

# LG Air Cooled Screw Chiller

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## Introduction



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## 1 Line-up

## 2 Why LG Screw Chiller?

## 3 Features & Benefits

- High Energy Efficiency
- Reliability & Stability
- Convenience



# Line-up

RT

70

100

150

200

300

400

500

## Standard Efficiency Model 74 ~ 489 RT

50,60 Hz R-134a

1 Comp.

2 Comp.

3 Comp.

4 Comp.

## High Efficiency Model 71 ~ 311 RT

50,60 Hz R-134a

1 Comp.

2 Comp.

## Air Cooled Screw Chiller



# Why LG Screw Chiller?

**High Performance  
Screw Compressor**



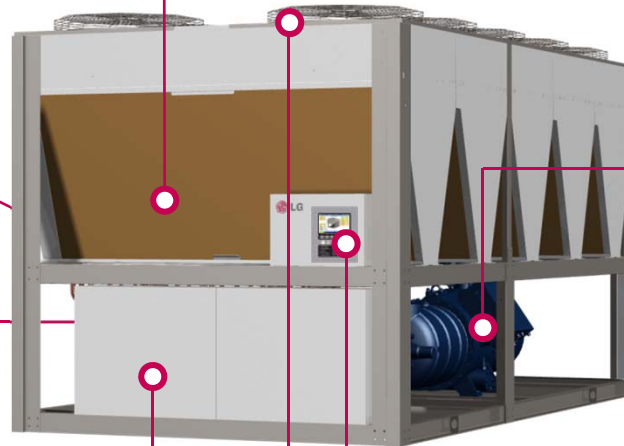
**Optimized refrigerant  
flow control**



**Multi Circuit**



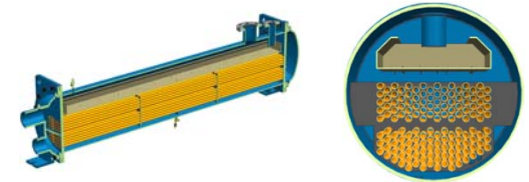
## AIR COOLED SCREW CHILLER



**Corrosion Resistance Goldfin™**



**Falling Film Type Evaporator**



**User Friendly Controller**

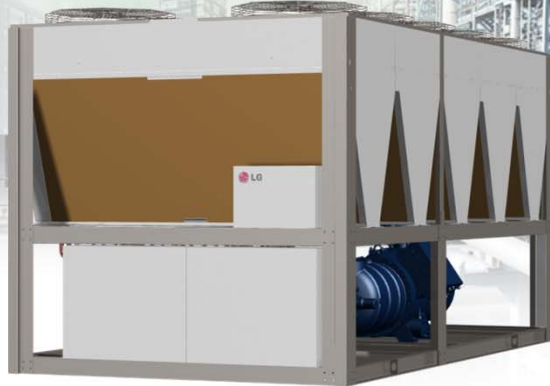


**Low Noise Fan Module**



## Air Cooled Screw Chiller

- High Efficiency Model  
COP 3.2 (@AHRI condition, 160RT)
- Standard Efficiency Model  
COP 2.9 (@AHRI condition, 160RT)



### High Energy Efficiency

- High performance compressor
- Falling film type evaporator
- V-shape structure & wide louver gold fin

### Reliability & Stability

- Corrosion resistance Goldfin™
- Multi circuit for back up operation
- Safety control system
- R-134a refrigerant, ODP = 0

### Convenience

- Low noise fan module
- User friendly controller with various functions
- Modular configuration (4cycle to 1controller)
- Easy BMS interface (Modbus, BACnet, TCP/IP)



# High Performance Screw Compressor

High Energy efficiency

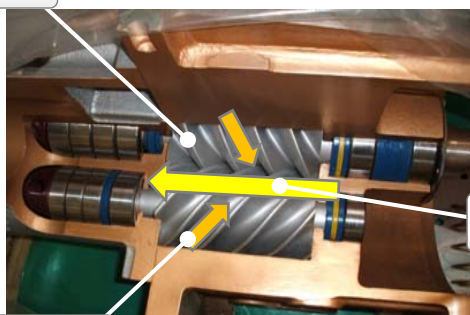


- Screw compressor is achieved high efficiency through patented design rotors & semi-hermetic motor.

