Complete, Easy To Read
INSTALLATION AND OPERATING INSTRUCTIONS

LUX CAG1500 SERIES
SMART TEMP® ELECTRONIC THERMOSTAT

Easy as 1–2–3

1 Installs Easily
2 Set Day and Time
3 Choose Heat or Cool
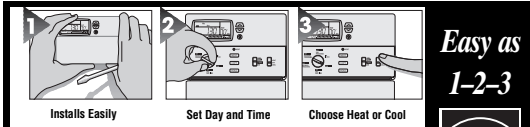
LUX PRODUCTS CORPORATION 52009
Mt. Laurel, New Jersey 08054, USA

ENERGY STAR

WARNING: Use Energizer® or DURACELL® Alkaline Batteries Only.
Energizer® is a registered trademark of Eveady Battery Company, Inc.
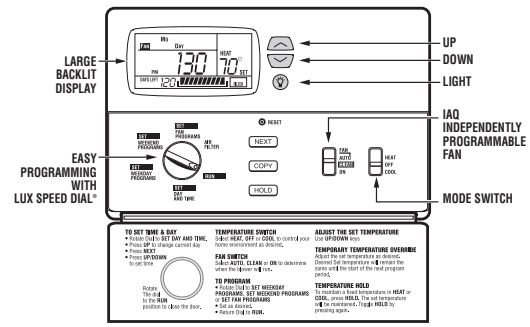DURACELL® is a registered trademark of The Gillette Company, Inc.

IMPORTANT!
Please read all instructions carefully before beginning installation. Save them for future reference. Before removing any wiring from your existing thermostat, its wires must be labeled with their terminal designations. Ignore the color of the wires since they may not comply with any standard.

Thank you for your confidence in our product. To obtain the best results from your investment, please read these instructions and acquaint yourself with your purchase before installing your new thermostat. Then follow the installation procedures, one step at a time. This will save you time and minimize the chance of damaging the thermostat and the systems it controls. These instructions may contain information beyond that required for your particular installation. Please save for future reference.

COMPATIBILITY

The CAG1500 can be used with most single stage 24 volt gas, oil or electric heating and air conditioning systems, single stage heat pumps, or gas millivolt heating systems. It cannot be used with 3 wire zone valves, 120 volt heating systems, or multi stage heat pumps. Ask your dealer for other LUX thermostats to control those systems.

FEATURES

LARGE-BACKLIT DISPLAY
EASY PROGRAMMING WITH LUX SPEED DIAL®
MODE SWITCH
UP
DOWN
LIGHT
IAQ INDEPENDENTLY PROGRAMMABLE FAN

- Small elegant design
- Exclusive LUX Speed Dial®
- EL Illuminated Display
- Comprehensive Graphical Filter Monitor
- 7 Day Programming
- Energy Star Compliant
- 4 Periods Per Day
- Independent Fan Program
- Programmable (minimum) Fan Duty Cycle
- Nonvolatile Memory For All Programs And Settings
- Temporary Temperature Override
- Temperature Hold
- Keyboard Lockout
- EL Illuminated Display
- F/C Temperature Display
- 12/24 Hr Clock Display
- Adjustable Temperature Differential / Cycle Rate
- User Temperature Offset / Calibration
- 5/2 minute selectable minimum Run/Off time provides short cycle and compressor protection

C A U T I O N
The CAG1500 is protected against normal static electric discharges. To minimize the risk of damaging the unit in extremely dry weather, touch a grounded metal object before touching your thermostat.

INSTALLATION

Please read all instructions carefully before beginning installation.

C A U T I O N
Turn off electricity to the appliance before installing or servicing thermostat or any part of the system. Do not turn electricity back on until work is completed.
- Do not short (jumper) across electric terminals on furnace or air conditioner to test the system. This may damage the thermostat and void your warranty.
- All wiring must conform to local codes and ordinances.
- The thermostat should be limited to a maximum of 1.5 amps; higher current may cause damage to the thermostat.
- Your thermostat is a precision instrument. Please handle it with care.

