



*Leaders in Refrigeration Solutions*

**JOHN OATES**



***TRANSICOLD***

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**United  
Technologies  
Corporation**



**UTC Fuel Cells**

A United Technologies Company



**Pratt &  
Whitney**



**Hamilton Sundstrand**

A United Technologies Company

**Hamilton  
Sundstrand**



**Sikorsky**

**OTIS**

**Otis**



**Chubb**

A United Technologies Company

**Chubb**



**Carrier  
Corporation**

# UTC 2003 Revenue : \$ 30+ billion(USD)

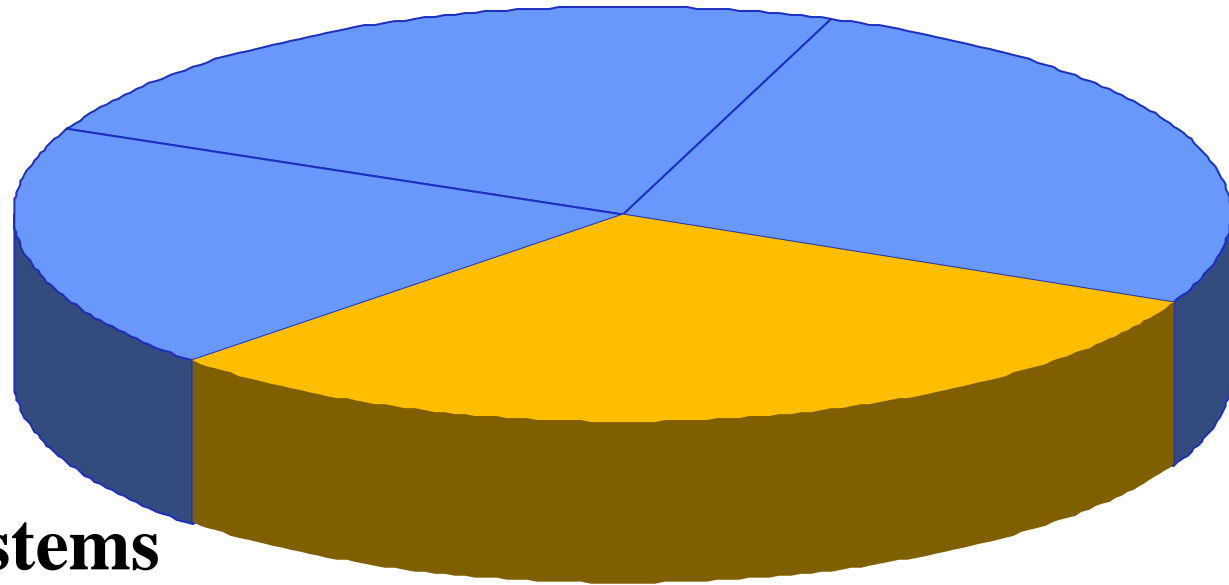
(not including Chubb: \$2.5 )

**Pratt & Whitney**

**\$ 7.6**

**Otis**

**\$ 6.8**



**Flight Systems**

**\$ 5.9**

**Carrier**

**\$ 9.7**



# The First Vector in New Zealand



# Vector

Overview

Performances

LogiCOLD

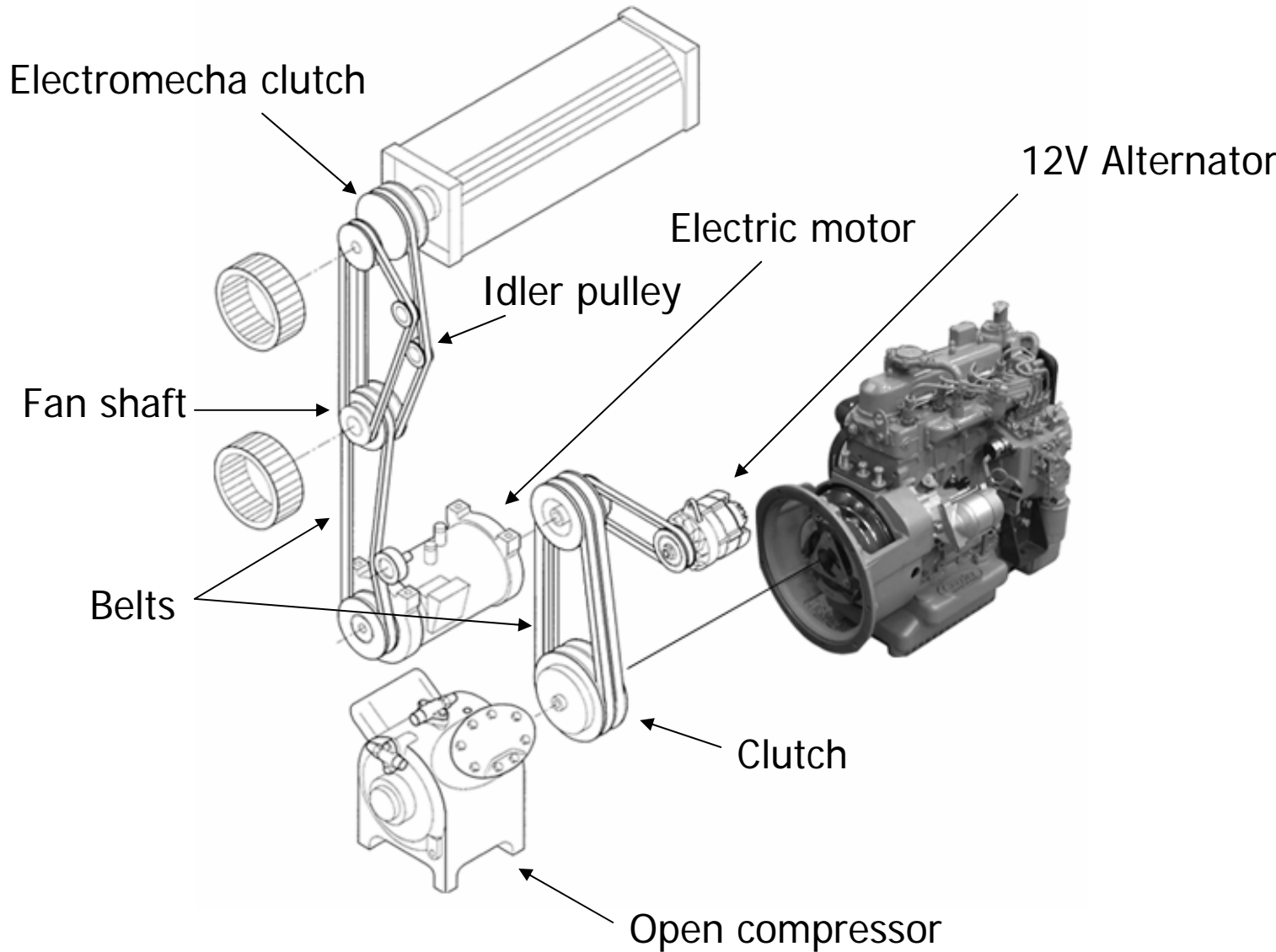
Functionality

Reliability



# Conventional Unit Concept

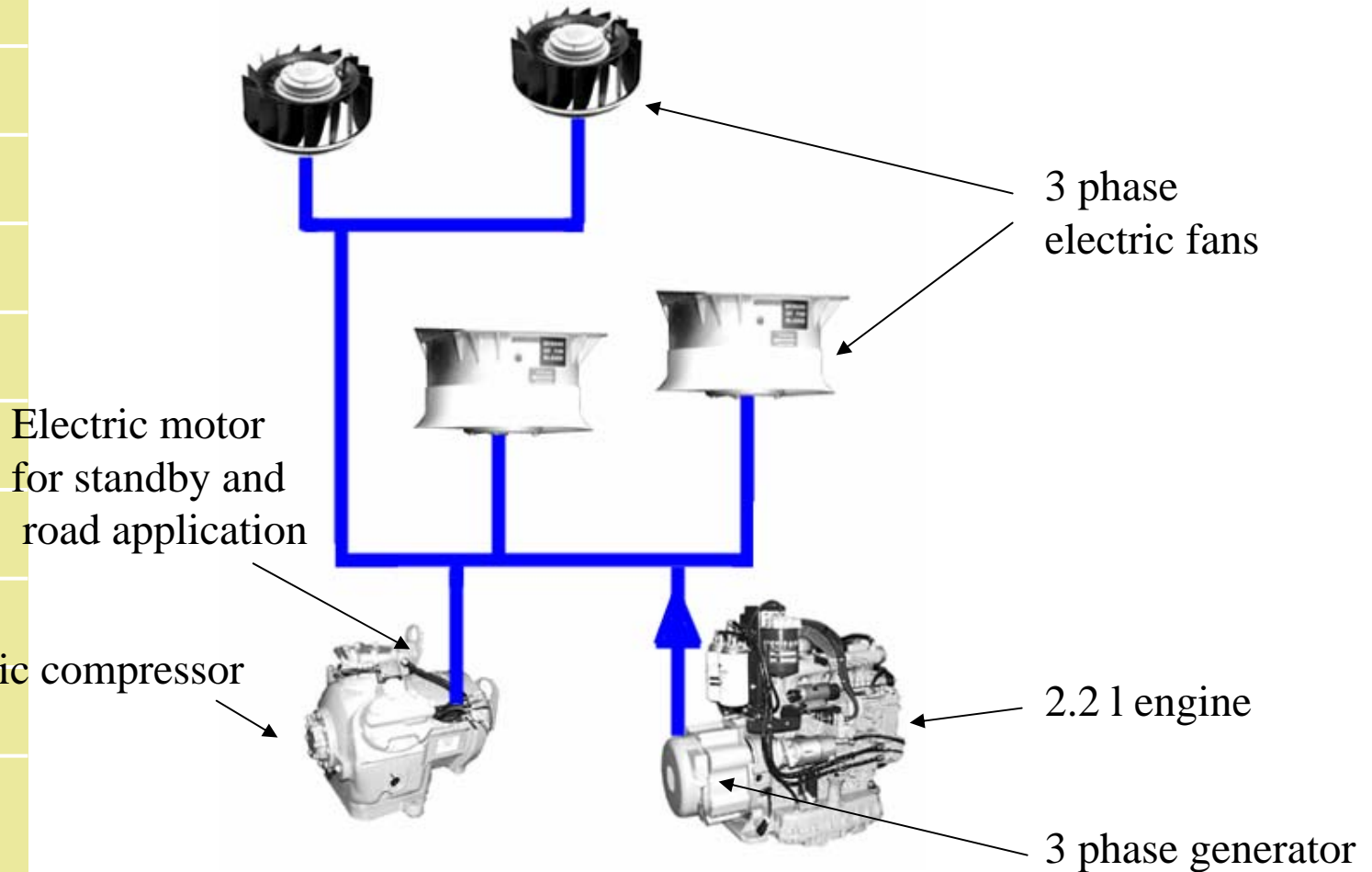
- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability





