

**Natural Refrigerant (NH<sub>3</sub>/CO<sub>2</sub>) Chilling Package for Mid/ Small Scale Facilities**

***SIERRA* Series**

2017.2.20

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## **SIERRA** Series

**An efficient refrigeration system using natural refrigerants developed for chilling temperatures in mid/ small scale facilities**

**CONCEPT:** 【Non-freon】 【High efficiency】 【Safe】 【Compact】 【Chilling】

### **PURPOSE:**

- Processing rooms and cold storages in food factories
- Process cooling, and low temp. air conditioning  
for various manufacturers
- Anterooms and cargo-handling rooms for cold storages
- C-class cold storages, etc.

Effective area : 100m<sup>2</sup>~



## **SIERRA**

### Series Features



#### World's first to combine a semi-hermetic ammonia scroll compressor with an IPM motor

- World's first to integrate an ammonia scroll compressor into a natural refrigerant package for chilling temperatures.
- The adoption of IPM motor and accumulation of its technology has realized compact design and high efficiency.

#### Safe, secure, and environmentally friendly system consisted of indirect cooling system

- Indirect cooling system. A system which cools CO<sub>2</sub> with NH<sub>3</sub>. The characteristics of the two refrigerants are fully utilized.
- Cooled CO<sub>2</sub> will circulate through the secondary side –cold storage-, so it can be cooled safe and efficiently.
- NH<sub>3</sub> is only charged inside the Sierra package, so there is no risk of ammonia leaking in the cooling area.
- The adoption of semi-hermetic compressor and fully welded and brazed heat exchanger achieved NH<sub>3</sub> charge quantity no more than 3.5kg.

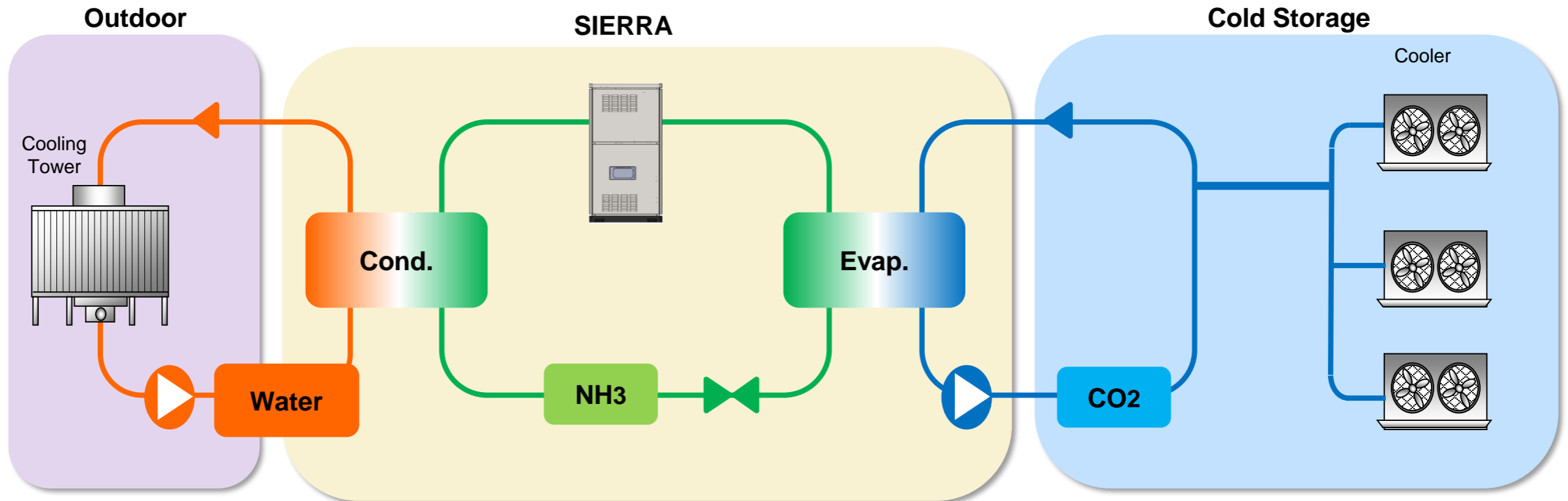
#### A highly efficient and energy saving system fully utilizing the two refrigerants NH<sub>3</sub> and CO<sub>2</sub>

- Pure CO<sub>2</sub> circulates through cold storages or chilling processes so cooler unit performance can be maintained high.
- The level of energy saving can be expected to be equivalent as a large NH<sub>3</sub>/CO<sub>2</sub> system.

#### A compact package ideal for chilling temperatures (From -10 to 15 degC)

- A system of supplying liquid CO<sub>2</sub> simplifies equipment designing (ex: connecting multiple coolers)
- A modular system with connectivity of up to four units will flexibly meet user needs

**SIERRA** System Outline



Ammonia/CO<sub>2</sub> indirect cooling system outline



Modular design enables connection up to four units covering a range from 24kW to 100kW.