TOOLS REQUIRED
- #1 Phillips screwdriver (small)
- Drill with 3/16-in. (4.8mm) bit
- Wire stripper/cutter

THERMOSTAT LOCATION
On replacement installations, mount the new thermostat in place of the old one unless the conditions listed below suggest otherwise. On new installations, follow the guidelines listed below.
1. Locate the thermostat on an inside wall, about 5 ft. (1.5m) above the floor, and in a room that is used often.
2. Do not install it where there are unusual heating conditions, such as: in direct sunlight; near a lamp, television, radiator, register, or fireplace; near hot water pipes in a wall; near a stove on the other side of a wall.
3. Do not locate in unusual cooling conditions, such as: on a wall separating an unheated room; or in a draft from a stairwell, door, or window.
4. Do not locate in a damp area. This can lead to corrosion that may shorten thermostat life.
5. Do not locate where air circulation is poor, such as: in a corner or an alcove; or behind an open door.
6. Do not install the unit until all construction work and painting has been completed.

C A U T I O N
- Read instructions carefully before removing any wiring from existing thermostat.
- Wires must be labeled before they are removed.
- Do not allow wires to touch each other or parts on thermostat.
- When removing wires from their terminals, ignore the color of the wires since they may not comply with any standard.

REMOVING THE OLD THERMOSTAT
1. Switch electricity to the furnace and air conditioner OFF; then proceed with the following steps.
2. Remove cover from old thermostat. Most are snap-on types and simply pull off. Some have locking screws on the side. These must be loosened.
3. Note the letters printed near the terminals. Attach labels (enclosed) to each wire for identification.
Remove and label wires one at a time. Make sure the wires do not fall back inside the wall.
4. Loosen all screws on the old thermostat and remove it from the wall.

MOUNTING THE CAG1500
1. Strip insulation leaving 3/8 in. (9.5mm) bare wire ends and clean off any corrosion.
2. Fill wall opening with non-combustible insulation to prevent drafts from affecting the thermostat.

C A U T I O N
Be careful not to drop the unit or disturb electronic parts. Leave the door closed while the body is being removed from the base.
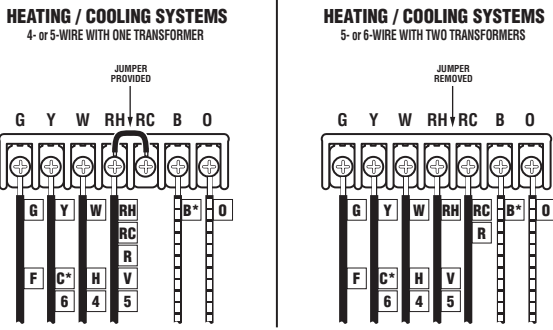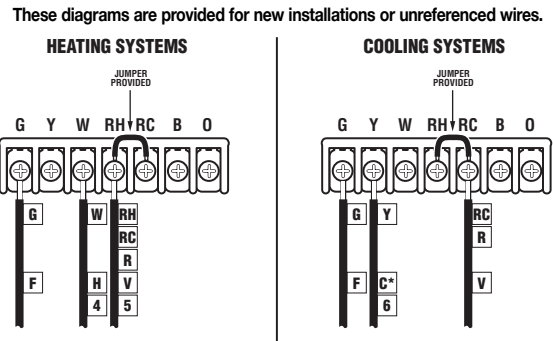
3. Remove the body from the thermostat's base by pressing the thumb latch at the bottom center of the unit and swinging the body away.

N O T E
If you are mounting the base to soft material like plasterboard or if you are using the old mounting holes, the screws may not hold. Drill a 3/16 in. (4.8mm) hole at each screw, and insert the plastic anchors provided.