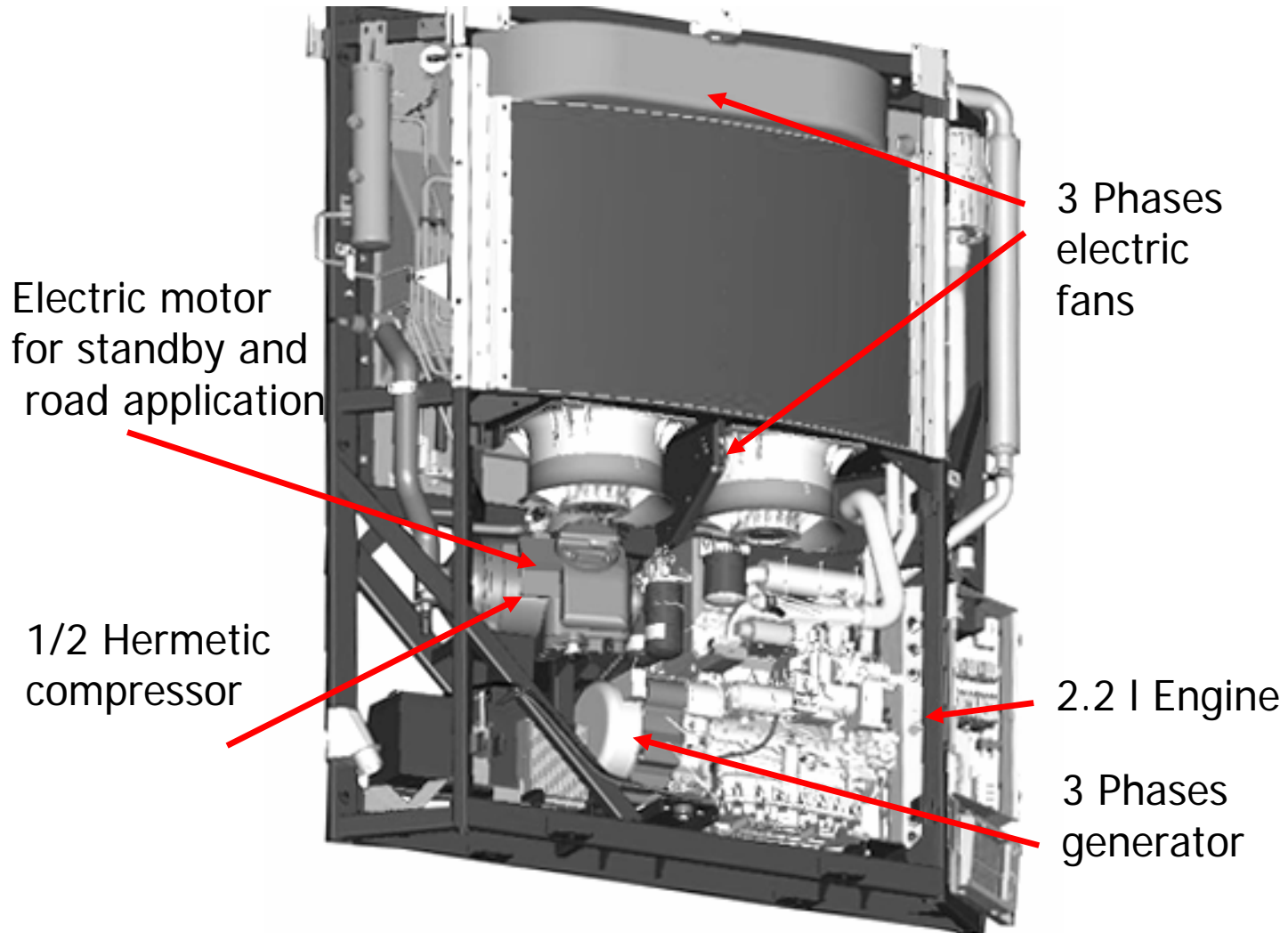
# All electric concept = no belts

The generator driven by the engine provides power to all Vector's components and control system



# All electric concept = no belts

- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability



❑ The generator driven by the engine provides 460V/3phases/65Hz power to all Vector's components and control system

# Front view

Overview

Performances

LogiCOLD

Functionality

Reliability

Defrost air switch

Electronic suction modulation valve

1/2 hermetic 670cc compressor

3 phases generator

12V battery charger

Low noise air filter

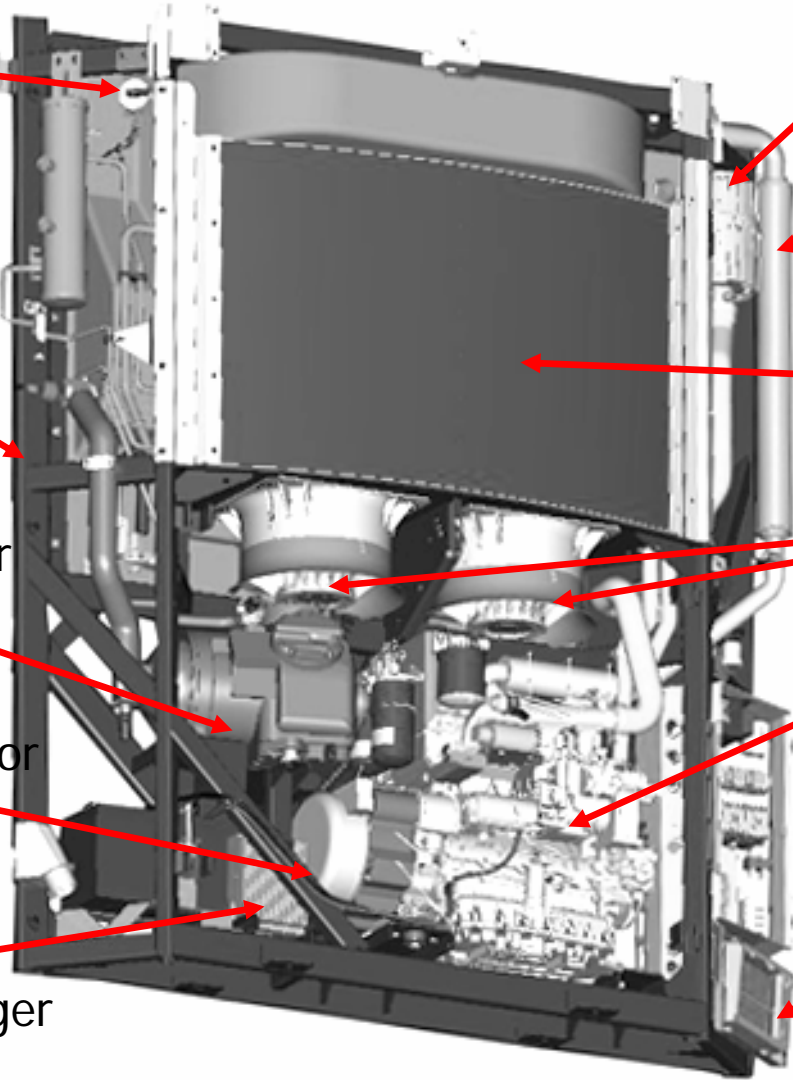
Low noise muffler

Large front condensor

Condensor blowers

2.2 l engine

LogiCOLD



# Back view

Overview

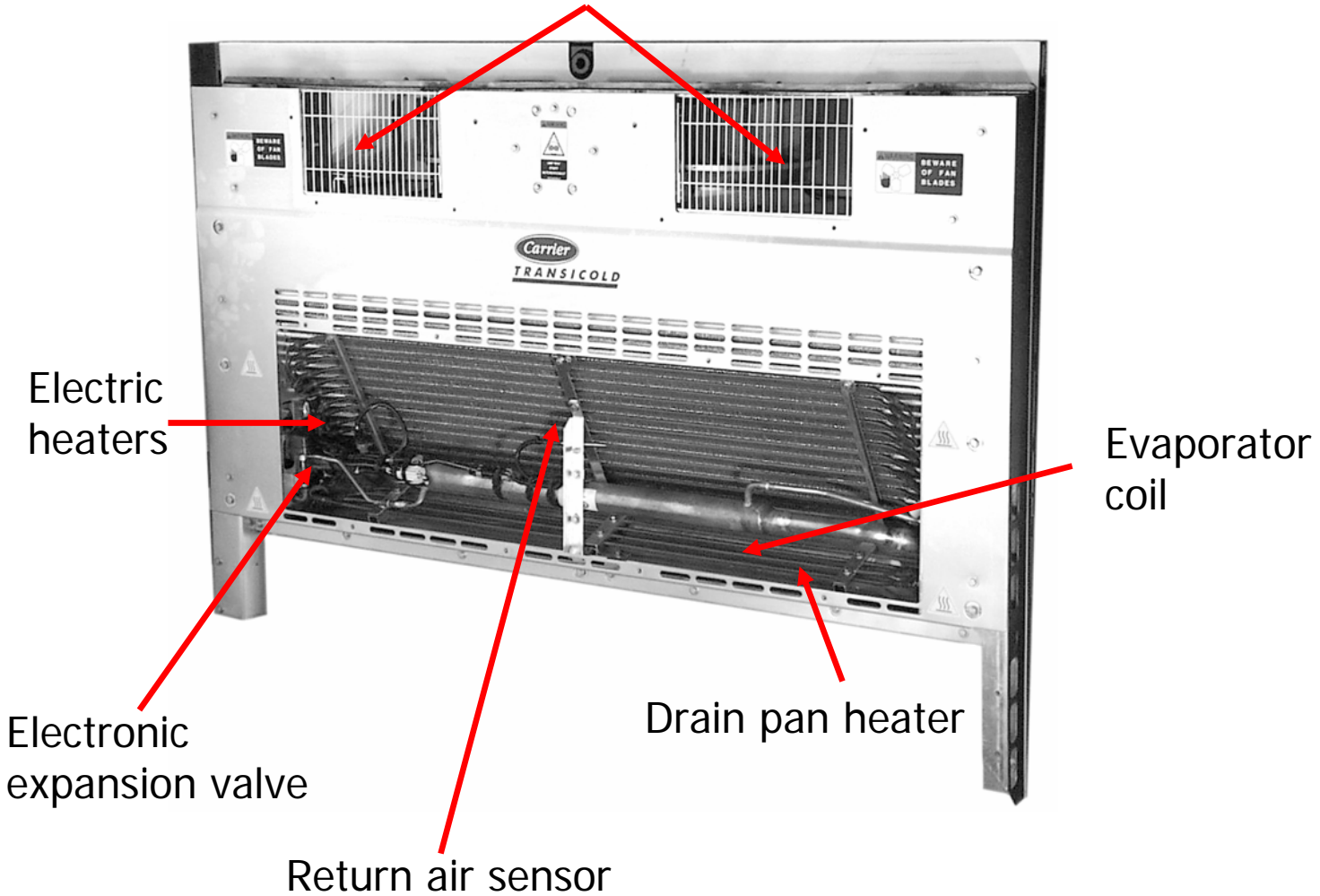
Performances

LogiCOLD

Functionality

Reliability

Evaporators fans: 2 outlets with boots



# Buyers motivations

## Overview

## Performances

## LogiCOLD

## Functionality

## Reliability

### Reliability

- ▶ The design eliminates a maximum number of the wear parts that have to be replaced during routine maintenance and high failure components which can immobilise the unit

### Performances

- ▶ The design enables the use of a high capacity compressor and the use of electrical heaters

### Ease of use:

- ▶ LogiCOLD prompts and guides the user with complete messages in 8 different languages

### Profitability

- ▶ The design means lower cost and less downtime for routine maintenance and repairs

# Semi-hermetic Compressor

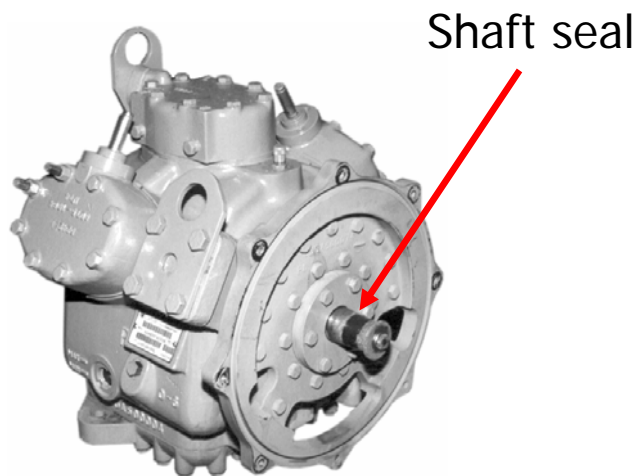
Overview

Performances

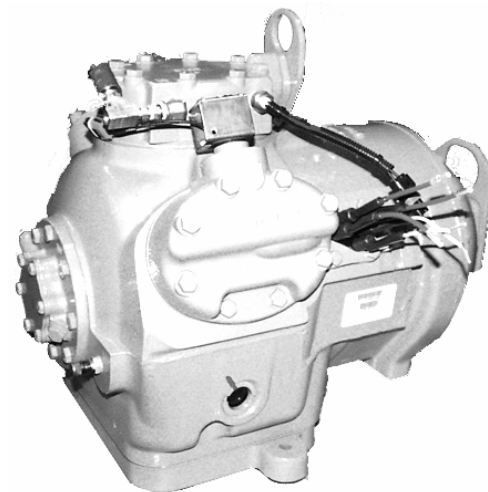
LogiCOLD

Functionality

Reliability



ULTRA



VECTOR

Overview

Performances

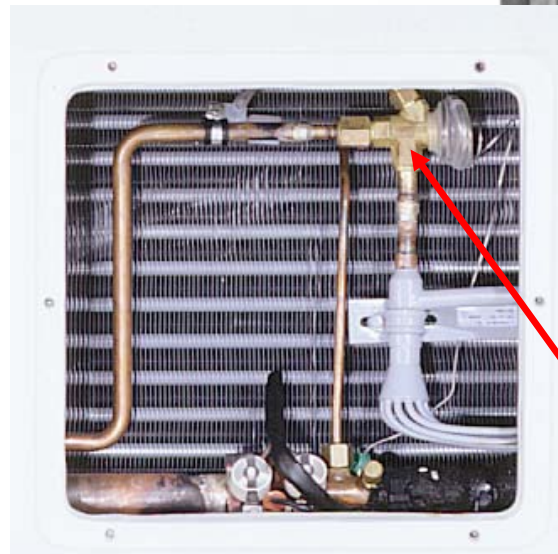
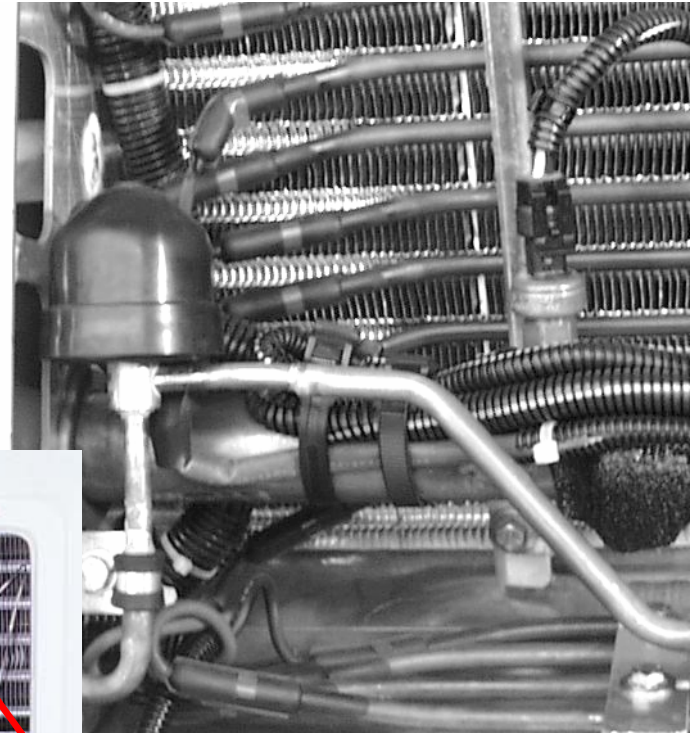
LogiCOLD

