❶ Description

Nuheat's NTG5110 & NTG5220 programmable thermostats can be used to control the ambient air temperature or floor temperature. You can select among the following temperature control modes:

A mode: ‣ controls the ambient air temperature

F mode: ‣ controls the floor temperature using an external temperature sensor

AF mode:
‣ controls the ambient air temperature
‣ maintains the floor temperature within desired limits using an external temperature sensor

Power On switch / reset GFCI
Appears when the setpoint is displayed
Operating mode icons
Set day
Set time
Set programming
Erase programming
Select Operating Mode / Return

Time and day
Temperature
Comfort, Economy and Vacation icons
Heating indicator
Ground fault indicator
Comfort setpoint
Economy setpoint
Vacation setpoint
Temperature adjustment

Period number
Temperature control mode icons

Backlight button
Lights up display, automatically turns off after 12 seconds

❷ Operating Modes

MANUAL	Allows you to manually adjust the temperature setpoint. ❶ To activate this mode, press **Mode/Ret** to display the icon. ❷ Set the desired temperature using △ ▽ or select one of the pre-programmed settings (☼, ☾ or ⌂).
AUTO	Executes the default schedule or your own programming. Use this mode to maximize energy savings. To activate it, press **Mode/Ret** to display the ⏱ icon. The ☼ or ☾ icon indicates which temperature setting is used. Also, the icon of the period number will be shown. (i.e.)

Memory Backup:

In the event of a power failure, an internal circuit will maintain the programming and time. However, the time will have to be re-set if the power failure exceeds 6 hours.

❸ Time and Day Adjustment

❶ Set the time using the **Hour** and **Min** buttons.

❷ Set the day using the **Day** button.

❸ Press **Mode/Ret** to exit.

❹ Setpoint Configuration

The Comfort ☼, Economy ☾ and Vacation ⌂ settings respectively represent the temperatures that you wish to have during the day (☼), at night or while you are away at work (☾), or while you are away for an extended period (⌂).

Comfort setpoint
Economy setpoint
Vacation setpoint
Temperature adjustment
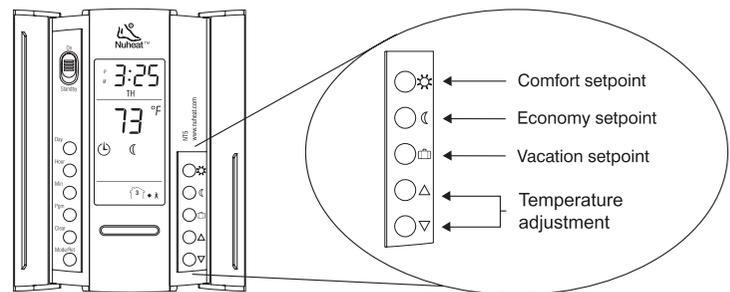
This thermostat is pre-programmed with the following default Comfort, Economy and Vacation setpoints.

Icon	Setpoint	F mode	A/AF mode
☼	Comfort	88 °F (31 °C)	70 °F (21 °C)
☾	Economy	73 °F (23 °C)	63 °F (17 °C)
⌂	Vacation	50 °F (10 °C)	50 °F (10 °C)

If the default temperature settings suit your personal preferences, skip the following section.

To Modify the Default Setpoints:

❶ To modify the Comfort temperature, select the desired temperature using the △ ▽ buttons and hold the ☼ button until the ☼ icon is displayed (app. 3 seconds).

❷ To modify the Economy temperature, select the desired temperature using the △ ▽ buttons and hold the ☾ button until the ☾ icon is displayed (app. 3 seconds).

❸ To modify the Vacation temperature, select the desired temperature using the △ ▽ buttons and hold the ⌂ button until the ⌂ icon is displayed (app. 3 seconds).

❹ Press the **Mode/Ret** button to exit this function and return to the normal operating mode.

❺ Default Schedule

This thermostat is pre-programmed with the following default schedule:

Periods		MON	TUE	WED	THU	FRI	SAT	SUN
🛏	88°F	6 AM	6 AM	6 AM	6 AM	6 AM	6 AM	6 AM
🛏🔑	73°F	9 AM	9 AM	9 AM	9 AM	9 AM	--:--	--:--
🛏🔑	88°F	5 PM	5 PM	5 PM	5 PM	5 PM	--:--	--:--
🛏	73°F	11 PM	11 PM	11 PM	11 PM	11 PM	11 PM	11 PM

It applies to people who wake up at 6:00 AM, leave for work by 9:00 AM, return home for 5:00 PM and go to sleep at 11:00 PM.

If the pre-programmed schedule fits your lifestyle, skip the following section.

