# European Supermarket Improves Efficiency of $CO_2$ System by More Than 30%* Using PX G1300™ Energy Recovery Device

## THE CHALLENGE

### Transitioning to a Climate-Friendly Refrigeration System While Improving Efficiency

Transitioning from hydrofluorocarbons (HFCs) to low global warming potential (low-GWP) natural refrigerants for use in commercial refrigeration equipment is one of the most impactful ways to address climate change globally. A supermarket in Northern Italy, where regulation limits HFC use, chose to install a carbon dioxide ($CO_2$)-based system to drastically reduce its emissions. While $CO_2$ is a leading natural refrigerant, $CO_2$ systems can consume large amounts of energy, increasing operating costs.

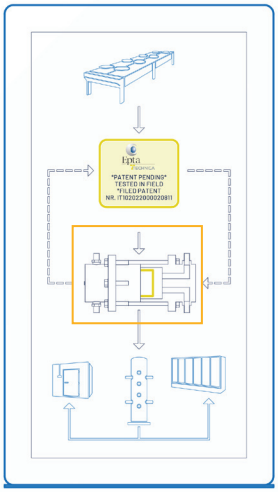
## THE SOLUTION

### Energy Recovery's PX G1300 Lowers Energy Consumption of $CO_2$ Systems

In collaboration with Epta, an independent global player and leader in commercial refrigeration, the supermarket became the first in Europe to incorporate a PX G1300 energy recovery device into its $CO_2$ system.

The installation occurred in a new 1,500 square meter store. This was the first field deployment of Energy Recovery's PX G1300 technology by Epta, which is now integrated into Epta's new XTE (Extra Transcritical Efficiency) system, the company's next generation $CO_2$ refrigeration technology. The PX G1300 was chosen for this green supermarket due to its ability to recycle pressure energy, allowing the system to run more efficiently. This enabled performance improvements at temperatures between 20ºC and 40ºC (68-104ºF), increasing annual efficiency as it allows the system to operate for longer periods. Epta also chose the PX G1300 for its simple design, low maintenance needs, and potential for improving rack stability at high temperature, an increasing challenge the location was facing.

**Epta XTE System**



**The recorded efficiency improvement compares a PX-enabled $CO_2$ refrigeration system to a $CO_2$ refrigeration system without an energy recovery device at temperatures above 40ºC (104ºF).*

## LOCATION

Northern Italy

## PROJECT

- Supermarket size: 1,500 sqm
- MT Load: 135 kW (461 MBH)
- LT Load: 30 kW (102 MBH)

## BENEFITS OF THE PX G1300

- Energy efficiency improvements are more than 25% at 35-40ºC (95-104ºF) and more than 30% above 40ºC (104ºF)
- High temperature rack stability
- Simple design and operation
- No additional capital costs
- Little to no maintenance

**Energy Recovery granted patents:**
Patent No.: US 11,421,918
Patent No.: US 11,397,030

**Energy Recovery published patents:**
Pub No.: US 2023/ 0106860
Pub No.: US 2022/ 0397310
Pub No.: US 2022/ 0397324

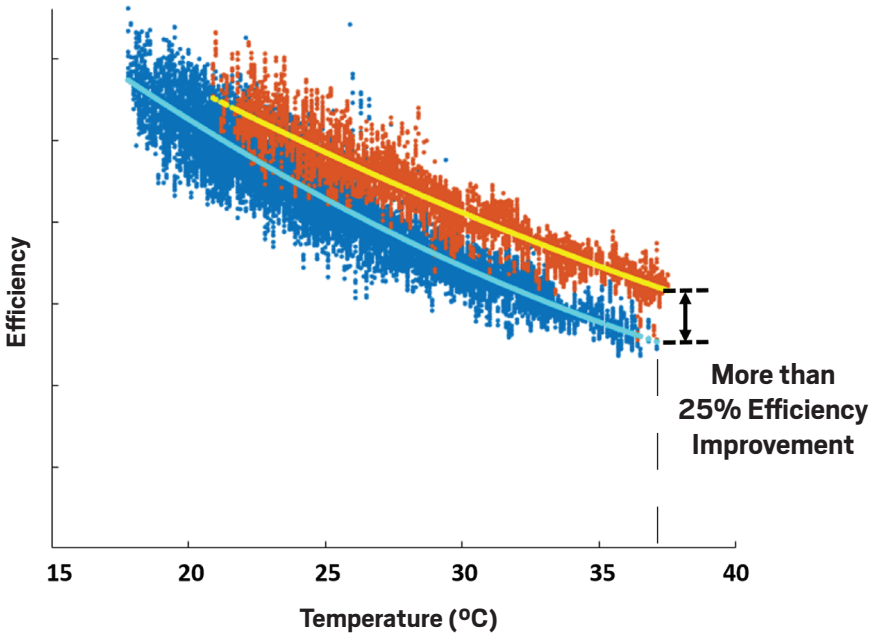
energy recovery®

## THE RESULT

# Supermarket Future-Proofs Refrigeration Operations While Reducing Operating Costs and Emissions

After the PX G1300 was installed, the supermarket saw efficiency improvements of more than 25% at 35-40ºC (95-104ºF) and more than 30% above 40ºC (104ºF), compared to a standard $CO_2$ booster system. $CO_2$ refrigeration systems typically lose efficiency as temperatures rise. The PX G1300 solved this issue by providing free compression power, increasing efficiency levels.

By integrating the PX G1300 into the $CO_2$ refrigeration system, high temperature rack stability was also achieved, which was important to the store when facing increased extreme weather conditions, including heat waves. Additional capacity provided by the PX G1300-enabled $CO_2$ refrigeration system ensured smooth operation even beyond its original design point. The new Northern Italy store is now prepared for future extreme energy variations, ensuring protection against refrigeration failure and revenue losses.




The efficiency improvements of the PX G1300 system are more than 25% at 35-40ºC (95-104ºF) and more than 30% above 40ºC (104ºF) compared to standard $CO_2$ booster systems

The PX G1300 energy recovery device