

# airixa<sup>TM</sup>

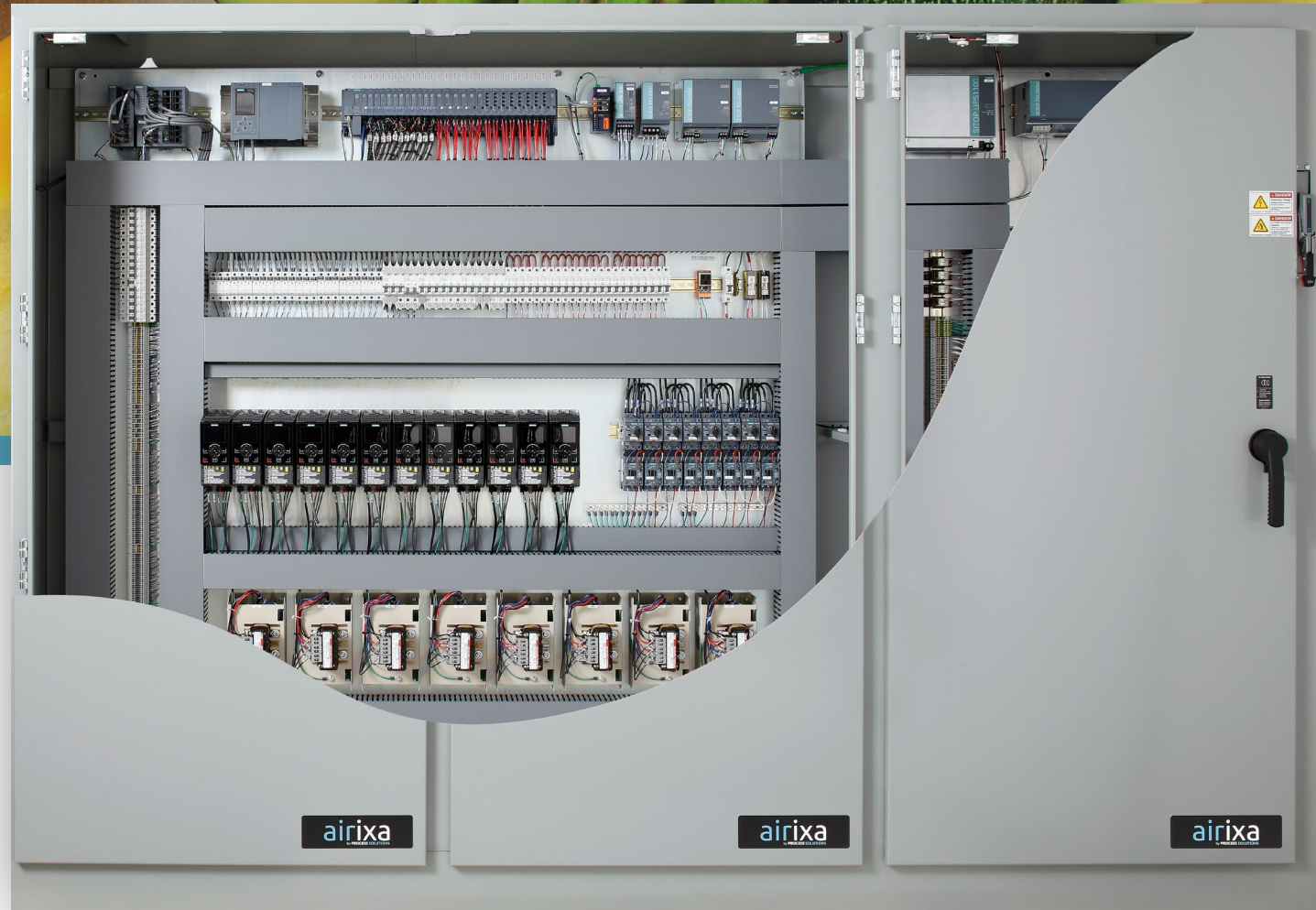
by **PROCESS SOLUTIONS**



Industrial Refrigeration  
**Control Systems**

POWERED BY  
**SIEMENS**









# Industrial Refrigeration Control Systems with Energy & Demand Management

Airixa is a technology platform for the control of industrial refrigeration systems, with integrated energy and demand management features. With Airixa, companies can reduce peak power demands and run their facilities at optimal energy efficiency without sacrificing performance.

