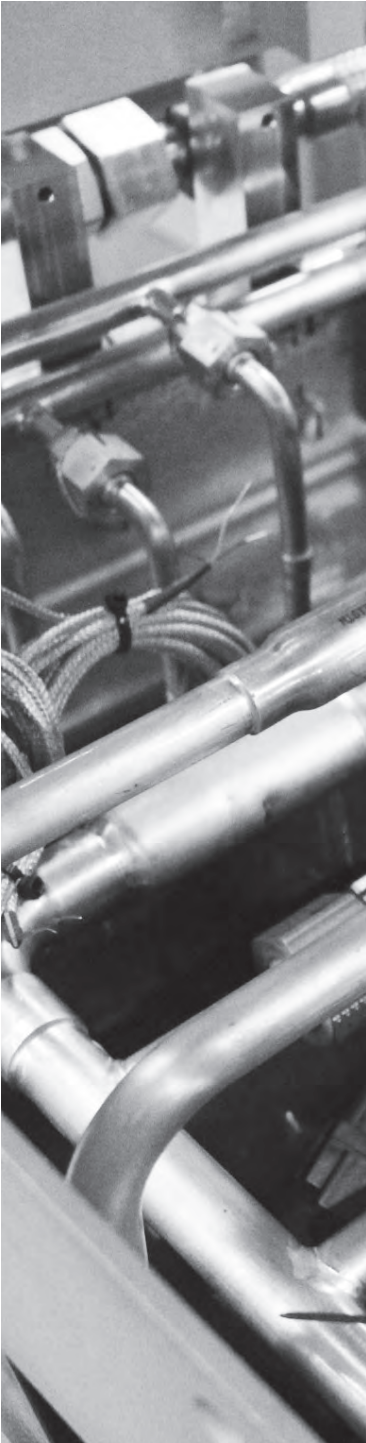




PUMPED TWO PHASE COOLING

ACT's Pumped Two Phase Cooling Systems have been designed in a rack-ready design, or can be configured as a drop-in replacement solution to easily retrofit legacy water or air-cooling systems.



THERMAL BENEFITS



- Lowest Thermal Resistance (0.008 C/W)
- High Heat Flux Capabilities (>50 W/cm²)
- 7 times the heat transfer for the same flow rate
Compared to pumped single phase
- Isothermal Device Temperatures
 - Single Device
 - Multiple Devices
- 1/3 the size of equivalent air cooled systems

0.008 C/W
Thermal
Resistance

MECHANICAL BENEFITS



- Flexible Building Block Design
 - Modular
 - Scalable
 - Hot Swappable
 - Remote Heat Sink
- Dense Electronics Packaging
 - Small Foot Print
 - Highest Power Density
 - Small Pumps
- Easily Replaceable Modules and Components
- Reliable
 - No corrosive fluids
 - No Water
 - No Freeze thaw issues
 - Electrically safe even in failure

