W. H. Cooke Times

Vol. 6, No. 4 Fall 2019 HANOVER PA FREE

Manufacturer of thermocouples, RTD's, and thermistors and distributor of instrumentation and controls for temperature, pressure, level, flow, pH, RH, flame and gas detection and heaters for almost any application. We also carry chart recorders and chart paper and pens as well as paperless recorders, data loggers, pumps, valves, and motors, and industrial oils, solvents, and lubricants. Here is a link to our website. www.whcooke.com

Quarter in Review

Page 2

W. H. Cooke & Co., Product Lines

Page 3

Boiler & HVAC Parts

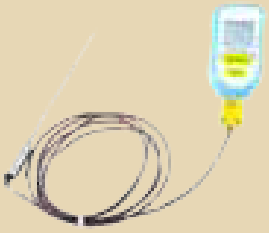
Page 4

Featured Line - Leister & Binmaster

Switchgear & Enclosure Heaters

Page 6

Tech Tips



Page 8

In The Community

Career & Technology Center

Page 9

LEISTER

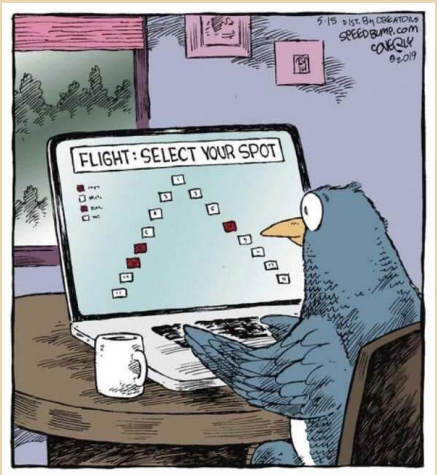
BINMASTER

Page 5

Sensor of the Quarter
RTDs

Page 7

Lame Jokes



Page 10

Quarter in Review

As we enter Q4 of 2019 heating becomes more of a priority for our customers. Here are a few applications that we frequently see:

Cooling Tower freeze protection: If you need a screw plug immersion heater to prevent your cooling towers basin from freezing, we sell heaters for that. We also have over the side immersion heaters for cement cooling tower basins

Tote Heating: If you have a tote and need to keep it warm, we have a line of heaters from Inteliheat https://www.whcooke.com/manufacturer_stage.php?compid=inteliheat They also make induction heaters for 55 gallon barrels and can customize heating blankets to cover totes as well as boxes of chocolate on skids or to pre-warm metal parts and more.

Heat Trace cable: If you need to heat trace a pipe, we can help you with calculating the necessary wattage as well as the correct gap on the wrapping of the cable.

Insulation-We sell a variety of EPDM insulation for pipes as well as tanks and flat surfaces. This insulation can also be used to go over the heat trace cable on your piping.

Hot Air-If you need hot air, we are happy to announce that we have acquired a line of hot air heaters from Leister https://www.whcooke.com/manufacturer_stage.php?compid=13322 The heaters can produce heat up to 1200°F and are great for adding extra heat in extrusion applications, embossing, removing flashing, blowing moisture off of a surface to apply a label, and much more. They are very versatile, and you can adjust the heat settings and the distance from product to get exactly the heat that you require. There are also a variety of fixtures that can be purchased to disperse the heat as required or you can fabricate your own fixtures to slip on the nozzle. There is more information on the Leister heaters further down in this newsletter.

Comfort Heaters-We also sell heaters for your plant, building, or office. We have also sold these to museums, government buildings, construction projects, and more. See these links for examples:
https://indeeco.com/products/wall-ceiling-floor-heaters

https://indeeco.com/products/radiant-heaters
https://indeeco.com/products/baseboard-convector-heaters

Off of the subject of heat, if you have any level applications we carry BinMaster brand. BinMaster designs and manufactures reliable, solid-state point and continuous bin level indicators, control systems, and sensing devices used while storing powders and bulk solids.

“You may not always have heating needs, but when you do, please think of W. H. Cooke & Co. for your heating needs. Stay warm my friends!”
-The Most Averagely Interesting Man in the World

W. H. Cooke & Co., Inc. Line Sheet

Click on Line Sheet below to view our product brochure

W. H. Cooke & Co., Inc. - Product Lines

W. H. Cooke & Co., Inc.
6868 York Road
PO Box 893
Hanover, PA 17331

Phone: 717-630-2222
Fax: 717-637-9999
Web: www.whcooke.com
Email: sales@whcooke.com

Featured Line - Leister & Binmaster

LEISTER

If you need hot air, we are happy to announce that we have acquired a line of hot air heaters from Leister

https://www.whcooke.com/manufacturer_stage.php?compid=13322 The heaters can produce heat up to 1200°F and are great for adding extra heat in extrusion applications, embossing, removing flashing, blowing moisture off of a surface to apply a label, and much more. Please contact us to discuss you application.