Functionality

Reliability

# Electronic Expansion Valve

- ❑ Replace thermostatic exp. Valve used on other units
- ❑ Benefits
  - ▶ Less welding
  - ▶ More precise
  - ▶ Improve pulldown



Std Thermostatic expansion valve

# Compressor Suction Modulation Valve

Overview

Performances

LogiCOLD

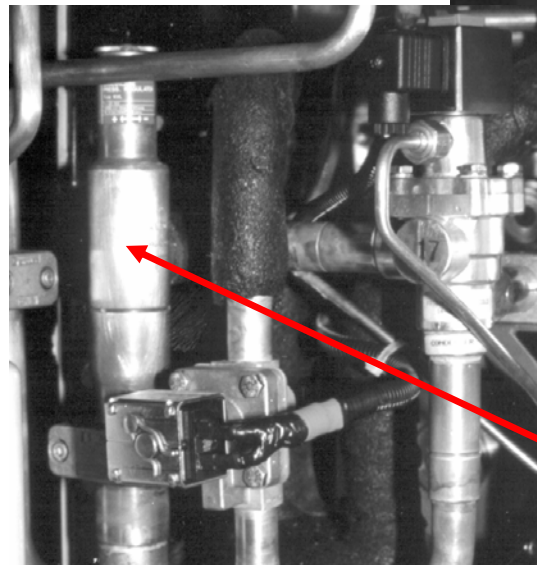
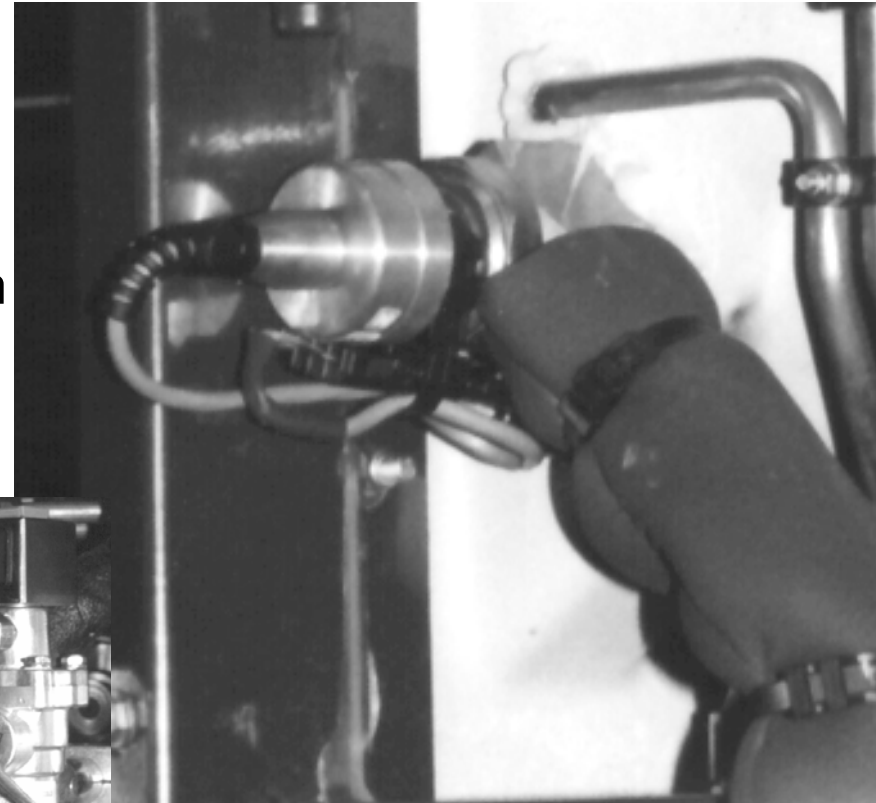
Functionality

Reliability

❑ Replace starting valve and by-pass valve

❑ Benefits

- ▶ Less weldings
- ▶ More precise
- ▶ Improve pulldown



Std Starting valve



# Generator

Overview

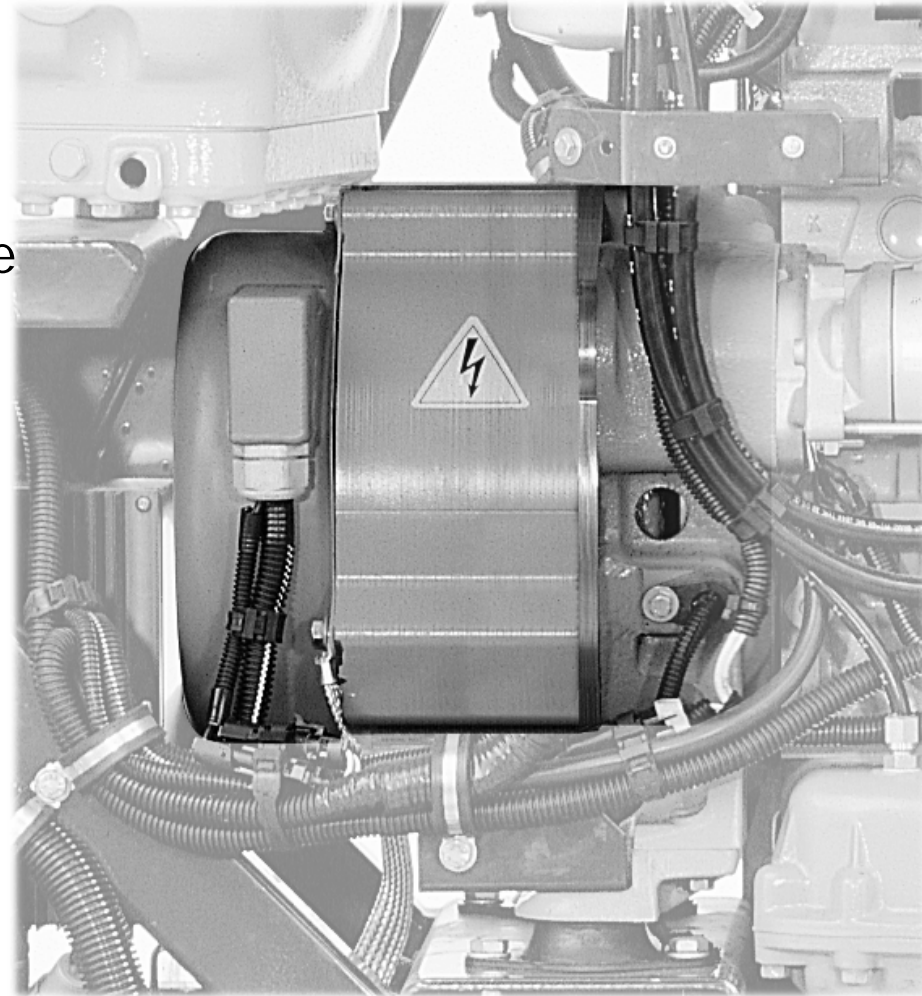
Performances

LogiCOLD

Functionality

Reliability

- ❑ Permanent magnet generator fitted on the engine
- ❑ Benefits :
  - ▶ High efficiency
  - ▶ No maintenance (no bearings)



