

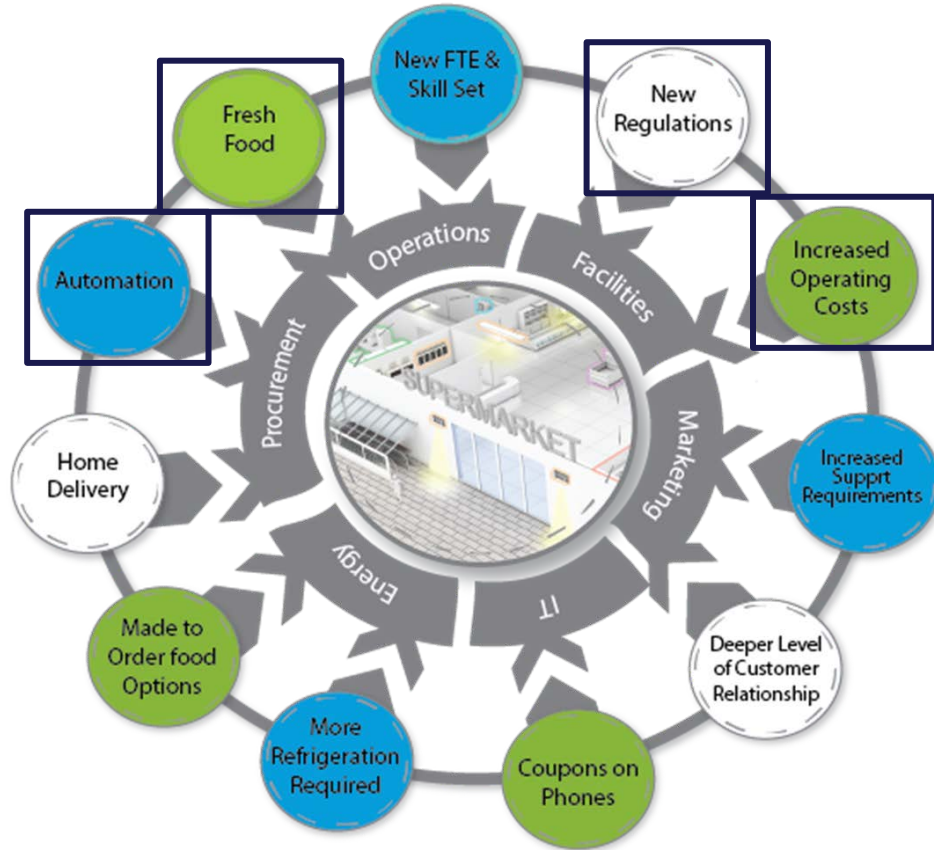
CAREL

HEOS Sistema-Changing the World Today for a Better Tomorrow

Brandon Marshall
Marketing Manager-Refrigeration Retail and Food
Service

Supermarket Trends & Challenges

Confluence of Challenges



Carel Solution Benefits



Heos sistema

High efficiency waterloop systems



HeOS sistema

High efficiency Waterloo systems



Savings

- Wide modulation range
- Maximum COP at part load
- Smart defrost per case
- Cooled water replaces most refrigerant throughout store

up to
25%
Energy savings

80%
Refrigerant charge reduction

+2days
fresh food life

96%
Refrigerant leak reduction

30%
Maintenance reduction

Rackless design

Performance

- High stability set-point adherence
- Efficiency components in every case
- Quality tested after charge at OEM

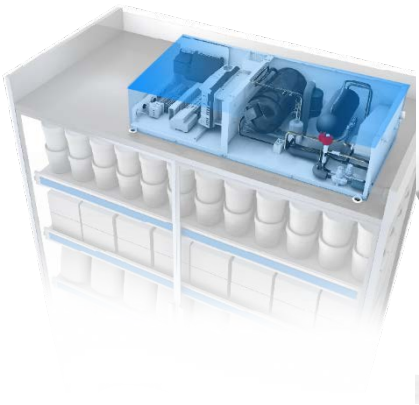
QC
Factory charged and tested

Plastic water pipes

Air cooled Waterloo

Simplicity

- Water loop installation at build-out
- OEM cases with "CAREL inside"
- In-field fast-fit connection



OEM all in one cases arrive charged and tested

In-field fast-fit connection

PVC Waterloo piping installed during build-out

Deployment Options

New Store and Retrofit Solutions

Option 1 – Full Case Replacement

Option 2 – Partial Case Replacement

Option 3 – No Case Replacement



Option Summary

Option 1	Option 2	Option 3
<p>Full Store Case Replacement</p> <ul style="list-style-type: none">- All cases are new, preprogrammed and quality inspected at the factory- Low to no brazing- Plug and Play- Full OEM support- Reduced install Time <p>Challenge</p> <ul style="list-style-type: none">-Higher cost	<p>Partial Case Replacement</p> <ul style="list-style-type: none">- All cases are new, preprogrammed and quality inspected at the factory- Low to no brazing- Plug and Play- Full OEM support- Reduced install Time <p>Challenge</p> <ul style="list-style-type: none">-Retrofit brazing required-Retrofit case programming-Longer installation time	<p>No Case Replacement</p> <ul style="list-style-type: none">-Lowest case expense option, with all units being retrofitted in the field-No changes to store aesthetics <p>Challenges</p> <p>Brazing</p> <p>Programming Required</p> <p>Longer Install Time</p> <p>Potential Hybrid System</p> <p>Potential Less OEM support</p>

