	Base	
130-000	130-000	Screen	
220-010	220-011	Solid State Thermostat	
220-029	220-030	10 Turn Thermostat	
220-016	220-016	Thermal Wafer	
460-018	460-018	Sensitive Snap Switch	

LYON
ELECTRIC COMPANY, INC.
2765 Main Street
Chula Vista, CA 91911

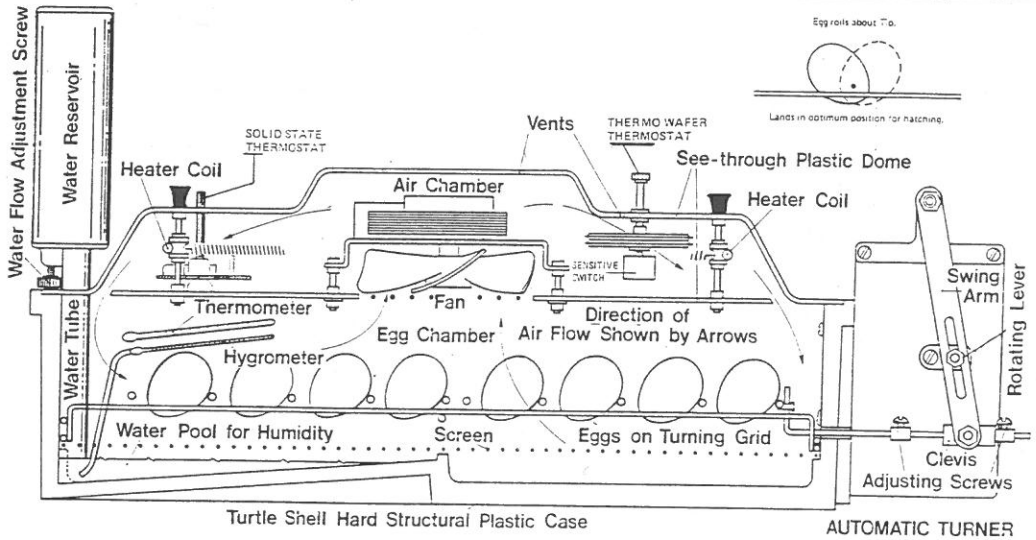
Telephone (619) 585-9900
Fax (619) 420-1426



2765 Main Street, Chula Vista, CA 91911, U.S.A. Telephone (619) 585-9900 Fax (619) 420-1426

MODELS RX AND RX1
ROLL-X INCUBATORS
ASSEMBLY AND OPERATION

BULLETIN
NO. 281-166
6/94



SPECIFICATIONS			
MODEL NO.	INPUT VOLTAGE	WATTS	HERTZ
RX1	120VAC	200	60
	230VAC		50/60

INSPECTION: Unpack the unit. Inspect the unit for external and/or internal damage. If the unit is received damaged, file a claim with the delivering carrier. We cannot file the claim for you.

WARNING

INCUBATORS ARE ELECTRICAL DEVICES AND SHOULD BE TREATED AS SUCH. ELECTRICAL REPAIRS SHOULD BE MADE BY COMPETENT ELECTRICAL SERVICE PERSONNEL. DISCONNECT OR UNPLUG THE POWER BEFORE ATTEMPTING REPAIRS OR CLEANING THE INCUBATOR.

IF THE INCUBATOR HAS A RECEPTACLE ON ITS TOP, IT IS FOR OPERATION OF AUTOMATIC TURNERS ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.

GROUNDING: Certain metal and electrical parts of the incubator are grounded. You can identify these parts as they have a GREEN or GREEN WITH YELLOW STRIPED wire connected to them. Grounds are for your protection and should never be removed or tampered with.

POWER CORDS: All incubators and turners have three prong plugs on the power cord. The bottom round prong is a ground connection. It is through this connection that ground is provided for the grounded incubator parts. You should be sure that the outlet the power cord is plugged into is actually grounded. Using an ungrounded outlet or defeating the purpose of the ground by cutting off or removing the ground prong on the plug could, under certain situations, cause serious electrical shock when the parts are touched. Frayed or worn power cords should be replaced immediately.

ELECTRICITY AND MOISTURE: Moisture and electricity do not mix well and because electric incubators must be operated in conditions of high humidity for part of the incubation cycle, certain precautions should be taken. 1. Do not add water to the incubator until it reaches operating temperature. 2. Use distilled water only. 3. As soon as incubation/hatching is complete, remove all water from the unit and dry the area that had water on it. If the top of the incubator is removable, remove it from the base. Allow the top to air dry, if the top is left on or water is not removed, a high concentration of moisture is left in the incubator. As the incubator cools, excessive moisture will accumulate on electrical and metal parts causing deterioration of these components, failure of the electrical components can occur when the incubator is again used.

