

HOTFOIL-EHS

BAGHOUSE AND PRECIPITATOR HOPPER HEATING SYSTEMS



FM Approvals

Ordinary Areas



INTRODUCTION:

Baghouse and precipitator hoppers experience pluggage problems due to flue gas condensation. This is an expensive and unnecessary problem.

The "HB" Heating Modules are designed to eliminate the maintenance nightmare of hopper pluggage.

Each system is custom-built to address the exact needs of the application. The HB Module has been used successfully on thousands of individual precipitator and fabric filter hoppers.

THE "HB" HEATING MODULE:

The HB Heating module has numerous outstanding design features proven by 30+ years of operation in the field.

- Robust, flexible, cushion like heater face that provides maximum heat transfer to the hopper surface. (Even when the hopper surface is irregular)
- Low watt-density design with flat foil heating elements for efficient heat transfer, low operating temperatures and increased heater life.
- Multiple parallel path circuitry design for increased heater reliability and increased design flexibility.
- Custom designing allows for heating systems to be used on voltages up to 600 volts, with minimal series connections.
- A lightweight, easily handled unit that simplifies installation and minimizes installation costs.
- The HB heating modules are manufactured from the highest quality materials and are subject to 100 percent inspection throughout the manufacturing process.
- The Hotfoil Type "HB" Heating Module is FM Approved for ordinary areas.

ENGINEERING AND DESIGN:

Interested in getting a quote on an HB MODULE Heating System?

WE OFFER: Complete system design FREE OF CHARGE without a Purchase Order.

- We are capable of designing the systems from drawings or site sketches. Once the system has been designed, it will be sent to you with a formal quote. Should you choose to purchase it, we will re-issue the drawings for approval.
- If drawings are not available, we will drive/fly to your site. Once there, we will measure and design the heating system directly on the hopper, chute, flogate, etc... We will return to the office, design the system on CAD, and offer you a formal quote. If we design the system from the field, we will take 100% responsibility for any heaters that don't fit.
- As with all of our heating systems, we offer a wide range of controls from your basic thermostat to electronic controllers. We try to keep everything simple so that you pay for only what you need and nothing more.
- And last but not least we are available 24 hours a day, 7 days a week, no exceptions.

The drawing you see below is the design that was originally put together for the picture you see on the front.

HEATING SYSTEM SPECIFICATIONS

HEATER TYPE.....HB MODULES
 MODULE LOAD.....26,100 WATTS
 MODULE AREA.....115.7 SQ. FT.
 MODULE WATT DENSITY.....226 WATTS/SQ.FT.
 FLEXIBLE HEATER LOAD.....386 WATTS

TOTAL ELECTRICAL LOAD.....26,486 WATTS
 VOLTAGE SUPPLY.....480V, 3PH, 60HZ, 3-WIRE.

HEATING SYSTEM DETAILS

REF.	QTY.	SIZE	WATTS	VOLTS	OHMS
A	12	12 x 10	179	160	143
B	4	10 x 6	76	65	56
C	1	36 x 10	506	480	455
D	2	30 x 8	385	274	194
E	2	18 x 10	271	240	213
F	10	60 x 6	506	480	455
G	2	24 x 10	405	349	301
H	16	72 x 6	700	480	329
J	1	24 x 6	240	217	195
K	2	12 x 10	162	115	82
L	2	10 x 6	82	74	67
M	8	48 x 6	504	480	457

FLEXIBLE HEATERS

TH	PT	SIZE	WATTS	VOLTS	OHMS
TH 1		40 x 1	128	115	104
PT 2		40 x 1	129	92	65

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION
1	40	SETS OF HB MODULE HOPPER HEATING SYSTEMS, 62 HB MODULES & 3 FLEXIBLE HEATER PER SET, 26,486 WATTS ON 480 VOLTS.
2A	40	JUNCTION BOXES: NEMA 4X, STAINLESS STEEL, 20"x20"x6 WITH 90 WELD/MILLER ST-SS TERMINAL BLOCKS, 65A, 600 VOLT RATED.
2B	40	JUNCTION BOXES: NEMA 4X, STAINLESS STEEL, 20"x20"x6 WITH 72 WELD/MILLER ST-SS TERMINAL BLOCKS 65A, 600 VOLT RATED.
3	40	SETS OF ALUMINUM MOUNTING CHANNEL, 2"x1"x1/8".
4	2	SETS OF MOUNTING TEMPLATES.
5	11000	STUDS: 3/8"-16x3", STEEL WITH CERAMICS.
6	11000	WASHERS: 1" DIA. STEEL
7	22000	NUTS: 3/8"-16, STEEL, HEX, PLATED.
8	160	CAUTION LABELS.
9	40	THERMOSTAT BULB MOUNTING BRACKET.
10	5000	7" INSULATION PINS/ LEAD WIRE GUIDES

NOTES:

