



AMMONIA
COMPRESSOR PACKS

ACP

IIAR Nashville March 25, 2014
Presented by :
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Designed for Industrial Refrigeration

BITZER The Heart of Freshness



- ❖ Founded in 1934 – Privately held
- ❖ Employees: > 3,200
- ❖ Number of subsidiaries worldwide: 40
- ❖ Number of manufacturing facilities: 14
- ❖ Manufacture 500,000 units / year
 - ❖ 450,000 Compressors
 - ❖ 50,000 Pressure Vessels / Other

Designed for Industrial Refrigeration

BITZER US Locations



Flowery Branch, GA

Production of Recips
(including Ammonia and CO₂)



Oakwood, GA

Production ACP and
Pressure Vessels



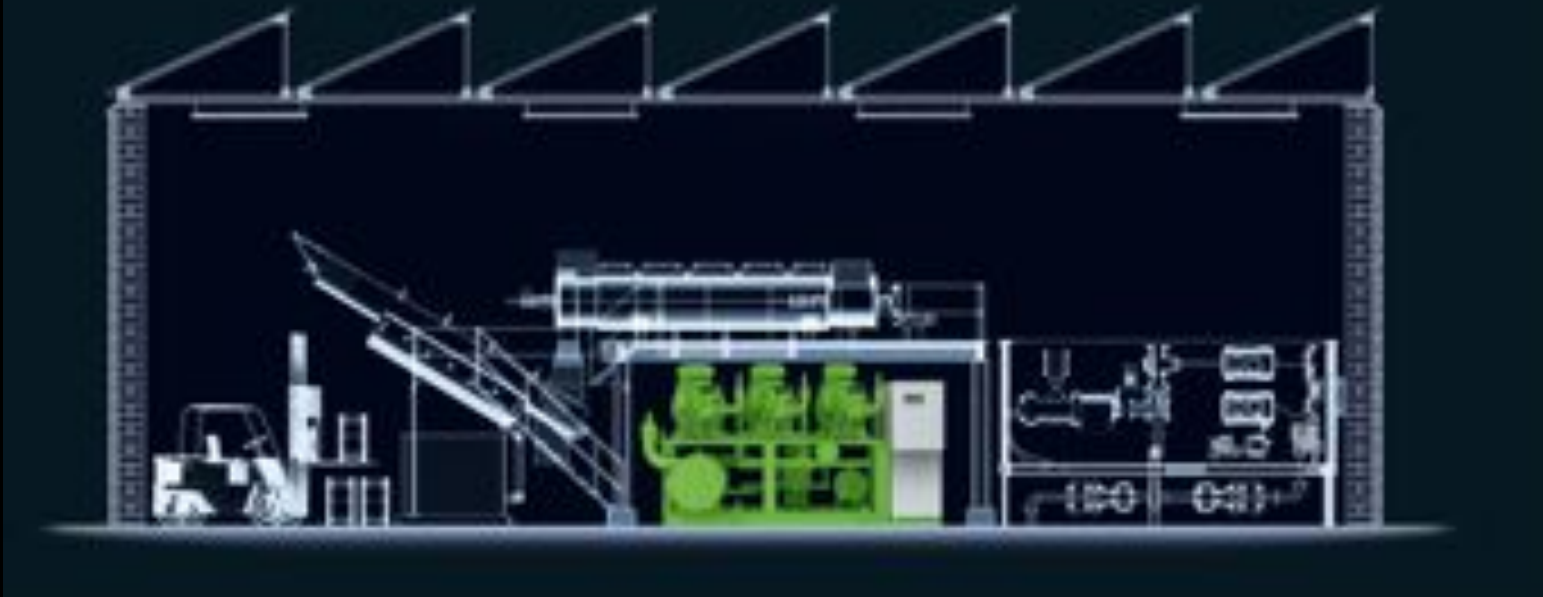
Syracuse, NY

Production of Scrolls

Designed for Industrial Refrigeration

ACP

For industrial applications



Designed for Industrial Refrigeration

Ambition

- / Supply industrial Ammonia Compressor Packs
- / Develop larger equipment to meet our customer's demand
- / Create new solutions with our customer for the future Ammonia market
- / Deliver the support, service and maintenance for safe operation
- / Increase the efficiency and operational reliability of Ammonia systems