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4. Hold the base against the wall. Route the wires through the hole below the terminal block. Position the base for best appearance (to hide any marks from an old thermostat). Attach the base to the wall with the two screws provided.
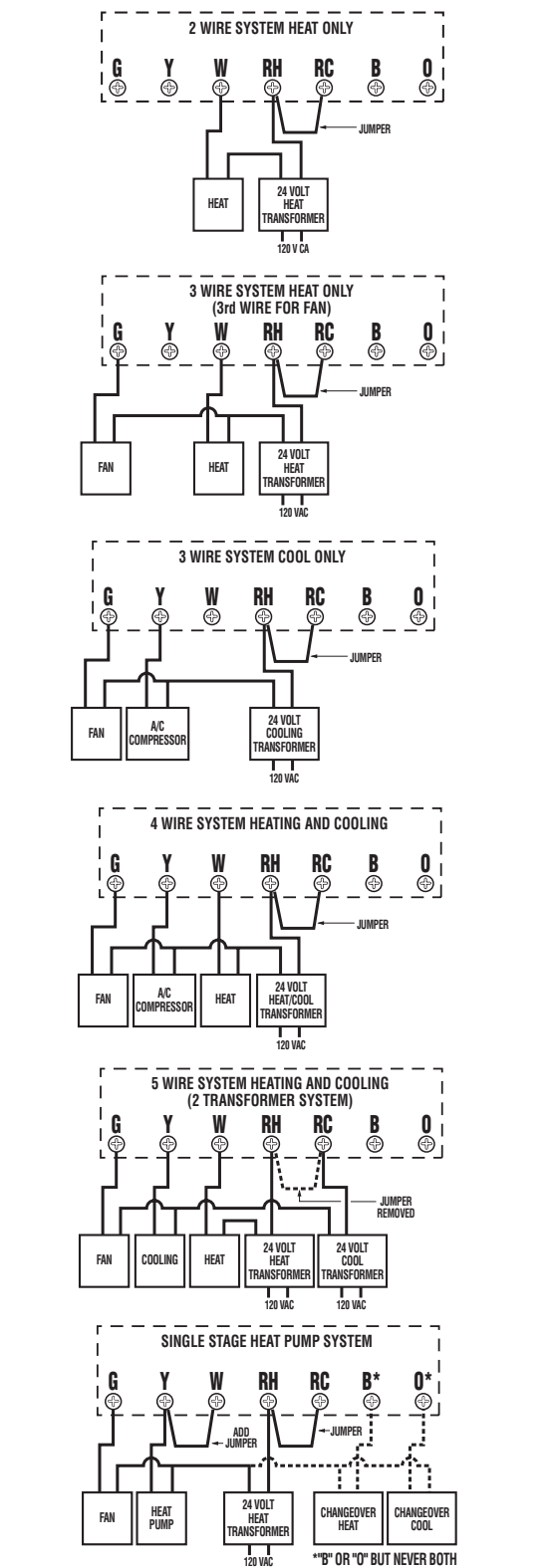
CONNECTING THE WIRES
5. Wires must be trapped between black clamp and brass terminal.
6. Securely tighten all 7 electrical terminal screws.

These diagrams are provided for new installations or unreferenced wires.

HEATING SYSTEMS
COOLING SYSTEMS
HEATING / COOLING SYSTEMS 4- or 5-WIRE WITH ONE TRANSFORMER
HEATING / COOLING SYSTEMS 5- or 6-WIRE WITH TWO TRANSFORMERS

ALL COMMON WIRES MUST BE TAPED OFF.
If "Y" and "C" are both present, "C" is a common wire. DO NOT USE "C"! TAPE IT OFF!
* If a "B" wire in your system is a system common, then connecting it at the "B" terminal may cause damage to your system. TAPE IT OFF!

2 WIRE SYSTEM HEAT ONLY
3 WIRE SYSTEM HEAT ONLY (3rd WIRE FOR FAN)
3 WIRE SYSTEM COOL ONLY
4 WIRE SYSTEM HEATING AND COOLING
5 WIRE SYSTEM HEATING AND COOLING (2 TRANSFORMER SYSTEM)
SINGLE STAGE HEAT PUMP SYSTEM

"B" OR "O" BUT NEVER BOTH

COMPLETING YOUR INSTALLATION
7. See Setup Options to configure jumpers.
8. Install two new Energizer or DURACELL "AA" size alkaline batteries at this time. For instructions, see BATTERIES/MAINTENANCE.