Airixa is a non-proprietary system utilizing both Siemens hardware and software components. By creating a non-proprietary system, Airixa has greater availability of parts while also being more reliable and easier to maintain.

In order to create an easy to use controls platform, Process Solutions developed Airixa's software to enable the ability to add and configure new equipment without the need to restructure the software's code. Airixa's software is based on methodically tested libraries to maintain consistency between installations. Due to object-oriented architecture, version control, and rigorous testing, new feature additions can easily be performed without compromising the system's integrity.

Overall, Airixa is a modular system that provides greater flexibility, increases production efficiency and reduces operational costs.

-  **Demand Management**  
Limit utility peak charges with power demand control, and generate revenue with demand response.
-  **Industrial Refrigeration Controls**  
Robust control systems platform for industrial refrigeration, built on Siemens hardware and software.
-  **Scalable**  
Airixa can be scaled to work with any size application or facility.
-  **Efficiency Measures**  
Run your production at optimal efficiency without compromise to operational performance.





## PLC **S7-1500**

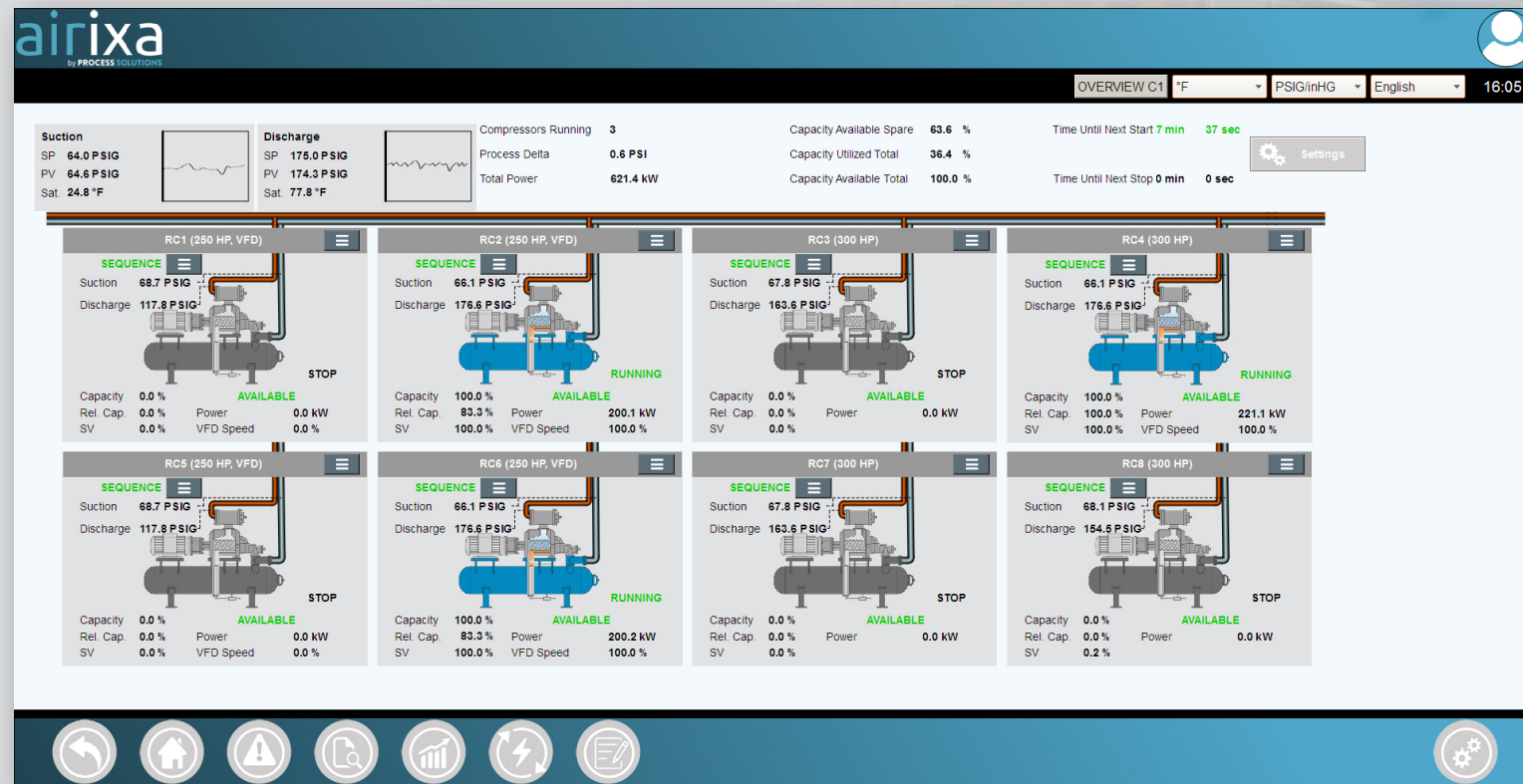
Airixa utilizes Siemens S7-1500 PLC technology, creating a high-performance system, while also providing flexibility and superior communication options, which include OPC, Modbus, and PROFINET support. Airixa can also seamlessly communicate with other software systems, such as existing facility controls, building management systems, or an ERP system.

