

# ThermOmegaTech®

## Aerospace & Defense

- Privately held Small Business
- Established in 1983
- 50,000+ sq. ft. manufacturing and office facility headquartered near Philadelphia, PA
- 95% of ThermOmegaTech®'s products are manufactured on site
- ISO 9001 Certified
- World Wide Distribution

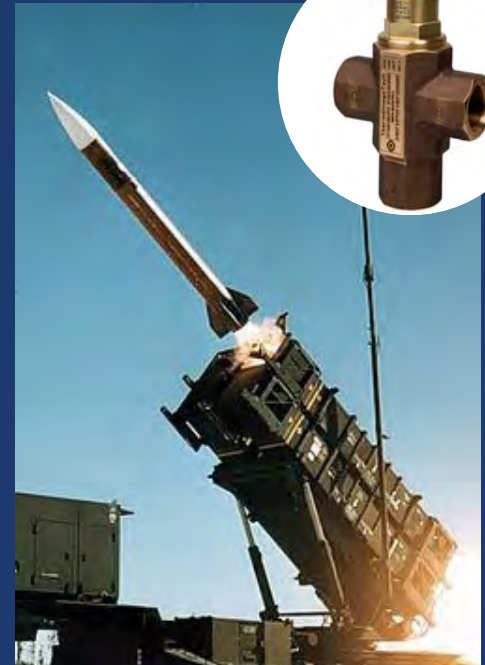


Electronics cooling on F-16 Fighting Falcon & EA-18G Growler Fighters aircrafts



Freeze Protection for cold water supply lines to docked ships

- Manufacturer of self-actuating temperature control products
- Offer innovative solutions to the Railroad, Commercial Plumbing, Industrial, and Aerospace & Defense markets
- Wide-range of applications
- High quality manufacturing process, problem-solving approach and innovative engineering techniques
- R&D capability & engineering services for mechanical & electrical technologies and integrated solutions



Hydraulic fluid temperature control on the Patriot missile launcher



# Aerospace & Defense

## Engineering Capabilities

- Engineers (12) mechanical & electrical
- Solidworks - 3D CAD design
- Solidworks - Flow simulation package
- OrCAD/Cadence Electronics Design S/W
- Microsoft Project
- Model shop
- Multi-purpose test stand
- Electronics lab
- 3D printing



3D simulation and modeling

## Quality Assurance Statement and Certification

ThermOmegaTech is ISO 9001:2008 and working towards AS 9001

Our company invests in the latest technology and processes to ensure our standard and custom products meet our design, quality, safety, environmental standards and specifications. Our quality assurance system is data driven and audited continually. Quality and continuous improvement, through our Lean Initiatives, is integral to our way of life always striving for 100% Customer Satisfaction.

## Manufacturing Capabilities

- CNC turning & milling centers
- Thermostatic actuator lab
- CMM (Coordinate Measuring Machine)
- Preactor scheduling S/W
- MasterCAM programming S/W
- Custom data logging S/W
- Test baths (qty 18) – aqueous & hi temp oil
- Environmental chambers (qty 3)
- Multi-station automated test stand
- Lean journey – ongoing, over 5 years



**NORTHROP GRUMMAN**

**BAE SYSTEMS**

**PDT**

**Jamco**



**Aurora**  
FLIGHT SCIENCES

**Raytheon**

**BOEING**



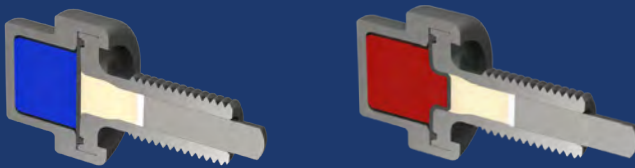
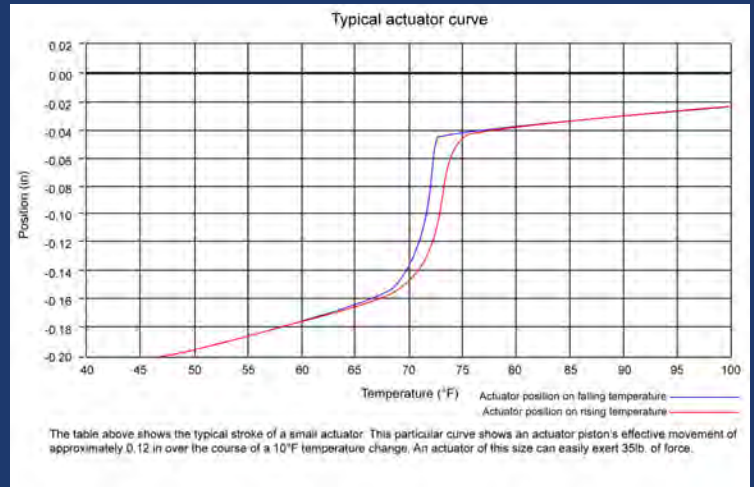
**LOCKHEED  
MARTIN**

# Aerospace & Defense

## Thermal Actuator Technology

### How it Works

- Our “phase change” thermal actuators are made with highly refined paraffin wax that changes in volume based on temperature.
- The piston movement results from a solid to liquid phase change of the paraffin wax, changing the length in a very precise, repeatable manner.
- No external power or signal is required.
- Our Thermoloid® material operates at temperatures ranging from 15°F to 300°F (-9.4°C-149°C).

