THERMAL – Thermal Recovery Radiators (TRR)

TRR (Thermal Recovery Radiators) are industrial heat recovery systems engineered to capture waste thermal energy from exhaust gas streams and return it to the process, directly cutting fuel consumption and plant operating costs.

Unlike standard heat exchangers, a heat recovery unit must prove real economic payback. Our proprietary sizing software identifies the optimal economic recovery point (kW per m²), accounting for added fan pressure drop, operating hours, and seasonality to target an ROI of 3 years or less.





Tube Options & Recovery Architectures:

- Finned Tubes (maximum area in compact footprints), Bare Tubes (lower cost and easier cleaning in dusty streams), or Corrugated Tubes (higher efficiency without increasing size);
- Direct Recovery (Air-to-Air): transfers heat directly between exhaust and intake air streams for higher temperatures and adjacent ducts;
- Indirect Recovery (Run-Around Loop): uses a closed intermediate fluid loop (water/glycol/oil) when zero cross-contamination is mandatory or ducts are physically separated.

Critical T2E Engineering Differentials:

- Condensation & Corrosion Control: thermal sizing within safe dew-point margins with proper alloy and fin selection;
- Limiting Temperature Calculation: prevents organic or inorganic dust particles from sticking and fouling heat transfer surfaces;
- Drainable & CIP-Ready Design: casings engineered for periodic washdown or CIP, with optional integration to our ASS Sound Attenuator;
- Assured quality: certified materials, qualified welders, PT inspection, and hydrostatic testing before shipment.

Exclusive T2E ROI Study: For an accurate payback calculation, please provide your local thermal kW cost and electricity tariff (or we can estimate from our database). This engineering study is exclusive to T2E recovery systems.

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Safety & Maintenance Instructions:

Utility Isolation:	Before performing any maintenance or inspection, ensure the equipment is shut down and locked out from all water, steam, process fluid, and power sources.
Pressure & Vacuum Relief:	Heat exchangers may operate under pressure or vacuum. Gradually and completely relieve internal pressure before opening any connections or flanges. Never tighten unions while the unit is operating.
Temperature Check:	The equipment may operate at high temperatures. Allow the unit to cool down to safe handling levels before servicing.
Overpressure Protection:	Never exceed the specified design pressure or temperature. Whenever overpressure risks exist (improper valve closure, pump shutoff head, etc.), properly sized safety relief devices must be installed.
Gasket Maintenance:	Periodic inspection and annual replacement of all gaskets (or shorter intervals depending on process media) is recommended to prevent leaks. Periodic hydrostatic tests must be performed by qualified personnel.

⚠ During operation and maintenance of thermal equipment, proper PPE is mandatory: safety helmet, safety glasses, thermal/mechanical gloves, safety boots, and hearing protection.

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