N O T E
Remove sticker from display.

9. Install your CAG1500 on its base. To do this hang the top of the unit by the tabs on the base, then snap the bottom of the unit into place. Do not use unnecessary force. If the body does not snap into place easily, remove the body, re-hang it from the tabs and try again.
10. Turn the power back on to your heating and/or air conditioning system.
11. Verify that the system and its fan are operating properly. When set to a high temperature, the heating system should provide warm air after a short time. Likewise, a cooling system should provide cool air after a short time. Usually sound from the furnace and air conditioning units can be heard while they are running. The rush of moving air should be heard within a short time after either has been started.
12. Your installation is now complete.

N O T E
If you have an electric system and the blower does not operate after installation, find the electric/gas heat jumper on the back of the body. Move the jumper to ELEC and perform a HARDWARE RESET.

OPERATING INSTRUCTIONS

The CAG1500 alternately displays the current time and the room temperature. It also displays the day of the week and the current program period, MORN, DAY, EVE, or NITE. Set temperatures are indicated in the right side of the display.
You can make program or setting changes with the thermostat body on the wall, or conveniently removed from its base plate.

SYSTEM MODES:
The Mode switch has three positions HEAT, OFF, and COOL. In the winter, set the system switch to HEAT to control your heating system. In the summer, set the switch to COOL to control your air conditioner. In spring and fall or when the windows are open, you can set the switch OFF.

UP/DOWN/CHANGE ARROW KEYS:
There are two arrow keys just right of the unit's display. They are used to adjust set temperatures and change other settings.

TEMPERATURE ADJUSTMENT:
Pressing an arrow key once adjusts the set temperature by one degree in the associated direction. Holding the key will automatically advance the setting in the associated direction.

CHANGING OTHER SETTINGS:
If there are many choices for a value, usually that setting will automatically advance by holding one of the arrow keys. Some settings though, must be changed one press at a time.

DISPLAY ILLUMINATION:
Press the light bulb button to illuminate the display. Pressing other buttons will keep the display illuminated until no button has been pressed for approximately 20 seconds.

FAN MODES:
The fan switch has three positions AUTO, CLEAN, and ON. Setting the FAN switch to AUTO automatically runs your system's fan as required only for heating and cooling. The CLEAN position insures that your system's fan runs at least the programmed minimum duty cycle. The default duty cycle requires it to run 15 minutes every hour. Setting the FAN switch to ON runs your system's fan continuously. The FAN icon will flash whenever the fan is running.

N O T E
The FAN switch works only if your system provides a wire for the CAG1500's "G" terminal.

SETTING THE TIME AND DAY:
Open the door on the front of the thermostat. Rotate the dial to the SET DAY/TIME position. You should see the display pictured below with a day of the week flashing.

Su
AM 12:00
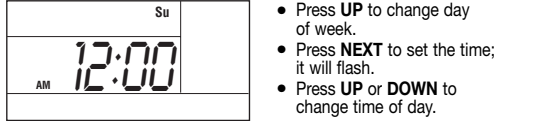
- Press **UP** to change day of week.
- Press **NEXT** to set the time; it will flash.
- Press **UP** or **DOWN** to change time of day.

When you are finished setting the day and time, rotate the dial to **RUN** to return to normal operation or to another position to continue programming.

HARDWARE RESET
This button will unlock your thermostat and read option switch positions, before the unit begins normal operation. It is located inside on the rear of the unit's circuit board. It is a small square component labeled S8, with a white button at it's center.

SOFTWARE RESET
Use this front panel RESET to return all software settings and programs to their default values. Option jumpers will be read and operation will correspond to their current positions. SOFTWARE RESET is disabled while your thermostat is locked. To assist in reprogramming, copy your programs into the chart provided before using SOFTWARE RESET.

