Unicla®

Unicla® eDrive™

The revolutionary electric compressor.

Unicla® eConnect™

The primary communication interface between the technician and compressor.

Unicla® eControl™

The intelligent compressor firmware.

GOOD DESIGN AWARD® WINNER

Unicla® eDrive™

Unicla eDrive is an intelligent, industrial-grade electric air-conditioning and refrigeration compressor. Its patented, award-winning design with dual onboard pressure and temperature transducers is designed for both OEM and retrofit applications in mining, locomotive, industrial and off-highway machinery.

eDrive incorporates the Unicla 10-cylinder swashplate compressor, a design that has been evolutionary for over 60 years. The Unicla swashplate compressor has endured extremes in service with transport, military and mobile refrigeration around the world proving it a worthy heavy-duty compressor in its class.

The evolution story of Unicla is now following an EV route with the incorporation of a brushless DC motor in a hybrid semi hermetic configuration allowing simple field separation of the motor and compressor if required. The same robustness seen in the swashplate compressor is embedded in the motor and electronics with incorporation of automotive grade components, conformally coated and staked PCBA which are validated in working conditions.

Connection accessories:

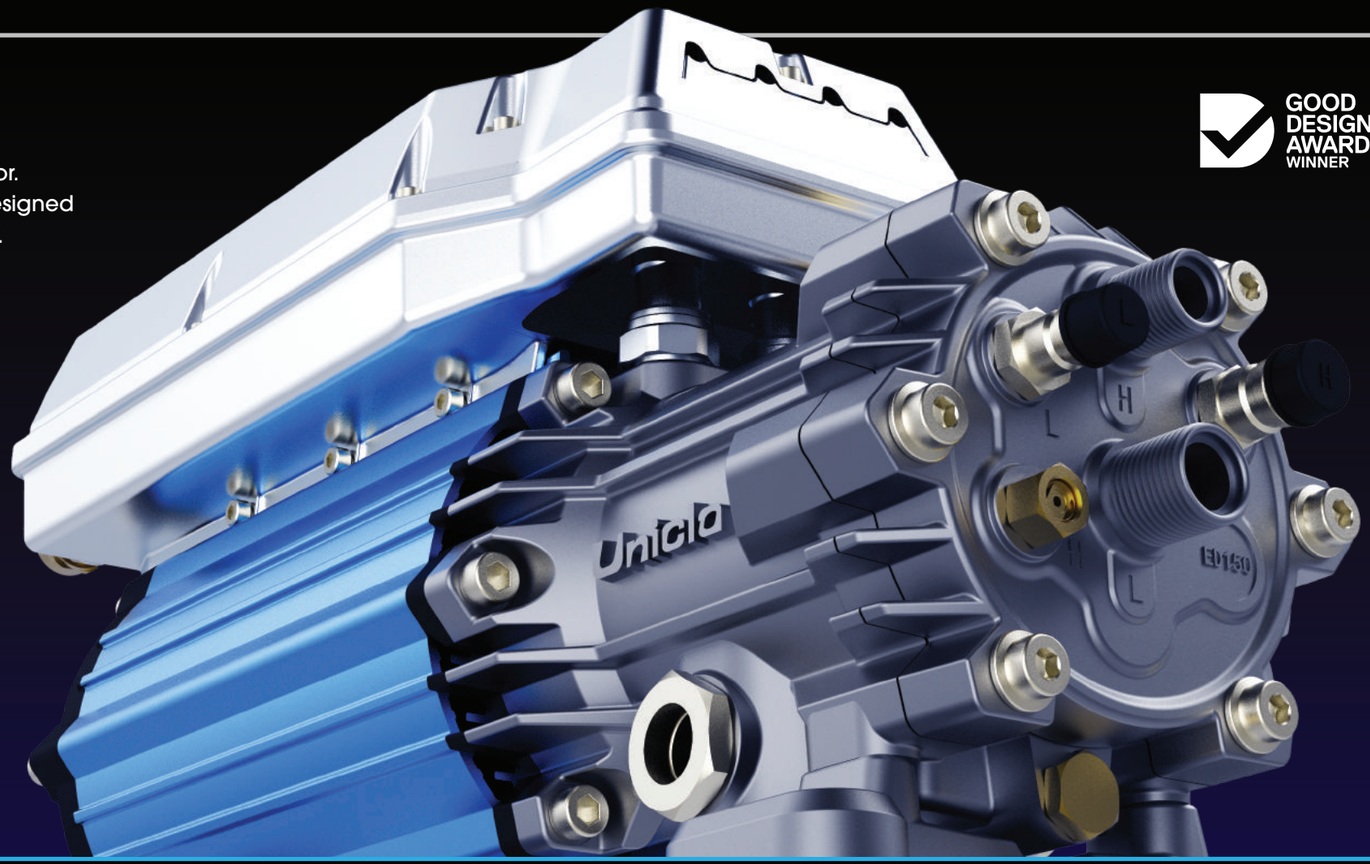
power cables, communication cables, anti-vibration mounts