## SCADA **WinCC OA**

Airixa's SCADA package utilizes Siemens WinCC OA to provide accurate system information at your fingertips. The SCADA package allows for graphic visualization, data collection, system analysis, and the ability to conduct full system audits, compliant with food safety requirements of the FDA CFR 21 Part 11. Airixa's system audits display changes to parameters, along with who made changes, from which location, and when.

Other standard features include alarming, email notifications, system health heartbeat emails, logging and trending of historical values and events, and automatic data backup. Simultaneous multi-user access is also standard in all installations.





## Remote Access

Designed to be a modern system connected to the world around it, Airixa comes standard with built-in simultaneous multi-user access via a web browser from any Internet connection. Always stay connected to Airixa while you are on the go with native iOS and Android apps.

## Efficiency Measures

Airixa's built-in efficiency features, such as condenser floating discharge pressure and evaporator fan VFD speed control, reduce energy consumption without compromising the operational performance of your facility and assets. Compressor optimization with staging, sequencing, and floating suction pressure control creates a highly efficient system with greater reliability.



Utility Account 1 Demand Management

Load Device	Power	Reduced	Status
Cooler 1 Evap 1	0.0kW	0.0kW	Available
Cooler 1 Evap 2	6.0kW	0.0kW	Available
Cooler 1 Evap 3	0.2kW	0.0kW	Available
Cooler 2 Evap 1	1.5kW	0.0kW	Constrained
Cooler 2 Evap 2	0.0kW	0.0kW	Available
Cooler 2 Evap 3	0.2kW	0.0kW	Available
Dock Evap 1	3.8kW	0.0kW	Available
Dock Evap 2	3.7kW	0.0kW	Available
Dock Evap 3	3.7kW	0.0kW	Available
Dock Evap 4	0.2kW	0.0kW	Available
Dock Evap 5	0.0kW	0.0kW	Available
RR1 - Left	9.5kW	0.0kW	Constrained
RR1 - Right	9.3kW	0.0kW	Constrained
RR2 - Left	0.0kW	0.0kW	Constrained
RR2 - Right	0.6kW	0.0kW	Available
RR3 - Left	0.6kW	0.0kW	Available
RR3 - Right	5.2kW	0.0kW	Available
RR4 - Left	0.6kW	0.0kW	Available
RR4 - Right	0.6kW	0.0kW	Available
RR5 - Left	13.6kW	0.0kW	Available
RR5 - Right	13.4kW	0.0kW	Available
RR6 - Left	0.6kW	0.0kW	Available
RR6 - Right	0.6kW	0.0kW	Available
RR7 - Left	5.3kW	0.0kW	Available
RR7 - Right	5.2kW	0.0kW	Available
RR8 - Left	0.6kW	0.0kW	Available

Utility Account 1 Setup

Demand Management  ENABLE  DISABLE

Demand Management Time of Use Holidays Billing Period

Off-Peak Part-Part-Peak Part-Peak Part-High-Peak High-Peak

Off-Peak Demand Management Settings

Demand Limit

January	140.0 kW
February	140.0 kW
March	135.0 kW
April	145.0 kW
May	150.0 kW
June	170.0 kW
July	180.0 kW
August	180.0 kW
September	170.0 kW
October	160.0 kW
November	150.0 kW
December	150.0 kW

