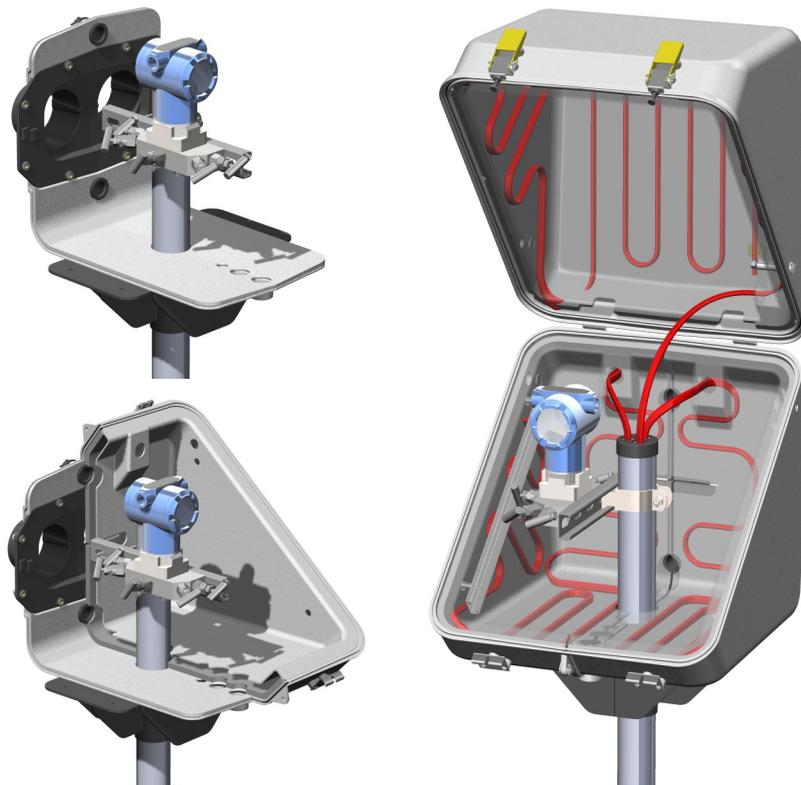




MODULAR INSTRUMENT ENCLOSURE SOLUTIONS



Enclosures
Insulation
Heaters
Pipe Stands
Tubing Bundle

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Modular Instrument Enclosure Solutions



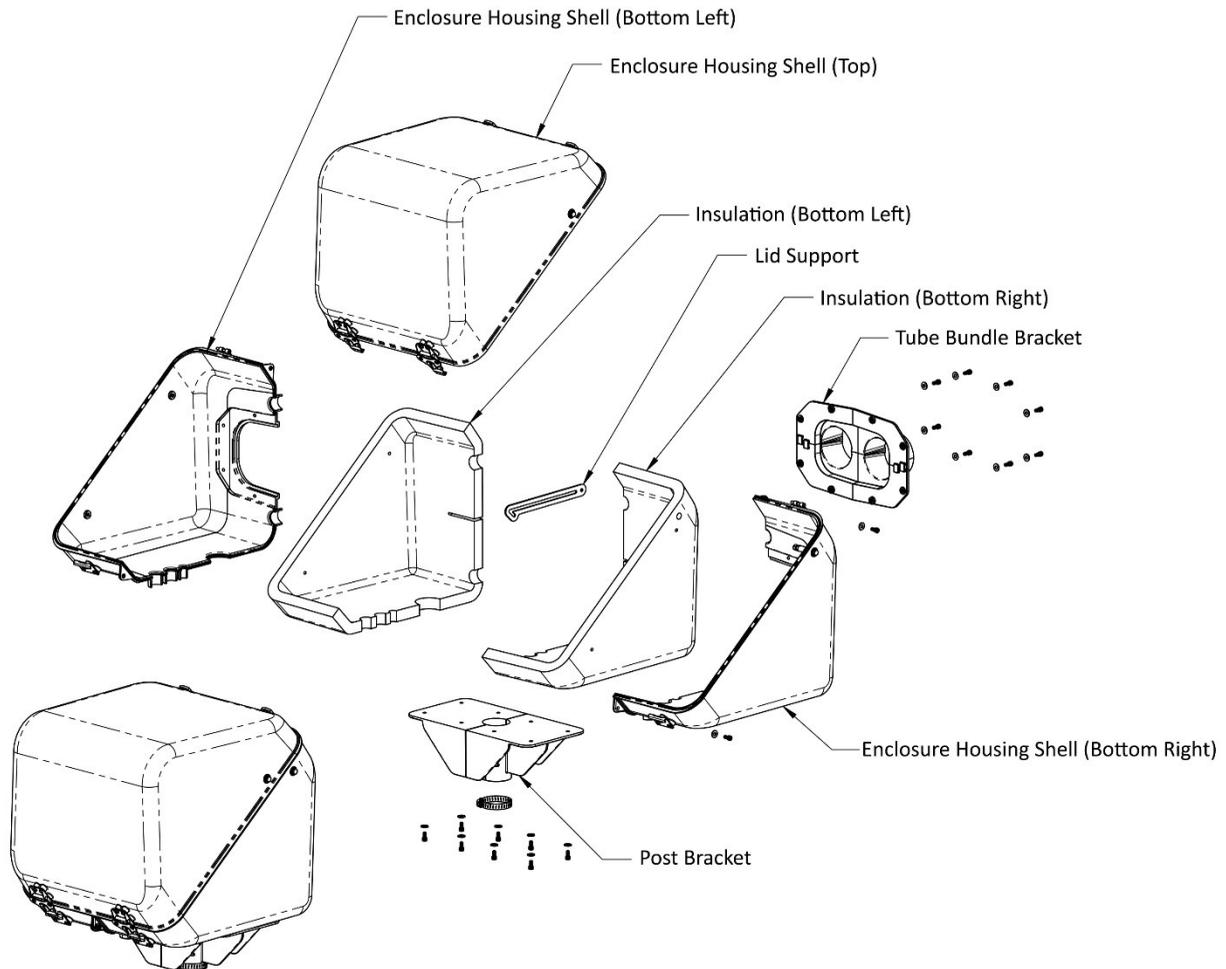


ThermaGuard Enclosure Systems

ThermaGuard Enclosure Description

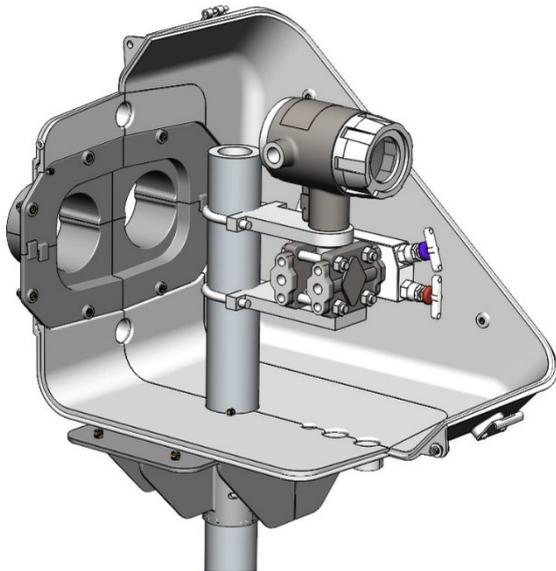
Terrapin's patented ThermaGuard modular design significantly simplifies the installations of rigid enclosures with a modular installation process. By providing an alignment manifold, every installation becomes standardized with Terrapin's pre-set holes for power wiring, control wiring, and process tubes. This allows for a complete installation in the field inclusive of process tubing, electrical, block heaters, vortex or thermoelectric coolers, calibration and testing without the need for offsite integration and schedule breaks. The insulation and heated liner systems are removable to provide extremely efficient maintenance and replacement if necessary.