PROGRAMMING

The CAG1500 provides four independent programming periods per day for HEAT, COOL, and FAN. Each is programmed separately. You can use the default programs or alter them to suit your schedule.

DEFAULT ENERGY STAR® TEMPERATURE PROGRAM
As supplied from the factory, the following ENERGY STAR® approved program will be used for temperature control in RUN mode. This program and all other software settings may be restored to their default values via a SOFTWARE RESET.

PERIOD	HEAT MODE	COOL MODE
MORN	6:00 AM 70°F (21°C)	6:00 AM 78°F (26°C)
DAY	8:00 AM 62°F (17°C)	8:00 AM 85°F (29°C)
EVE	6:00 PM 70°F (21°C)	6:00 PM 78°F (26°C)
NITE	10:00 PM 62°F (17°C)	10:00 PM 82°F (28°C)

EDITING HEAT OR COOL PROGRAMS
You can change any preset times and/or temperatures to suit your schedule for each day of the week. The four periods each day are Morning(MORN), Day,(DAY) Evening(EVE), and Night(NITE).

WEEKDAY PROGRAMMING
1. Select **HEAT** or **COOL** with the mode switch.
2. Rotate dial to **SET WEEKDAY PROGRAMS**. You will see the display shown here:

PROGRAM Mo MORN
START AT
AM 6:00 70° HEAT SET

3. The **HEAT** or **COOL** set temperature will be displayed on the right side of the display. The start timer for the displayed period will flash to show that this may be changed.
4. Use the **UP/DOWN** arrow keys to change the start time for this period. One period ends at the start time of the next period. The beginning of that period may not be any closer to the beginning of the next period than one 15 minute increment.
5. Press **NEXT** to accept the displayed start time and advance to edit the **SET TEMPERATURE**.
6. Use the **UP/DOWN** arrow keys to change the flashing **HEAT** or **COOL** set temperature to the temperature you desire.
7. Press **NEXT** to accept the displayed set temperature and advance to edit the start time for the next period. It will be flashing.
8. Repeat for each of the four periods per day. When all the periods for a day have been set, the start time for the next morning will be displayed flashing so that it may be edited.
9. Repeat PROGRAMMING for each remaining day.
10. Rotate the dial back to **RUN** to accept all current values and end the programming session.

WEEKEND PROGRAMMING
1. To program Saturday or Sunday, select HEAT or COOL and rotate the dial to **SET WEEKEND PROGRAMS**. You will see a display similar to that shown here:

PROGRAM Su MORN
START AT
AM 6:00 70° HEAT SET

2. Use steps 3 - 10 described in WEEKDAY PROGRAMMING to program Saturday and Sunday.

COPY BUTTON
COPY will copy the previous day's Heat, Cool or Fan program into the current day and advance to the beginning of the next day.

DAY	PERIOD	HEAT		COOL	
		TIME	TEMP.	TIME	TEMP.
MON	MORN				
	DAY				
	EVE				
	NIGHT				
TUES	MORN				
	DAY				
	EVE				
	NIGHT				
WED	MORN				
	DAY				
	EVE				
	NIGHT				
THURS	MORN				
	DAY				
	EVE				
	NIGHT				
FRI	MORN				
	DAY				
	EVE				
	NIGHT				
SAT	MORN				
	DAY				
	EVE				
	NIGHT				
SUN	MORN				
	DAY				
	EVE				
	NIGHT				

CLEAN AIR CYCLE.
The **CLEAN AIR CYCLE** insures that the fan runs for at least the specified duration each hour to circulate and filter the air in your home. Hourly fan run time may be specified from 9 to 60 minutes per hour."60" = ON or continuous run. The default minimum run time is 15 minutes total per hour. Additional fan run time is not called for when the heating or cooling requirement exceeds the threshold setting. When additional fan run time is required, it is met by running the fan at 20 minute intervals, for 1/3 the hourly run time setting.