## *5:6 Patented screw rotors*

- Large-volume and high efficiency rotor profile

Screw Rotor



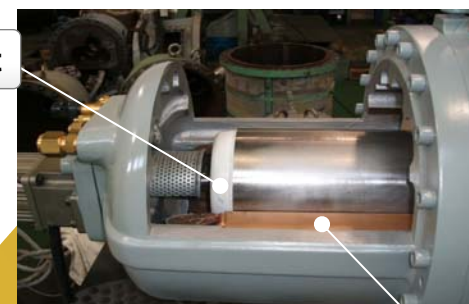
Refrigerant Flow

Compression

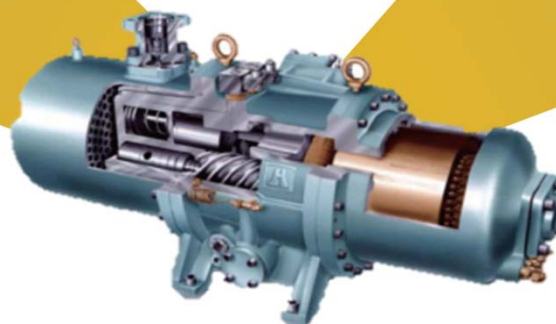
## *Semi-hermetic Screw Motor*

- Premium grade low-loss core steel
- Special motor cooling slot (refrigerant cooling)

Cooling slot



low-loss core steel



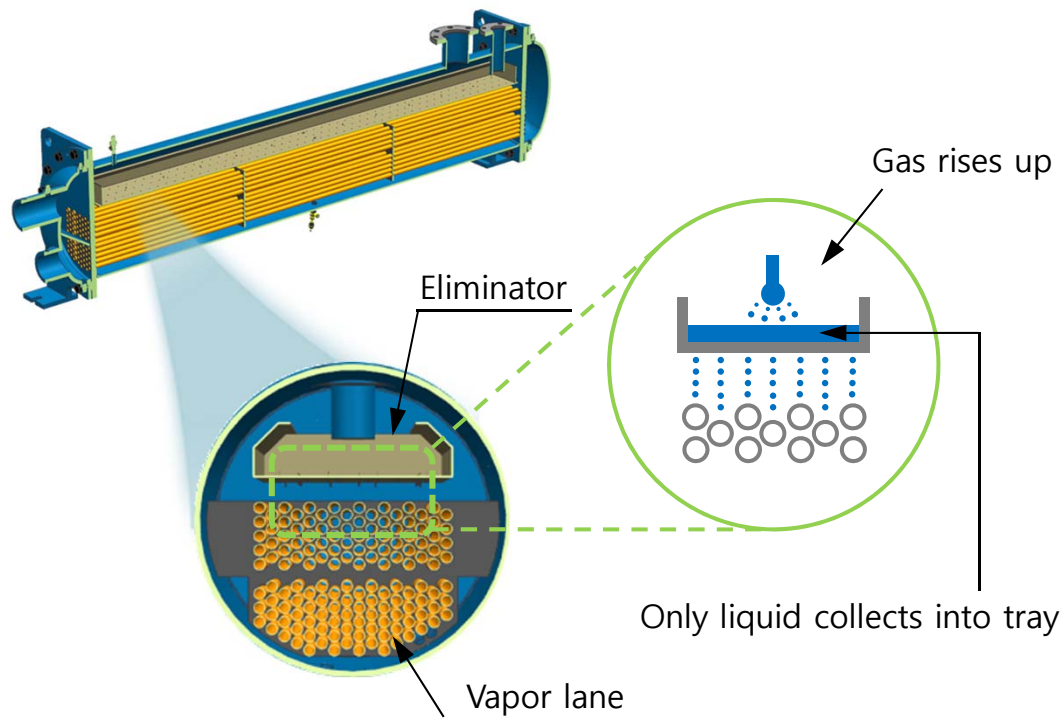
**Screw Compressor**

# Falling Film Type Evaporator

High Energy efficiency



- ❖ **Falling Film Type Evaporator offers more stable distribution & higher heat transfer efficiency**



## *Technologies & Benefits*

- ✓ **Gravity dropping distribution**
  - Prevent sludge
  - Stable operation
- ✓ **Using eliminator, separate gas and liquid refrigerant for better distribution**
- ✓ **Optimized vapor lane design for higher heat transfer efficiency**