Thermaguard Enclosures can also be used as an un-insulated or traced shell for protection from the elements where heating or cooling is not required.

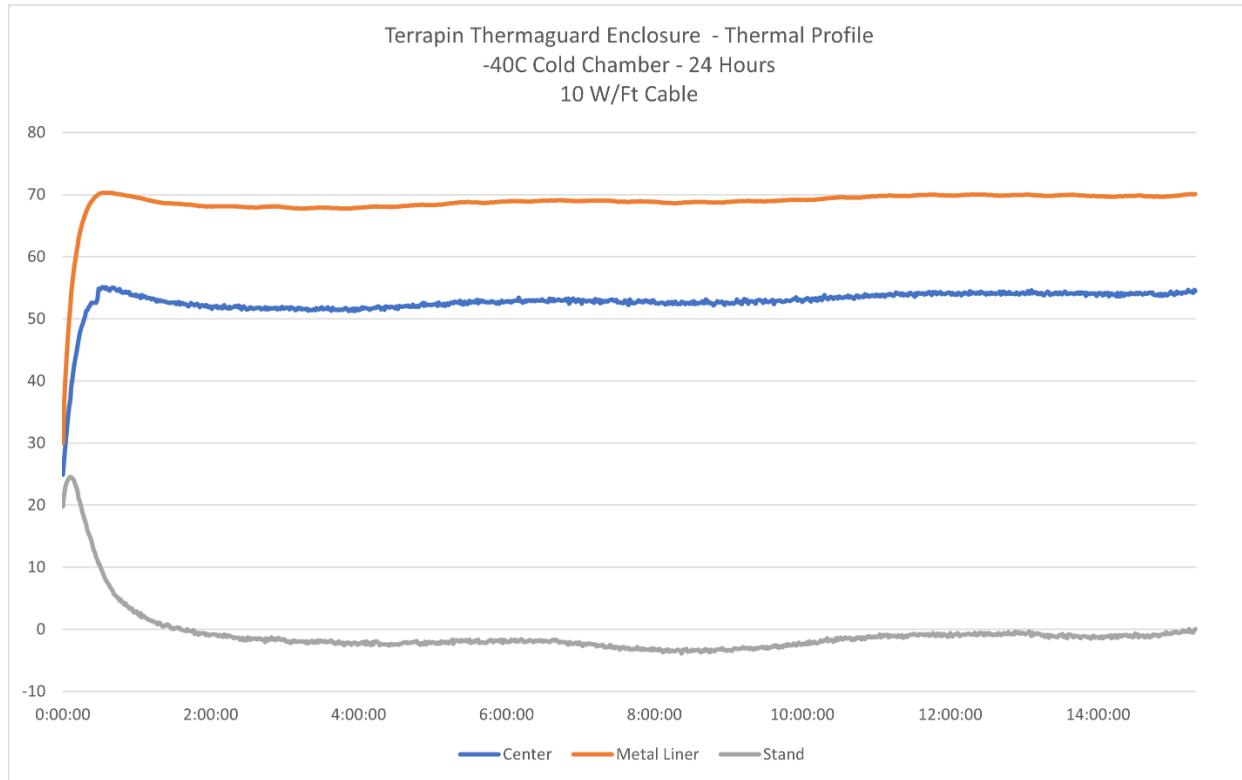


ThermaGuard Enclosure Advantages

- Enclosure can be installed around the instrument and disassembled without taking the instrument offline. (Pre-assembled enclosures available.)
- Quick connect design simplifies installation.
- Standardized installation.
- Enclosure parts are replaceable.
- Pre-Engineered ports for conduit & tubing bundle.
- Cold shrink end caps and boots to seal unused ports and create a flexible connection between the enclosure and conduit or bundle (included in installation kit).
- Optional, removable insulation in 10mm, 20mm or 1-inch(2.54cm) thicknesses.
- The insulated box (with ThermaGuard heated Liner) can maintain 75°F/23.9°C in temperatures as low as -60°F/-51.1°C.