INCUBATOR ENVIRONMENT: The environment your incubator is used in can have a pronounced effect on your hatch. Improper environment can cause temperature and humidity control problems during the incubation cycle. For best results, incubators should be used in an area that has a controlled ambient temperature of 70°F. Operating incubators in less than 70°F ambient or in a room that has wide temperature variations can have a detrimental effect on the incubator's operation and it may be necessary to make additional and frequent temperature control adjustments during incubation. Incubators should not be located near heat or in direct sunlight. Avoid locations near windows or doorways or where drafts occur. Remember that the eggs must receive air, avoid locations where carbon dioxide concentration might be high, (i.e., near gas furnaces or hot water heaters).

THE INCUBATOR SHOULD BE BROUGHT TO OPERATING TEMPERATURE FOR 24 TO 48 HOURS BEFORE PUTTING EGGS IN IT. LET YOUR EGGS STAY AT ROOM TEMPERATURE FOR AT LEAST 12 HOURS BEFORE SETTING THEM IN THE INCUBATOR.

HUMIDITY AND ITS CONTROL: There are two very important things you should know about humidity and its control. 1. You control humidity - the incubator can't. As the incubator operator, you set the temperature desired and you determine by adjusting the amount of water surface exposed to the heated air what the humidity in the incubator will be. 2. The wet bulb thermometer reading is not the percent of humidity in the incubator. To give you an example of this: if the incubator dry bulb thermometer reads 100°F, and the wet bulb thermometer reads 84°F, the humidity in the incubator is 51%, not 84%. The hatching manual shipped with your incubator describes how to determine humidity in detail. You should read the section on humidity and calibration thoroughly. Always use a new wick or carefully clean an old wick each time before the incubator is used.

INCUBATOR CLEANING: Clean the incubator as soon as you are done using it. DO NOT WAIT UNTIL YOU NEED TO USE IT AGAIN. Using a low velocity vacuum, remove as much dust and dirt as possible. You may use a mild soap with water to clean all the parts or a weak solution of ammonia and water. Wipe the incubator clean with a cloth coated with the cleaning solution. BE SURE THE ELECTRICAL POWER TO THE INCUBATOR IS DISCONNECTED OR UNPLUGGED BEFORE ATTEMPTING TO CLEAN THE UNIT. Avoid getting liquids on the temperature controller heater coil and the coil insulators. When cleaning is complete, allow the incubator to dry completely, then cover it in storage until it is used again.

PLEASE READ THESE INSTRUCTIONS CAREFULLY.

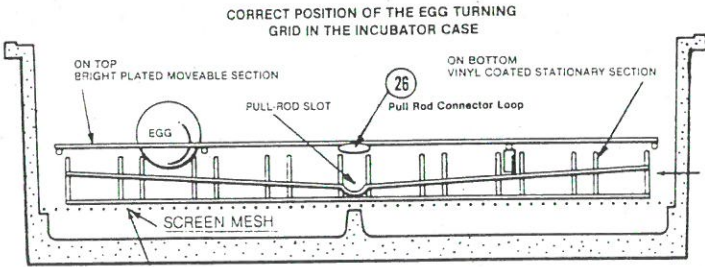
Position the Roll-X in front of you so that the water fountain is to the back and on your left side. This will aid you in adjusting the Roll-X.

Materials needed to assemble the Roll-X:
Small flat head screwdriver
Crescent wrench

1. Carefully remove and identify the following as you unpack the Roll-X.
Clear plastic dome is packed upside down
Grid assembly is shipped bottom side up
Screen mesh
Plastic base
2. IF THE UNIT IS MANUAL, INCLUDED IN THE BOX ARE:
L-shaped turning pull rod with black screw-on cap
Water fountain
Thermometer/hygrometer kit packaged in a paper bag
3. IF THE UNIT IS AUTOMATIC, THE FOLLOWING ITEMS ARE PACKED IN A SEPARATE BOX:
Automatic turner (available in 110VAC and 220VAC)
Two (2) screws and two (2) washers
L-shaped turning pull-rod with three (3) adjusting screws
4. **Assembling the Roll-X:** SKIP THIS INSTRUCTION IF YOUR ROLL-X IS MANUALLY OPERATED.

Remove the grid assembly and screen mesh from the inside of the base. Take the automatic turner and match the two holes in the base to the two threaded inserts on the side of the turner. Put the two screws with the washers on them through the wall from the inside of the incubator base. Place the turner against the base and tighten the screws. Do not overtighten the screws. Insert the L-shaped turning rod from the inside of the base with the short end remaining on the inside of the base. Place one adjusting screw on the L-shaped pull-rod located on the outside of the incubator. Run the rod through the clevis hole on the bottom of the swing arm of the turner and attach the second adjusting screw to the pull-rod. Do not tighten the adjusting screws onto the pull-rod at this time. Final adjustments will be made later (see ADJUSTING AUTOMATIC TURNER).

