



ThermOmegaTech®

Aerospace & Defense Division

Thermostatic Valves For Your Temperature Control Needs



ThermOmegaTech® offers a variety of thermostatic temperature control solutions for diverse Aerospace & Defense applications where temperature control, size, reliability, and repeatability are crucial.

ThermOmegaTech's QMS is certified
to the AS9100 D standard

www.TOT-AD.com
1-877-379-8258

Who We Are

Experts in phase-change technology and thermal actuator design, ThermOmegaTech® is a leading manufacturer of self-actuating thermostatic temperature control products. Established in 1983, ThermOmegaTech® is a privately-owned, small business, with 40,000 + sq. ft. of manufacturing and office space located about an hour outside of Philadelphia in Warminster, PA.

Key Differentiators

- We have the resources to dedicate time and capital to customized designs in the pursuit of technological advances, while ensuring rapid response and an individualized customer service experience.
- Engineering, manufacturing, assembly, testing, inspection, sales, and customer service departments are all located in one facility for maximum efficiency and effective communication.
- 3-year average of 99.5% on-time delivery rate.
- Management dedication to Lean initiatives and Continuous Improvement since 2010, fostering a progressive culture of innovation and improvement.

Certifications & Compliance

ThermOmegaTech's quality management system is AS9100D certified, demonstrating our strong commitment to quality to meet the stringent requirements for Aviation, Space and Defense organizations. Our entire team is dedicated to Lean Manufacturing Initiatives and strives to cultivate a culture of continuous improvement.

Custom Engineered Solutions

In addition to our comprehensive catalog of standard products for thermal bypass, electronics cooling, airflow control, freeze protection, and scald protection, ThermOmegaTech® offers custom-design engineering services to satisfy unique project requirements.

We can customize product characteristics, such as material, size, flow rates, number of inlets/outlets, and other optional features such as overrides. All new product development is supported by our on-site R&D services including prototype manufacturing and small batch runs for custom designs. We also can reverse engineer obsolete or single source parts for your projects if required.

Manufacturing Capabilities

ThermOmegaTech's production facility is equipped with state-of-the-art CNC turning and milling centers. We can provide valves from precision machined parts in stainless steel, aluminum, titanium, Monel, Inconel, Hastelloy and other exotic metals to meet the high stress and low weight material requirements of many A&D applications.

Our advanced testing equipment and stringent quality measures allow us to maintain a high standard of control throughout every step of the production process, offering full part and lot traceability on components for your project when requested.



Thermostatic Control for Aerospace & Defense

ThermOmegaTech® specializes in the design and manufacturing of customizable thermostatic valves and actuators for a multitude of Aerospace & Defense applications including thermal bypass, electronics cooling, cabin temperature control, airflow control, freeze protection.

Thermal Bypass Valves

Our Thermal Bypass Valves (TBVs) maintain optimal system temperature by monitoring the inlet flow and diverting the fluid based on temperature, thereby reducing system wear, minimizing warm up times, and extending component life. When the fluid temperature is above the valve's set-point, the TBV automatically diverts flow to the system's cooler or heat exchanger. When the fluid temperature is below the set-point, the flow is bypassed directly to the reservoir and continues to circulate through the system.

Innovatively designed, our TBVs can also be used in mixing applications where controlled outlet temperature is required, modulating between "hot" and "cold" inlet ports, to produce the desired outlet temperature.

Past Projects

- Electronics cooling on F-16 Fighting Falcon Aircraft
- Hydraulic Fluid Temperature control for Self-Propelled Military Tactical Vehicles
- Thermal Bypass on Family of medium Tactical Vehicles (FMTV) for Army
- Hydraulic Fluid Temperature Control for Patriot Missile System Radar Set
- Liquid Cooling on Unmanned Aerial Systems
- Thermal Bypass on Generic Aircraft Nitrogen Generator Carts



Cartridge Integration

Utilizing the same thermal element as our standard TBV's, we offer valve cartridges to ease integration into pre-existing systems with unique design requirements and space restrictions. We can design a manifold housing for the TBV cartridge specific to your system requirements and manufacture it in-house if desired.

Customizations

If our standard product offering does not meet your requirements, our team of engineers and project managers will work with your team to design a thermal control solution that works specifically for your project. Many customizations are possible, including size, configuration, type of metal, O-ring material, opening/closing temperatures, stroke, length, flow rates, thread type, and number of parts.

For product dimensions and specifications, or customizations visit www.TOT-AD.com

Thermostatic Actuators

Thermal actuators are designed to respond to a specified temperature range for heating, cooling, or control/activation applications. Utilizing our exclusive Thermoloid® paraffin wax, the actuator piston retracts or expands based on temperature.

In its “cold position” the wax is solid and the piston is retracted. As temperature increases to within the valve’s pre-determined active range, the wax changes into its liquid phase, causing the piston to extend, producing usable stroke and putting the actuator into its “hot position.” This piston movement can be used to push/pull, open/close or move a load based on temperature.

Benefits

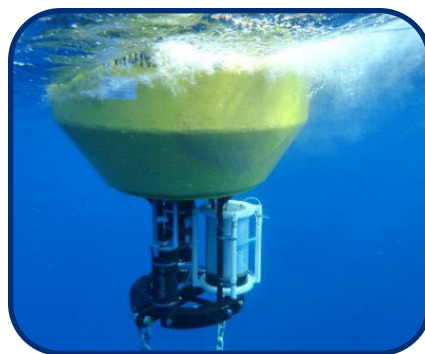
- Self-actuating: No need for an external power source
- Maintenance-free: No periodic calibration required
- Predictable: Piston moves in relation to specific temperature
- Simplistic Design: Increases service life and minimizes part failures
- High power to size and weight ratio
- No Electric Power: Ideal for explosion-proof environments



The wax in each actuator is individually blended to respond to a specific temperature range and used in a wide variety of temperature control applications. The effect of the piston stroke generated by the thermal actuator depends entirely on the thermal management/control system it’s integrated into.