# Simple Generator Construction

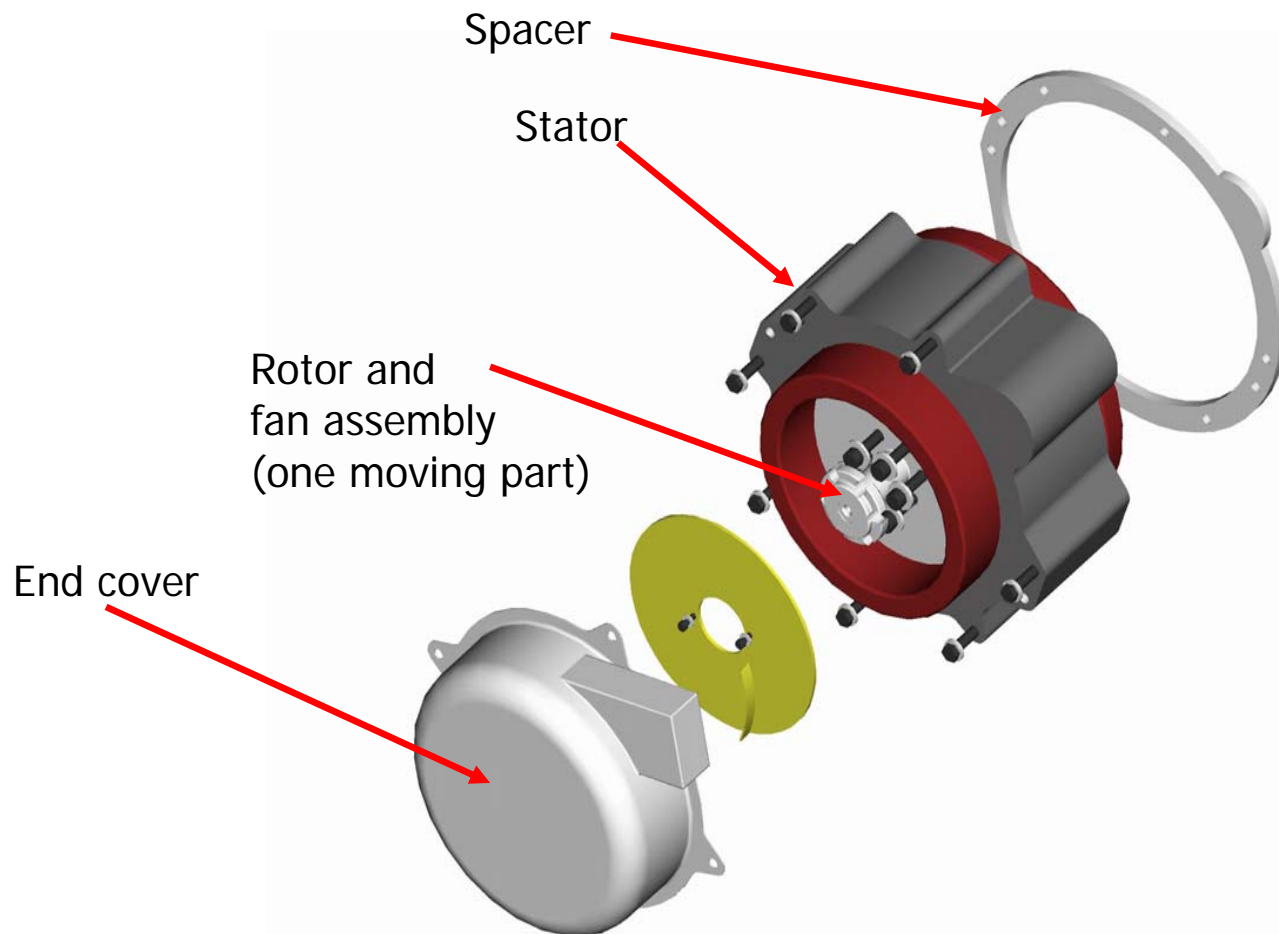
Overview

Performances

LogiCOLD

Functionality

Reliability



## 2 Electric Evaporator & Condenser fans

- ❑ Electric motor driven
- ❑ Benefits
  - ▶ No belts



Evaporator fan



Condenser fan



Overview

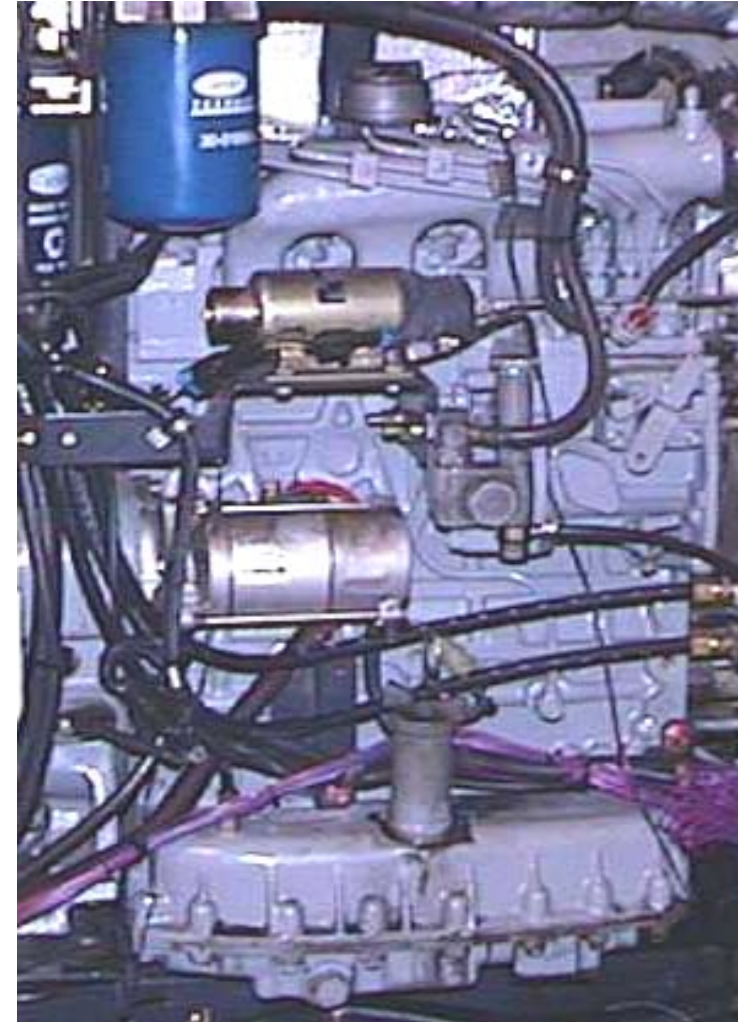
Performances

LogiCOLD

Functionality

Reliability

- ❑ Kubota 2.2 Liter
- ❑ 35 Horsepower
- ❑ Patented 4 Point Mount
- ❑ 1900 Rpm HS
- ❑ 1350 Rpm LS
- ❑ Quiet
- ❑ Meets Ec Emissions