Click on any image below to view pdf

LEISTER PROCESS HEAT

Success Story
06 / 2016

Process Heat

Smoothing and Deflashing with Leister Hot-Air Blowers

Eliminating Gate Vestige and Problematic Stringing

Modern plastics have become a part of our everyday lives. One can even go as far to say plastics consumption is a benchmark for measuring how developed a country is. According to *Plastics – the Facts 2014/2015*, a report published by Plastics*Europe*, "...plastics materials have been key enablers for innovation and have contributed to the development and progress of society."

Plastic parts, manufactured using the injection molding process, can be realized in essentially every industry in many different ways. In an extremely competitive market where there are over 16,000 injection molding and plastics manufacturing facilities in the U.S. alone; part quality, appearance and especially consumer safety are at the top of the list to even be considered a viable candidate to produce these everyday items used throughout the world.

Caps and closures.

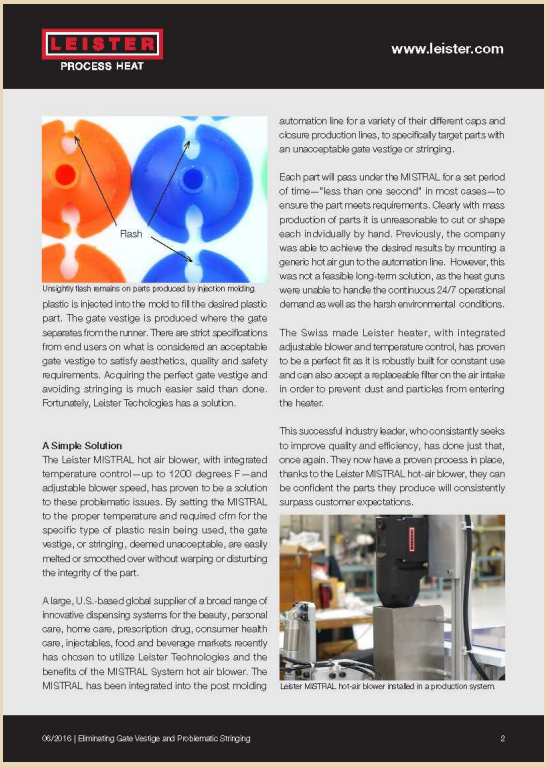
> "By setting the MISTRAL to the proper temperature and required cfm...the gate vestige or stringing... are easily melted or smoothed over."

Gate Vestige, Stringing and Flashing

Because these markets are highly driven by appearance, aesthetic imperfection is an understandable pain point. One of the most common headaches while producing these parts is the left over gate vestige caused by poor gate quality and tool wear over time. The gate vestige is a byproduct created when molten

One of the largest markets for injection molding would be the packaging and containers industry that includes dispensing systems for caps and bottles. These products are used in the beauty, personal care, home care, prescription drug, consumer health care, injectables, food and beverage markets.

We know how.



LEISTER PROCESS HEAT

www.leister.com

Unsightly flash remains on parts produced by injection molding

plastic is injected into the mold to fill the desired plastic part. The gate vestige is produced where the gate separates from the runner. There are strict specifications from end users on what is considered an acceptable gate vestige to satisfy aesthetics, quality and safety requirements. Acquiring the perfect gate vestige and avoiding stringing is much easier said than done. Fortunately, Leister Techologies has a solution.

A Simple Solution

The Leister MISTRAL hot air blower, with integrated temperature control—up to 1200 degrees F—and adjustable blower speed, has proven to be a solution to these problematic issues. By setting the MISTRAL to the proper temperature and required cfm for the specific type of plastic resin being used, the gate vestige, or stringing, deemed unacceptable, are easily melted or smoothed over without warping or disturbing the integrity of the part.

A large, U.S.-based global supplier of a broad range of innovative dispensing systems for the beauty, personal care, home care, prescription drug, consumer health care, injectables, food and beverage markets recently has chosen to utilize Leister Technologies and the benefits of the MISTRAL System hot air blower. The MISTRAL has been integrated into the post molding automation line for a variety of their different caps and closure production lines, to specifically target parts with an unacceptable gate vestige or stringing.

Each part will pass under the MISTRAL for a set period of time—"less than one second" in most cases—to ensure the part meets requirements. Clearly with mass production of parts it is unreasonable to cut or shape each individually by hand. Previously, the company was able to achieve the desired results by mounting a generic hot air gun to the automation line. However, this was not a feasible long-term solution, as the heat guns were unable to handle the continuous 24/7 operational demand as well as the harsh environmental conditions.

The Swiss made Leister heater, with integrated adjustable blower and temperature control, has proven to be a perfect fit as it is robustly built for constant use and can also accept a replaceable filter on the air intake in order to prevent dust and particles from entering the heater.