PLEASE NOTE: One corner of the mesh screen and the grid assembly are notched out to accommodate the water fountain. The notched corners of the mesh screen and the grid assembly are to be placed at the opposite end of the incubator from the turner. Place the mesh screen directly on the bottom supports.



5. SKIP THIS INSTRUCTION IF YOUR ROLL-X IS AUTOMATICALLY TURNED. Insert the L-shaped turning pull-rod from the inside of the base with the short end remaining on the inside of the base
6. Place the grid assembly (plastic coated side down, bright plated side up) over the screen. Be sure the guide rollers are connected between the plastic coated and bright plated grids. The grid assemblies should be resting against each other firmly but move freely without friction against the walls of the base. **NOTE:** If the grid assembly appears to "climb the walls" it is up side down. Connect the pull rod inside the base with the small plastic loop on the end of the removable grid. (Make sure the notched corner of the grid assembly is on the opposite side of the base from the turner.)
7. Locate the hole on the back side of the base next to the water fountain. From the inside of the base, insert the thermometer assembly and apply the washer and wing nut to the exterior of the base. Tighten the wing nut snugly, but do not over tighten.

The bulbs of the thermometers should slant downward but still clear the eggs to be set. Extend the wick of the wet-bulb or hygrometer through the grid notch so that the end will rest on the bottom of the base. Place the dome with the hole for the water tube directly over the notched corner of the grid.

The water fountain must always be removed before the dome is lifted from the base.

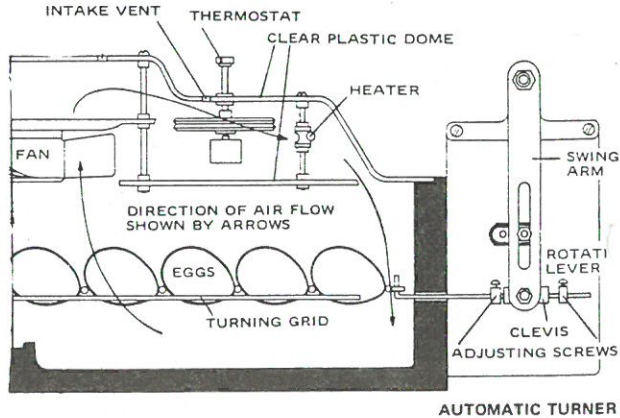
8. Position the empty water fountain with the water tube through the hole in the corner of the dome making sure it extends down to the bottom of the base. Plug the long cord from the dome into your electrical power source.
9. SKIP THIS INSTRUCTION IF YOUR ROLL-X IS MANUALLY OPERATED.

Plug the automatic turner cord into the socket on the dome.

YOUR NEW ROLL-X INCUBATOR WILL BEGIN OPERATING.

10. ADJUSTING THE AUTOMATIC TURNER

SKIP THIS INSTRUCTION IF YOUR ROLL-X IS MANUALLY OPERATED.



CAUTION: Do not tighten the adjusting screws on the L-shaped turning pull rod until they are in the proper position. Incorrect positioning may cause the turning grid to be forced against the walls of the incubator and break either the automatic turner or its connections.

Lift the dome and move the grid to the left (away from the automatic turner) to within 1/4" of the incubator wall. Press the red button on the top of the automatic turner. This will activate the automatic turner and cause the lever to move either to the right or left. Observe the lever as it moves to the left.

At the point when the lever reaches the maximum position to the left remove your finger from the red button and tighten the adjusting screw against the clevis at the left and tighten the adjusting screw against the clevis at the right.

11. ADJUSTING THE HUMIDITY

Locate the water fountain and note the adjusting screw. When the fountain is in position, the head of the screw will rest against the outer corner of the dome. Fill the water fountain with water. Place one finger over the end of the tube, turn it upside down and place over the hole in the dome. Remember to remove your finger quickly and push the fountain as far down toward the base of the incubator as it will go.

WATER WILL BEGIN TO GURGLE OUT OF THE FOUNTAIN. A READING FROM THE WET-BULB THERMOMETER INDICATING HUMIDITY CAN BE TAKEN AFTER A FEW MINUTES.

Turn the adjusting screw clockwise to increase the humidity. The humidity reading will gradually increase and become stable in a few minutes after each adjustment. Increase the humidity in gradual steps until the desired level is achieved. Remove the water fountain only when necessary. Each removal will increase the water level in the incubator. Practice withdrawing and replacing the water level in the fountain holding a finger over the end of the water tube. This will help eliminate spilling water into the incubator.