# Falling Film Type Evaporator

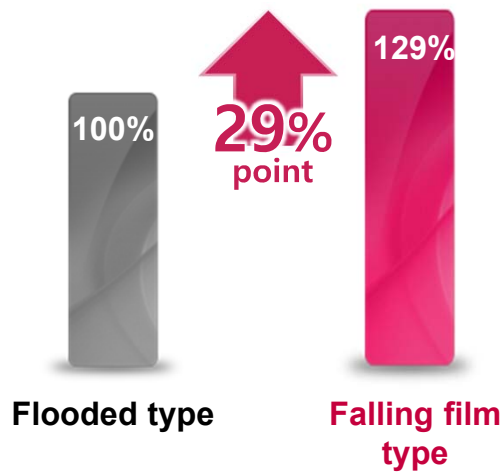
High Energy efficiency



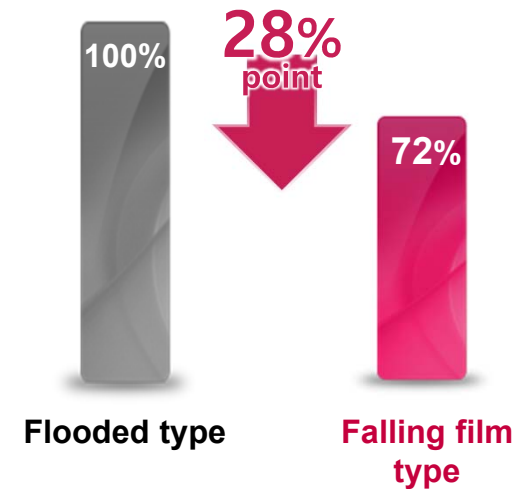
- Falling Film Type Evaporator has high thermal efficiency & lower refrigerant charge.