# Only 1 poly-V belt

Overview

Performances

LogiCOLD

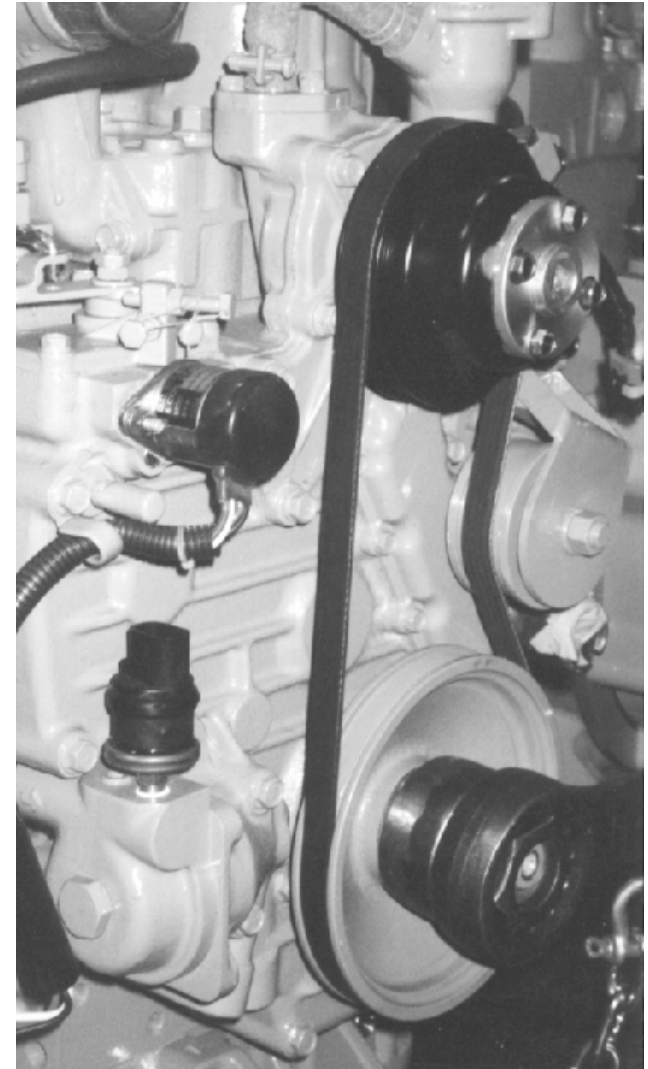
Functionality

Reliability

❑ Only 1 stretchy poly-V belt

❑ Benefits

- ▶ No idler pulley
- ▶ Easy to install
- ▶ Increase life time



# CAPACITIES

Overview

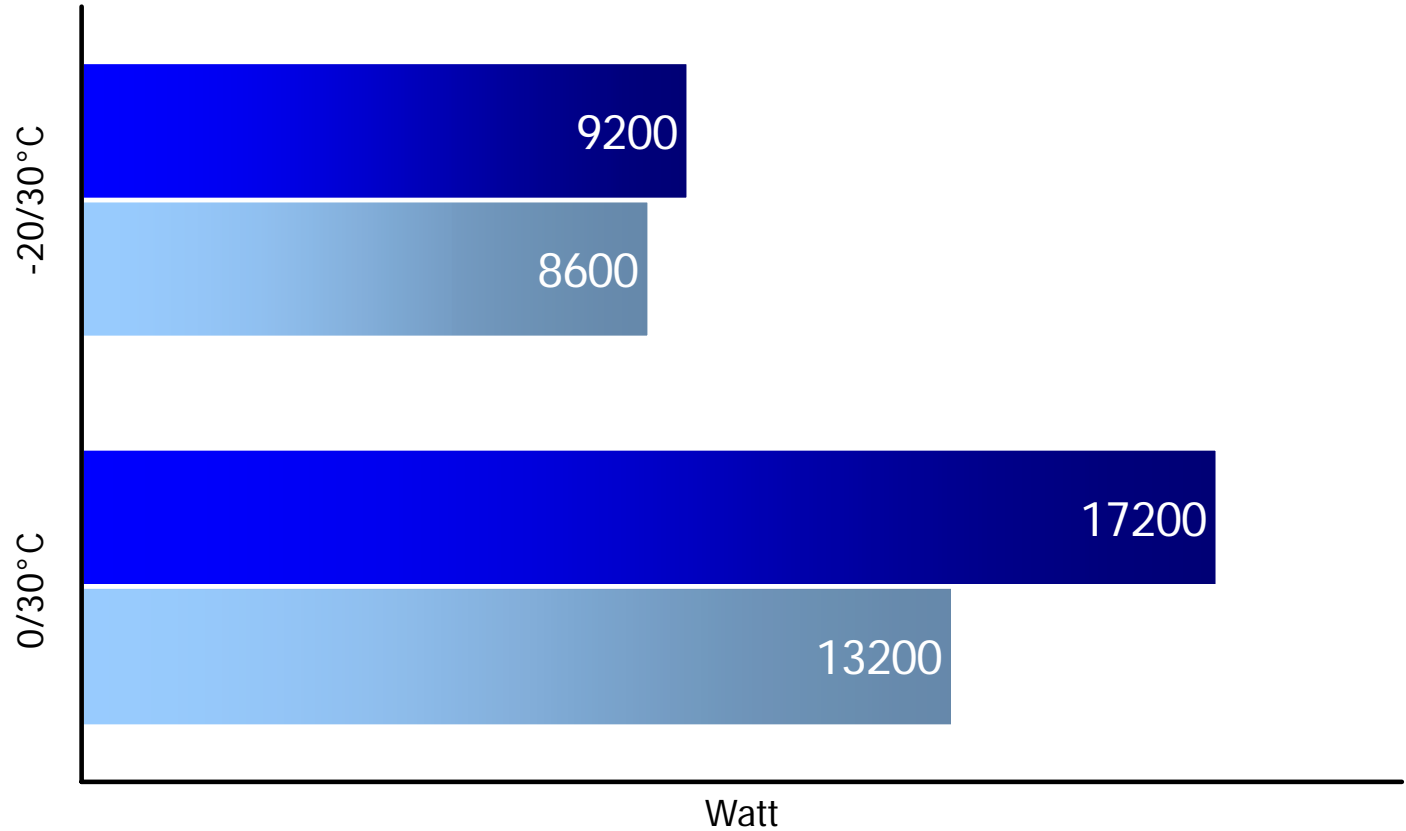
Performances

LogiCOLD

Functionality

Reliability

■ Standby ■ Road



# PULLDOWN

Overview

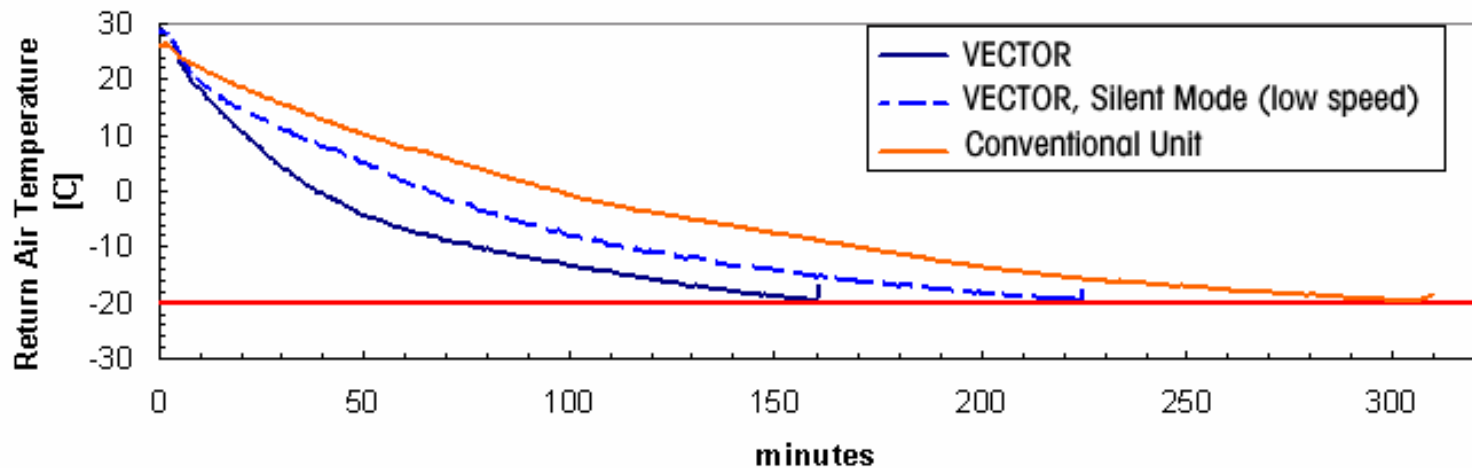
Performances

LogiCOLD

Functionality

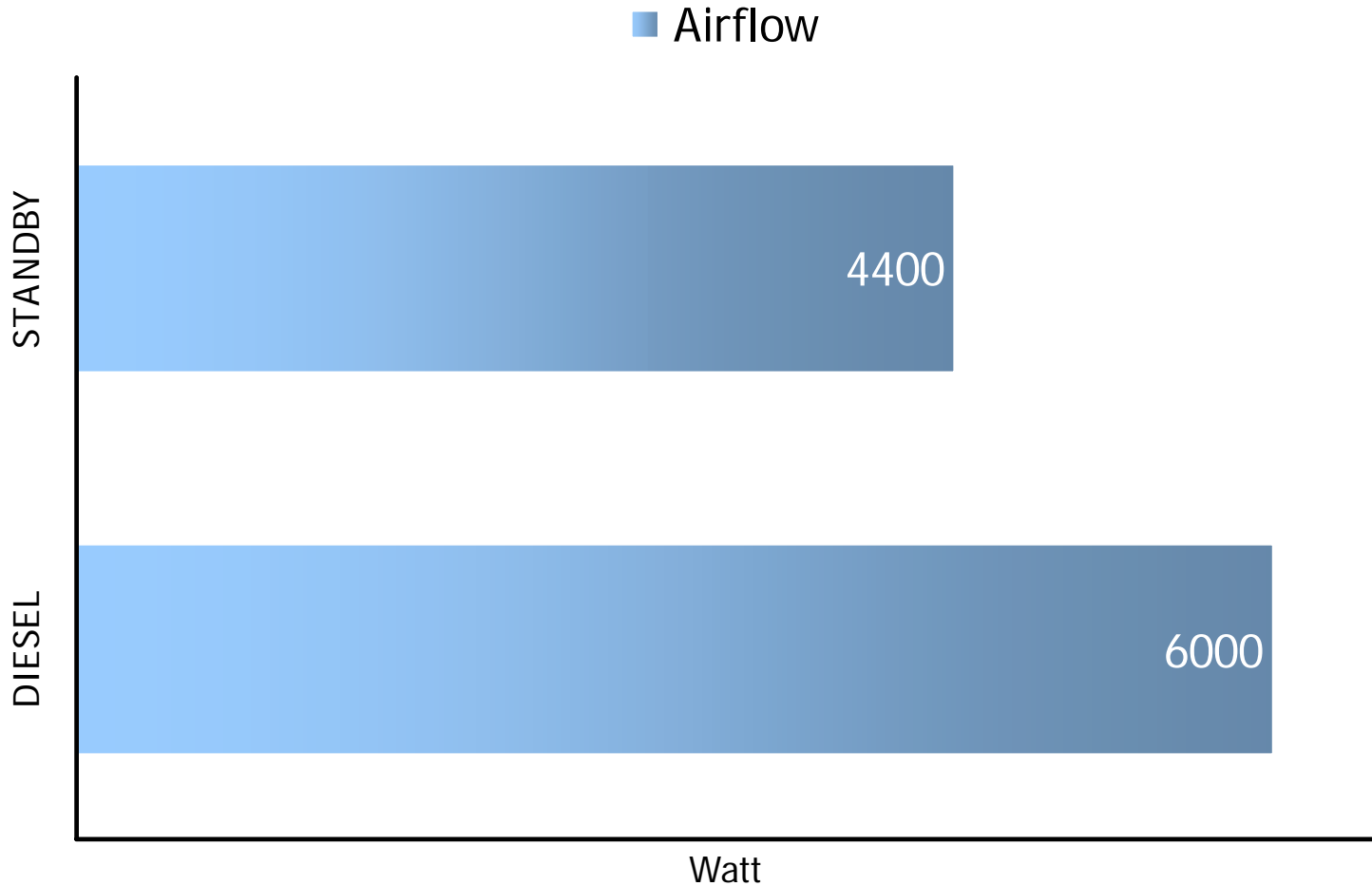
Reliability

-20 °C Setpoint / 30 °C Ambient, Auto Start/Stop



- ❑ Better performance in low speed vs. conventional 33 pallet unit in high speed

# AIRFLOW



□ Highest airflow of the industry



# AIR DISTRIBUTION

Overview

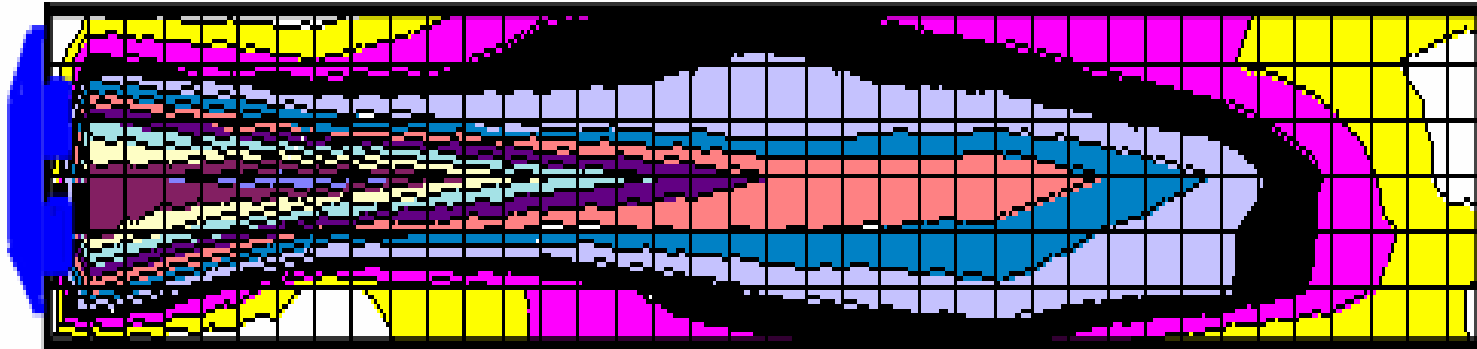
Performances

LogiCOLD

Functionality

Reliability

- Thanks to its twin discharge outlets, air temperature is homogenous throughout the complete box.



# AIRFLOW, AIRTHROW & AIR DISTRIBUTION

Overview

Performances

LogiCOLD

Functionality

Reliability

## *Advantages*

## *Benefits*

Highest airflow of any diesel unit, in high and low speed, as well as on electric operation.

Products at the same temperature at the front and at the rear.  
Better product quality.

High airthrow, the air is thrown to the rear of the box.

Products at the same temperature at the front and at the rear.  
Better product quality.

Good air distribution, on both sides of the trailer and at the rear.

Homogeneous air temperature.  
Better product quality.

# TEMPERATURE REGULATION

Overview

Performances

LogiCOLD

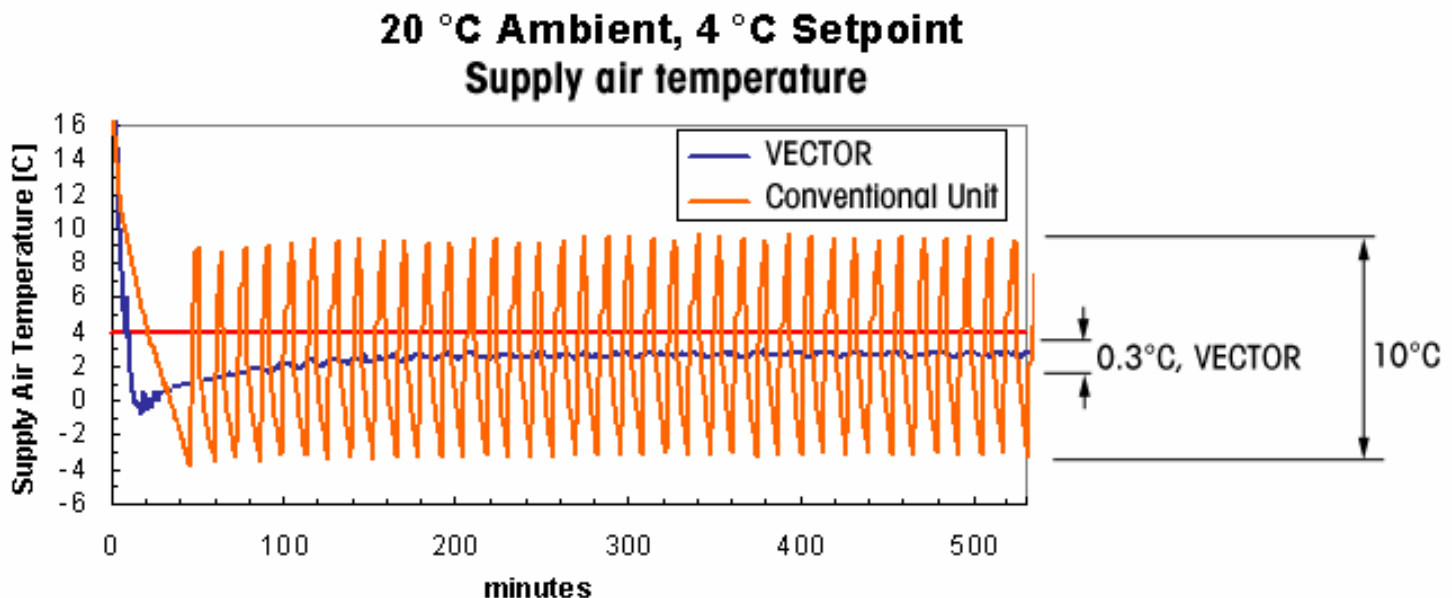
Functionality

Reliability

❑ Unmatched temperature control

▶ Box temperature is maintained within  $0.3^{\circ}\text{C}$  from setpoint

❑ Tight temperature control and proper air distribution allow constant air temperature in the complete box



# UNMATCHED TEMPERATURE MANAGEMENT

Overview

Performances

LogiCOLD

Functionality

Reliability

## *Advantages*

## *Benefits*

Best temperature control in the refrigeration transport industry.

Better product quality.

No risk of top freezing.

No product loss.

Uses Varypower to adjust unit capacity to box needs.

Better temperature control for better quality.

Reduces fuel consumption.

# Micro

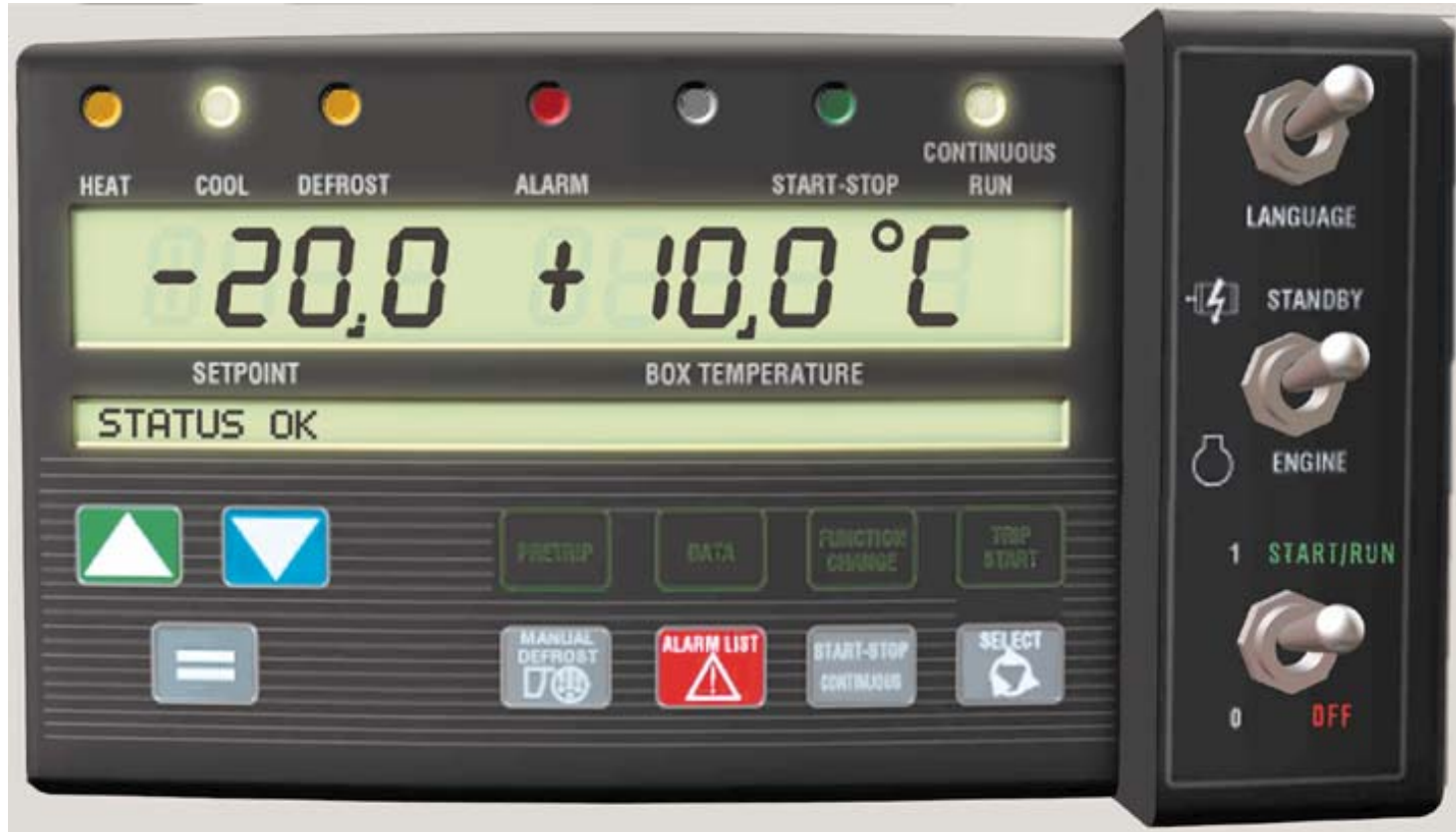
Overview

Performances

LogiCOLD

Functionality

Reliability



# Microprocessor Buyer Motivations

Overview

Performances

LogiCOLD

Functionality

Reliability

## ❑ Drivers

- ▶ Easy to use

## ❑ Technicians

- ▶ Fast & easy diagnostics

## ❑ Fleet management

- ▶ Exceptionnall fonctionnality

The logo for LogiCOLD, featuring the word "Logi" in white and "COLD" in blue, set against a black background.