BITZER is the largest independent compressor manufacturer in the world with 25 years of Ammonia compressor production and application

Designed for Industrial Refrigeration

Compressor Pack Design

MODULAR INDUSTRIAL DESIGN

- // Sturdy design with industrial components
- // 2 or 3 compressors – 1 with VSD
- // Large versatile range of capacities

BITZER PACK CONTROLLER

- // Optimized part-load features for up to 9 compressors
- // Easy menu structure
- // Multiple external communication opportunities (USB, RS485, TCP/IP web server, etc.)
- // Designed for global use

BITZER ADVANCED OIL MANAGEMENT SYSTEMS

- // Optimized oil separator
6-10ppm (liquid drops)
- // Compact oil cooler, multiple cooling options
- // 2-stage oil filter
- // Low differential pressure operation

OPTIONAL BITZER ECONOMIZER SYSTEM

- // Complete with liquid control and pipings
- // Compact design

MAXIMUM REDUNDANCY

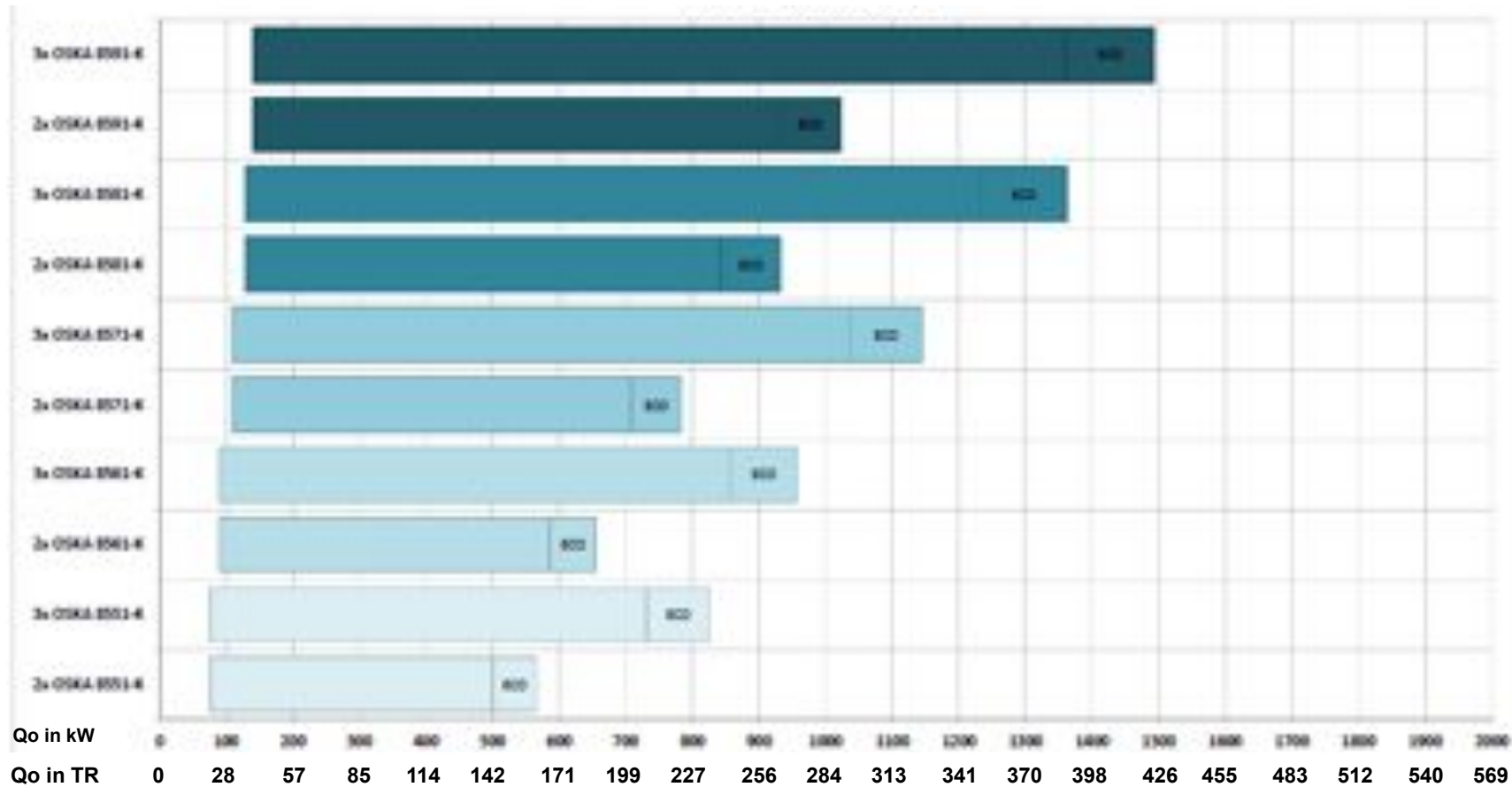
- // Multiple compressors
- // Multiple drivelines & starters
- // Backup controller CPU and sensors
- // Dual oil filters