This successful industry leader, who consistantly seeks to improve quality and efficiency, has done just that, once again. They now have a proven process in place, thanks to the Leister MISTRAL hot-air blower, they can be confident the parts they produce will consistently surpass customer expectations.

Leister MISTRAL hot-air blower installed in a production system.

06/2016 | Eliminating Gate Vestige and Problematic Stringing 2

LEISTER PROCESS HEAT

www.leister.com

Regardless of whether a new mold with a new hot runner is having any of these issues, the fact of the matter is that at some point these problems are bound to occur and a solution is ready through Leister. Ideally, a newly built tool can be optimized to avoid gating issues. But if the particular part is going to be mass produced and the mold will be cycled over a long period of time, the gate in the tool steel and the hot tip of the hot runner nozzle will begin to wear. The same will happen with a valve gated system. The more cycles run—to produce any part—means the more times the valve pin will be opening and closing within the gate, which also creates wear on the tool steel. As this occurs, an unappealing gate vestige or cold slug will begin to appear that will need to be eliminated.

Rather than the costly unplanned downtime needed to remove the mold from the press to re-weld the gate, replace a tip and/or replace a valve pin; utilizing the technology and reliability of Leister Technologies will give injection molding and plastics manufacturing facilities the piece-of-mind that they can continually produce a quality product.

Leister Sales and Service Center:
Leister Technologies LLC | Itasca, Ill. United States

Material:
Caps & Closures

Leister Products:
MISTRAL System

Text & Imagery:
Brad Podge | © Leister Technologies LLC.
© Leister Technologies AG
© keerati | CanStockPhoto.com
© nevenm | CanStockPhoto.com
© mylbean | CanStockPhoto.com

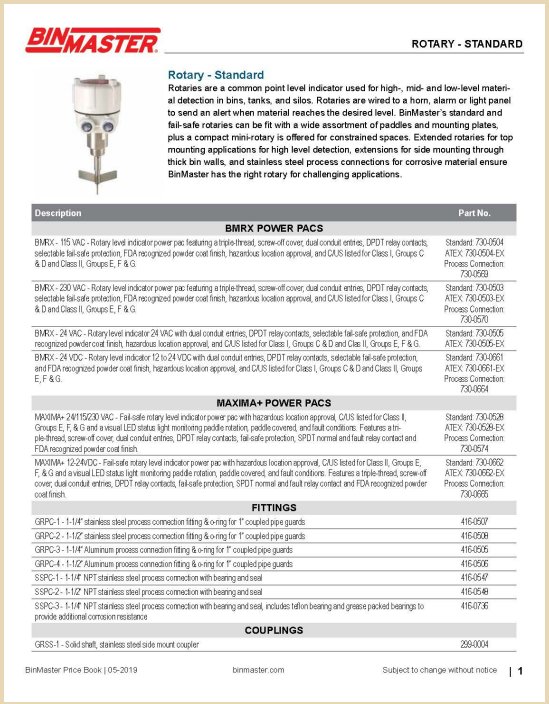
Leister tools in use

Hot-Air Blower
MISTRAL System

06/2016 | Eliminating Gate Vestige and Problematic Stringing 3

We sell BinMaster brand level sensors and controls. BinMaster designs and manufactures reliable, solid-state point and continuous bin level indicators, control systems, and sensing devices used while storing powders and bulk solids. Please let us know if we can help with BinMaster or Bindicator needs.

Click on any images below to view pdf

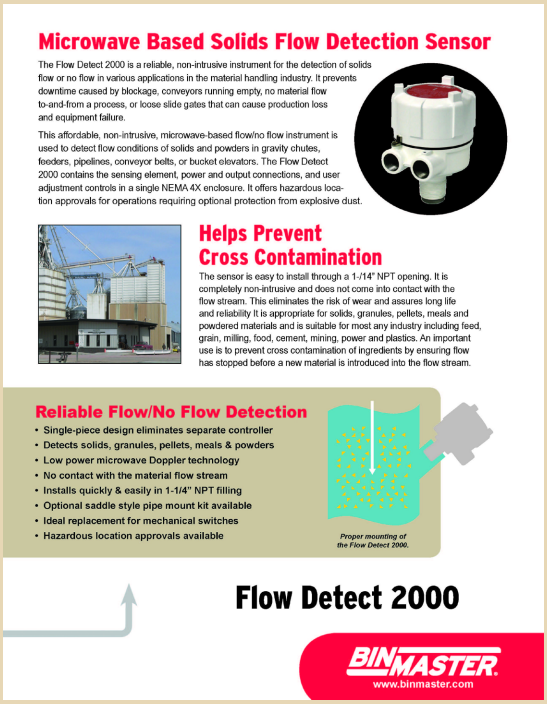


BINMASTER ROTARY - STANDARD

Rotary - Standard

Rotaries are a common point level indicator used for high-, mid- and low-level material detection in bins, tanks, and silos. Rotaries are wired to a horn, alarm or light panel to send an alert when material reaches the desired level. BinMaster's standard and fail-safe rotaries can be fit with a wide assortment of paddles and mounting plates, plus a compact mini-rotary is offered for constrained spaces. Extended rotaries for top mounting applications for high level detection, extensions for side mounting through thick bin walls, and stainless steel process connections for corrosive material ensure BinMaster has the right rotary for challenging applications.