# A new generation of microprocessor

Overview

Performances

LogiCOLD

Functionality

Reliability



8 languages: Danish / Dutch / English /  
French / German / Italian / Spanish /  
Russian

# LogiCOLD: ACCESSIBILITY

Overview

Performances

LogiCOLD

Functionality

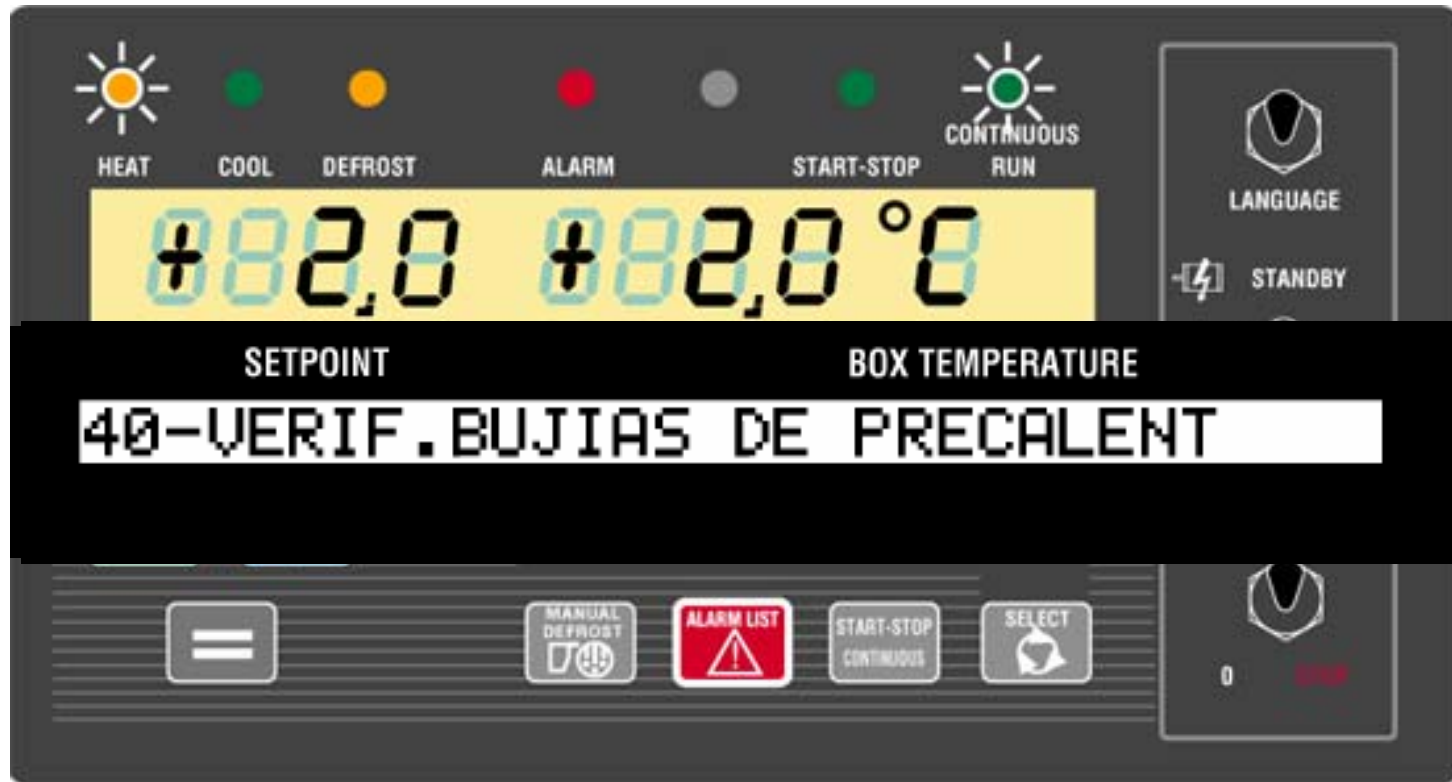
Reliability

- ❑ LogiCOLD is tilted to the user on the side of the unit, for easy access and reading





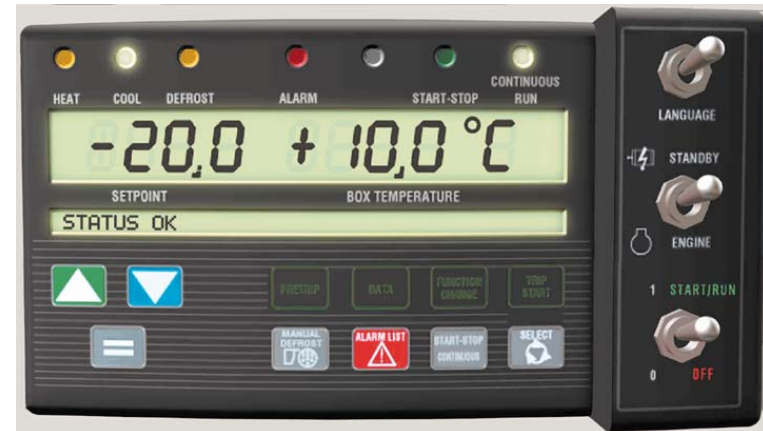
# Fast & easy diagnostics



- ❑ Alarm messages are displayed in the message center, in the language of your choice

# Fast & easy diagnostics

- ❑ Sensors are interfaced with the micro
- ❑ No need to use
  - ▶ gauges
  - ▶ Thermometers
  - ▶ Ammeters
  - ▶ Voltmeters
- ❑ 10 minutes pre-trip inspection



# Functionality : Lock key pad

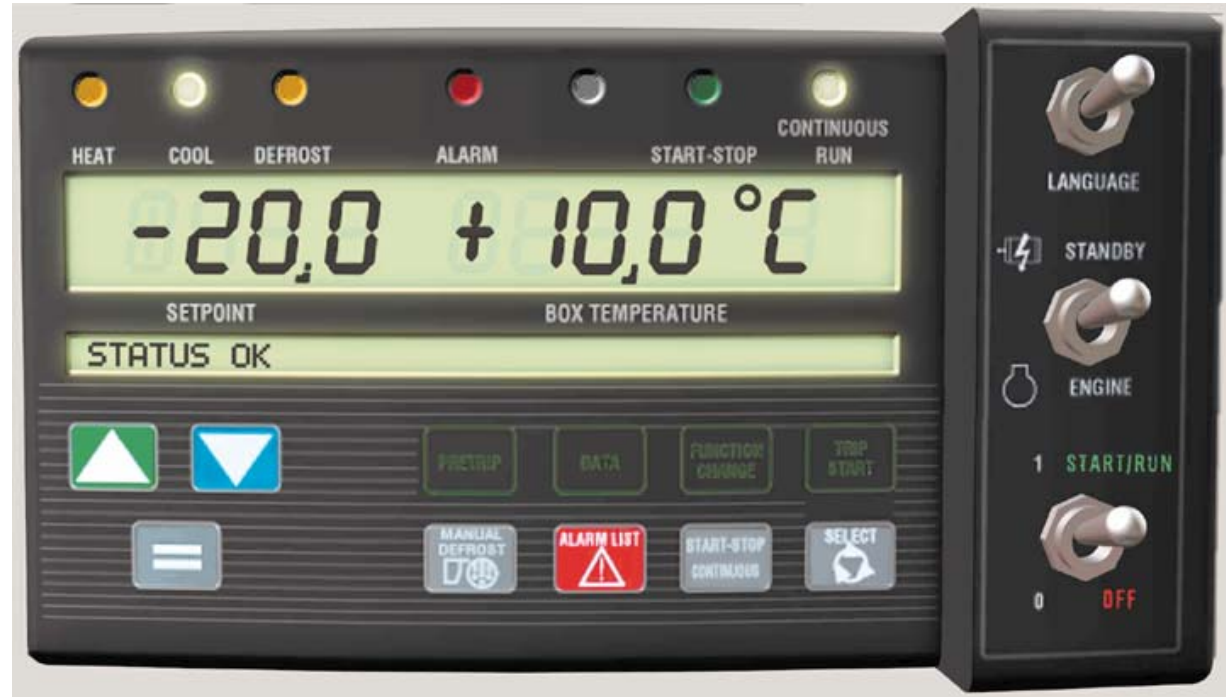
Overview

Performances

LogiCOLD

Functionality

Reliability



- ❑ Programmable key pad lock out to prevent operation errors

# Functionality "3 modes"

Overview

Performances

LogiCOLD

Functionality

Reliability

## Silent mode

- ▶ The unit is locked on low speed operation to reduce noise and fuel consumption

## Eco mode

- ▶ This mode is active when unit is on continuous run. The compressor is stopped when the setpoint is achieved, but ventilation is still working. The temperature regulation is less tight: box temperature is maintained within 2°C from setpoint instead of 0.3°C in standard running mode

## Sleep mode

- ▶ On sleep mode, the unit does not control the box temperature, but oblige the unit to restart if battery voltage or coolant temperature is too low. No risk anymore to have the battery flat after a cold night.

# Functionality : 8 Hourmeters

- ❑ 8 hourmeters including 5 programmable for easy tracking

- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability

SETPOINT	BOX TEMPERATURE
ENGINE HOURS: 2650HRS	
SETPOINT	BOX TEMPERATURE
NEXT ENGINE MAINT: 3000HRS	
SETPOINT	BOX TEMPERATURE
HOURS TO ENGINE MAINT: 350HRS	
SETPOINT	BOX TEMPERATURE
223-ENGINE MAINTENANCE DUE	

# Functionnality : Data recorder

Overview

Performances

LogiCOLD

Functionality

Reliability

Integrated data recorder

Records temperatures

▶ RAS, SAS, WTS.....

Records all operational parameters

▶ HP, ON/OFF, door opening....

Records all unit settings

▶ Start Stop, Defrost.....

Records all alarms

▶ Actives and Passives

512 kb memory:  
records up to 2  
years of data

# Functionality : PC card

Overview

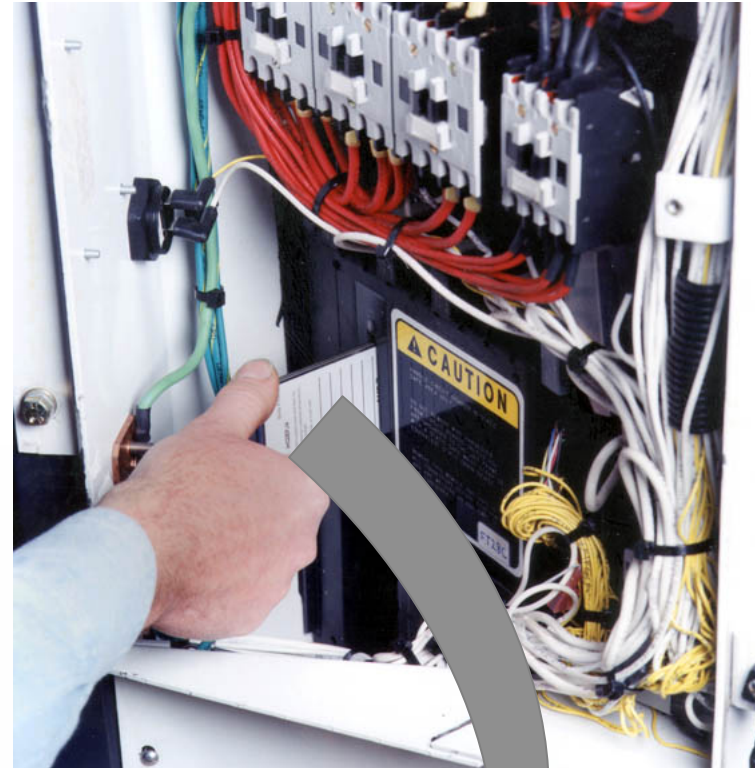
Performances

LogiCOLD

Functionality

Reliability

- ❑ PC card for fast and easy data download



# Easy to use

Overview

Performances

LogiCOLD

Functionality

Reliability

## *Advantages*

## *Benefits*

User-friendly with message centre and languages, diagnostics, integrated temperature recorder.