Designed for Industrial Refrigeration

Cooling capacities

Medium Temperature Applications : 20 °F / 95 °F



Designed for Industrial Refrigeration

Advantages

- / Multiple Compressors are More Efficient
 - / Best System Part Load Efficiency
 - / Smaller VSD - Uses Less Power
 - / Lower Starting Current per Motor
- / Redundant Compressors and Controls
- / Superior Load Matching – Down to ~5%
- / Shared System Components
- / Allow Flexible Design & Control Strategies
- / Low Charge Economizing Option



Designed for Industrial Refrigeration

BITZER ACP Controller



- / Complete Monitoring and Control of up to 3 ACPs (9 Compressors)
- / Automatic Switchover to Redundant CPU and Sensors
- / Application Envelope Protection with Separate Warning, Alarm and Shutdown Limits
- / Optional Remote Color Touch Display

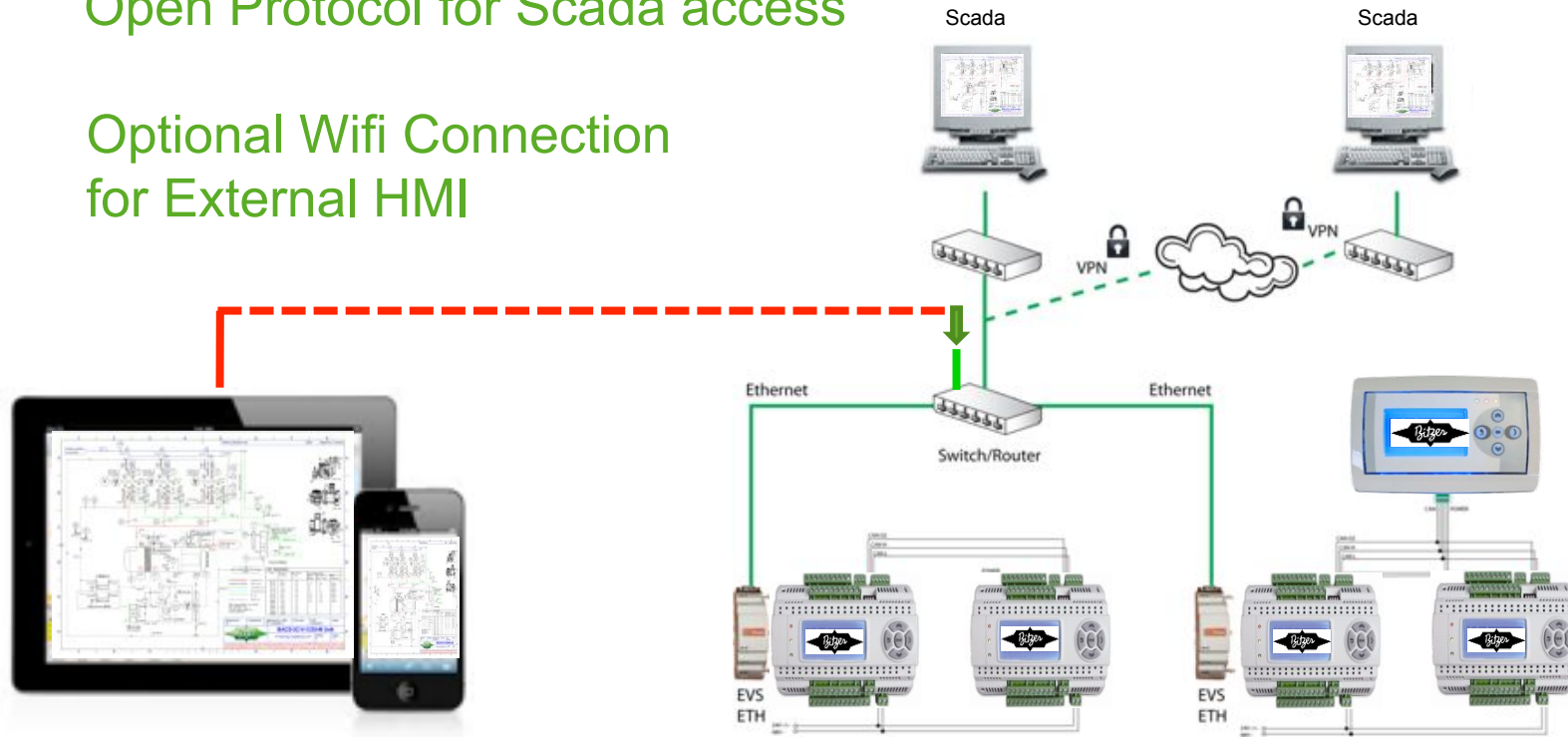
Keep ACP in a Reliable, Non-stop and Trouble-free Operation