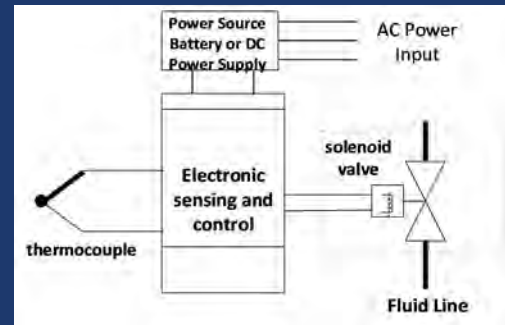
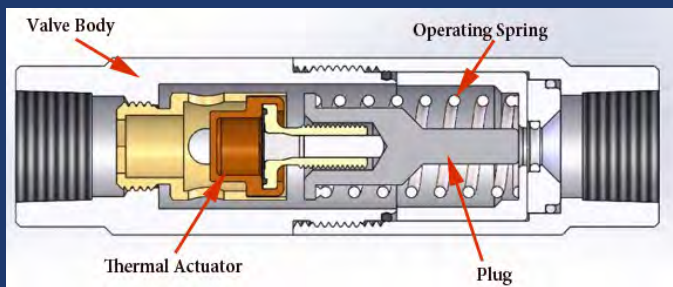


### Benefits

- Self-actuating - no external power
- Few moving parts
- Long service life
- Maintenance free – no periodic calibration
- Very high power to size and weight ratio
- Highly repeatable position vs. temperature
- Excellent for applications in many hazardous and extreme environments

### Advantages of Thermostatic Valve vs Electronic Sensing / Solenoid Valve

Provides temperature sensing, control (open or closed loop) and fluid modulation without wires & external power in one compact package – highly reliable and low cost, addressing many temperature control applications.



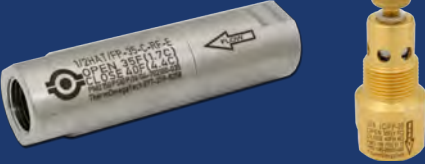





### Applications

- Scald protection for commercial airplane galleys
- Diverting fluid to a cooling or heating mechanism when temperature becomes excessive
- Electronics cooling
- Freeze protection for airplane lavatories
- Actuators applied to mechanisms for various temperature applications
- Linear (heated) Actuator – force/stroke
- Freeze protection for cold water supply lines
- Thermal based permissives / latching mechanism
- Electro-mechanical solenoid replacement in various temperature control applications
- Fluid mixing applications based on temperature
- Pump seal over temperature relief
- Equipment enclosure temperature control

# ThermOmegaTech®

## Aerospace & Defense

PRODUCTS	APPLICATIONS
<p>THERMAL ACTUATORS</p> 	<p>In addition to being the central control element in ThermOmegaTech® valves, they can also be married with other mechanisms to be used in custom applications such as safety latches, louver controls, trigger mechanisms, force generating devices and so on, please contact us to discuss your specific application.</p>
<p>M/D (3 way mixing/diverting)</p> 	<p>For Mixing or Diverting applications:  <u>Mixing</u>: The M/D will proportion the flow from two inlet ports to produce the desired outlet temperature. <u>Diverting</u>: The M/D will divert or switch the inlet flow to either of two outlet ports depending on the fluid temperature. Good for fluid cooling or heating applications; fluid temperature control, etc.</p>
<p>HAT/FP &amp; IC/FP</p> 	<p>Freeze protection for airplane lavatories, cold water supply lines to docked ships, condensate lines, pumps, safety showers, and other similar applications.</p>
<p>HAT &amp; TV/HAT</p> 	<p>Temperature control for tank coil heating, instrument enclosures, &amp; steam traps. Also can be used as scald protection to shut flow off to a spigot in commercial airplane galleys.</p>
<p>TV/SCI &amp; TV/SC-IR</p> 	<p>For enclosure heating and cooling applications:  <u>TV/SC-I</u> (inside the enclosure), a thermostatic element regulates the steam supply to the heater to accurately maintain the desired temperature. <u>TV/SC-IR</u> opens on rising temperature to regulate the flow of cooling media to the enclosure.</p>
<p>ECONO/HAT-RA</p> 	<p>Thermal relief for booster pumps; controlling cooling water outlet temperature; and controlling flow of cooling water, glycol or other cooling media in applications requiring economical removal of heat from equipment or a process.</p>
<p>YOUR CUSTOM DESIGN</p>	<p>ThermOmegaTech® offers customized engineering and fabrication services to help you create the perfect solution. Contact us to learn more about how ThermOmegaTech® can solve your aerospace and defense challenges!</p>