Less parts to replace and to adjust, easy diagnostics with LogiCOLD.

Simple container design, plus great accessibility to the components.

Faster user training.

Less risk of driver errors.

Less risk of product loss.

Quicker diagnostics for less downtime.

Less downtime.

Lower operating costs

Less risk of breakdown.

Easier diagnostics and repairs.

Lower operating costs.



# Why is this unit more reliable?

Overview

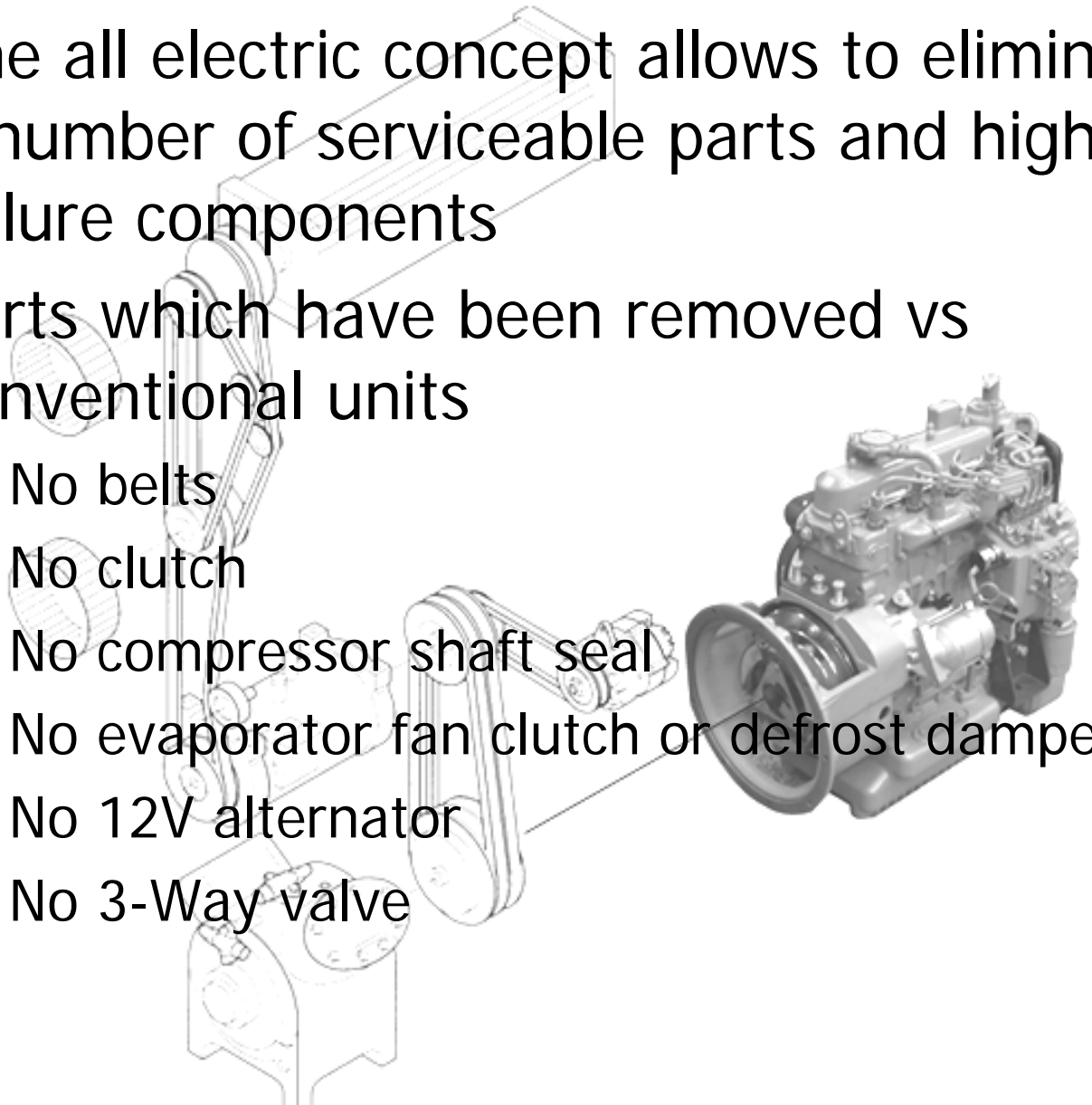
Performances

LogiCOLD

Functionality

Reliability

- ❑ The all electric concept allows to eliminate a number of serviceable parts and high failure components
- ❑ Parts which have been removed vs conventional units
  - ▶ No belts
  - ▶ No clutch
  - ▶ No compressor shaft seal
  - ▶ No evaporator fan clutch or defrost damper
  - ▶ No 12V alternator
  - ▶ No 3-Way valve



# Why is this unit more reliable?

Overview

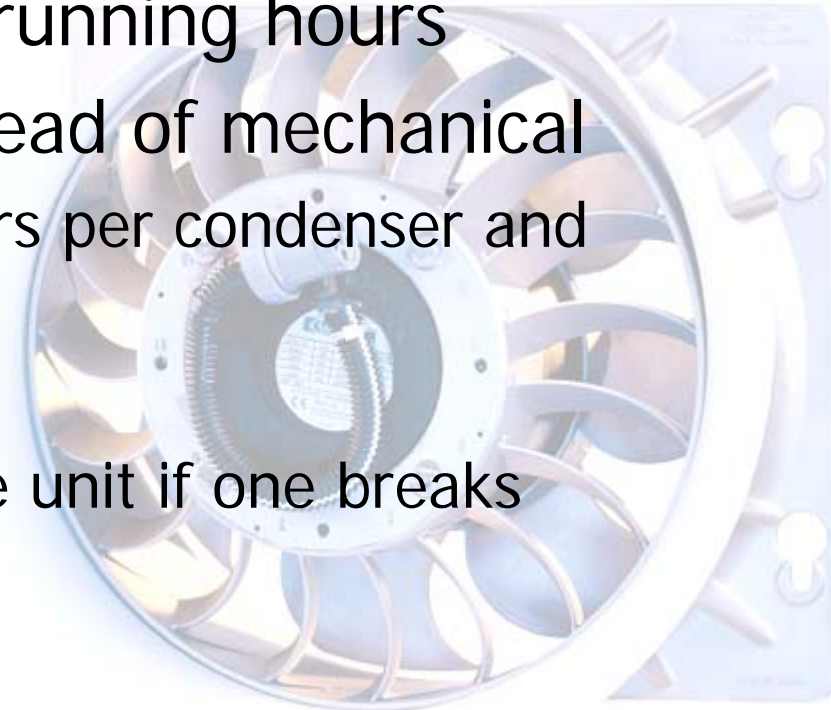
Performances

LogiCOLD

Functionality

Reliability

- ❑ Uses electric heating
- ❑ Simple refrigeration circuit with less brazing
- ❑ No risk of compressor flooding
- ❑ Less compressor running hours
- ❑ Uses AC fans instead of mechanical
  - ▶ 2 brushless motors per condenser and evaporator
  - ▶ No belt
  - ▶ Does not stop the unit if one breaks



# Key components

Overview

Performances

LogiCOLD

Functionality

Reliability

*Advantages*

*Benefits*

**GENERATOR :**

Enables elimination of a number of serviceable parts and high-failure components.

Less maintenance

**COMPRESSOR :**

Used world-wide in container and refrigeration industry, no risk of leaks due to the elimination of the shaft seal and electric motor cooled by refrigerant.

Less risk of breakdown

Less downtime

Lower operating costs

**ENGINE :**

2.2 l engine used on ULTRA and TR1000. The large, high-capacity components enable the unit to run more often on low speed.

Less risk of product loss.

# Electrical concept

## Overview

## Performances

## LogiCOLD

## Functionality

## Reliability

### *Advantages*

### *Benefits*

The design enables elimination of a number of serviceable parts.

Less maintenance

Less downtime

Lower operating costs.

Less risk of breakdown.

Less downtime

The design enables elimination of a number of high-failure components.

Lower operating costs

Less risk of product loss.

Less risk of breakdown.

### **ELECTRICAL HEATING :**

Simple refrigeration circuit with less brazing, no risk of compressor sucking liquid, less compressor running hours.

Easier trouble diagnostic and repairs.

Lower operating costs.

### **AC FANS INSTEAD OF MECHANICAL :**

2 brushless motors for each condenser and evaporator instead of belts, unit does not stop if one breaks.

Less risk of breakdown.

Less downtime.

Less risk of product loss.

# What is "Cost of Ownership"

Overview

Performances

LogiCOLD

Functionality

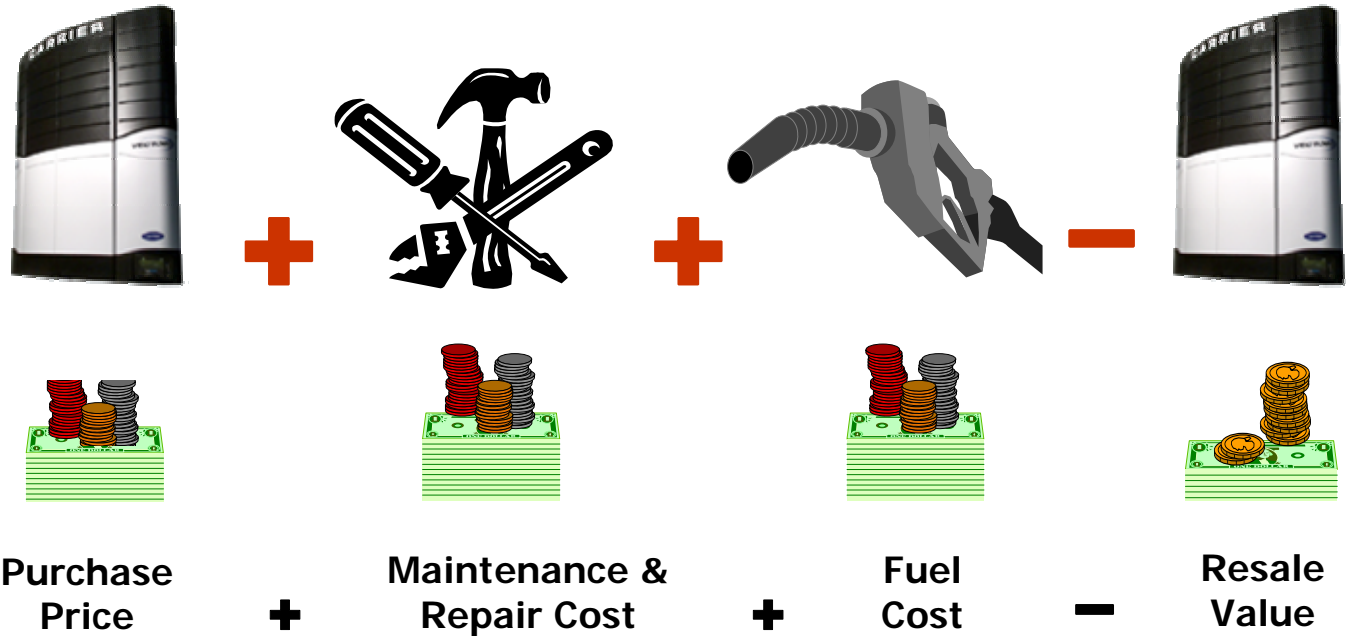
Reliability

Cost of Ownership

- ❑ Cost of Purchasing the Unit
- ❑ Cost of Routine Maintenance
- ❑ Cost of Repairs
- ❑ Cost of Fuel
- ❑ Reduced by Resale Value