Designed for Industrial Refrigeration

Controller Communication Features

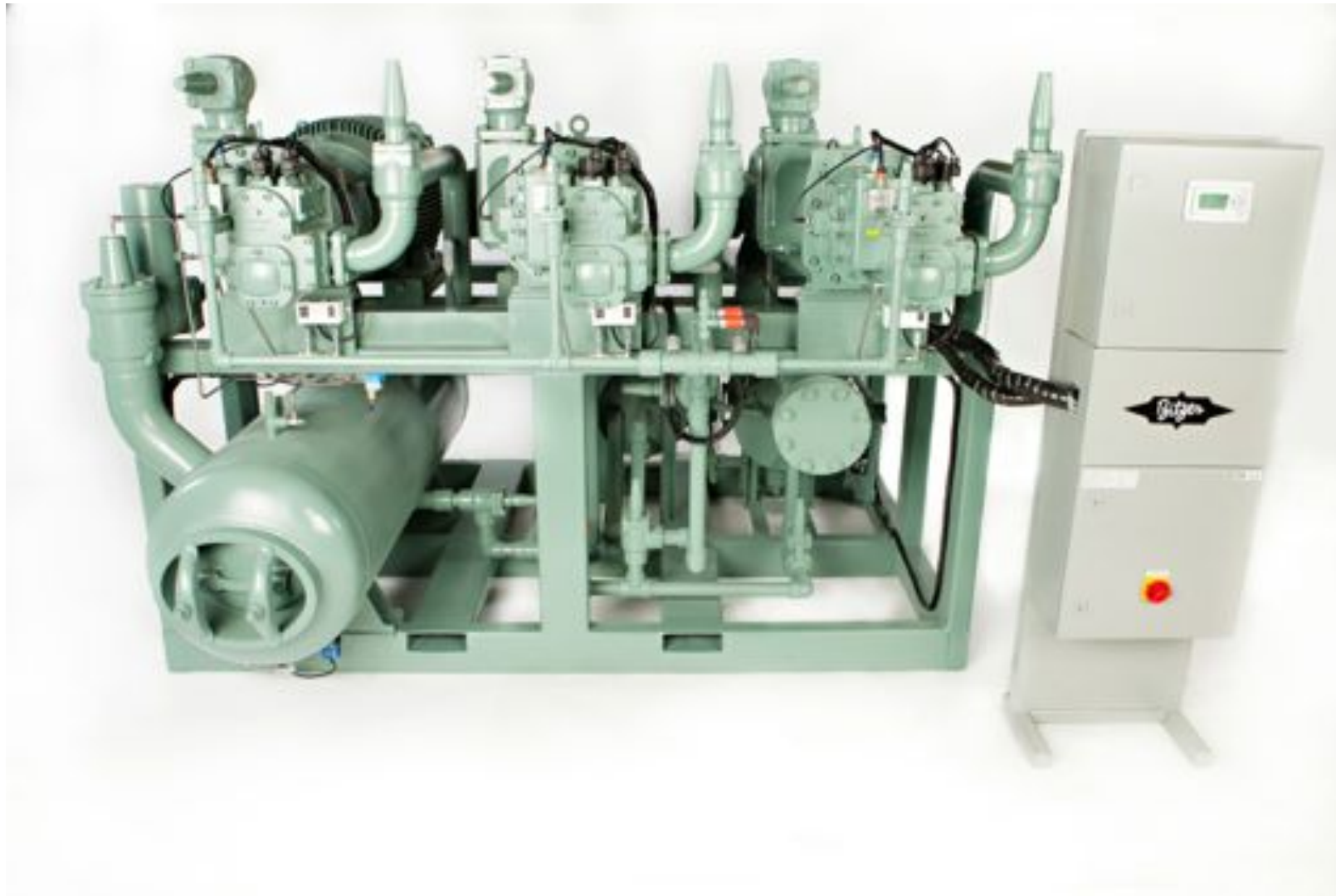
Open Protocol for Scada access

Optional Wifi Connection
for External HMI



Designed for Industrial Refrigeration

BITZER Pack design



Designed for Industrial Refrigeration

BITZER Pack design



Designed for Industrial Refrigeration

Prototype / test unit in operation



1550 kW @ 4°C / 30°C – 70/60/60Hz



Cooling capacity: 440 TR @ 40°F / 86°F (70/60/60Hz)
Refrigerant charge : 185 pounds (85kg)

In operation since December 2013

Designed for Industrial Refrigeration

BITZER training sessions and support



Seminars



Lab Training



On-Site Support



Web Support/Software

Designed for Industrial Refrigeration

BITZER Software - ongoing development

Optimized BITZER software for calculation of all ACP modules

Calculation of compressors and heat exchangers

Calculations of part load like ESEER / IPLV, etc.

The image displays three overlapping screenshots of the BITZER Software v6.4.1 rev0985 interface. The leftmost screenshot shows a menu with options like 'Semi-hermetic Recips', 'Semi-herm. Recips 2-stage', and 'Semi-hermetic Screws'. The middle screenshot shows the 'Open-Screw Compressors OS' configuration window with settings for refrigerant (R717 (NH3)), calculation mode (1 Operating point), and compressor selection (3 OSNA8591-K units). The rightmost screenshot shows the 'Show Overview' window with a schematic diagram and a detailed technical data table.