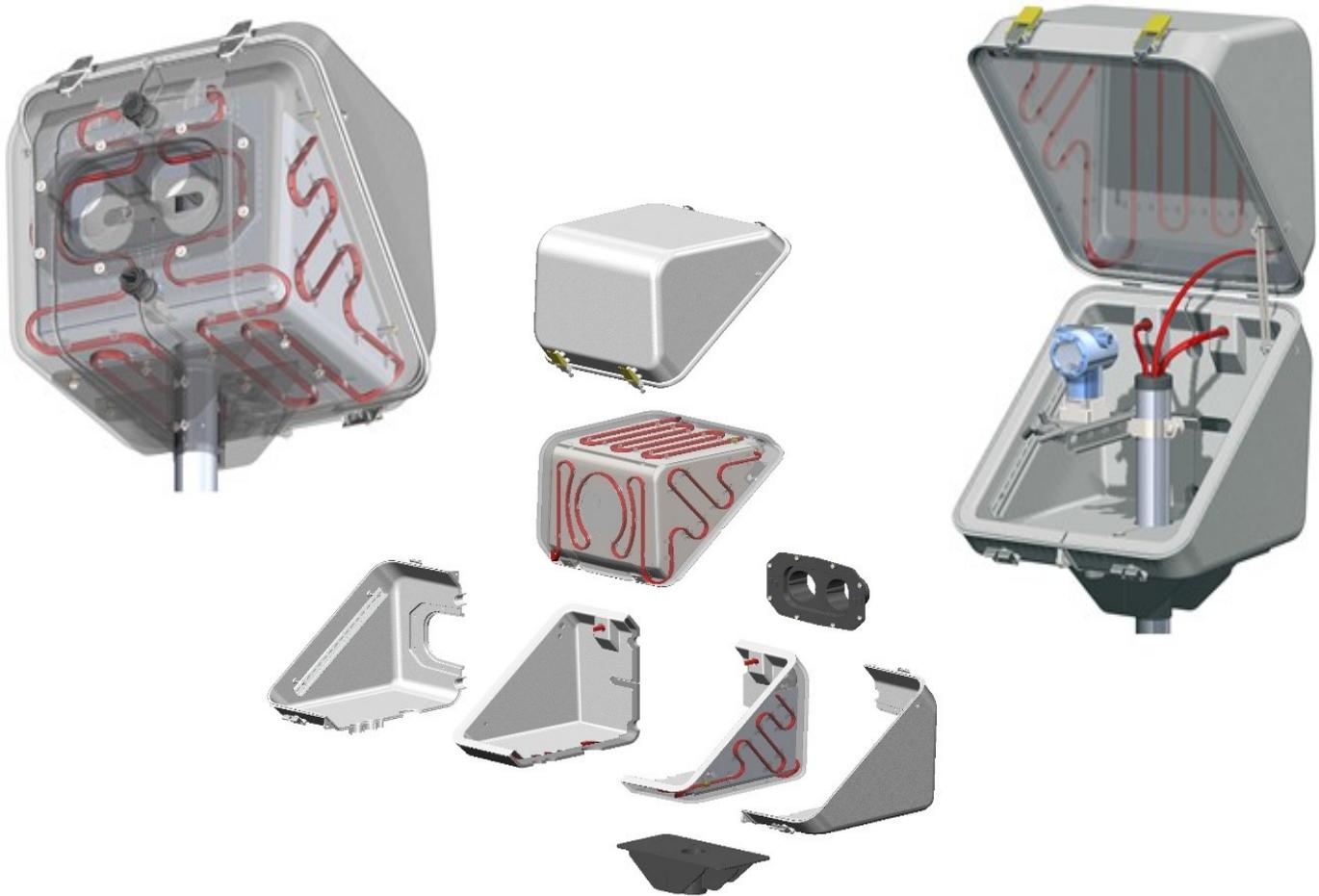


ThermaGuard Enclosure - Cold Chamber Test Results



ThermaGuard Heated Liner System – Patent Pending

ThermaGuard heated insulation provides the ultimate freeze protection for enclosures. Our patent-pending design incorporates insulation and heater cable with a 30-year life expectancy. Classic finned and block style heaters are notorious for failures within 5 years due to single-use thermal fuses. ThermaGuard insulation is removable and replaceable at any time with an easy 2-piece design.

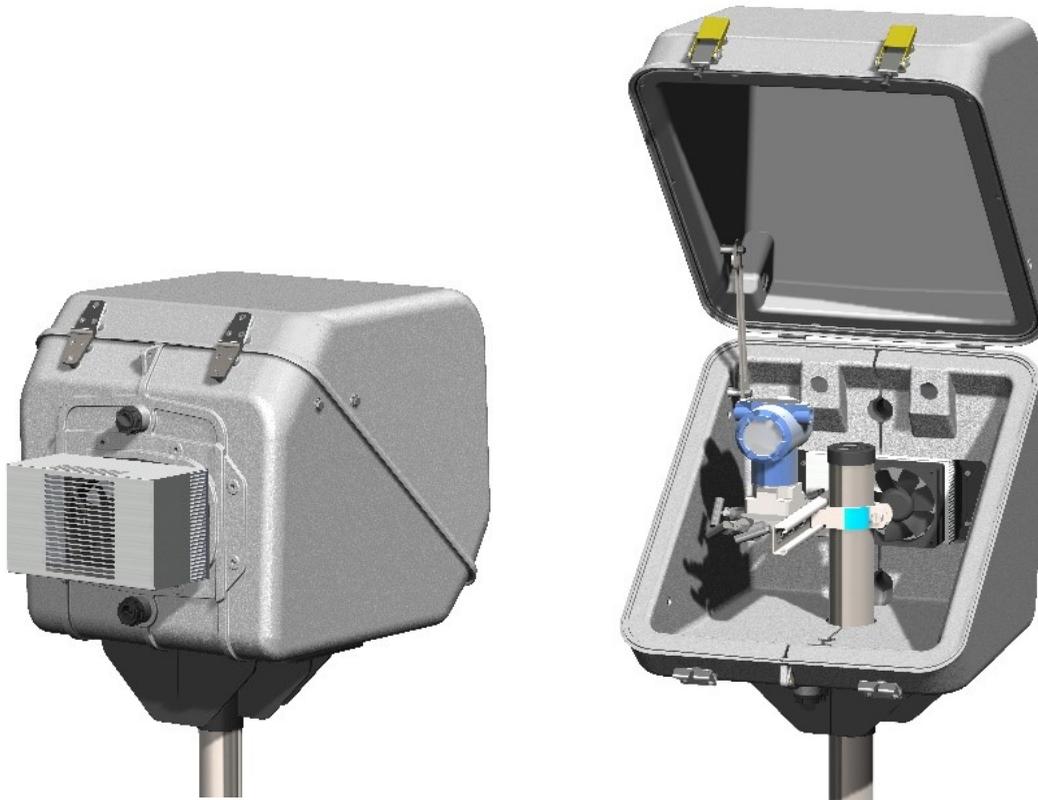


- Eliminates finned heaters, GUAT and rigid conduit for a more spacious enclosure interior and greater access to instrument and process tubing.
- Exceptional heat output ranges from 108 watts with 3watt/ft heater cable up to 720 watts with 20watt/ft heater cable for the most extreme temperature environments.
- Various insulation types to suit various ambient conditions: Standard Insulation is molded urethane 1" or 3/8". Also available are Pyrogel, mineral wool, or fiberglass temp mat.
- Allows for installation in hazardous areas the insulation heater cable is rated for. Heated liner can be used in T6 areas, whereas finned and block heaters are typically limited to T3 (392°F)
- Heater cable for the liner is integrated into the pipe stand for seamless installation and operation.
- Can maintain enclosure temperatures > 75°F/23.9°C in a -60°F/-51.1°C environment.



ThermaGuard Enclosure Insulation & Cooling System for Process Analyzers

ThermaGuard Enclosures are designed to provide cooling advantages for hot climates. The optional cooling system bracket is designed to give you a quick connect method of installing a thermoelectric or vortex cooler. The ThermaGuard enclosure shell is also manufactured using an inert foam injection molding process which traps air between two solid layers of plastic to significantly reduce heat loss at the enclosure's shell. Additionally, Terrapin utilizes a very light gray ASA plastic to reflect sunlight and reduce the transfer of conductive heat into the enclosure.



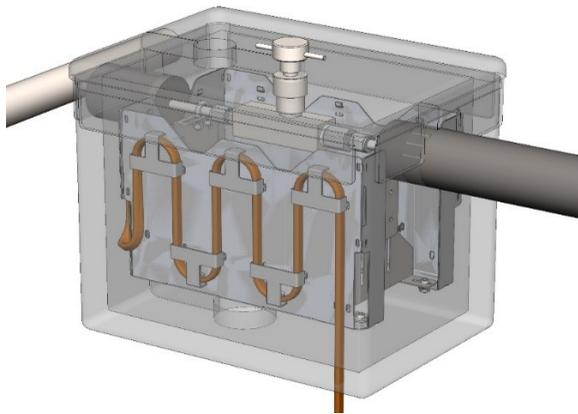
- Simple and standardized bolt on Cooling System Bracket available.
- Designed for a standardized quick connect installation of thermoelectric or vortex coolers.
- Pre-Engineered ports for conduit & tubing bundle.
- Cold shrink end caps and boots to seal unused ports and create a flexible connection between the enclosure and conduit or bundle (included in installation kit).
- Removable insulation available in 10mm and 25mm molded urethane (also available: Pyrogel, fiberglass, mineral wool)



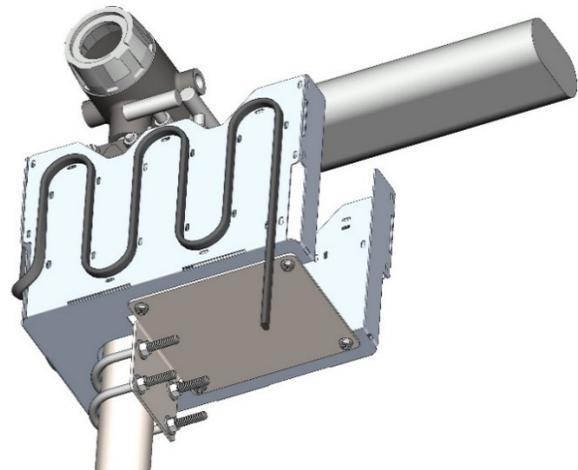
ThermaGuard Rigid Heated Blanket (Patent Pending)

Terrapin's Rigid Heated Blanket provides easy installation and exceptional heating capabilities packed in a small area by applying self-regulating cables to a conductive rigid frame. This design is applicable to instruments and root valves and provides a support system for the surrounding blanket.