Adaptive Demand Limit

Enable  Disable

Deadband

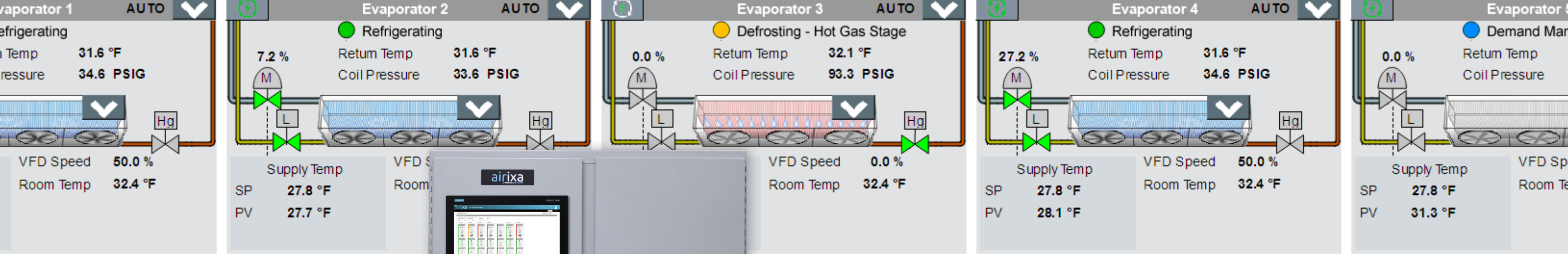
Increase

# Demand Management

Electricity bills include demand charges measured in kilowatts (kW) based on the peak demand within a billing period. Typically, the demand charge is determined by the highest average kW during a set amount of time and can account for up to almost 50% of a business's utility bill. Using sophisticated load shifting and control algorithms, in coordination with customer-defined control rules, Airixa can limit demand spikes by shifting power demand with the help of thermal buffers and other control strategies. Through Airixa, companies can reduce demand charges by 10-40%, and significantly lower their utility bill.

## Demand Management Features

- Demand Control – Reduce peak demand charges.
- Demand Response – Generate revenue by participating in utility's DR events, including DRAS.
- Adaptive demand limits (Setpoint learning).
- User-selected load reduction priorities.
- Dynamic operation priorities based on production metrics and constraints.
- Equipment system start-up sequencing.
- Detailed energy, demand, and reduction monitoring of individual loads.
- Available load sub-metering.
- Utility-grade power metering, or pulse interface (KYZ) integration.
- Support for multiple utility accounts within one facility.



# System Specifications

## Control System Features

- Siemens S7-1500 PLC system.
- Siemens WinCC OA SCADA software.
- Extensive data logging and trends.
- Alarming with e-mail and daily system heartbeat notification.
- User authentication; up to five levels of user roles.
- Auditing features – Tracking of system settings changes specific to individual users. Compliant with food safety requirements of the FDA of 21 CFR Part 11.
- Various user interface options available: Standard UI client for desktop or touchscreen installation, HTML5 client for Internet browser access, Mobile client utilizing native iOS and Android applications.
- Simultaneous multi-user access
- Siemens industrial PC with 22" multi-touch HMI.

## Refrigeration and Energy Efficiency Measures

- Condenser floating discharge pressure control.
- Compressor optimization: Staging, sequencing, and floating suction pressure control based on zone temperature feedback and other factors.

- Evaporator fan speed control based on zone set points and temperature conditions.
- All common defrost cycles: Hot gas, Air, Electric, Water.
- Available pulse-width control of evaporator electronic expansion valves based on superheat.
- Available modulated control of evaporator suction valves for tight supply air temperature control.
- Communications, including diagnostics features, to common compressor controllers: GEA-FES, Frick, Mycom, and others.
- Direct control of screw and reciprocating compressors, including diagnostics of all common safeties.
- Optional redundant system suction and discharge pressure sensors, including diagnostics.
- Standard compressor interlock features: High level, Engine room Freon/Ammonia concentration, E-stop.
- Communications, including diagnostics features, to common VFDs: Siemens, Rockwell, Schneider Electric, Yaskawa.
- Refrigerant vessel monitoring and modulated level control.
- Recirculator pump runtime-based sequencing and differential pressure diagnostics (cavitation prevention).
- Standard PT1000 temperature sensors with 3-wire connection for long cabling distance temperature compensation (other temperature sensor types available).
- Various sensor types available depending on the application: Relative humidity, Absolute humidity, Enthalpy, Superheat/Sub-cooling, Freon/Ammonia detection, CO2, and others.



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