Compressor	Total	OSNA8591-K	OSNA8591-K	OSNA8591-K
Capacity step	100%	100%	100%	100%
Cooling capacity	2120 kBtu/h	707 kBtu/h	707 kBtu/h	707 kBtu/h
Cooling capacity *	-	715 kBtu/h	715 kBtu/h	715 kBtu/h
Evaporator capacity	2120 kBtu/h	707 kBtu/h	707 kBtu/h	707 kBtu/h
Shaft power	289 kW	96.2 kW	96.2 kW	96.2 kW
Condenser Capacity	2447 kBtu/h	816 kBtu/h	816 kBtu/h	816 kBtu/h
Ratio	-	33.3 %	33.3 %	33.3 %
CDP/EER	7.35	7.35	7.35	7.35
CDP/EER *	-	7.38	7.38	7.38
Mass flow LP	3932 lb/h	1311 lb/h	1311 lb/h	1311 lb/h
Mass flow HP	4521 lb/h	1507 lb/h	1507 lb/h	1507 lb/h
Operating mode	Economizer	Economizer	Economizer	Economizer
Liquid temp. (lcl)	25.0 °F	25.0 °F	25.0 °F	25.0 °F
Mass flow ECO	589 lb/h	196.3 lb/h	196.3 lb/h	196.3 lb/h
sub-cooler load	285 kBtu/h	94.8 kBtu/h	94.8 kBtu/h	94.8 kBtu/h
sat. ECO Temp.	16.01 °F	16.01 °F	16.01 °F	16.01 °F
ECO pressure	-	44.2 psia	44.2 psia	44.2 psia
Oil volume flow	44.5 GPM	14.85 GPM	14.85 GPM	14.85 GPM
Oil cooler-outlet	104.8 °F	104.8 °F	104.8 °F	104.8 °F
Oil cooler-load	847 kBtu/h	216 kBtu/h	216 kBtu/h	216 kBtu/h
Miscos. driving motor	-	143.0 kW	143.0 kW	143.0 kW
Discharge gas temp. w/o cooling	410 °F	410 °F	410 °F	410 °F



Many thanks for your attention.



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