ROOT VALVE APPLICATION



INSTRUMENT APPLICATION

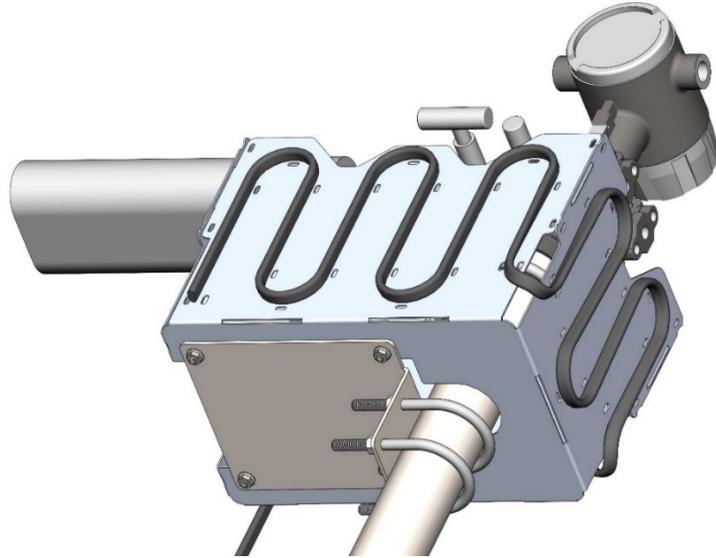


- Metal cable connectors and pre-engineered routing allows up to 10 feet of heating cable to be installed in a very small area. Due to minimal surface area, installing heating cable *directly* to the root valve would only allow two or three feet of heat cable to be applied without overlapping cables.
- By applying the heating cable to the metal frame, the heating cables are buffered from the hot process piping with an air gap. An inner high temp fabric insulation can also be neatly connected to the inner portion of the conductive frame to act as an added buffer from extreme temperatures.
- The ThermaGuard Rigid Heated Blanket is designed for simplified access, removal and reattachment during maintenance and operation. By loosening 4 bolts, the rigid heated blanket is easily removed as one entire unit and maintains its rigid shape to help avoid the cumbersome nature of soft blankets and encourages field staff to properly reattach the blanket during maintenance.

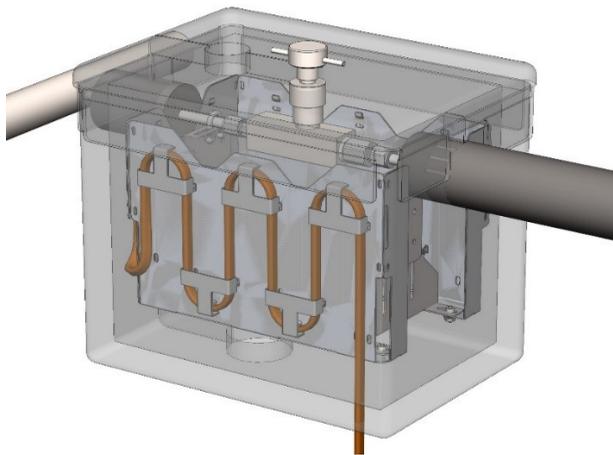


ThermaGuard Rigid Heated Blanket - Easy Installation

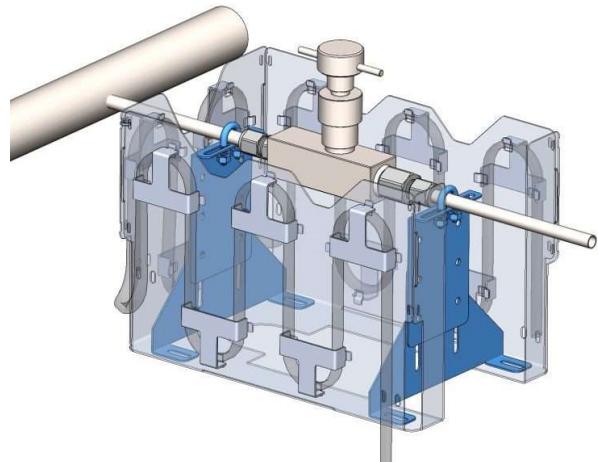
In an instrument application, the ThermaGuard Rigid Heated Blanket is supported by an L-bracket that bolts to the bottom of the conductive aluminum or stainless-steel metal frame. The L-bracket attaches to the pipe stand using two U-bolts. Loosen the U-bolts to remove the Rigid Heated Blanket. 10 ft of heating cable (Polymeric or MI or Steam) can be easily attached to the rigid frame.