Description	Part No.
BMRX POWER PACS	
BMRX - 115 VAC - Rotary level indicator power pac featuring a triple-thread, screw-off cover, dual conduit entries, DPDT relay contacts; selectable fail-safe protection; FDA recognized powder coat finish, hazardous location approval, and CUS listed for Class I, Groups C & D and Class II, Groups E, F & G.	Standard: 730-0504 ATEX: 730-0504-EX Process Connection: 730-0559
BMRX - 230 VAC - Rotary level indicator power pac featuring a triple-thread, screw-off cover, dual conduit entries, DPDT relay contacts; selectable fail-safe protection; FDA recognized powder coat finish, hazardous location approval, and CUS listed for Class I, Groups C & D and Class II, Groups E, F & G.	Standard: 730-0503 ATEX: 730-0503-EX Process Connection: 730-0570
BMRX - 24 VAC - Rotary level indicator 24 VAC with dual conduit entries; DPDT relay contacts, selectable fail-safe protection, and FDA recognized powder coat finish, hazardous location approval, and CUS listed for Class I, Groups C & D and Clas II, Groups E, F & G.	Standard: 730-0505 ATEX: 730-0505-EX
BMRX - 24 VDC - Rotary level indicator 12 to 24 VDC with dual conduit entries; DPDT relay contacts, selectable fail-safe protection, and FDA recognized powder coat finish, hazardous location approval, and CUS listed for Class I, Groups C & D and Class II, Groups E, F & G.	Standard: 730-0651 ATEX: 730-0651-EX Process Connection: 730-0654
MAXIMA+ POWER PACS	
MAXIMA+ 24/115/230 VAC - Fail-safe rotary level indicator power pac with hazardous location approval, CUS listed for Class II, Groups E, F, & G and a visual LED status light monitoring paddle rotation, paddle-covered, and fault conditions. Features a triple-thread, screw-off cover, dual conduit entries, DPDT relay contacts, fail-safe protection, SPDT normal and fault relay contact and FDA recognized powder coat finish.	Standard: 730-0528 ATEX: 730-0528-EX Process Connection: 730-0574
MAXIMA+ 12-24VDC - Fail-safe rotary level indicator power pac with hazardous location approval, CUS listed for Class II, Groups E, F, & G and a visual LED status light monitoring paddle rotation, paddle covered, and fault conditions. Features a triple-thread, screw-off cover, dual conduit entries, DPDT relay contacts, fail-safe protection, SPDT normal and fault relay contact and FDA recognized powder coat finish.	Standard: 730-0652 ATEX: 730-0652-EX Process Connection: 730-0655
FITTINGS	
GRPC-1 - 1-1/4" stainless steel process connection fitting & o-ring for 1" coupled pipe guards	416-0507
GRPC-2 - 1-1/2" stainless steel process connection fitting & o-ring for 1" coupled pipe guards	416-0508
GRPC-3 - 1-1/4" Aluminum process connection fitting & o-ring for 1" coupled pipe guards	416-0505
GRPC-4 - 1-1/2" Aluminum process connection fitting & o-ring for 1" coupled pipe guards	416-0506
SSPC-1 - 1-1/4" NPT stainless steel process connection with bearing and seal	416-0547
SSPC-2 - 1-1/2" NPT stainless steel process connection with bearing and seal	416-0548
SSPC-3 - 1-1/4" NPT stainless steel process connection with bearing and seal, includes teflon bearing and grease packed bearings to provide additional corrosion resistance	416-0736
COUPLINGS	
GRSS-1 - Solid shaft, stainless steel side mount coupler	299-0004



Microwave Based Solids Flow Detection Sensor

The Flow Detect 2000 is a reliable, non-intrusive instrument for the detection of solids flow or no flow in various applications in the material handling industry. It prevents downtime caused by blockage, conveyors running empty, no material flow to-and-from a process, or loose slide gates that can cause production loss and equipment failure.

This affordable, non-intrusive, microwave-based flow/no flow instrument is used to detect flow conditions of solids and powders in gravity chutes, feeders, pipelines, conveyor belts, or bucket elevators. The Flow Detect 2000 contains the sensing element, power and output connections, and user adjustment controls in a single NEMA 4X enclosure. It offers hazardous location approvals for operations requiring optional protection from explosive dust.

