



Mike Baker (left) and Jarrod Swain presenting at ATMO Australia

ATMO Australia: Remodeled Ritchies Store Grows in Size by 71% While Cutting Energy Use by 15% with New Transcritical CO₂ HVAC&R System

In the Balnarring store's refurb project, AJ Baker Refrigeration replaced an R404A system with an Epta CO₂ DX cooling plant.

Jae O. Haroldsen May 26, 2025



[Air conditioning, Commercial Refrigeration, Oceania](#)

Australian supermarket chain Ritchies Stores increased the footprint of its Balnarring, Victoria, location by 71% during a remodel, but the store uses 15% less energy than before after replacing its R404A refrigeration system with a transcritical HVAC&R CO₂ (R744) cooling plant.

The refurbishment project, carried out in 2023 and 2024, expanded the store from 1,530 to 2,630m² (16,500 to 28,300ft²) and added 211kW of solar panels to the roof. The integrated transcritical CO₂ HVAC&R system was manufactured by [Epta](#).

Mike Baker, Managing Director at AJ Baker Refrigeration, and Jarrod Swain, National Merchandise General Manager at Ritchies Stores, presented the project at [ATMO Australia 2025](#). The event, organized by ATMOSphere, publisher of [NaturalRefrigerants.com](#), was held May 12–13 in Sydney.

"The refurbished store increased the connected cooling, heating and refrigeration load by 230%, but the data from the last 12 months captures a 15% energy consumption drop," said Baker. He added that, before the refurbishment, the only sources for store heating and cooling came from the R404A system's heat reclaim and cold aisle return, making it "dead cold in winter and hot in summer."

Refrigeration specs: The CO₂ system provides 32kW (9.1TR) of low-temperature (LT) capacity and 160kW (45.5TR) of medium-temperature (MT) capacity for display cases and cold rooms.

- The design includes a twin-system gas cooler with adiabatic cooling, according to Baker.
- “During high ambient temperature operation, we run the [Epta ETE](#) [extreme temperature efficiency] subcooling system,” Baker said, which allows cooling the load internally without external refrigerants.
- The pressure designs include 60bar (870psi) on the LT/MT lines, 100bar (1,450psi) on the ETE and 90bar (1,310psi) on the Epta CoolPack.

Integrated design: The system provides domestic hot water from the LT waste heat, 150kW (42.7TR) of space heating from the MT waste heat and 150kW of cooling from a DX coil in the air handling unit (AHU) duct.

- The hot water system includes a 300L (79gal) storage tank.
- The retailer can use passive heat reclaim to heat the store or supplement the heat by increasing the MT compressor output on cold days.
- “To cool the store, we take off a refrigerant line before the gas cooler and run it through an electronic expansion valve to get DX cooling,” Baker said. “The return line then discharges the refrigerant back into the compressor suction.”

Making progress: Baker compared the annual energy consumption of the HVAC&R load in seven Ritchies Stores locations that use CO₂ to the updated Balnarring store, noting that the various technologies in the other locations were installed within the past eight years.

- The Balnarring store is the second largest in the CO₂ fleet in terms of both footprint and connected refrigeration load.
- It is the fifth lowest energy consumer per the refrigeration load. However, when including the energy consumption for HVAC, it is the lowest energy consumer in both kilowatt hours per connected load and square meters.

Quotable: “In the past six months, the store has maintained temperature without supplementary heating,” Swain said. “The DX combined plant provides stable operation in specific store conditions, reduces the energy consumption and gives the retailer full control.”

📍 [AJ Baker Refrigeration](#), [ATMO Australia](#), [Australia](#), [CO2 System](#), [Epta](#), [Ritchies Stores](#)