1. Heater resistance tolerance is +/- 10%.
2. All heater cold leads are #16 awg stranded nickel-plated copper, double glass insulated and silicone rubber sheathed.
3. All heater cold leads are of sufficient length to exit the insulation and are to be terminated inside each junction box. Junction box to be mounted within two feet of the heater lead exit points.
4. HB heating modules are supplied with mounting channels, studs, nuts and washers. Flexible heaters are supplied with glass tying tape.
5. Heater Wiring-By Hotfoil, On-site & Power Wiring-By others.
6. For installation instructions refer to Hotfoil Inc. Installation, Operation & Maintenance Manual.
7. It is the responsibility of the client/user to ensure that the heater installation is in compliance with all applicable federal, state and local electrical codes and regulations.
8. **CAUTION:** Do not weld, flame cut, or grind near the installed heaters - Remove the heater first.
9. All series connections are as shown on the schematic diagram and are to be made inside the junction box. Jumpers inside junction box provided by Hotfoil Inc.

Hopper Junction Box Tag No(s):
 1-209-HTR-121A through 1-209-HTR-121K
 2-209-HTR-121A through 2-209-HTR-121K
 1-209-HTR-221A through 1-209-HTR-221K
 2-209-HTR-221A through 2-209-HTR-221K

REV.	DESCRIPTION	DR.	DATE

SCALE	1/2" = 1'
DRAWN BY	
CHECKED BY	
DATE	
BY	

hotfoil Electric Heat Tracing	HOTFOIL INC. 11000 WILSON AVENUE MARIETTA, GA 30067
"HB" MODULE HOPPER HEATING SYSTEM LAYOUT & DETAILS	HOT DRAWING NO. D-6251

SYSTEM DESIGN:

When the problem of hopper condensation was originally investigated, it was found that the simple application of strip and rod type electrical heaters was not the answer; high temperatures in localized areas cause warped hoppers. Hotfoil's HB modules flat-foil, low watt-density design overcome this problem, efficiently solving the issue of hopper condensation.

Hotfoil's engineering staff has designed many HB Module systems both large and small. Our package will involve heater layout, installation equipment and instructions, electrical schematics, and temperature control equipment. All applications are handled on a project management basis to ensure customer and end user satisfaction.

IEEE 1069 - 1991

In 1991 there was published the "IEEE 1069 Recommended Practice for Precipitator and Baghouse Hopper Heating Systems".

These guidelines were put together by engineers involved with the air pollution control industry. The members of the chosen committee involved utility engineers, designers of APC systems, architect engineers, and the leading heating manufacturers of the day. The group laid out basic guidelines for the industry with desired parameters. The publication covered design, layout, calculations, temperature control, etc. to give the industry a standard on which to base.

Today these guidelines are used throughout the world as the most comprehensive basis for fly ash hopper heating projects. **Hotfoil was an active member of the committee establishing the guidelines** and we uphold and adhere to the proven recommendations.

PRODUCT/SYSTEM FEATURES

Custom Designed System

Each client gets the assurance that the specific problem in question is being addressed with a product designed for the job. We pride ourselves on understanding, processing, and supplying the product with the knowledge that it will live up to its name and prove itself year after year.

Factory Mutual Approved

The product and system are approved for use in non-hazardous areas. In most cases, the heaters can be installed in hazardous areas as the heaters are insulated over and protected. Controls are then supplied in NEMA 7,9 boxes to protect against ARCS and Sparks. Safety and reliability is unquestionable.

OTHER INSTALLATION PICTURES



Module installation is quite simple; we supply all of our heating systems with templates. You simply hold the template in place, apply the studs using a stud gun, place the heater in between the studs, add the mounting channel and the nuts, and the installation is complete.



The Installation here shows our custom designed junction box bracket. This allows the box to be fixed in place with pipe nipples, which are connected to allow the cable to run from the hopper to the junction box outside the insulation cleanly. Non-Adhesive glass tape holds the leads in place.

CONTROL SYSTEMS

We supply custom control systems for all of our hopper heating systems.

- Simple on/off thermostat controls.
- Control Boxes on each Hopper with a thru-the-door disconnect, supplementary circuit breaker, contactor, control transformer, electronic thermostat or Hotfoil-EHS electronic controller with type “J” T/C, power-on light, heater-on light, and terminal blocks, completely pre-wired and tested prior to shipping.
- Control Panels with main thru-the-door circuit breaker, supplementary circuit breakers, contactors, control transformer, Hotfoil-EHS electronic controllers with type “J” T/C’s, power-on light, heater-on lights, low-alarm lights, hand off auto switches, and terminal blocks, completely pre-wired and tested prior to shipping.
- We are now supplying full PLC controls for our clients. In recent years the idea of an HMI system talking to the plants main control system has become a priority. With the PLC controls, the main Control Panels can be up on the hopper deck and can be watched and controlled from a small Touch screen HMI system in the control house. We are also capable of controlling the rappers, and the “TR’s” with our Control systems. We can customize the controls to your specific applications.



