



IGSHPA Accredited Installers Course And ClimateMaster's Service & Installation Course

Location: ClimateMaster, Oklahoma City, OK
Organizations eligible for training: ClimateMaster and OEM

Attendees should plan to arrive in Oklahoma City one day prior to the training and departure from Oklahoma City should be planned for after 5:00 pm of the last day.

Cost: \$1,600 per attendees
Optional: \$600 fusion kit

With standard class registration, you will receive:

- Hotel accommodations
- Transportation to and from the hotel
- Meals
- IGSHPA training materials
- IGSHPA membership
- Residential training materials kit
- All products Technical Guide
- Residential Training Supplement
- Slide Rule Calculator
- Pressure gauge
- Various Handout/Component Examples
- Optional Fusion Tool Kit (additional fee)

IGSHPA accredited installer course

Day 1 Objective: Discuss GSHP systems and proper sizing of equipment. Discuss soil and proper grouting procedures as well as designing and the ground heat exchanger

8:00am	Arrive at ClimateMaster plant
8:10-10:00am	Introduction and Overview of GSHP <ol style="list-style-type: none">1. GS-System Concept2. Energy Source3. Basic Heat Pump System4. Heat pump Configurations5. Heat Pump Operation6. Domestic Hot water options7. System materials and components8. Economics, Marketing and demand reduction
10:00-10:15pm	Break
10:15-12:00pm	Selecting, Sizing and designing the heat pump system <ol style="list-style-type: none">1. Design procedure for the heat pump system2. determining building loads (heating and Cooling)3. Load Calculations procedures4. Performance of a Air source Heat pump5. Performance of a ground source heat pump6. Energy calculations

- 12:00-12:45pm Lunch will be served
- 12:45-2:30pm Introduction to grouting, Soils and Thermal conductivity
1. Importance of Bore hole grouting
 2. Grouting materials
 3. Dry bore holes
 4. Grout placement methods
 5. Grout pumps
 6. Grout mixing
 7. Properties of soils
 8. Classifications of soils
 9. Field identification procedures for fine-grained soils fractions
 10. Rock classifications
 11. Thermal conductivity levels
- 2:30pm-2:45pm Break
- 2:45-5:00pm Designing the ground heat exchanger
1. Steps in ground heat exchanger design
 2. Ground heat exchanger configurations
 3. Standardized parallel system header
 4. Selection of heat exchanger
 5. Pipe selection
 6. Selecting the correct pump for the loop design
 7. Headers
- 5:00 pm Adjourn for the day

Day 2 Objective: Discuss proper installation and flushing procedures of the ground heat exchanger.

- 8:00am Arrive at ClimateMaster plant
- 8:00-10:00am Installation of the ground heat exchanger
1. Site plan
 2. Excavating for different configurations of loops
 3. Back filling
 4. Testing loop before back filling
 5. Horizontal boring
 6. Vertical boring and types
 7. Pond and lake loops
- 10:00-10:15am Break
- 10:15-12:00pm Flushing the ground heat exchanger
1. System flushing
 2. Air purging
 3. Verifying earth coil pressure/ flow design
 4. Error detecting
 5. Charging system with antifreeze and types
 6. Pressurizing the closed loop system

12:00-12:45pm	Lunch will be served
12:45- 2:30pm	Heat pump system startup and Checkout & Fusion of loop pipe <ol style="list-style-type: none"> 1. Heat pump performance HE/HR check 2. Looking up specifications of a particular unit to verify performance Socket Fusion demonstration and talk about other fusion methods <ol style="list-style-type: none"> 1. Slide show showing Butt fusion and electro fusion 2. Review socket fusion procedures 3. demonstrate a socket fusion in front of class
2:30-2:45pm	Break
2:45-5:00pm	Review and Test For IGSPHA Accredited Installers

ClimateMaster's 202 Residential Service and Install Training

Day 3 Objective: Review of installation, operation and maintenance of ClimateMaster geothermal equipment and fundamentals of loop type and installation procedures

8:00 - 8:15am	Introductions and review of days objectives
8:15 – 10:30am	Service and installation Power Point overview <ul style="list-style-type: none"> • Review of basics and advantages of geothermal • Components of a geothermal unit. • Basic refrigeration review Superheat/Subcooling
10:30 – 10:40am	Break
10:40 – 12:00pm	Continuation of installation review <ul style="list-style-type: none"> • Unit performance Verification HE/HR • Show slide rule calculator • Begin going through IOM • Install procedures
12:00 – 12:45pm	Lunch
12:45-1:45pm	Plant tour
12:30 – 5:00pm	Power Point Review – Service and Installation (continued) <ul style="list-style-type: none"> • Well Water Systems and Closed Loops • Hot Water generator • CXM control board • Product Overview • Auxiliary heat
5:00pm	Adjourn for the day



Day 4 Objective: Loop types and installations Familiarization of Software Tools: GeoDesigner and Pressure Drop Calculations

8:00 – 8:15am	Introductions and review of days objectives
8:15 – 12:00am	Geothermal Loop Design <ul style="list-style-type: none">• Loop Technology• Flow rates• Loop types Vertical/Horizontal/Pond• Flushing procedures• Run GeoDesigner Job Sizing Analysis<ul style="list-style-type: none">○ Job information○ Load input information○ Utility information Rates/Data Base○ Systems comparisons○ Reporting capabilities of software
12:00 – 12:30pm	Lunch
12:30 – 2:00pm	GeoDesigner Analysis Continued
2:00 – 2:10pm	Break – 20 minutes
2:30 – 4:00pm	Pressure drop calculation software <ul style="list-style-type: none">○ How to load from the internet○ Familiarize and overview○ Save job file function
4:00 – 5:00pm	ClimateMaster's Certification Test
5:00pm	Adjourn for the day