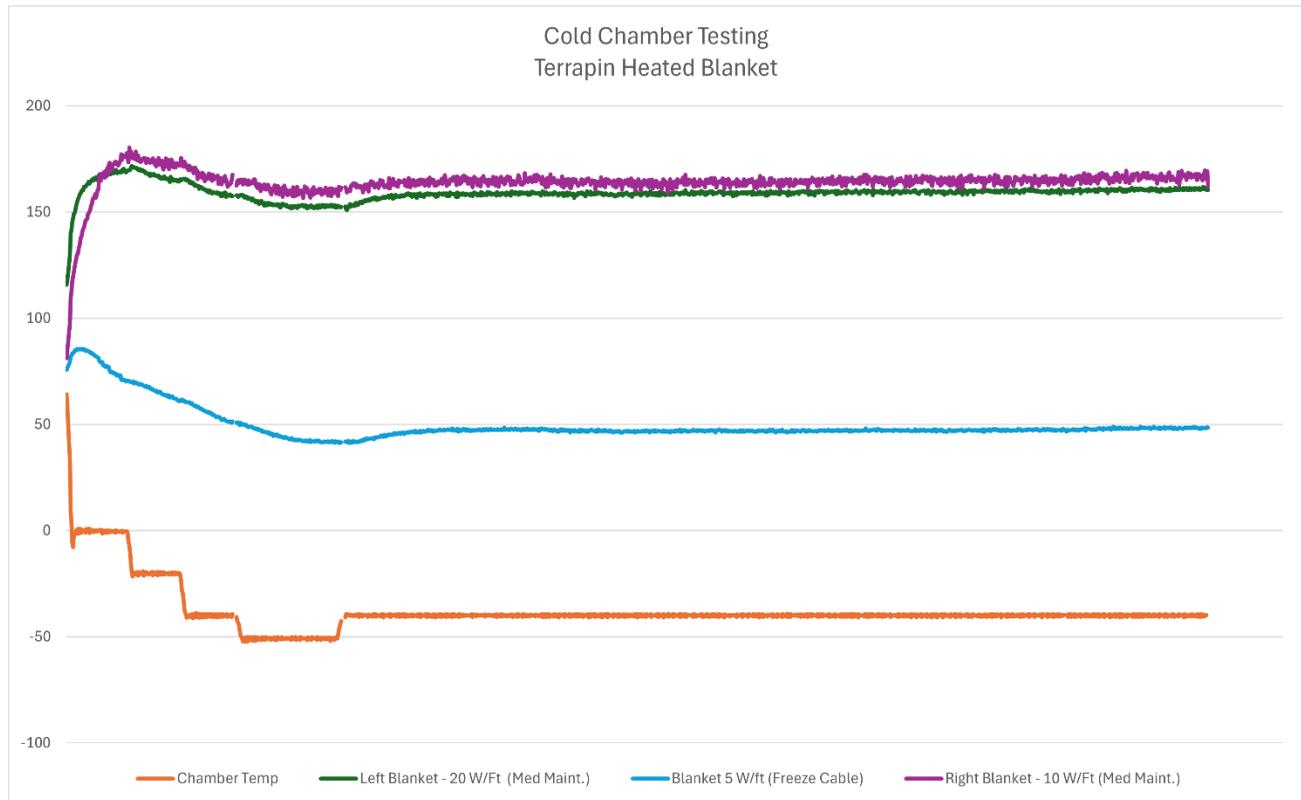
The insulating blanket bottom section attaches to the heated liner. The top Insulation lid section can be customized to the application, (i.e. valve covered or exposed)



Adjustable hanger bracket (shown in blue) attaches to piping/tubing. The hanging plate is height adjustable to hang the heated liner lower or higher, depending on the installation requirements



ThermaGuard Rigid Heated Blanket - Cold Chamber Test Results



ThermaGuard Insulated, Traced/Insulated Tubing Bundles.

Terrapin offers insulated and pre-traced tubing bundles for any application including steam and electric traced tubing bundles, CEMS and steam supply. Our materials and finishes have been curated to provide efficient, versatile, and durable tubing solutions to meet the highest standards even for electrically classified hazardous areas.



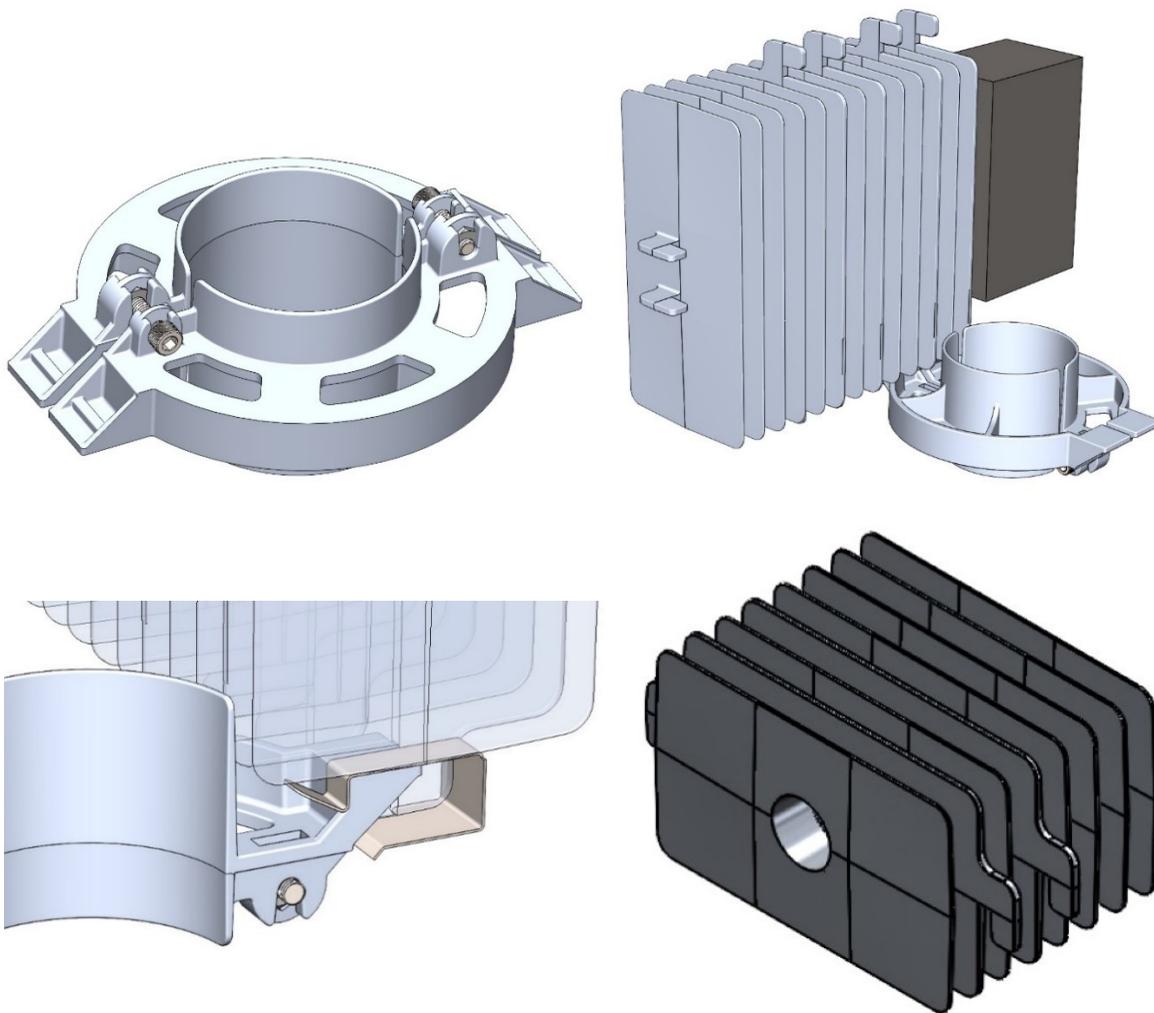
- **Pre-insulated Pipework:** Advanced tubing and insulation with maximum temperature consistency for industrial processes.
- **PVC Coating:** Enhances the tubing's resistance against environmental elements for longer-lasting performance in the harshest conditions.
- **Inert Nonreactive Silicon Coating:** Non-reactive and non-absorbent with liquids or gases. Produces smoother flow and better control without affecting analytical samples. This coating can bond to stainless steel, alloy, ceramic, or glass with tolerance for high pressure and extreme temperatures.
- **Stainless Steel Tubing:** Commercial grade instrument tubing welded for medium pressure and temperatures. A seamless option is available for high pressure and temperatures. Suitable for steam supply or transport for oil, gas, or chemicals.
- **Steam Trace Tubing:** Optimally designed for applications requiring consistent high temperature maintenance, this tubing facilitates efficient steam tracing.
- **Semiconductor Grade and Electropolished Tubing:** Hydrophobic tubing that ensures high-level purity for process applications such as semiconductor production and critical analytical sampling which require internal environments free from contaminants.
- **Polymer Tubing:** Designed to withstand challenging environments, particularly in industries dealing with aggressive and caustic chemicals or substances.
- **Tube Bundle:** Bundled tubing solutions to help streamline installation, with integrated solutions for a diverse range of needs.
- **Steam Bundles:** Crafted for applications leveraging steam to ensure optimal heat distribution and system efficiency.
- **Insulated Tubing & Insulation Bundles:** Enhanced temperature maintenance and energy savings, tailored for industries needing consistent temperature regulation.