Past Projects

- Airflow Control on Unmanned Prototype Jets
- Linear Heater for Buoy Release
- Hydraulic Temperature Control for Military Vehicles



Customizations

In addition to our comprehensive catalog of standard products, we offer engineering services for custom designs, to satisfy unique product requirements.

The flexibility of our thermostatic wax actuator technology allows for temperature control within the standard range of 35°F to 210°F (1.7°C to 98.9°C). If you require lower temperatures than our standard offerings, please inquiry.

For product dimensions and specifications, or customizations, visit www.TOT-AD.com

Freeze Protection

Our HAT/FP freeze protection valves prevent water supply lines from freezing during cold weather. Continuously monitoring ambient or water supply line temperature, the valve's actuator senses when temperature falls below the factory-specified set-point and will automatically modulate open to bleed off the cold water. Once warmer water backfills and the temperature in the line rises above 40°F (4.4°C), the valve will modulate closed again to conserve water.

Applications

These valves prevent freezing of water supply lines to docked naval ships. Installed at the end of each supply line, the mechanical HAT/FP automatically opens when temperature is close to freezing and closes when the danger passes, eliminating water waste and reducing utility costs.

Thousands of our HAT/FP's are installed at Naval bases across the country, saving them tens of thousands of dollars each year on their water bill and energy usage.



Scald Protection

Scald protection valves respond to thermal variations, effectively preventing over-temperature water from being released and potentially scalding the user.



Applications

Installed in airplane galleys where coffee makers and faucets are inter-connected through a shared manifold, our HAT valves will sense the water temperature and automatically close to interrupt flow when it's above the valve's set-point preventing scalding to personnel and passengers.

Our scald protection valves are also available in 316 SS and can be passivated to prevent corrosion from disinfection solutions. ThermOmegaTech® valves protect personnel in hundreds of commercial aircraft including the Airbus 380, A330, & A350, Boeing B747 & B777, and the Boeing KC-46A Tanker.

Electronics

Our sister company, TJM Electronics, is a leading electronics contract manufacturer specializing in PCB assemblies for rigorous Aerospace & Defense applications.

TJM's state-of-the-art machines provide the speed, accuracy, and flexibility to process virtually any printed circuit board assembly project accurately and on-time.

Capabilities

- PCB Assembly for Mission Critical Applications
- Prototyping & Testing
- Turnkey Solutions

Visit www.TJMelectronics.com for more information.



For product dimension and specification, or customization, visit www.TOT-AD.com

Our Technology

Inside each of our thermostatic valves is an actuator filled with our proprietary Thermoloid® blend of precisely mixed paraffin wax. The wax blend is designed to give a controlled volume change, translating to a known stroke response, within a narrow range of temperature variation.

Each of our valves includes the Thermoloid® pellet (the expansion-producing element), a diaphragm to seal the wax within the cup and help transfer the expansion of the pellet, a plug which amplifies the wax expansion and transforms it into linear motion, and a piston which produces usable stroke.

When the actuator is in its “cold position” the Thermoloid® wax is solid, and the piston is retracted. Once the temperature increases to within the wax’s active range, the wax changes into its liquid phase, undergoing thermal expansion and increasing in volume.

This expansion extends the piston, putting the actuator into its “hot position.” The piston can then act upon a valve stem, lever or any other mechanical device requiring this type of movement.

This thermal phase change in the active region and resulting piston motion occur over a narrow and customizable temperature range – typically within 10-15°F.

The precise temperature range varies depending on the chemical composition of the Thermoloid® material used. The wax can be blended to change phase within a specified temperature range to meet the required characteristics of an application in order to convert changes in temperature into mechanical motion.

In addition, due to the incompressible nature of the wax and its high density to size ratio, the motion produced generates a significant amount of force.

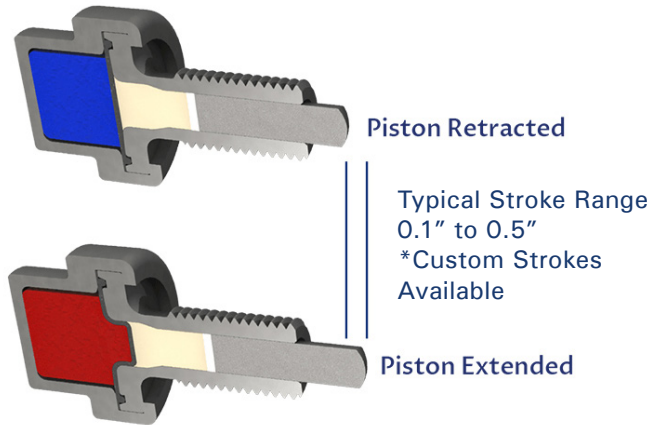
Thermostatic Vs. Solenoid

Unlike “electronics sensing” solenoid valves, thermostatic valves provide temperature sensing control (open or closed loop) and fluid modulation without wires and external power, in one compact package. Solenoid valves require additional installation expenses, increased space requirements, and potentially disastrous results for delicate systems should power be lost.

Thermostatic Design = Cost Savings Every time

- No extra cost for additional components are required for the valve to operate.
- Temperature regulation, fluid control, and positioning modulation are contained within the valve body, eliminating maintenance and part failure expenses.
- Facility power outage will not affect the valve or the temperature-sensitive system it maintains.

“Cold Position” - Solid State



“Hot Position” - Liquid State