## *Falling Film Type Evaporator*

### Higher heat transfer efficiency



### Lower Refrigerant Charge



※ Overall heat transfer coefficient, Internal test result rated condition

※ Charge amount on average basis



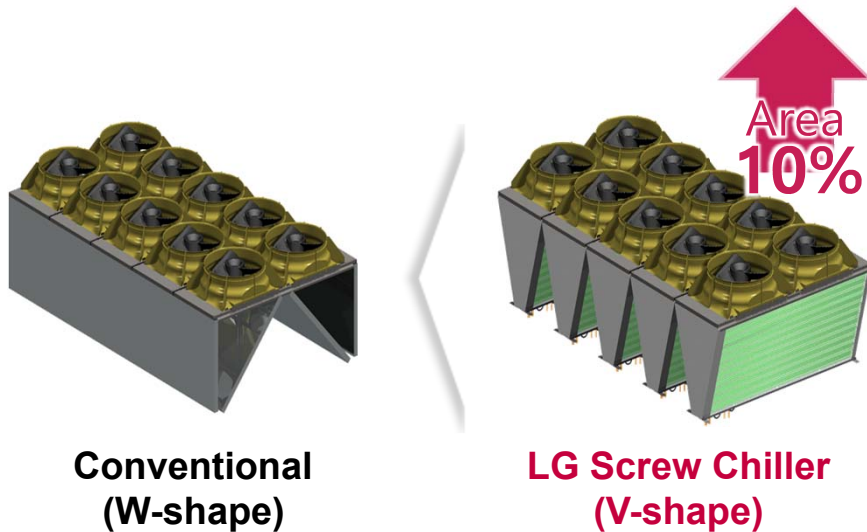
# High Efficient Air Cooled Condenser

High Energy efficiency

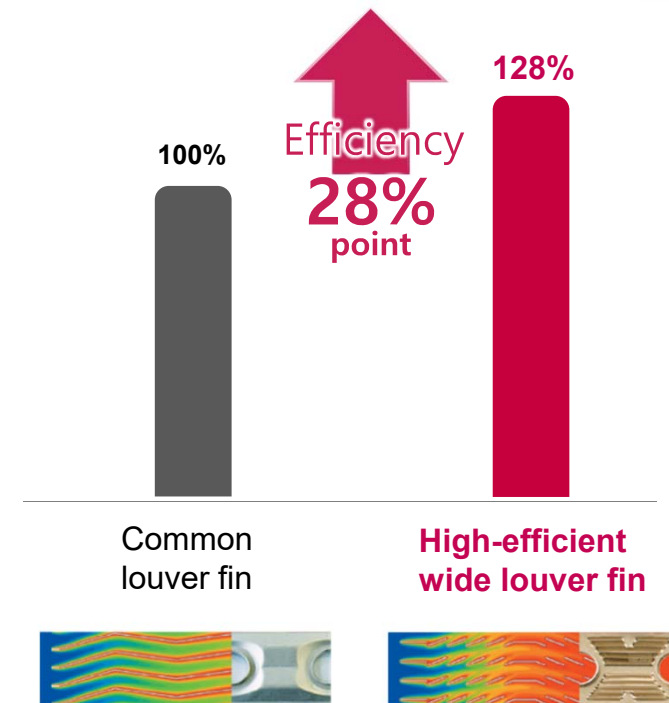


- LG developed V-shape structure condenser for increasing heat transfer area. With wide louver fin, heat transfer ratio increased up to 28%.

## V-shape structure



## Wide louver fin



- heat transfer area ↑ (@same fin area)

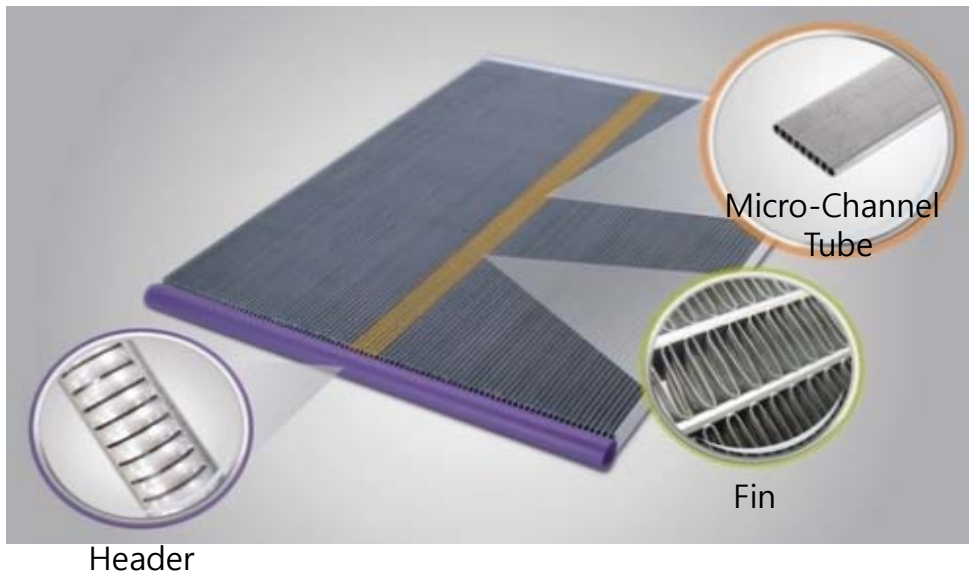
# High Efficient Air Cooled Condenser

High Energy efficiency



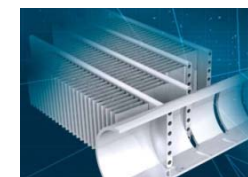
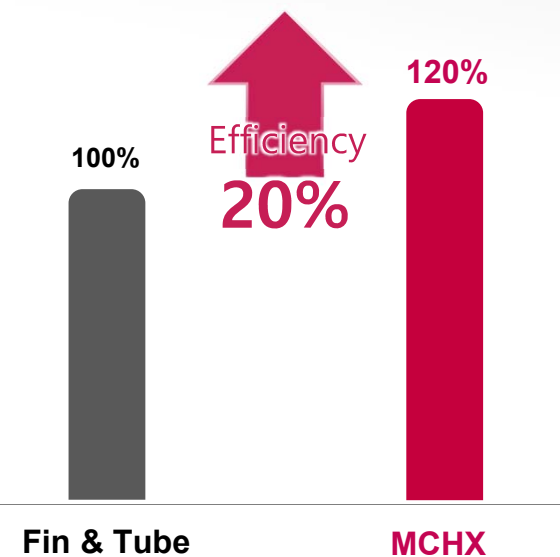
## • Micro-Channel Heat Exchanger ( MCHX Condenser)

MCHX



- Reduce condenser weight
- Save refrigerant than conventional product about 10~15%