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ThermaGuard Heaters & Mounting Bracket – Patent Pending

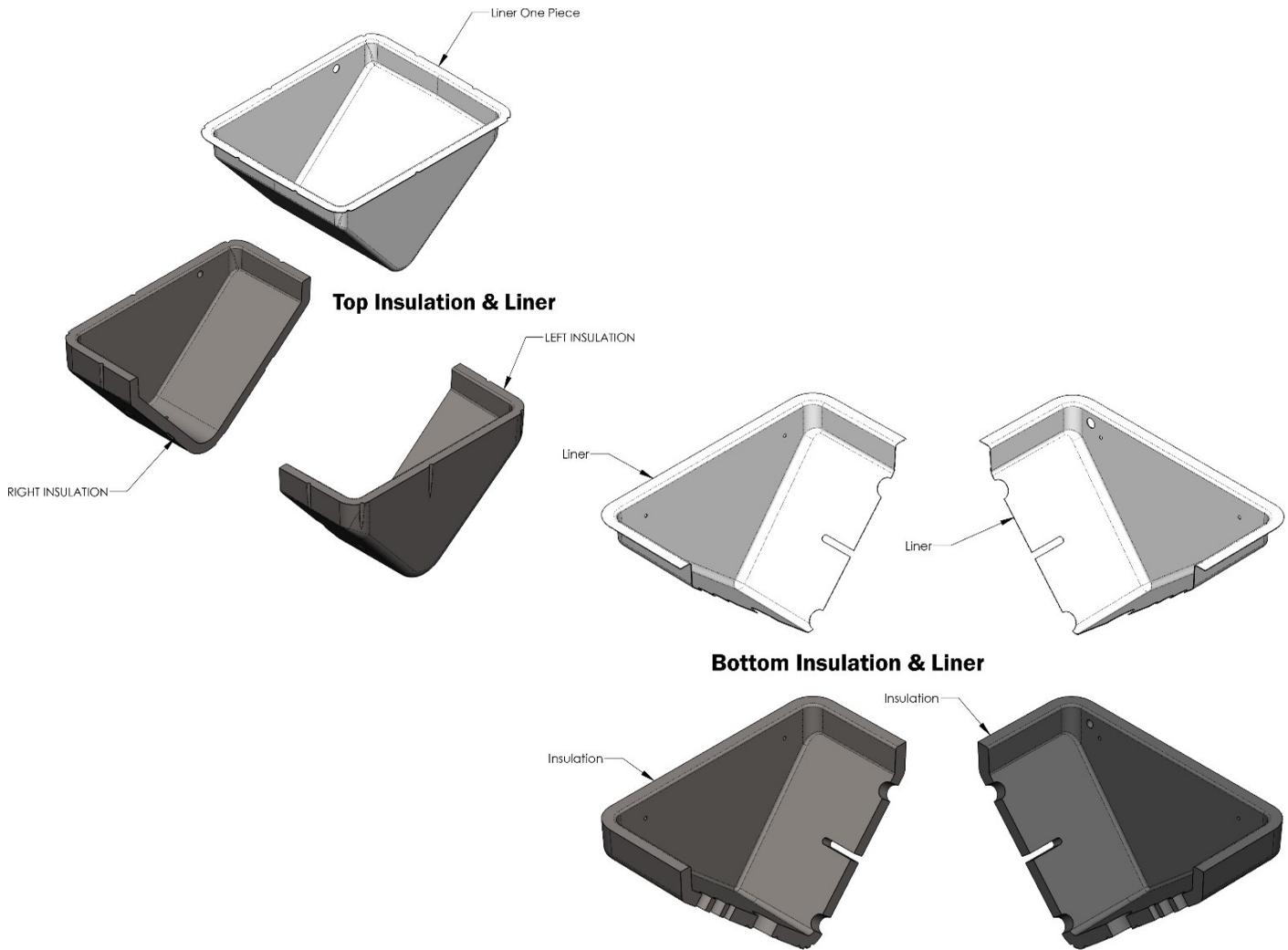
- With the Terrapin Mounting Bracket, the heaters can be suspended in the middle of the enclosure for better heat distribution.
- Patent-pending bracket with locking clip allows the heater to be locked into place in vertical or horizontal configurations.
- 360° mounting positions for versatile installation
- Thermostat with a variety of preset temperatures.



ThermaGuard Removable Insulation (Optional, Non-Heated)

ThermaGuard removable insulation is designed to be replaceable with various insulation thicknesses as demand may change. Our design is a one size fits all winterized enclosure assembly that eliminates customization and hardware unlike instrument enclosures available on the market today.

