ECO-0550 (Stand Alone Geothermal Control)

Technical Data Sheet



Submittal: HBX ECO-0550

Project: [

HBX Control Systems Inc. - Specification

Part 1: ECO-0550 Product

- 1. The Hydronic Control must be a full microprocessor control with at least an 8-bit, 8MHz integrated microprocessor chip.
- 2. The control must be capable of utilizing a multi-colour backlight character display. The display must be capable of showing the following information on one screen:
 - a. Heat demand
 - b. Cooling demand
 - c. WWSD (warm weather shutdown)
 - d. CWSD (cold weather shutdown)
 - e. Tank temperature (actual vs. target)
 - f. Outdoor temperature
 - g. Heat pump/backup/reversing valve/system pump are on/off
- 3. The Control must be capable of the following Input/Output Functions
 - a. 2 x Dry Contact Demand Inputs
 - b. 1 x 2Amp Dry contact
 - c. 3 x Thermistor Inputs
 - d. 3 x Dry contact relays
- 4. The control must be capable of automatically calculating and resetting the heating and cooling fluid target temperature based on outdoor temperature (where applicable).
- 5. The control must be capable of controlling and staging up to 3 heat pumps/chillers.
- 6. The control must be capable of operating a system pump and reversing valve.
- 7. The Control must have the ability to program and control for Warm Weather Shut Down and Cold Weather Shut Down.











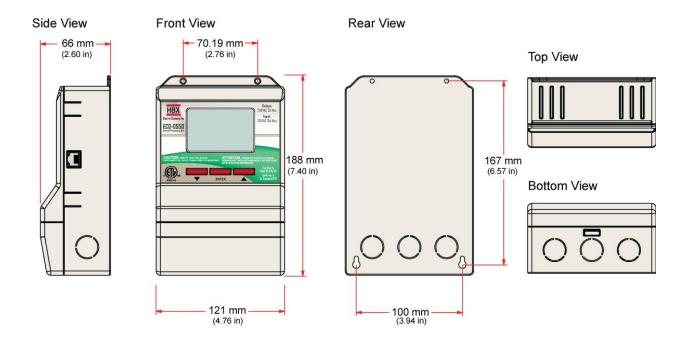


- 8. The Control must be capable of automatically calculating and resetting the heating and cooling storage tank target temperature based on Outdoor Temperature.
- 9. The Control must have separate programming parameters for operating a backup heat source.
- 10. The control must allow for heat pump rotation based on time or cycles.
- 11. The control must allow priority setup when there is a heat and cooling demand simultaneously.
- 12. The control must allow viewing temperatures in Celsius (°C) or Fahrenheit (°F)
- 13. The Control must be ETL approved.

Part 2: Acceptable Products

1. HBX ECO-0550 Geothermal Control

Part 3: Physical Dimensions















Part 4: Technical Data, Main Parts & Labels

Inputs / Outputs:

- 3 x Thermistor Input (10K Ohm)
- 2 x Miscellaneous Input signals
- 3 x Relay Dry Contact Outputs (240VAC 10 Amps)
- 1 X 2Amp Dry Contact

Power Supply:

120 VAC, ± 10%, 50/60Hz 15A Max

Microprocessor:

8-Bit, 8MHz

Languages:

English

Graphic Display:

2.50" x 1.57" (63.5mm x 40mm) viewable area

Weight:

0.408 KG (0.89 lbs)

Supplied Parts:

2 x HBX 029-0022 – 10K Ohm Thermistor, 12" lead wire

1 x HBX OUT-0100 - 10K Ohm Outdoor Sensor

2 x Cable tie

1x Terminal Screwdriver (2.5mm)

Dimensions:

4.76" x 7.40" x 2.59" (121mm x 188mm x 66mm)

ETL Listings:

Meets CSA C22.2 No. 24 Meets UL Standard 873 ETL Control No. 3068143

Storage:

50°F to 104°F (10°C to 40°C)





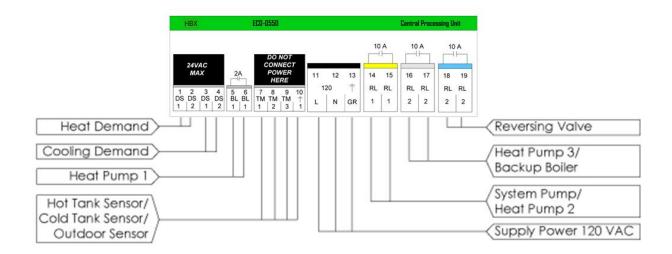








Pin Out / Terminal Block Labels:



Wiring

All signal wiring must be with a minimum of 18AWG wire at a maximum of 500ft.

- **1, 2 Demand Signal 1 –** Apply heat demand from a dry contact, or 24VAC.
- 3, 4 Demand Signal 2 Apply cool demand from a dry contact, or 24VAC.
- **5, 6 Heat Pump 1** Heat pump 1 Output.

Sensor Inputs

- **7, 10:** Hot tank temperature in dual tank mode, or tank temperature in single tank mode.
- **8, 10:** Cold tank temperature. If the cold tank sensor in not connected, the control assumes single tank operation. If connected, the control will operate in dual tank mode.
- 9, 10: Outdoor temperature
- **14, 15: Relay 1** This relay is generally a second heat pump, or can be used as system pump output.
- 16, 17: Relay 2 Generally used as a third stage heat pump or backup boiler.
- **18, 19: Relay 3** Used as a Reversing Valve and/or 3 way diverting valves.
- *Relays 1, 2 and 3 are dry contacts and rated for a maximum of 10 Amps.