EDITING CLEAN CYCLE PROGRAMS
1. Turn rotary dial to **SET FAN PROGRAMS**. You will see a display similar to that shown here:
2. The start time for the displayed period will flash to show that this may be changed. Use the **UP/DOWN** arrow keys to change the start time for this period. One period ends at the start time of the next period. The beginning of that period may not be any closer to the beginning of the next period than one 15 minute increment.
3. Press **NEXT**. The minimum run time flashes to show that it may be edited.
4. To change the minimum run time for this period, use the **UP/DOWN** keys.
5. Press **NEXT** to accept the setting and progress to the next period.
6. Repeat for each of the four periods per day.
7. When all the periods for a day have been set, the start time for the next morning will be flashing so that it may be edited.
8. Repeat programming for each remaining day.
9. Rotate the dial back to **RUN** to accept all current values and end the programming session.

PROGRAM Mo MORN
FAN
START AT
AM 6:00

AIR FILTER USAGE MONITOR
The AIR FILTER USAGE MONITOR counts the number of days a filter has been in use. In RUN mode, the display shows the remaining filter life via a bar-graph, and the number of **DAYS LEFT** in the 3 digit filter display area.

CHANGE FILTER will appear when the days remaining has reached zero and the filter should be changed. **DAYS OVER** is indicated when a filter change is past due. Setting filter usage to 000 will disable this function. The filter section of the display will not be highlighted when this function is disabled. The filter counter can count from 000 to 999 days. The default air filter life is 90 days.

RESETTING AIR FILTER COUNTER
To reset the air filter counter when you replace your filter:
1. Rotate dial to **AIR FILTER** .
2. press and release **COPY** to reset counter
3. Press and release **COPY** again to restore previous count.
4. Return the dial to the **RUN** position.

SETTING THE AIR FILTER LIFE
This value sets the number of days to be counted before a filter change is indicated.
To set the AIR FILTER USAGE LIMIT:
1. Rotate dial to **AIR FILTER**.
2. LCD shows: **SET LIMIT** at lower left, with current setting center screen.
3. With a new filter installed, use the **UP/DOWN** keys to change this value to the number of days of useful filter life specified by your filter manufacturer.
4. The counter will be reset to zero when usage limit has changed.
5. Return the dial to the **RUN** position.

TEMPERATURE OVERRIDE
OVERRIDE allows you to change the current SET TEMPERATURE in HEAT or COOL until the next program period without changing your temperature control programs.
- Press **UP/DOWN** to change the current temperature setting. The **OVERRIDE** indicator appears on display.
- The OVERRIDE will be canceled at the start of the next program period, and the temperature setting will return to its programmed value.
- An OVERRIDE may be terminated by rotating the dial, switching the mode to **OFF**, or initiating a HOLD.
- Adjusting the set temperature to its program value will also cancel an OVERRIDE.

TEMPERATURE HOLD
HOLD may be used for manual temperature control. HOLD is the simplest means to set and maintain a fixed temperature. It allows you to set and maintain a fixed temperature indefinitely in Heat or Cool without concern for programming. To initiate a HOLD:
- Press and release **HOLD**.
- Adjust temperature as desired with **UP/DOWN**.
- Temperature setting will not change until the HOLD is cancelled.
- To cancel a HOLD, press and release **HOLD** again, rotate the dial, or switch mode to **OFF**.

ADVANCED FEATURES

TEMPERATURE SWING
A thermostat works by turning your heating or cooling system on or off whenever the room temperature varies from the set-point temperature. This variation is the "swing." Your system should cycle on about 3 to 6 times per hour. A smaller swing number increases the number of cycles, so room temperature is more constant. A larger swing number decreases the number of cycles, but saves energy in most cases.

SWING SETTING
1. Rotate dial to the **AIR FILTER** position.
2. Simultaneously press **NEXT & HOLD**.
3. Use **UP/DOWN** keys to change swing.
4. Choices are 1 through 9. The default is 2.
5. Rotate the dial to the **RUN** position to finish.