MCHX Condenser



# Corrosion Resistance Goldfin™

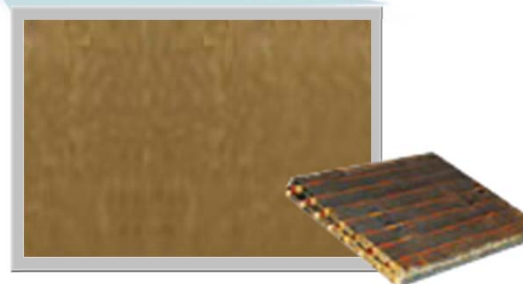
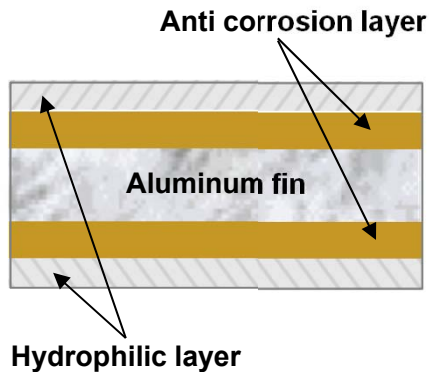
Reliability & Stability



❖ Adapting patented Goldfin™, corrosion resistance increased.

## Goldfin™

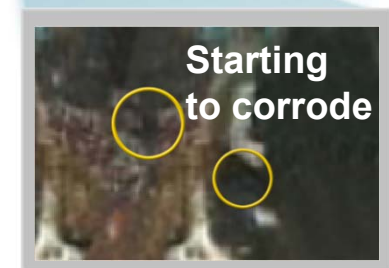
- Patented chloride-induced corrosion resistant