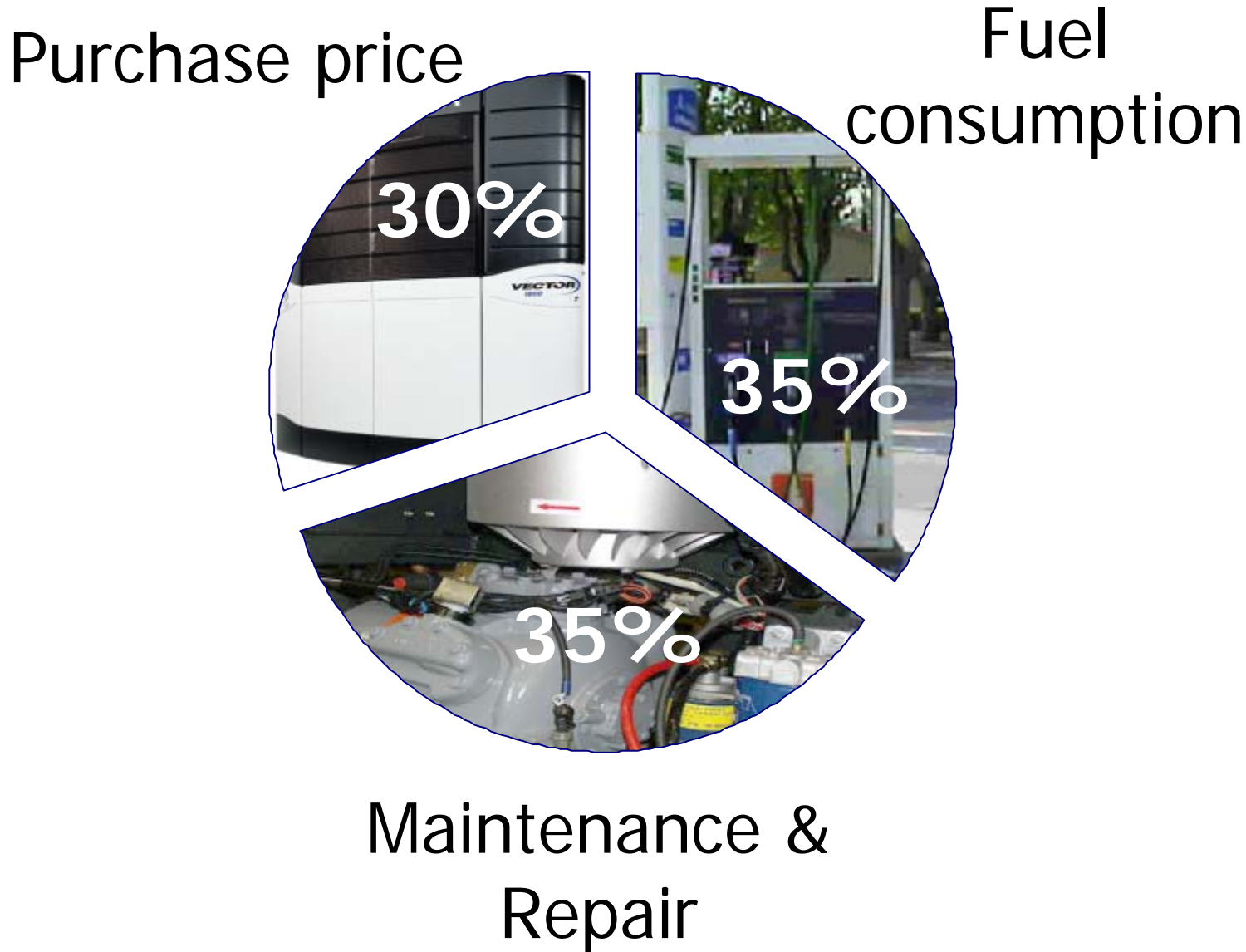
# Lowest Cost of Ownership

- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability
- Cost of Ownership**



# Lowest Cost of Ownership

- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability
- Cost of Ownership**



# Purchase Price

Overview

Performances

LogiCOLD

Functionality

Reliability

Cost of Ownership

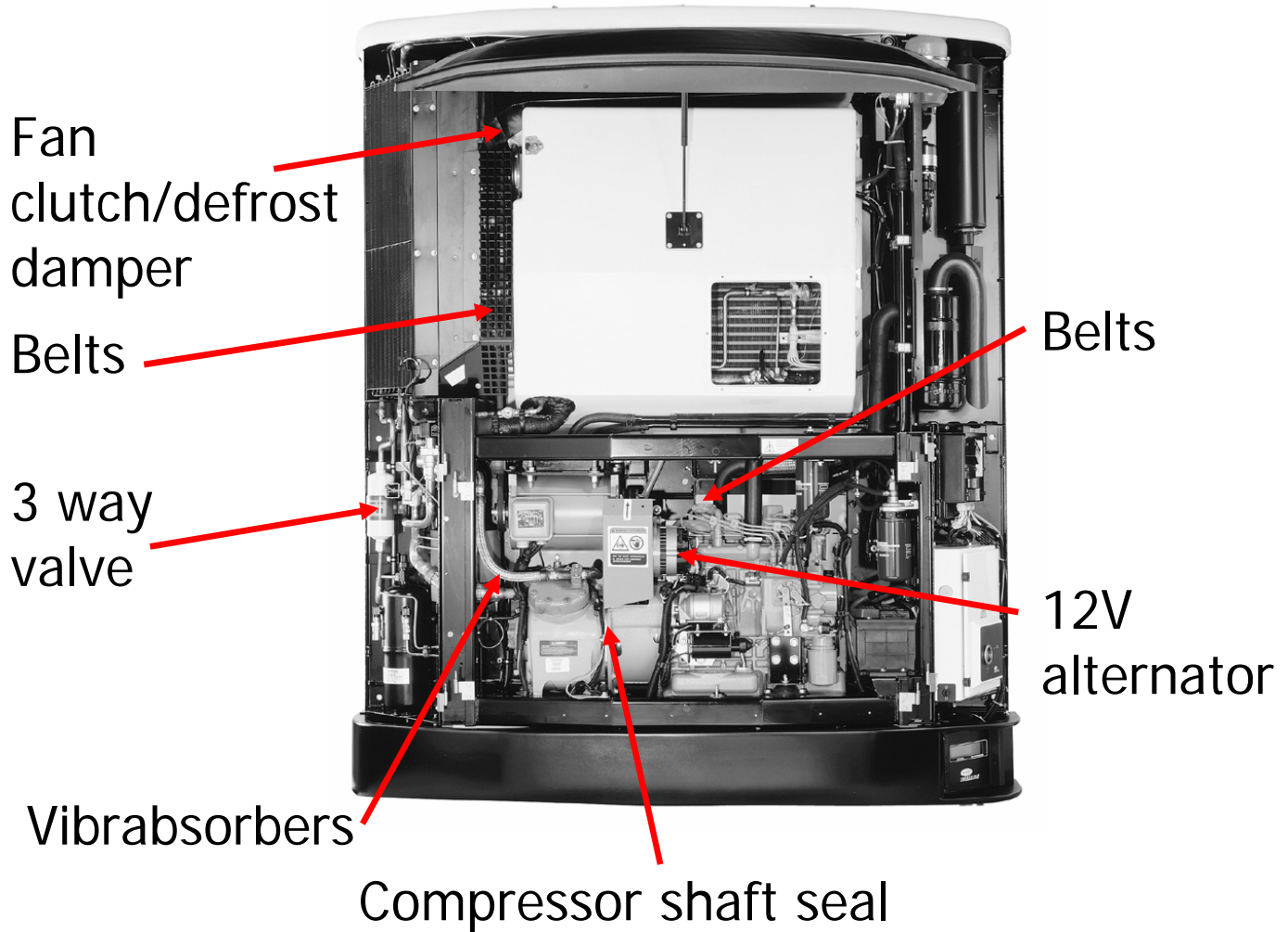
- ❑ Higher Purchase Price Does Not Mean Higher Cost of Ownership!
- ❑ Higher Purchase Price Requires Providing Customers Greater "VALUE"
- ❑ Value is Derived from Lower Maintenance, Repair, and Fuel Costs
- ❑ Value is Derived from Higher Equipment Utilization and Better Load Protection



# Maintenance & Repair Cost

- Overview
- Performances
- LogiCOLD
- Functionality
- Reliability
- Cost of Ownership

## ❑ Vector Eliminates...



# Maintenance & Repair Cost

Overview

Performances

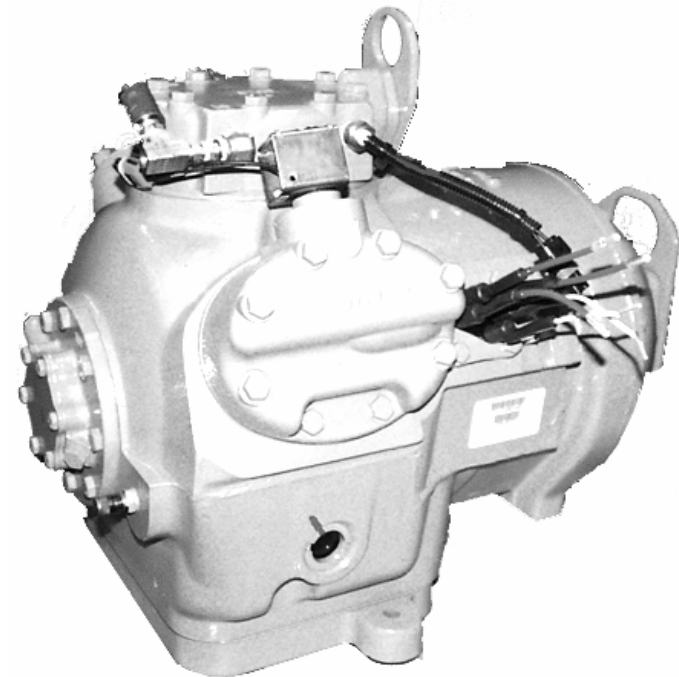
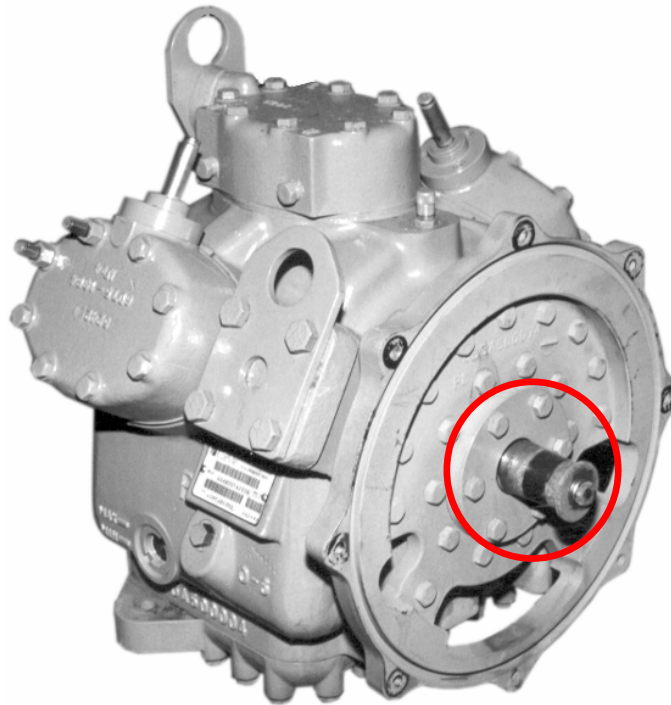
LogiCOLD

Functionality

Reliability

Cost of Ownership

- ❑ Vector Eliminates Compressor Shaft Seals . . .



# Maintenance & Repair Cost

**Overview**

**Performances**

**LogiCOLD**

**Functionality**

**Reliability**

**Cost of Ownership**

Parts	Average Life Time		Time Required for Replacement	
	Vector	Conventional	Vector	Conventional
Clutch	No	7,000 h	No	4.0 h
Belts:				
Engine/Standby	No	1,500 h	No	0.5 h
Alternator	No	3,000 h	No	1.5 h
Evaporator Fan	No	3,000 h	No	1.5 h
Condenser Fan	No	3,000 h	No	1.5 h
Compressor Shaft Seal	No	12,000 h	No	4.0 h
Evaporator Damper	No	7,000 h	No	0.5 h
Alternator Brushes	No	3,000 h	No	0.5 h
Alternator	No	6,000 h	No	0.6 h
3-Way or Solenoid Valve	No	12,000 h	No	3.15 h
Vibrasorbors	No	Repair	No	2.0 h

# Maintenance & Repair Cost

Overview

Performances

LogiCOLD

Functionality

Reliability

Cost of Ownership

- ❑ Vector's Advanced Control System Provides
  - ▶ Industry Leading Pre-trip
  - ▶ Comprehensive Diagnostics
  - ▶ Electronic Recording of Unit Functions
  - ▶ Alarm Messages
  - ▶ Maintenance Hour Meters

Reduces Troubleshooting  
and Diagnostic Time!



## Overview

## Performances

## LogiCOLD

## Functionality

## Reliability

## Cost of Ownership

- ❑ In High and Low Speed, Full Load Conditions . . . Vector Burns More Fuel
- ❑ Do Not Fear! Vector Wins in Every Typical Operating Condition
  - ▶ Faster Pulldown
  - ▶ More Low Speed/Low Load Operation
  - ▶ Fuel Saving Control Features
    - ⌘ Eco Mode
    - ⌘ Silent Mode

Overview

Performances

LogiCOLD

Functionality

Reliability

Cost of Ownership

❑ Resale Value is Determined By :

- ▶ Reliability
- ▶ Serviceability
- ▶ Appearance
- ▶ After Sale Support by 'TRANSCOLD'  
the New Zealand Distributor for  
CARRIER TRANSCOLD

CARRIER TRANSICOLD

THANK YOU