Helps Prevent Cross Contamination

The sensor is easy to install through a 1-/14" NPT opening. It is completely non-intrusive and does not come into contact with the flow stream. This eliminates the risk of wear and assures long life and reliability It is appropriate for solids, granules, pellets, meals and powdered materials and is suitable for most any industry including feed, grain, milling, food, cement, mining, power and plastics. An important use is to prevent cross contamination of ingredients by ensuring flow has stopped before a new material is introduced into the flow stream.

Reliable Flow/No Flow Detection

- Single-piece design eliminates separate controller
- Detects solids, granules, pellets, meals & powders
- Low power microwave Doppler technology
- No contact with the material flow stream
- Installs quickly & easily in 1-1/4" NPT filling
- Optional saddle style pipe mount kit available
- Ideal replacement for mechanical switches
- Hazardous location approvals available

Proper mounting of the Flow Detect 2000.

Flow Detect 2000

BINMASTER
www.binmaster.com

BINMASTER

VR-21, VR-41, & VR-51
VIBRATING ROD

OPERATING INSTRUCTIONS
PLEASE READ CAREFULLY

BINMASTER
Division of Garner Industries
7201 North 98th Street
Lincoln, NE 68507-9741
(402) 434-9102

925-0307 Rev D

Switchgear and Enclosure Heaters

As Winter approaches, we can help with heating solutions for outdoor enclosures and switchgear spaces. Off the shelf units can be supplied in wattages from 100-500.

Please reach out to team@whcooke.com for help with your application.

Click on any image below to view pdf

Enclosure Thermal Management

INDEECO

Enclosure Heating and Heater Selection

Why Do Enclosures Need Heat?

Heat is required to raise the temperature of the control panel, for freeze protection, reduce humidity, and prevent damage to the electronic components. As the complexity of electronics increase the temperatures in the panel increase, and it becomes even more critical to safeguard the enclosures. As a result of the higher temperatures, cooling systems are often required in many applications. When you have both the heat build-up and cooling moisture forms which causes the components to fail whether the enclosure is indoors or outdoors, insulated or un-insulated.

Moisture and Failure

When moisture is combined with contaminants, such as gas, dirt, water or dust, it may cause atmospheric corrosion, and failure of the components such as relays, transformers, bus bar, and integrated circuit boards. The most dangerous conditions are outdoors with large variation in ambient temperatures. Failure modes include; resistance changes, creepage current, insulation properties being compromised and flash-overs.

Eliminate Moisture

It is important to keep the relative air humidity below 60% to minimize moisture and corrosion. Should the relative air humidity rise above 65% it greatly increases the opportunity for moisture and corrosion problems to occur. Keeping the enclosure temperature 10°F higher than the ambient air temperature prevents moisture and corrosion in the enclosure. Consistent temperatures assure peak operating conditions. Continual changes in the enclosure temperatures produce condensation and decrease the life expectancy of the components

Heater Location

Mounting the heaters along with a thermostat near the bottom of the enclosure provides the best performance. Thermostats can be an integral part of the heater or purchased as an accessory item. The controller should be positioned in a neutral location that will provide an average humidity or temperature reading. Placing the thermostat too close to the heater may provide a reading that is influenced by the direct heat off of the heater.

Enclosure Surface Area - Square Feet	Temperature Rise from Minimum Expected Ambient Temperature to Desired Enclosure Temperature (°F)													
	20		40		60		80		100		120		140	
50	935	402	1800	774	2740	1178	3600	1548	4600	1978	5475	2354	6340	2726
40	750	323	1430	615	2200	946	2875	1236	3700	1591	4400	1892	5065	2178
30	560	241	1100	473	1650	710	2175	935	2760	1187	3285	1413	3795	1632
25	470	202	900	387	1370	589	1800	774	2300	989	2735	1176	3170	1363
20	375	161	725	312	1100	473	1450	624	1840	791	2200	946	2525	1086
15	280	120	540	232	820	353	1075	462	1375	591	1650	710	1900	817
10	185	80	360	155	550	237	725	312	920	396	1100	473	1265	544
9	165	71	315	135	480	206	635	273	805	346	960	413	1110	477
7.5	140	60	270	116	410	176	540	232	690	297	825	355	950	409
6	112	48	216	93	325		450	194	550	237	660	284	770	331
5	95	41	180	77	275	118	365	157	460	198	550	237	635	273
4	74	32	142	61	216	93	290	125	370	159	440	189	500	215
3	55	24	110	47	165	71	220	95	275	118	330	142	385	166
2	37	16	75	32	109	47	145	62	185	80	220	95	250	108

Required wattage – Double above values in areas with extreme wind factors.

uninsulated cabinet insulated cabinet

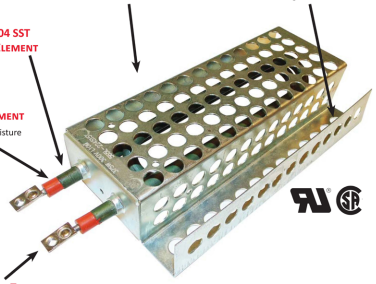
HX Series Enclosure Heaters
100W - 500W

Corrosion-Resistant Mounting Bracket
Offers maximum protection from accidental contact while allowing continuous air circulation