❻ Modify the Default Schedule

First, program your schedule. You can program 4 different periods for each day of the week. For each day, enter:

🛏   Time you wake up (Period 1)

🛏🔑   Time you leave for work (Period 2)

🛏🔑   Time you return home (Period 3)

🛏   Time you go to bed (Period 4)

❶ Press **Pgm** to access the programming mode. Period 1 is displayed (🛏).

❷ Press **Day** to select the day to be programmed (hold for 3 seconds to select all days of the week).

NOTE: It is faster to program the same schedule for the entire week, then modify the exception days (i.e. Saturday and Sunday).

❸ Press **Hour** and **Min** to program the start time, OR Press **Clear** to clear a time entry.

❹ Press **Pgm** to select the next period.

❺ Repeat steps 3 and 4 for remaining periods.

❻ When you have completed your programming, press **Mode/Ret** to exit the programming mode.

Programming Example:

This example applies to people who are home during the week.

- Comfort period from 6:00 AM to 11:00 PM (Period 1)
- Economy period from 11:00 PM to 6:00 AM (Period 4)
- Identical schedule for all days of the week.

❶ Press **Pgm** to access the programming mode. Period 1 is displayed (🛏).

❷ Press and hold **Day** for 3 seconds to select every day of the week.

❸ Press **Hour** to enter 6:00 AM for Period 1.

❹ Press **Pgm** to select Period 2 (🛏🔑) and press **Clear** to delete the time entry (- - : - -).

❺ Press **Pgm** to select Period 3 (🛏🔑) and press **Clear** to delete the time entry (- - : - -).

❻ Press **Pgm** to select Period 4 (🛏) and press **Hour** to enter 11:00 PM.

❼ When you have completed your programming, press **Mode/Ret** to exit the programming mode.

To modify the Saturday and Sunday Schedules:

When making modifications, make sure you are in the right period.

For example, if you are modifying the time for the time you wake up, make sure you are in Period 1.

❶ Press **Pgm** to select Period 1 (🛏).

❷ Press **Day** to select **SA** (Saturday).

❸ Press **Hour** and **Min** to enter the time you wake up on weekends.

❹ Press **Pgm** to select Period 4 (🛏).

❺ Press **Hour** and **Min** to enter the time you go to sleep on weekends.

❻ Repeat above steps for Sunday (**SU**).

❼ Press **Mode/Ret** to exit programming mode.

❼ Floor Temperature Limits (AF mode only)

NOTE: To avoid damaging your floor, follow your floor supplier's recommendations regarding the minimum and maximum floor temperature limits.

The minimum and maximum floor temperature limits are 5 °C (41 °F) and 28 °C (82 °F) by default. To modify these limits, proceed as follows:

❶ Switch the thermostat to Standby.

❷ Press and hold the ☼ button.

❸ Switch the thermostat back to On.

❹ Release the ☼ button when the minimum temperature limit (FL:LO) appears.

❺ Set the minimum temperature limit using the △ ▽ buttons.

❻ Press the ☼ button to display the maximum temperature limit (FL:HI).

❼ Set the maximum temperature limit using the △ ▽ buttons.

❽ Press **Mode/Ret** to exit.

❽ Special Features

Temporary or Permanent Temperature Bypass:

This operation allows you to temporarily modify the floor temperature while you are in the Automatic mode.

- Simply press △ ▽ to select the desired temperature, or ☼ or ☽ button to select the Comfort or Economy settings you have programmed.
  This temperature will be maintained until the beginning of the next programmed schedule.

- You can also switch to the Vacation setting for a prolonged absence by pressing 🏠. In that case, the temperature bypass is permanent.
  To return to the normal operating mode, press **Mode/Ret**.

If you wish to immediately return to the programmed settings, press **Mode/Ret**.

Early Start Function:

This thermostat is equipped with a function that enables it to calculate the optimum time to start the heating system to achieve the desired temperature setting by the programmed time.

It could start the heating system as early as 6 hours prior if necessary. Every day, the thermostat will automatically re-evaluate how early to start heating, based on the previous day's performance.

The switch on the back of the thermostat is factory-set to Early Start ON. To disable this function, see the Switch Selection section.

Daylight Savings Time:

The thermostat can automatically re-adjust its time at Daylight Savings Time changeover.

Year 2006: When this function is enabled (On), the thermostat switches to Daylight Savings Time on the first Sunday of April and to normal time on the last Sunday of October.

Year 2007 and on: When this function is enabled (On), the thermostat switches to Daylight Savings Time on the second Sunday of March and to normal time on the first Sunday of November.

NOTE: The function is disabled (default setting) when the clock loses its setting.

❶ Press the **Day** button (3 seconds) until **DLS** appears on the screen.

❷ Press the △ ▽ to toggle between On (enabled) and Off (disabled).

❸ Press the **Day** button briefly. The year setting is displayed.

❹ Press the △ ▽ to set the current year.

❺ Press the **Day** button briefly. The month setting is displayed.