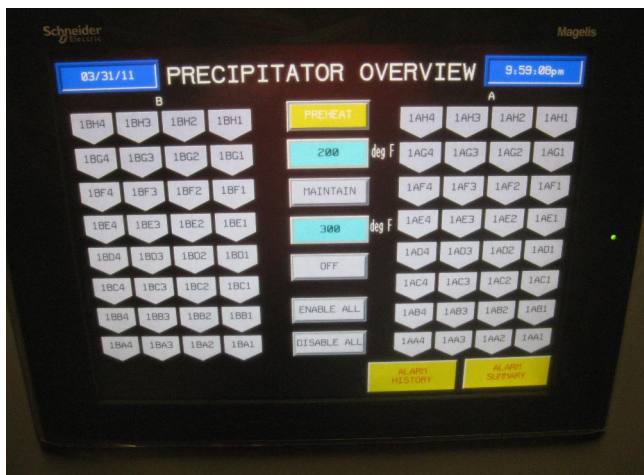
Stainless Steel Dual Door



Inside the PLC Cabinet



HMI in the control room



64 Hoppers shown running in pre-heat mode, Red Hopper means High-temp, Blue Hopper low-temp, green hopper at temp



64 Hoppers shown running in pre-heat mode, Red Hopper means High-temp, Blue Hopper low-temp, green hopper at temp



Control Panel using Electronic Controllers

The Control Panel to the left incorporates our own Hotfoil-EHS Electronic controllers. The controllers are designed for ease of setting; they are programmed to ramp to a set point and hold it. We also include Main thru-the-door Circuit breaker, supplementary circuit breakers, contactors, indicating lights, hand-off-auto switches, terminal blocks and relays. The control panel comes pre-wired and tested to the job-site ready to install.



Basic Control Panel using Thermostats

Above pictures depict a control panel that is simply controlled by a thermostat which is located on the hopper, similar to a T/C but instead using basic on/off technology. We also include Main thru-the-door Circuit breaker, supplementary circuit breakers, contactors, indicating lights, hand-off-auto switches, terminal blocks and relays. The control panel comes pre-wired and tested to the job-site ready to install.



AND HOPPERS: *We are now building hoppers*

Hotfoil-EHS; a leader in the field of Heating Baghouse and Precipitator Hoppers.

We have taken the next step in our pursuit of offering the best hopper heating systems. Our mission is to supply a complete package. We are offering hoppers up to 9' wide x 9' deep x 10' high in both steel or stainless steel up to a ¼" in thickness. We are so sure of our heaters that we are willing to extend the warranty up to 10 years. Whether it's designing systems in the field or engineering them at our Hamilton location, our experience makes our "HB Modules" second to none.

WHAT MAKES US DIFFERENT?

We can now supply the lower section of the hoppers to your spec. We will design the heating system to your specifications as normal; we will attach the studs, junction box bracket, thermocouple or thermostat mounting kit, and another box bracket for the T/C if it's required. This allows perfect placement of the heaters. All locations will be labeled on the hopper with the heater reference and the direction of the lead. This simplifies the installation 10 fold, requires less field time for welders, and eliminates errors. It also helps with making sure that all of the lead lengths are accurate and the junction box is located correctly. In addition, the temperature sensor will be in the correct location which is the most important part of heater installation.

WHAT ABOUT THE WARRANTY?

Standard warranty

The warranty for Hotfoi-EHS products is valid for eighteen (18) months from shipment or twelve (12) months from heating system start-up; whichever is sooner. This warranty covers the repair or replacement of Hotfoil equipment only and does not cover costs associated with the removal or reinstallation of equipment found to be defective. Hotfoil-EHS, Inc. does not accept any liability damages for other losses or consequential damages.

Warranty for heaters and controls

If Hotfoil-EHS Manufactures the heaters and the control system for a Baghouse or a Precipitator, we will warranty the heaters and the controls for 60 Months from Start-up or 66 months from shipment. This warranty covers the repair or replacement of Hotfoil equipment only and does not cover costs associated with the removal or reinstallation of equipment found to be defective. Hotfoil-EHS, Inc. does not accept any liability damages for other losses or consequential damages.

Warranty for heaters and controls plus hoppers

If Hotfoil-EHS Manufactures the hoppers, heaters and the control system for a Baghouse or a Precipitator we will warranty the hoppers up to 12 months, heaters and the controls for 120 Months from Start-up or 126 months from shipment. This warranty covers the repair or replacement of Hotfoil equipment only and does not cover costs associated with the removal or reinstallation of equipment found to be defective. Hotfoil-EHS, Inc. does not accept any liability damages for other losses or consequential damages.

HOTFOIL-EHS

HOTFOIL-EHS, INC.

2960 EAST STATE STREET EXT.

HAMILTON, NJ 08619

Phone: (609) 588-0900

Fax: (609) 588-8333

www.HOTFOILEHS.com