Easy Installation
Multiple 3/8" diameter mounting holes

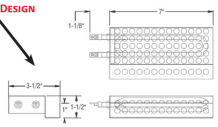
Rugged 304 SST Tubular Element

Sealed Element
To prevent moisture absorbtion



#8-32 Screw Tabs
For convenient electrical connections

Compact Design



Optional Features

- Custom wattages/voltages
- Custom dimensions/sizes
- Special moisture resistant vulcanized terminal with lead wire
- Custom mounting brackets and shrouds
- Thermostat
- Terminal shield for touch safe protection

Shown with optional thermostat

HX Series Enclosure Heaters

Watts	Operating Voltage	Max Current	Stocked	Part Number	WITH THERMOSTAT 30°F - 150°F Stocked	Part Number
100	250	.40 A	Y	HX-565003	N	HX-565003T
100	125	.80 A	Y	HX-565002	Y	HX-565002T
125*	120*	1.04 A	Y	HX-565060**	Y	HX-565060T**
125	240	.52 A	Y	HX-565070	N	HX-565070T
150	120	1.25 A	Y	HX-565071	Y	HX-565071T
150	240	.625 A	Y	HX-565079	N	HX-565079T
250	125	2.0 A	Y	HX-565004	Y	HX-565004T
250	250	1.0 A	Y	HX-565005	Y	HX-565005T
300	125	2.4 A	N	HX-565008	N	HX-565008T
300	250	1.2 A	N	HX-565009	N	HX-565009T
350	125	2.8 A	Y	HX-565006	Y	HX-565006T
350	250	1.4 A	Y	HX-565007	N	HX-565007T
375	125	3.0 A	Y	HX-565011	N	HX-565011T
375	250	1.5 A	Y	HX-565012	N	HX-565012T
500	120	4.17 A	Y	HX-565061**	Y	HX-565061T**
500*	240*	2.08 A	Y	HX-565060**	Y	HX-565060T**

Pricing current through 12/31/2018. Check our website for up-to-date pricing and delivery.
Stocked items can ship in 24 HRS ARO on orders of 10 or less. Orders exceeding 10 units please contact factory.
Non-stocked items ship in three (3) weeks ARO.
Thermostat option adds 1" to the width of the unit.
* Item is are dual rated.
**CSA Only.

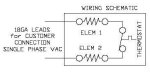
Field Upgrade Enclosure Heater

INDEECO Field Upgrade Heating Units offer the same basic design as the INDEECO Enclosure Heater with the benefit of expanded voltage ranges.

Heater can be wired directly to incoming power source, eliminating the need to increase the transformer size to accommodate an enclosure heater.

Watts	Operating Voltage	Max Current	Height	Width*	Length	WITH THERMOSTAT 30°F - 150°F Stocked	Part Number
250	460	.54 A	2.625"	5.250"	10.50"	N	739DR286599
203	415	.49 A					
170	380	.45 A					

* Includes thermostat dial
22 ga 304 SST shroud
UL Recognized and CSA Listed Component
Delivery 4 weeks ARO



Comparison of INDEECO Enclosure Heaters versus Typical Strip Heaters

Concern	Enclosure Heaters	Typical Strip Heater
Mounting Options	Enclosure heater is supplied complete with mounting bracket. Bracket allows for installation by any one of numerous pre-punched holes. Heater can be installed horizontally or vertically. Unique design supports the element in a mounting flange allowing for expansion of the element independent of the shroud while allowing continuous circulation of air. Therefore, no stand offs, insulation, or special mounting hardware is required.	Strip heaters are supplied with two mounting slots. This requires specific holes or bolts to install. Due to expansion of the heater the mounting bolts need be left loose to avoid buckling. Also, additional labor and materials are required to provide stand offs and/or insulation to disallow transfer of heat to the surface it is mounted to. All at additional cost.
Element Protection	Enclosure heater provides corrosion resistant shroud which offers maximum protection from accidental contact of heating element.	Strip heaters require additional fabrication installed around the heater (at additional cost) to provide protection from accidental contact of heating element.
Moisture absorption	Enclosure heater uses tubular element sealed at the ends which disallows moisture absorption. This maximizes heater life.	Standard strip heater is generally sheet metal with crimped seams the length of the heater. These seams many times allow for moisture to be absorbed by the hygroscopic insulating material resulting in premature failure. Expansion and contraction during operation exacerbates this problem over the life of the heater.
Heater Size/Shape	The unique design of the enclosure heater featuring a tubular element allows for the same bracket/shield for many different wattages. To increase the wattage the element length is increased and formed to fit within the shroud. The mounting footprint, price for the heater, and installtion cost stays consistent.	To increase the wattage on a strip heater the size of the heater must increase to keep the same watt density. The heater must get longer, wider or both. This changes the mounting holes and requires additional fabrication for larger shields to protect the heater. All of this is at additional cost to the user.
Price/Cost	Consistently lower than strip heaters.	Consistently higher than INDEECO Enclosure Heaters. Especially when considering extra added expense in mounting and protecting strip heaters.