Refrigerants:

R134a, R404A, R513a, R452a, R1234yf or R1234yz

Voltages:

24, 48, 72, 400, 600 or 800 V dc



GOOD DESIGN AWARD® WINNER

Unicla® eConnect™

Unicla eConnect is the primary communication interface that allows the technician to view, log and configure the eControl pressure, temperature and electrical operational parameters of the eDrive compressor and the system.

Dashboard

A simple, intuitive interface that provides total oversight and primary control of the compressor. An option is to switch to 'table view' for a tabular data viewer.

Plots (individual & combined)

A viewing portal for all metrics of the eDrive in graphical form. It facilitates live data or selected time graphing and can be export to an excel CSV file.

Information

Important factory and statistical information regarding this eDrive.

Event Log

A list of critical and non-critical events to help the technician understand operational sequences and faults.

App Setup

Configure app preferences and settings.

Commissioning

The primary tab for configuring the desired operational behaviour including operational limits and oil balance settings.

There are two versions of eConnect:

eConnect Desktop
Two-way communication to the eDrive compressor via USB or ethernet cable

eConnect Web
One-way communication
(view only - requires an internet connection via ethernet cable)

Features include:

- Main Dashboard - all essential operational data
- Performance graphing, events with CSV output
- Compressor information - name, serial number, run time
- Configure eControl settings - Control, Protect, Adapt *(Desktop version only)*

Unicla® eControl™

eControl is a Unicla proprietary firmware split in three sections – Control, Protect and Adapt. It is embedded in the eDrive compressor hardware and is configurable via the eConnect communication interface. eControl uses the eDrive system measurements from on board dual pressure temperature transducers and various mechanical sensors from the DC motor and PCB hardware to manage the compressor and influence the desired system reliability, safety and operating behaviour.

CONTROL

The primary layer of eDrive operational logic that is accessible and configurable in the eConnect commissioning tab.

Fixed speed:
10-24V on/off by thermostat signal

Variable speed:
4-20mA or 0-10V

Communication:
CAN bus, RS485

PROTECT

A suite of user-configurable and factory-fixed safety limits that maintain the compressor durability and lifespan.

Pressure:
Cut in and cut out setpoints for suction and discharge pressure

Temperature:
Cut in and cut out setpoints for suction and discharge temperature

Superheat:
Cut in and cut out setpoints for suction and discharge superheat

Oil Balance System (OBS):
A mandatory but configurable feature to manage the oil retention ratio between the compressor oil level (COL) and total system oil quantity (SOQ). The OBS function runs a series of start and stop cycles after a specific stationary period to minimise high or low COL upon full start-up and prior to resuming normal operation

ADAPT

A set of discrete functions that overlay the primary logic for a high-level control intervention.

Adaptive control is an additional option activated in eConnect to control low or high side parameters and power consumption. The settings for each parameter are configurable to suit individual systems. Compressor speed is dynamically adjusted to keep systems operating efficiently and safely within specific control settings.

High Side Pressure protection:
Adaptive control adjusts compressor speed within a predefined range to maintain safe HP levels. This extends system operational time and minimises setpoint triggers causing the systems to power off. An example would be a blocked condenser.

Low Side Pressure protection:
Adaptive control adjusts compressor speed within a predefined range to maintain safe LP levels. This extends system operational time and minimises setpoint triggers causing the systems to power off. An example would be a low gas charge.

Low Side Pressure control:
Adaptive control continuously adjusts compressor speed within a defined range to maintain LP control settings. Suited for applications where low side pressure control is preferred rather than traditional thermostat output.

Power protection:
Adaptive control adjusts compressor speed to keep power consumption within specific limits to prevent circuit breaker trips, system shutdowns or excessive depletion of battery capacity in electric vehicles and machinery.

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