❻ Press the △ ▽ to set the current month.

❼ Press the **Day** button briefly. The date setting is displayed.

❽ Press the △ ▽ to set the current date.

❾ Press **Mode/Ret** to exit.

| dLS |
| On |

| YEAr |
| 06 |

| Mon |
| 12 |

| dAY |
| 30 |
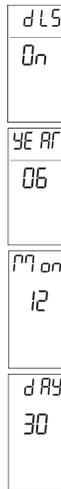
⑨ Switch Selection

The thermostat can be configured with the following settings:

#	FUNCTION	UP	DN
1	Temperature format display	°F	°C
2	Early Start	ON	OFF
3	Temperature control mode [a]	F	AF

Factory settings

a. To select the F mode, place the switch in the F position. To select the AF mode, place the switch in the AF position and ensure that the remote temperature sensor is connected to the thermostat. To select the A mode, place the switch in the AF position and ensure that the remote temperature sensor is **NOT** connected to the thermostat.
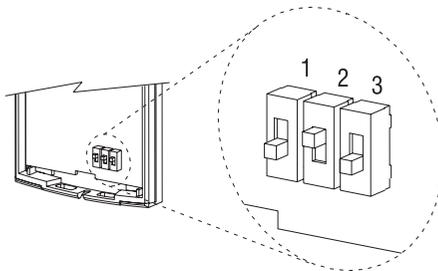
To Modify the Default Settings:

❶ Locate the screw at bottom of thermostat. Unscrew.

❷ Remove thermostat faceplate.

❸ Locate the switches at the back of the faceplate. Set the switches to your preferences.

❹ Put the faceplate back on the thermostat.

❺ Secure the thermostat with the screw.

❶	❷	❸	❹	❺
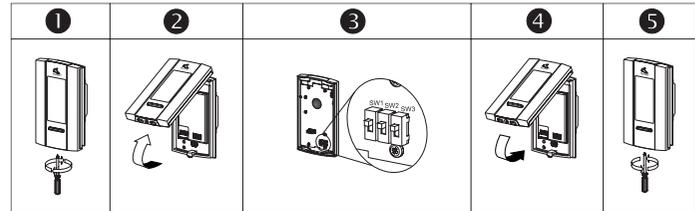
⑩ Technical Specifications

Display range: 32 °F to 158 °F (0 °C to 70 °C)
Ambient setpoint range (A/AF models): 40 °F - 86 °F (5 °C to 30 °C)
Floor setpoint range (F model): 40 °F - 104 °F (5 °C to 40 °C)
Floor limit range (AF model): 40 °F - 104 °F (5 °C to 40 °C)

☑ Warranty

NUHEAT INDUSTRIES ONE (1) YEAR LIMITED WARRANTY

This product is guaranteed against workmanship defects for a one-year period following the initial date of purchase. During this period, NUHEAT will repair or replace, at our option and without charge, any defective product which has been used under normal conditions.

The warranty does not cover delivery costs and does not apply to products poorly installed or randomly damaged following installation. This warranty cancels and replaces any other manufacturer's express or implied warranty as well as any other company commitment.

NUHEAT cannot be held liable for related or random damages following the installation of this product. The defective product as well as the purchase invoice must be returned to the place of purchase or mailed, prepaid and insured, to the following address:

NUHEAT INDUSTRIES LTD.

USA
6920 Salashan Parway
Building D-200
Ferndale, WA 98248

CANADA
1689, avenue Cliveden
Delta, BC
V3M 6V5

1 (800) 778-9276
www.nuheat.com

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As an ENERGY STAR® partner, Nuheat™ has determined that this thermostat meets the ENERGY STAR guidelines for energy efficiency.

❶ Installation

This power base is designed to control electric floor-warming systems. The resistive load must not exceed:

- NTG110: 1800 watts (NI) @ 120 VAC (15 A)
- NTG220: 3600 watts (NI) @ 240 VAC (15 A)

The thermostat is equipped with a Ground Fault Circuit Interrupter (GFCI) and therefore the isolation of the line and load are required for operation. **Do not cap all the white wires together.** During a ground fault, both line and load will be cut-off. Connect the thermostat as shown on diagram.

Must be installed in accordance with national and local electrical codes. TURN OFF POWER TO THE HEATING SYSTEM AT THE MAIN POWER PANEL TO AVOID ELECTRICAL SHOCK.

1) Connect the power base wires

❶ Connect the power base wires to the supply and load using solderless connectors for copper wires as per diagram.