Burner Controls & Parts

The cold weather is coming and if you need heat we can help with sensors and controls for your boilers, ovens, and furnaces. We have excellent pricing and availability on Fireye and Honeywell.

We can cross your Eclipse Veriflame numbers to a Fireye number. Standard lead times are 1-2 weeks but same day shipping with an expedite fee is often available. Please check our prices before you buy your next Fireye part!

Some Honeywell items are still running long lead times, but many can be shipped same day or within a week or two. We stock some in Hanover, PA and can drop ship to you from the closest warehouse if we do not have stock at our facility.

Sensor of the Quarter

RTDs

RTDs, also known as Resistance Temperature Detectors or Resistance Thermometers, come in various temperature vs resistance curves but they all measure temperature by a change in the resistance that they generate when heated or cooled.

As you know, thermocouples produce a millivoltage as opposed to changing resistance. Thermocouples operate over a wider range than RTDs and generally are more rugged and can withstand harsher environments found in some manufacturing environments.

RTDs are typically more accurate than thermocouples but their temperature range is more limited.

The most common types are made with platinum, copper, or nickel. They can be manufactured by winding the wire on a ceramic or glass core or by deposition on a flat substrate. We use both types depending on the application.

The platinum versions are typically either:

1. 100-ohm platinum .00385-ohm curve also known as the Europeanor DIN curve - see note below
This RTD produces 100 ohms at 0 Degrees C and for each degree C deviation from 0 C the resistance is increased or decreased by .385 ohms. Ex: At 1 degree C, the resistance reading is 100.385 ohms. At -1 degree C, the resistance is 99.615 ohms and so on.

2. 100-ohm platinum .00392-ohm curve also known as the American or NIST curve
The same rules apply as above except resistance changes by .00392 ohms per degree C

Of the two, the European or DIN curve is most popular

The platinum sensors are the most accurate over the widest range. The copper sensors are used up to about 300 F and nickel up to about 550 F due to non-linearity and oxidation issues above these temperatures. The copper sensors are often used in motor windings and the nickel sensors for bearing temperature measurements.

RTDs are available in 2, 3, or 4 wire configurations. Two wire units are used when the leads are short, under 6 ft. or so. When longer leads or better accuracy is required, a three (3) wire unit can be used. The extra wire is connected to one side of the RTD resistor bead and is used by the measuring device to subtract the extra resistance introduced by the longer lead wires. Same is true of the four (4) wire RTD except that an extra lead wire is added and measured on both sides of the resistor for even more accurate readings, providing your instrumentation has the capability to accept a 4 wire RTD.

How to check a 100-ohm platinum .00385 RTD for proper operation.

Two (2) wire version:
Using a multimeter set for resistance readings connect one meter lead to one lead of the RTD and the other meter lead to the other RTD lead. At 70 F, ambient temperature, your reading should be approximately 108 ohms.

To measure for a short to ground inside the RTD housing, connect both RTD leads to one lead of the multimeter and touch the other multimeter lead to the RTD metal sheath. You should read open or infinity. If you get any resistance reading, there is a short to ground which will cause the instrument to read erratically or give an incorrect value.

Please call us with your questions or applications. We're here to help.

Note: DIN is the abbreviated name of the Deutsches Institut für Normung (German Institute for Standardization) similar to the American NIST or National Institute of Standards & Technology. They set the "standards" for certain measurements such as size - in the case of 1/16th and 1/4 DIN instruments as well as electrical measurements such as the Din RTD curve

Tech Tips

How to check the polarity of a thermocouple: Part 2 of a 2 part series
with Wayne Cooke Sr.

How to check the polarity of a thermocouple: Part 2 of a 2 part series with Wayne Cooke Sr. C. Check for proper polarity. Many thermocouples are terminated with connectors or a transition where it is possible to have a reverse connection. That is, the negative wire is connected to the positive pin of the connector and positive wire is connected to the negative pin. When heat is applied to the thermocouple with the sensor plugged into a temperature tester, the reading will go down as the temperature goes up.