TEMPERATURE CALIBRATION
1. Rotate the dial to **SET DAY/TIME**.
2. Simultaneously press **NEXT & HOLD**.
3. Use **UP/DOWN** keys to adjust the thermostats calibration by as much as ± 5°F (± 3°C).

LOCK
To prevent tampering, press **NEXT NEXT NEXT HOLD**. This sequence of keys will lock and unlock the set temperature, programs and other settings. When the keys are locked, a padlock icon will be visible above the time and temperature display. The Lock will be disabled after a Hardware Reset.

Mo
NITE HEAT
1:30 70°
120 FILTER SET

SETUP OPTIONS

JUMPER SETTINGS
There are four jumpers, each controls a setting depending on its position.

GAS/ELECTRIC MODE - J4
The position of this jumper controls when the thermostat requests the system fan to run. In HEAT mode with the gas jumper in place, the fan is controlled by the heating system itself. In HEAT mode with the jumper open or removed, the fan is controlled by the thermostat.

5MIN/2MIN MINIMUM RUN TIME - J3
The position of J3 sets the minimum length of time that the thermostat must remain with Heat or Cool either On or Off before it will automatically switch to the alternate On or Off state. This feature prevents short cycling and provides compressor protection for cooling units. Choices are 2 or 5 minutes.

TEMPERATURE DISPLAY FORMAT °F/C - J2
The position of this jumper controls whether temperature is displayed in degrees F° or C°

TIME DISPLAY FORMAT 12/24 HR CLOCK - J1
The position of this jumper controls whether time is displayed in 12 hour or 24 hour Military Time format.

REPOSITIONING JUMPERS
To change a setting, the jumper must be repositioned and a HARDWARE RESET must be performed. These jumpers are located inside the thermostat on the rear of its circuit board. To access them, remove the unit from the wall by pressing up on the thumb latch at the bottom of thermostat and swinging the body out and away.

The table pictured on the right is also printed on the circuit board. The closed or shorted position is that which covers both a jumpers pins. To prevent its loss, a jumper may be placed over one pin only for the open positions. After settings have been changed, press S8, the HARDWARE RESET button for the changes to take effect. See **HARDWARE RESET**

	OPEN	CLOSE
J4	ELECT	GAS
J3	2MIN	5MIN
J2	C	F
J1	24HR	12HR

BATTERIES AND MAINTENANCE

INSTALLING BATTERIES/ MAINTENANCE
The CAG1500 requires batteries to operate your heating/cooling system. Replace the batteries when the battery **REPLACE** indicator appears in the display or **at least once a year**.
1. Switch electricity to the furnace and air conditioner OFF.
2. To access your units batteries remove the unit from the wall by pressing up on the thumb latch at the bottom of thermostat and swinging the body up and away.
3. Remove the used batteries.
4. **Install two new Energizer or DURACELL "AA" size alkaline batteries in the battery compartment. Observe the polarity marking shown in the compartment.**
5. Hang the top of the unit by the tabs at the top corners of the base, then snap the bottom of the unit into place. Do not use unnecessary force. If the body does not snap into place easily, remove the body, re-hang it from the tabs and try again.
6. Turn the power back on to your heating and/or air conditioning system. If this is the first time you are installing batteries, the thermostat will display **"SUN 12:00 AM"**.
Within 90 seconds the thermostat will begin to display the room temperature alternately with the time. To correct the display, see **"Setting the TIME and DAY,"** after you set the programs.

TECHNICAL ASSISTANCE

If you have any problems installing or using this thermostat, please carefully and thoroughly review the instruction manual. If you require assistance, please contact our Technical Assistance Department at 856-234-8803 during regular business hours between 8:00AM and 4:30PM Eastern Standard Time, Monday through Friday. You can also receive technical assistance online anytime day or night at http://www.luxproducts.com. Our web site offers you answers to the most common technical questions, and also permits you to email your questions to our technical support staff at your convenience.

WARRANTY