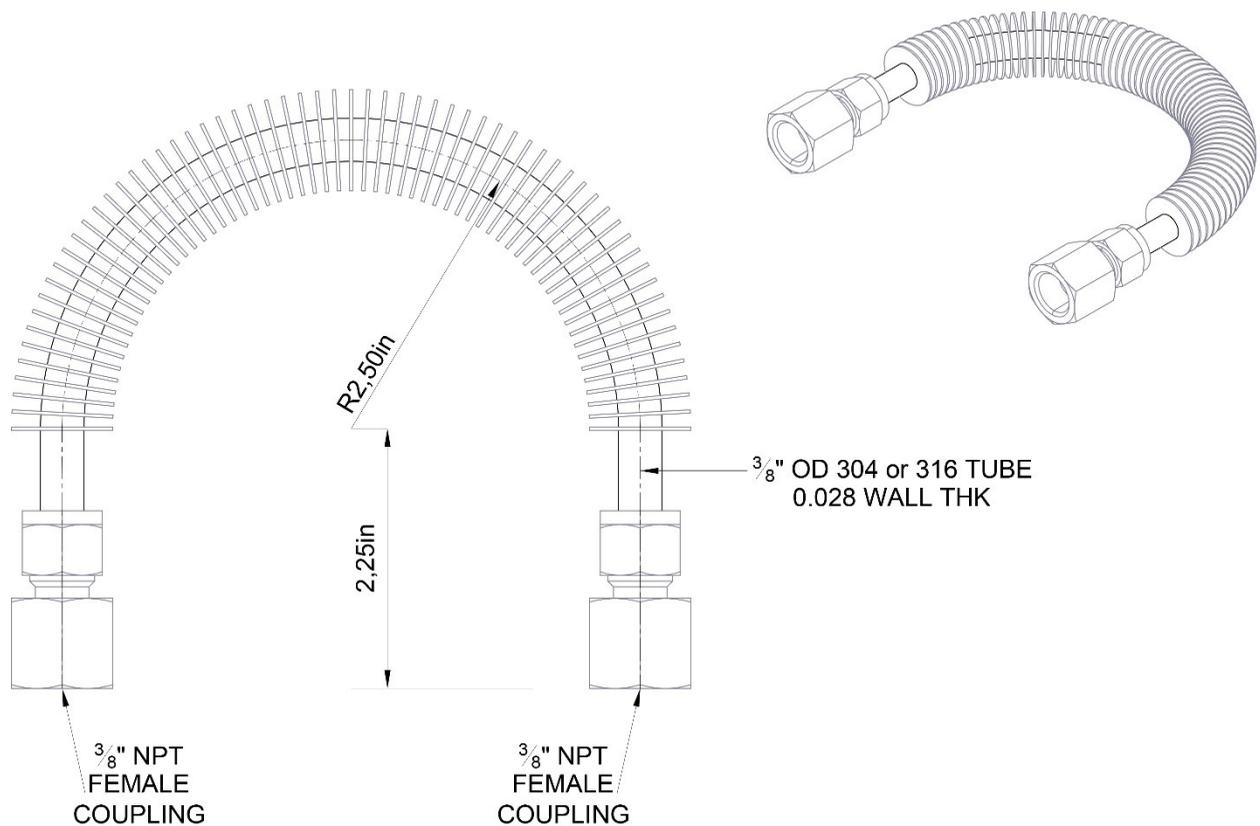
- Terrapin insulation is made from a hard yet lightweight polyisocyanurate foam that excels in conserving heat loss.
- Insulation K Factor .159 BTU (IT) inch/hour/foot²/Fahrenheit.
- The 2-piece removable design allows insulation to be installed or replaced at any time.
- With foam insulation and ThermaGuard heater, the ThermaGuard Enclosure can maintain 40°F in -60°F temperatures.
- Terrapin insulation also comes with an optional lined shell that covers the insulation from the operator, if this is required or desired.
- Removable insulation available in 10mm and 25mm molded urethane (also available: Pyrogel, fiberglass, mineral wool)



ThermaGuard Steam Heater

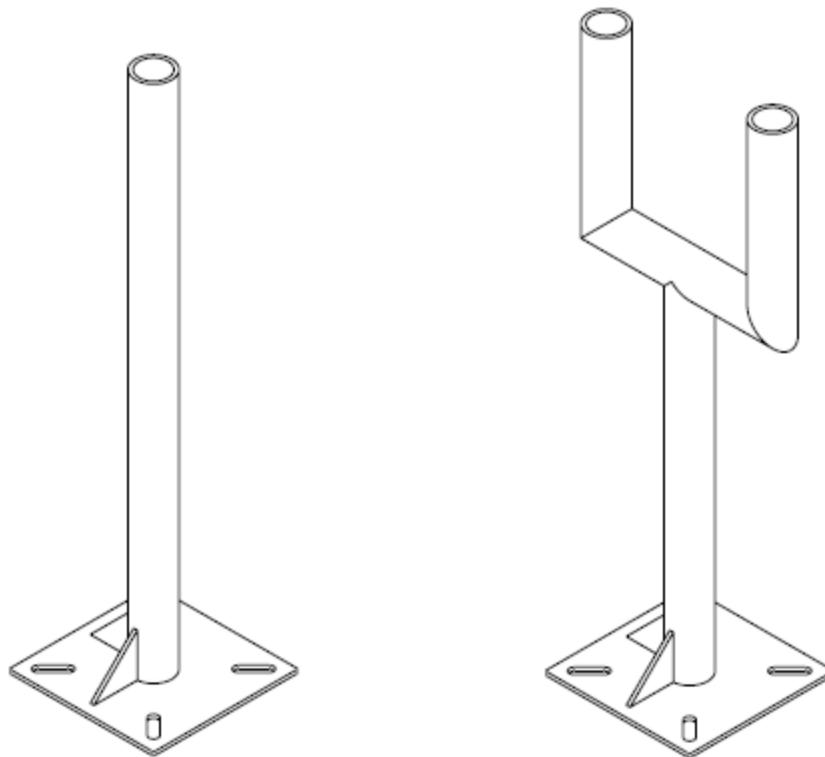
The ThermaGuard Steam Heater offers an efficient enclosure heating solution in steam applications. Assuming 50F freeze protection in the enclosure, the ThermaGuard Steam Heater provides 100 Watts at 50psi (300F)

- 304 or 316 Stainless Steel options available.
- Compact design uses a 3/8" Outer Diameter and 0.028" tube thickness.
- 100 Watts at 50psi (300F)

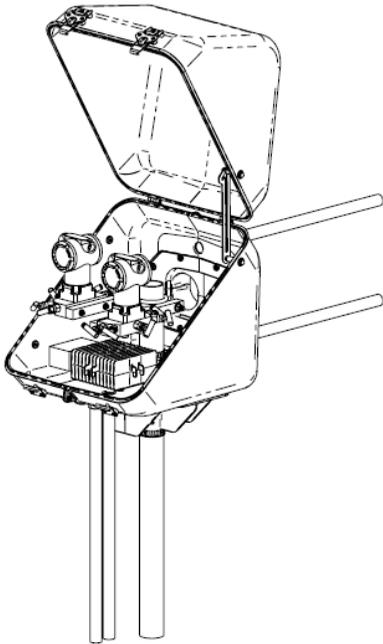


Pipe Stands

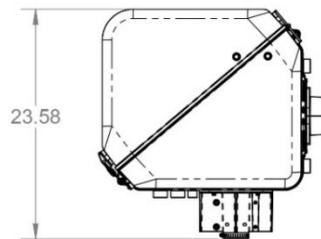
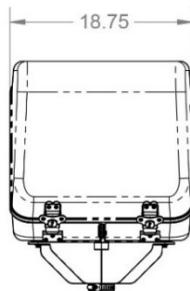
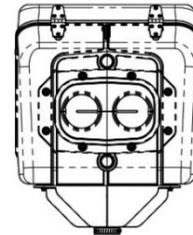
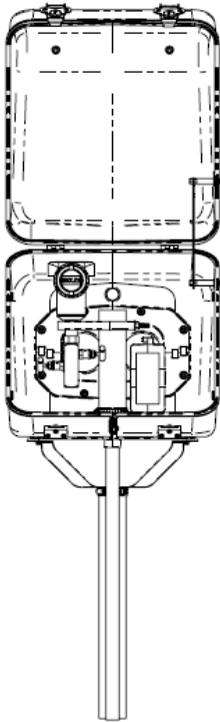
- Single and dual instrument pipe stands available.
- Multiple material options available: HDG (hot-dipped galvanized), painted galvanized, or fiberglass.
- Fiberglass pipe stands allow for minimal temperature transference into the enclosure, while also providing structural integrity comparable to steel.