Note: It is not unusual to also see what is known as a “double reverse” connection. Here is an example. Customer has a type K thermocouple terminated with a screw cover head on top of a hot furnace. The electrician connects the wire in the head in reverse. Negative to positive and vice versa. He walks back to the controller 50 ft away and observes that the temperature is reading in the negative direction. Obviously he has a reverse connection. Instead of getting the ladder back out and climbing up on top of the hot furnace, he reverses the connection at the terminals of the controller and sure enough the controller reads in the positive direction. Problem solved? No. He must go back and correct the wiring because he still has the chromel wire connected to the alumel and vice versa in the run of wire from on top of the furnace (where the ambient temp in the screw cover head might be 150 F) and the terminals on back of the controller (where the ambient temp might be 70 F). The result is the same as it would be if he used uncompensated copper wire between the 2 connections and the reading will be off by 80 F (150-70 = 80). Remember red is always negative when working with a thermocouple and usually positive in a standard electrical connection so it easy to get that mixed up.

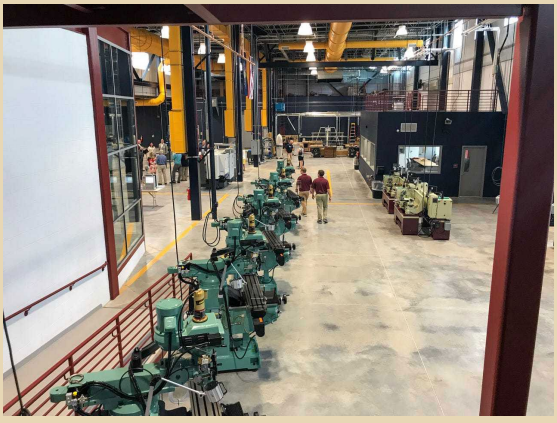
D. If you want to determine if your thermocouple or the instrument it is connected to is bad, try the following. Disconnect the thermocouple from the temperature controller or PLC input module and short across the 2 input terminals at the controller. If the controller reads ambient at the terminals, the thermocouple is most likely the problem. This is not always true for all controllers as I’ve seen a few where you must connect a thermocouple to the instrument terminals so it is best to take a short piece of thermocouple wire, strip both ends and twist securely at one end to form a junction and connect the other end to the input terminals and see if you read ambient temperature.

We hope that you have enjoyed this 2 part tech series on thermocouples. Stay tuned for more tech tips in future issues. Thanks! Wayne Cooke Sr.

In The Community

Career & Technology Center

A new career and technology center has opened just north of Hanover in New Oxford, PA. This new facility provides access to technical training courses for high school students interested in pursuing a technical career and for adults wanting to enhance their resumes and expand their job opportunities. We look forward to seeing what they will accomplish in the future.



”The program is one of the first of its kind at a public high school in Pennsylvania.
The Colonial Career and Technology Center will extend the high school's technology education wing by 13,000 square feet, adding locker rooms, a glass "think tank" and several labs dedicated to a variety of fields including plastics, robotics, welding, construction production, metal fabrication and electrical production."

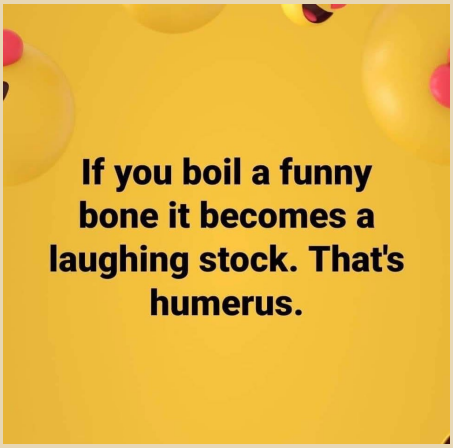
"The school district is working with the Hanover Area Chamber of Commerce to help set up students for future careers with local manufacturers. The Hanover and New Oxford area are saturated with manufacturing opportunities."

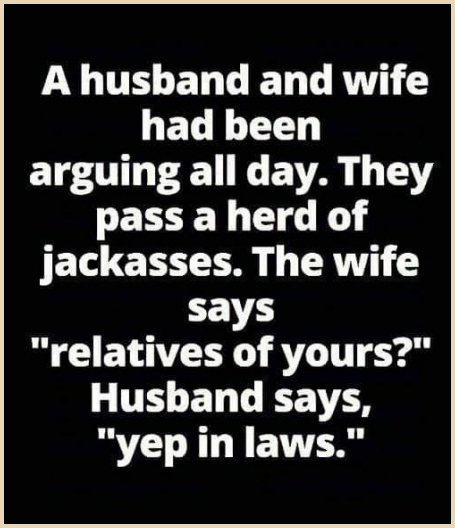
Please click links below for more information and photos.

https://www.eveningsun.com/picture-gallery/news/2019/09/06/new-oxford-high-school-unveils-new-colonials-career-technology-center-conewago-valley/2234958001/

https://www.eveningsun.com/story/news/2019/04/15/cvsd-tech-center-paves-path-new-careers-opening-features/793477002/

Lame Jokes





1. If unicorns existed, cavalry charges in war would have been even more terrifying.

2. If you put a fridge in Antarctica, it’s technically a heater.
3. Waterfalls are the complete opposite of fireflies.