Natural Refrigerants for Micro Distributed Systems

CO₂ R744

HC R290

We need your help to introduce this technology in North America

- Pilot project locations and funding
- North America based case studies to demonstrate the benefits of the solution

Q&A



Exceeding Refrigerant Regulations

80%

Refrigerant charge
reduction

Micro distributed Condensing Units with an average charge of 7-10 Lbs. per case

96%

Refrigerant leak
reduction

Factory tested to ensure on-site quality with no in field welding required for new systems and only four connections for retrofit systems

30%

Maintenance
saving

Fewer Leaks means lower operational costs and fewer service requirements for compliance

Superior Energy Efficiency



energy efficiency

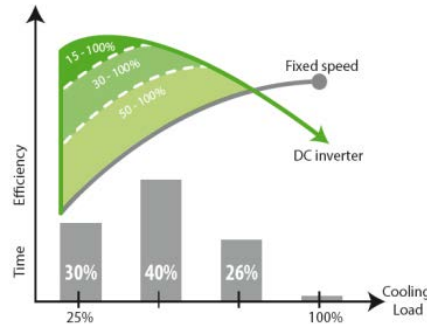


Advanced control algorithms for superior unit operation and optimization

Electronic expansion valve technology for best in class evaporator performance



DC technology

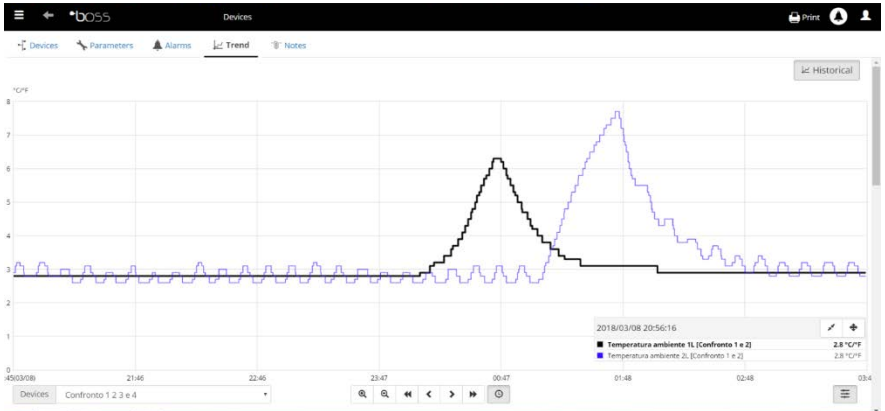


DC technology pushes the envelope of energy savings by optimizing and granting better control of the units highest impact components

Improved Food Preservation



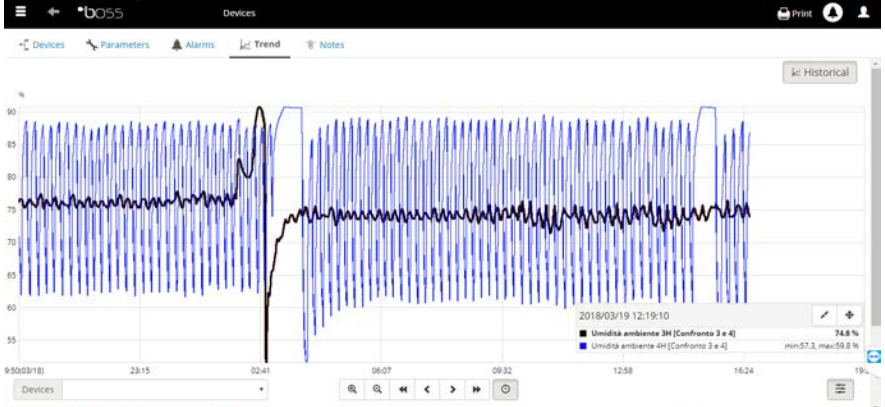
Temperature Control



- Precise temperature control
- Flat product temperature
- Reduced fluctuation during defrosts

**+2 days
shelf
life**

Humidity Control



- Reduced humidity fluctuations
- Less food humidity stress

In Collaboration with the University of Padova:



Option 1 – Full Store Case Replacement

- Positives
 - All Cases Pre-Programmed & Charged
 - Quality control @ Manufacturer
 - Less Brazing – Potentially No Brazing
 - “Plug & Play” Using Quick Connects
 - All Cases = Carel Functional Spec
 - Quickest Install Time
 - Full OEM Support
- Challenges
 - Expense



Option 2 – Partial Case Replacement

- Positives
 - Some Cases Pre-Programmed & Charged
 - Some QC @ manufacturer
 - Less Brazing
 - Some “Plug & Play” Using Quick Connects
 - Some Cases = Carel Functional Spec
 - Lower Case Expense
- Challenges
 - Brazing (4 Connections)
 - Programming Required
 - Longer installation time



Option 3 – No Case Replacement

- Positives
 - Lowest Case Expense Option
 - No Change to Aesthetics
- Challenges
 - Brazing (4 Connections)
 - Programming Required
 - Longer Install Time
 - Potential Hybrid Ref System
 - Potential Less OEM support