Part 5: HBX Sensor Temperature Conversion / Resistance Table

| Celsius | Fahrenheit | Ohms | Celsius | Fahrenheit | Ohms | Celsius | Fahrenheit | Ohms |
|---------|------------|---------|---------|------------|--------|---------|------------|-------|
| -30 | -22 | 177,000 | 15 | 59 | 15,714 | 60 | 140 | 2,488 |
| -29 | -20.2 | 166,342 | 16 | 60.8 | 15,000 | 61 | 141.8 | 2,400 |
| -28 | -18.4 | 156,404 | 17 | 62.6 | 14,323 | 62 | 143.6 | 2,315 |
| -27 | -16.6 | 147,134 | 18 | 64.4 | 13,681 | 63 | 145.4 | 2,235 |
| -26 | -14.8 | 138,482 | 19 | 66.2 | 13,071 | 64 | 147.2 | 2,157 |
| -25 | -13 | 130,402 | 20 | 68 | 12,493 | 65 | 149 | 2,083 |
| -24 | -11.2 | 122,807 | 21 | 69.8 | 11,942 | 66 | 150.8 | 2,011 |
| -23 | -9.4 | 115,710 | 22 | 71.6 | 11,418 | 67 | 152.6 | 1,943 |
| -22 | -7.6 | 109,075 | 23 | 73.4 | 10,921 | 68 | 154.4 | 1,876 |
| -21 | -5.8 | 102,868 | 24 | 75.2 | 10,449 | 69 | 156.2 | 1,813 |
| -20 | -4 | 97,060 | 25 | 77 | 10,000 | 70 | 158 | 1,752 |
| -19 | -2.2 | 91,588 | 26 | 78.8 | 9,571 | 71 | 159.8 | 1,693 |
| -18 | -0.4 | 86,463 | 27 | 80.6 | 9,164 | 72 | 161.6 | 1,637 |
| -17 | 1.4 | 81,662 | 28 | 82.4 | 8,776 | 73 | 163.4 | 1,582 |
| -16 | 3.2 | 77,162 | 29 | 84.2 | 8,407 | 74 | 165.2 | 1,530 |
| -15 | 5 | 72,940 | 30 | 86 | 8,056 | 75 | 167 | 1,480 |
| -14 | 6.8 | 68,957 | 31 | 87.8 | 7,720 | 76 | 168.8 | 1,431 |
| -13 | 8.6 | 65,219 | 32 | 89.6 | 7,401 | 77 | 170.6 | 1,385 |
| -12 | 10.4 | 61,711 | 33 | 91.4 | 7,096 | 78 | 172.4 | 1,340 |
| -11 | 12.2 | 58,415 | 34 | 93.2 | 6,806 | 79 | 174.2 | 1,297 |
| -10 | 14 | 55,319 | 35 | 95 | 6,530 | 80 | 176 | 1,255 |
| -9 | 15.8 | 52,392 | 36 | 96.8 | 6,266 | 81 | 177.8 | 1,215 |
| -8 | 17.6 | 49,640 | 37 | 98.6 | 6,014 | 82 | 179.6 | 1,177 |
| -7 | 19.4 | 47,052 | 38 | 100.4 | 5,774 | 83 | 181.4 | 1,140 |
| -6 | 21.2 | 44,617 | 39 | 102.2 | 5,546 | 84 | 183.2 | 1,104 |
| -5 | 23 | 42,324 | 40 | 104 | 5,327 | 85 | 185 | 1,070 |
| -4 | 24.8 | 40,153 | 41 | 105.8 | 5,117 | 86 | 186.8 | 1,037 |
| -3 | 26.6 | 38,109 | 42 | 107.6 | 4,918 | 87 | 188.6 | 1,005 |
| -2 | 28.4 | 36,182 | 43 | 109.4 | 4,727 | 88 | 190.4 | 974 |
| -1 | 30.2 | 34,367 | 44 | 111.2 | 4,544 | 89 | 192.2 | 944 |
| 0 | 32 | 32,654 | 45 | 113 | 4,370 | 90 | 194 | 915 |
| 1 | 33.8 | 31,030 | 46 | 114.8 | 4,203 | 91 | 195.8 | 889 |
| 2 | 35.6 | 29,498 | 47 | 116.6 | 4,042 | 92 | 197.6 | 861 |
| 3 | 37.4 | 28,052 | 48 | 118.4 | 3,889 | 93 | 199.4 | 836 |
| 4 | 39.2 | 26,686 | 49 | 120.2 | 3,743 | 94 | 201.2 | 811 |
| 5 | 41 | 25,396 | 50 | 120.2 | 3,603 | 95 | 203 | 787 |
| 6 | 42.8 | 24,171 | 51 | 123.8 | 3,469 | 96 | 204.8 | 764 |
| 7 | 44.6 | 23,013 | 52 | 125.6 | 3,340 | 97 | 206.6 | 742 |
| 8 | 46.4 | 21,913 | 53 | 127.4 | 3,217 | 98 | 208.4 | 721 |
| 9 | 48.2 | 20,883 | 54 | 129.2 | 3,099 | 99 | 210.2 | 700 |
| 10 | 50 | 19,903 | 55 | 131 | 2,986 | 100 | 210.2 | 680 |
| 11 | 51.8 | 18,972 | 56 | 132.8 | 2,787 | 100 | 213.8 | 661 |
| 12 | 53.6 | 18,090 | 57 | 134.6 | 2,774 | 102 | 215.6 | 643 |
| 13 | 55.4 | 17,255 | 58 | 136.4 | 2,675 | 102 | 217.4 | 626 |
| 14 | 57.2 | 16,464 | 59 | 138.2 | 2,579 | 103 | 217.4 | 609 |
| 14 | 31.2 | 10,404 | 37 | 136.2 | 2,3/9 | 104 | 217.2 | 009 |
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