2. SETTING TEMPERATURE CONTROL

The incubator was tested and the temperature regulated to 100°F before it was shipped to you. Due to handling in shipment or the environment it is used in, it may require further adjustment. Temperature adjustment is made according to the type of control ordered with the incubator. They are described in the following paragraphs. Watch the thermometer as the temperature in the incubator rises. The indicator light should go off at 100°F. After the set temperature is reached the light will go on and off at short intervals. This on and off of the indicator light and a constant thermometer reading of 100°F indicates the thermostat is controlling the heat.

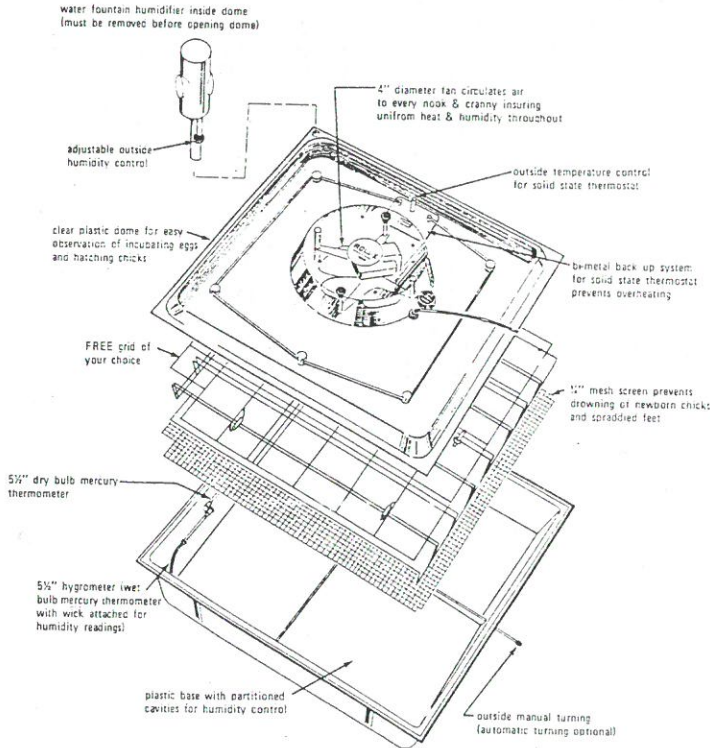
NOTE: The desired temperature must be constant and stable within the unit BEFORE adjusting humidity.

A. **SOLID STATE TEMPERATURE CONTROL:** The solid state temperature control is mounted on the baffle of the Roll-X. The regulator (adjusting) shaft protrudes through the incubator dome above the control. Turning the shaft CLOCKWISE will increase the temperature in the incubator. Turning the shaft COUNTER-CLOCKWISE will decrease the temperature. Turn the shaft slowly and carefully when making adjustments.

B. **TEN TURN POTENTIOMETER SOLID STATE CONTROL:** This control performs the same as the solid state control described in paragraph A above except that the regulator (adjusting) shaft is a 10 turn potentiometer for precise adjustment. This feature allows approximately one full 360° turn of the control knob to increase or decrease the temperature approximately 1.7°F.

C. **THERMAL WAFER TEMPERATURE CONTROL:** A 3 inch diameter double metal wafer that expands with heat increase and contracts with a drop in temperature. When the thermostat is properly adjusted, the wafer expands until the desired temperature is reached. At this point the wafer pushes the plunger on the sensitive snap switch under it, opening the circuit and turning off the heat. As the wafer contracts with temperature drop, it releases the sensitive snap switch turning the heater back on. To adjust the temperature, loosen the locking wing nut, make the adjustment and lock the setting by retightening the wing nut. TURN THE KNOB COUNTER-CLOCKWISE to increase the temperature. To decrease the temperature TURN THE KNOB CLOCKWISE. Turn the knob slowly and carefully making small incremental adjustments. BE SURE TO LOCK THE SETTING BY TIGHTENING THE WING NUT AFTER EACH ADJUSTMENT.

D. **OVER TEMPERATURE (BACK UP) CONTROL:** The over temperature control is usually a thermal wafer type control described in paragraph C. It is set and adjusted in the same manner. The back up control is usually adjusted to a point 1 degree higher than the incubation temperature setting of the primary control. It is factory preset to 101°F. When adjusting the incubator temperature SET THE OVER TEMPERATURE CONTROL TO THE DESIRED TEMPERATURE FIRST, THEN THE PRIMARY CONTROL. For example: Set the over temperature control to 101°F then the primary to 100°F. Turn the primary control FULL ON while adjusting the over temperature control, then reset it to 100°F.



EXPLODED VIEW - RX1M/RX1A