ThermaGuard Enclosure Specifications

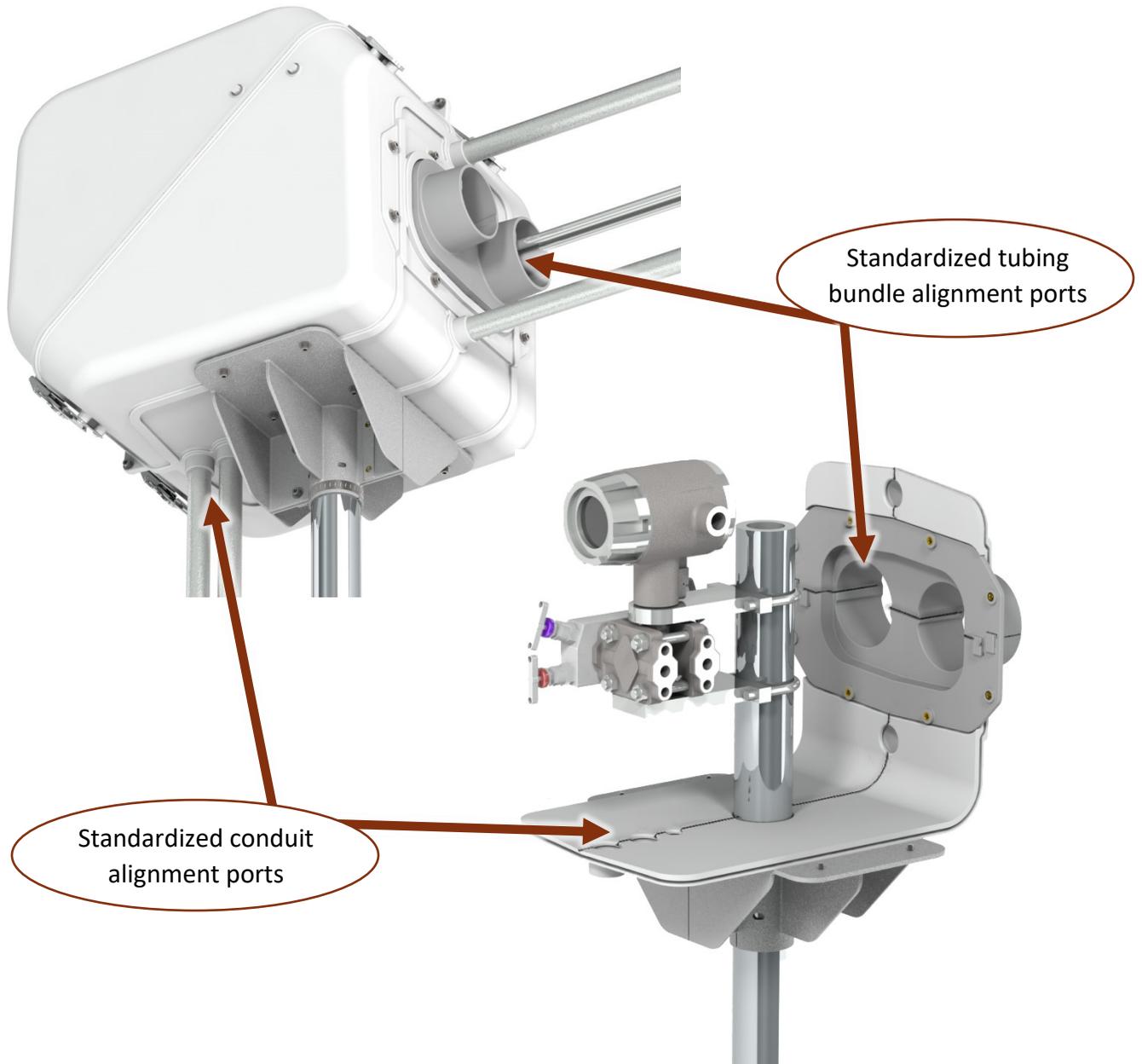


Outer Dimensions H x W x L:	23.58" x 18.75" x 23.61" 59.89cm x 47.62cm x 59.96cm
Inner Dimensions H x W x L:	23.33" x 18.5" x 23.36" 55.75cm x 45.51cm x 58.62cm
Material Thickness:	1/4" (0.635cm)
Material Type:	ASA Plastic w/ glass reinforcement
Temperature Rating:	> 75°F/23.9°C in -60°F/-51.1°C environment (with ThermaGuard Heated Liner)
Protection Standard:	IP 66
Gasket Material:	Neoprene gaskets
Color:	Light grey
Approx. Weight:	19.4 lbs (8.8 Kg)
Pipe Stand Mount Size:	sch 40 2" pipe dia (2.375") sch 40 5.08cm pipe dia (6.03cm)
Lip Support:	(1) Stainless steel lid support
Hinges:	(2) Stainless steel hinges
Latches:	(2) Stainless steel latches
Hardware:	All Stainless steel hardware



ThermaGuard Enclosure Standardized Assembly Design

Once the ThermaGuard enclosure manifold is fitted to the pipe stand it provides standardized ports for installation of conduit and tubing bundle. The ThermaGuard manifold is a quick connect design that aims to reduce the total install time and cost by 30%. Every ThermaGuard install has a consistent conduit and bundle alignment allowing for a standardized enclosure installation for all projects.





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Modular Instrument Enclosure Solutions



Terrapin is led by industry professionals with extensive industrial thermal heating experience. Our boots on the ground knowledge has fueled Terrapin's development of innovative solutions for flexible, standardized installation and decommissioning of instrument enclosures. Patented ThermaGuard products offer maximum winterization and freeze protection for process instruments. We take pride in our quick response and expert consulting skills to assist customers in making the right decisions for the job.

Brad Faseler; CEO/Founder

Matthew Nance; Board Member

Jim Bundschuh; Board Member

Jerry Dearing; Board Member

Eric Anderson; Board Member

David Anderson; Board Member



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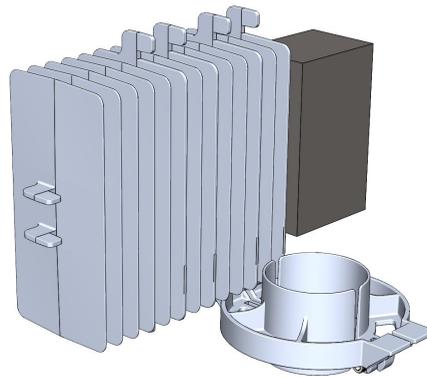


ThermaGuard Patented Enclosure Products



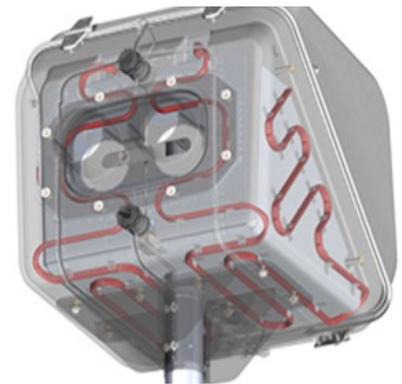
Modular Instrument Enclosures

Install or Decommission Enclosures without taking the instrument offline. Assemble the enclosure around the instrument. Pre-assembled also available.



360° Heater Mounting Bracket

Fast installation heater bracket allows for 360° heater mount inside the enclosure. Includes patented mounting clip for flexible vertical or horizontal heater orientations.



Enclosure Heated Insulation

Maximum freeze protection for process instruments. Keep production protected in the harshest winter temperatures. Non-heated insulation also available.