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**SIERRA -W**

## Water Cooled Natural Refrigerant (NH<sub>3</sub>/CO<sub>2</sub>) Chilling Package

Release date: May 15<sup>th</sup>, 2016



### Specification

Type	Natural refrigerant (NH <sub>3</sub> /CO <sub>2</sub> ) Chilling Package	
Model	MNCP-NSC15-W	
Power	3 Phase/200V 50Hz/60Hz	
Performance	Cooling capacity (kW)	24.1
	Power consumption (kW)	8.9
Dimensions (mm)	W800×L800×H1,626	
Net weight (kg)	526	
Compressor	Type	Semi-hermetic Scroll Compressor
	Starting method	Inverter
Refrigerant	Type	Ammonia
	Charge quantity (Kg)	3.5
Secondary Refrigerant	Type	CO <sub>2</sub> (R717)
	CO <sub>2</sub> supply temperature	-15~5
Pipe	CO <sub>2</sub>	SUS304 Rc 3/4
	Cooling Water	SUS304 Rc 1.1/4
	Water sprinkling	SUS304 Rc3/8
	Drain	SUS304 Rc1.1/2



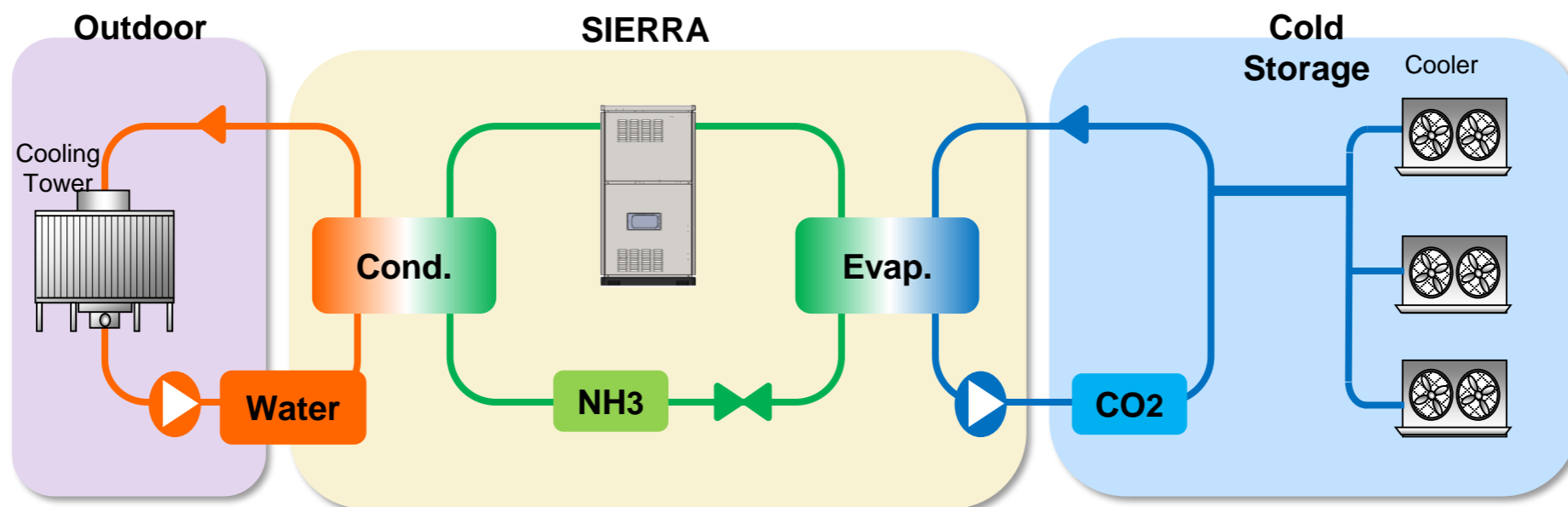
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## SIERRA -W

### ターゲット：水冷式自然冷媒シリーズでの高効率運用

用



大型低温～チルド (NewTon)



中型低温用 (REABEL)



小型チルド用 (SIERRA-W)



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## **SIERRA -A** New Model

**Air cooled Natural Refrigerant (NH<sub>3</sub>/CO<sub>2</sub>) Chilling Package**

**Release schedule : In 2017 Spring**

**Motor kW : 11.3kW**

**Rating Performance : Cooling capacity =20.4kW**

**Power consumption =11.3kW**

**Dimensions (mm) : 865W×1,100L×1970H**

**Net Weight (kg) : 577**

**Room Temperature : -10°C~+15°C**

**Refrigerant : Type = Ammonia (R717)**

**Charge quantity =3.5kg**

**Secondary Refrigerant : Type = CO<sub>2</sub> (R717)**





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## SIERRA -A

ターゲット：低温空調や食品加工室・チルド室等へ、空冷式の取扱い易さとを特徴として自然冷媒冷凍機の導入を目指しています。



- ◆空冷式凝縮器にマイクロチャンネル熱交換器を採用することで、コンパクトなパッケージを実現。
- ◆空冷式凝縮器に特殊コーティングを施すことで、耐食性を向上させ、熱交換器の性能を長期保持。(特許出願中)
- ◆アンモニア充填量を水冷タイプと同じ3.5kgに抑える事に成功。
- ◆もちろん、自然冷媒を採用した間接冷却方式により、安全かつ省エネルギーなシステム





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Thank you very much!

**MAYEKAWA**