SMALL
Footprint

ELECTRICAL BENEFITS



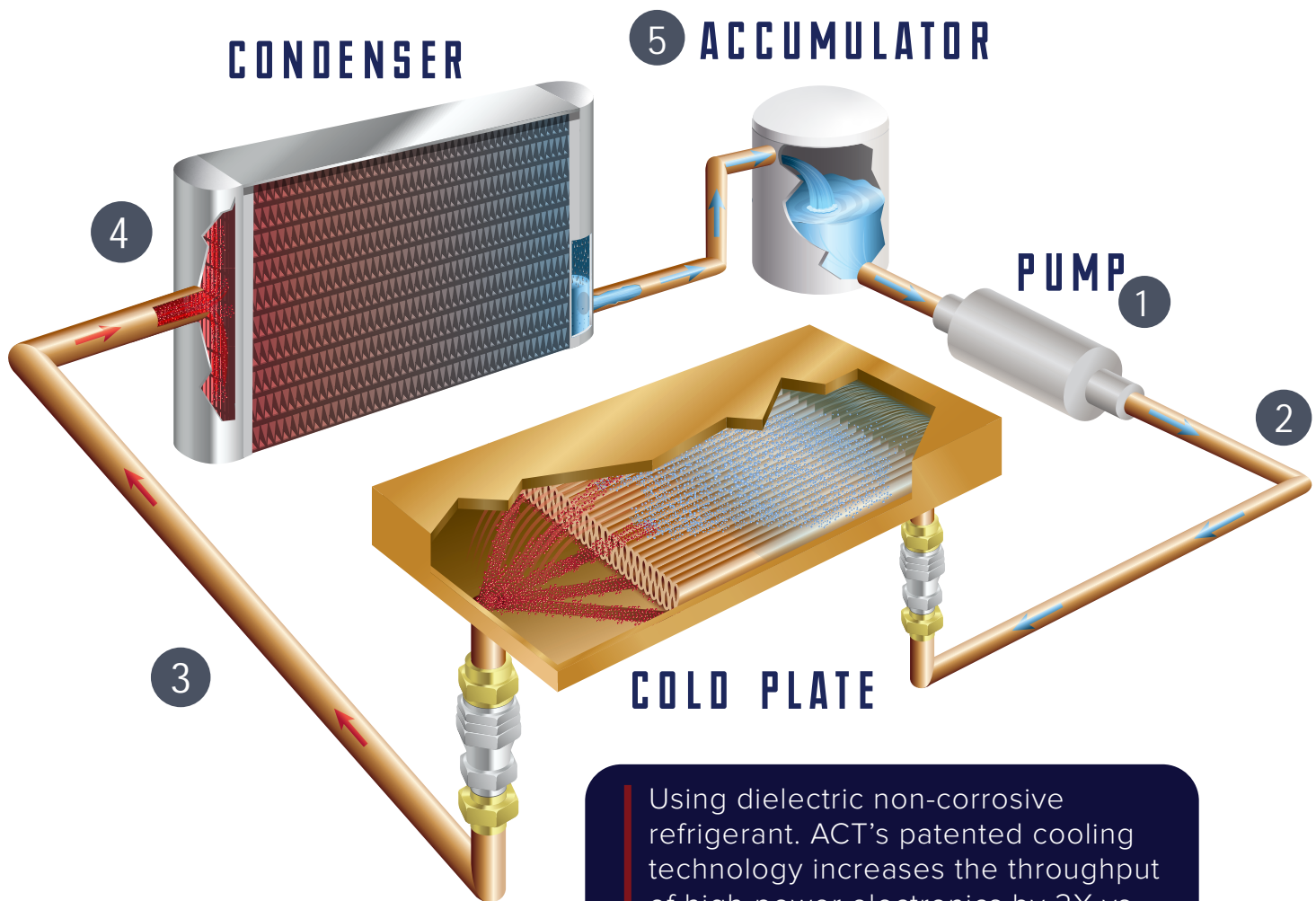
- Improved Conversion efficiencies (98.5%)
 - Due to lower parasitic losses / Pumping power
 - 85% reduction EG water systems
- Dielectric Fluid and Fittings
 - Simplified electrical isolation
- Intrinsically safe
 - Even in failure
 - Vaporizable dielectric fluid
- High Power Densities
- Longer Device Life
 - Lower operating temperatures
 - Isothermal device temperatures

85%
REDUCTION
EG Water
Systems

How Does **PUMPED TWO PHASE COOLING** WORK

A basic Pumped Two Phase cooling system has a pump, one or more cold plates to remove heat, a condenser to condense the two phase mixture, and an accumulator.

- 1 The fluid flows through hard tubing or hose to a low-flow pump
- 2 Pump moves saturated liquid into a cold plate directly attached to a heat source. The fluid absorbs the heat and immediately starts to vaporize
- 3 Heat is carried away by the vapor
- 4 Vapor moves to an air or water-cooled condenser where it condenses back to liquid as the heat is dissipated by the cooling water or air
- 5 Excess liquid is stored in the accumulator ready to be pumped back into the system



Using dielectric non-corrosive refrigerant. ACT's patented cooling technology increases the throughput of high-power electronics by 2X vs. traditional water/glycol systems.