Power supply

Load
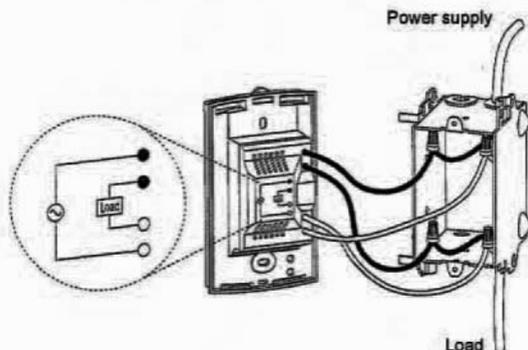
❷ Push the excess wire back into the electrical box to prevent interference with the power base.

❶ Secure the power base to the electrical box using the provided screws.

NOTE: All cables and connections must conform to the local electrical code.

WARNING: Special CO/ALR solderless connectors must be used when connecting with aluminum conductors.

2) Connect the temperature sensor wires

❶ Connect the temperature sensor wire to terminals 1 and 2 on the power base (no polarity needs to be respected).

- The wire must pass outside the electrical box and follow the wall down to the floor.
- The probe should be placed in a representative heat area for maximum system performance and should be centered between the wires in the mat.
- The wire cannot cross any heater wires and the probe must NOT be directly on or adjacent to a heating wire.

❷ Once the sensor is connected, mount the faceplate.

Floor temperature sensor
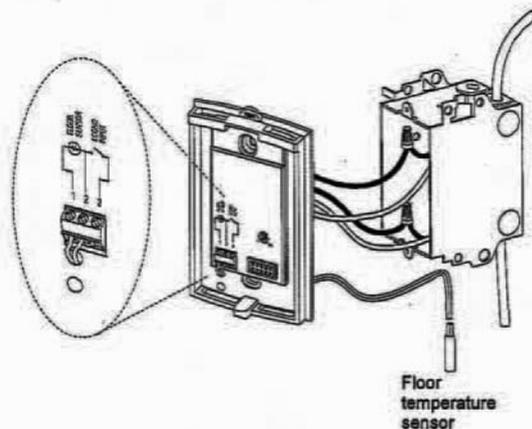
❷ Mounting the Faceplate

Keep the thermostat's air vents clean and free from obstructions.

❶ Locate the screw at the bottom of the faceplate.

❷ Secure the faceplate with the screw.

❸ Turn the power back on.
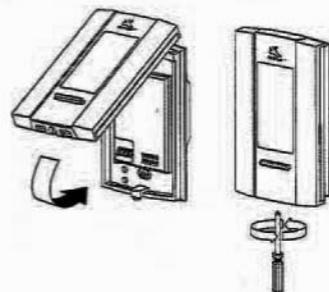
❸ First Power-On

When the unit is powered on for the first time, the following appears on-screen:

- 12:00 and MO (Monday)
- Floor temperature (°F)
- Manual mode icon

If improperly installed, you will see an error message.

```
12:00
MO
78 °F
🖑
```
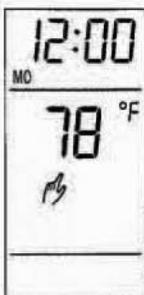
❺ Error Messages

```
12:00
LO
🖑
```
The measured temperature is below the thermostat's display range. If the heating indicator is also displayed, then the relay is closed and current is going through the load.

```
12:00
HI
🖑
```
The measured temperature is above the thermostat's display range. Heating is deactivated.

```
12:00
Er
🖑
```
Verify the thermostat and sensor connections.

❹ GFCI Test

5.1 GFCI Operation

The GFCI protects against risks of electrocution caused by leakage current. If the leakage current exceeds 5 mA, the GFCI will automatically trigger, cutting power to the floor heating system. To indicate the fault, the **TEST** button on the top of the base will illuminate.
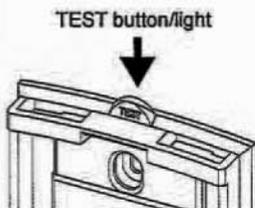
TEST button/light

5.2 GFCI Reset

When the GFCI has triggered, to reset it, switch the thermostat to **Standby** and back to **On**. The **TEST** button light will go off.

5.3 GFCI Test

To ensure the GFCI is always in working order, test it once the thermostat is installed and on a monthly basis thereafter.

❶ Increase the setpoint temperature above the measured floor temperature in order to activate the floor heating system.

❷ Press the **TEST** button.

- The test is successful if the **TEST** light is On. Reset the thermostat and place it back to the desired temperature.
- The test has failed if the **TEST** light remains off. Cut power to the heating system at the main electrical panel and replace the thermostat.

❺ Technical Specifications

	NG110	NG220
Supply	120 VAC, 50/60 Hz	240 VAC, 50/60 Hz
Load	15 A maximum	
Power	1800 watts (NI) @ 120 VAC	3600 watts (NI) @ 240 VAC
Ground Fault Circuit Interrupter (GFCI)	Class A (5 mA)	
Approvals	CSA / C,US	
Storage	-4°F to 120°F (-20°C to 50°C)	

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