Salt Spray Test  
15 Days later

## Conventional fin

- Low Efficiency / Starting to corrode



Starting  
to corrode

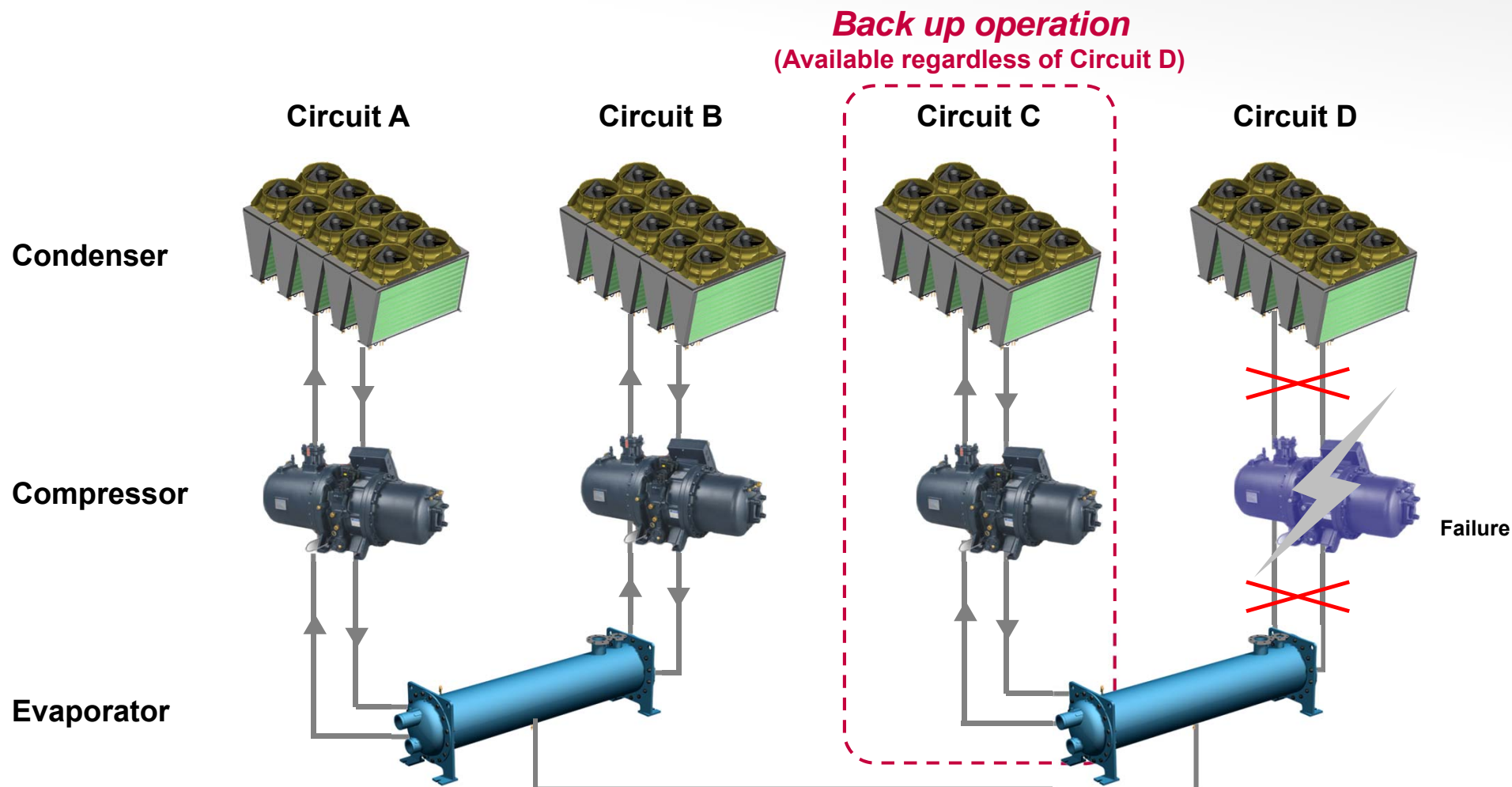
Salt Spray Test  
15 Days later

# Multi Circuit

Reliability & Stability



- Multi circuit for back up operation enables one circuit to operate continuously, whether another circuit has a trouble or be repaired.



※ 140~300RT- 2 Circuit, 360/400RT- 3 Circuit, 450/500RT- 4 Circuit

# Safety Control System

Reliability & Stability



- Through product protection devices and high performance digital sensors, Air Cooled Screw Chiller can avoid the damage, thereby increasing reliability.

## Fan Motor Overload Protect

Magnet switch  
Over current  
relay



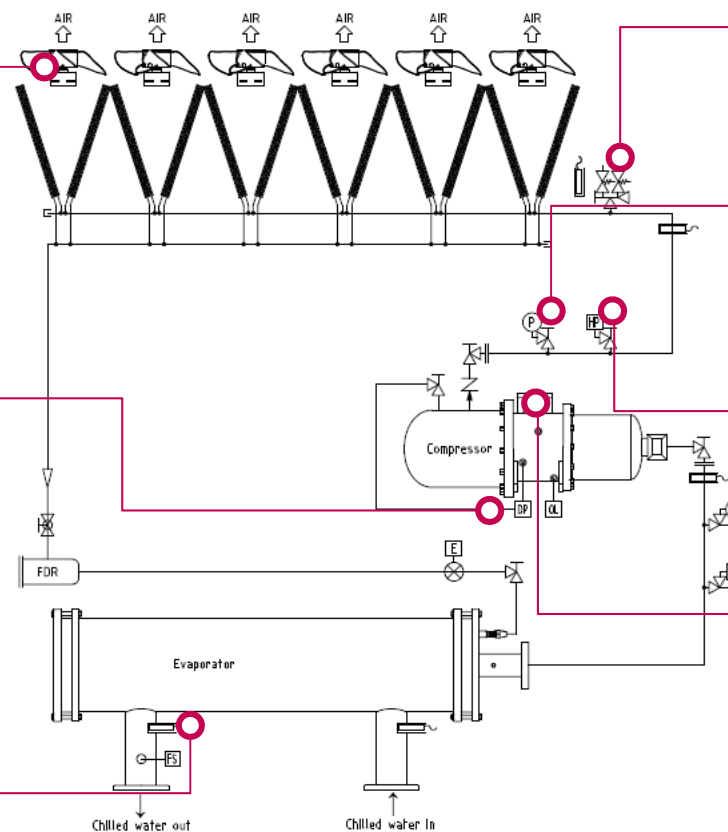
## Oil Circulation Detect (Dual Safety Devices)

Oil level switch  
Oil diff. pressure  
switch



## Accurate Temperature Control

High accurate  
thermometer



## Safety Valve

Pressure relief valve



## Pressure Control

High pressure sensor  
Low pressure sensor



## Pressure Cut Off

Pressure switch



## Motor Overload Protect

Winding temp. sensing

Current sensing

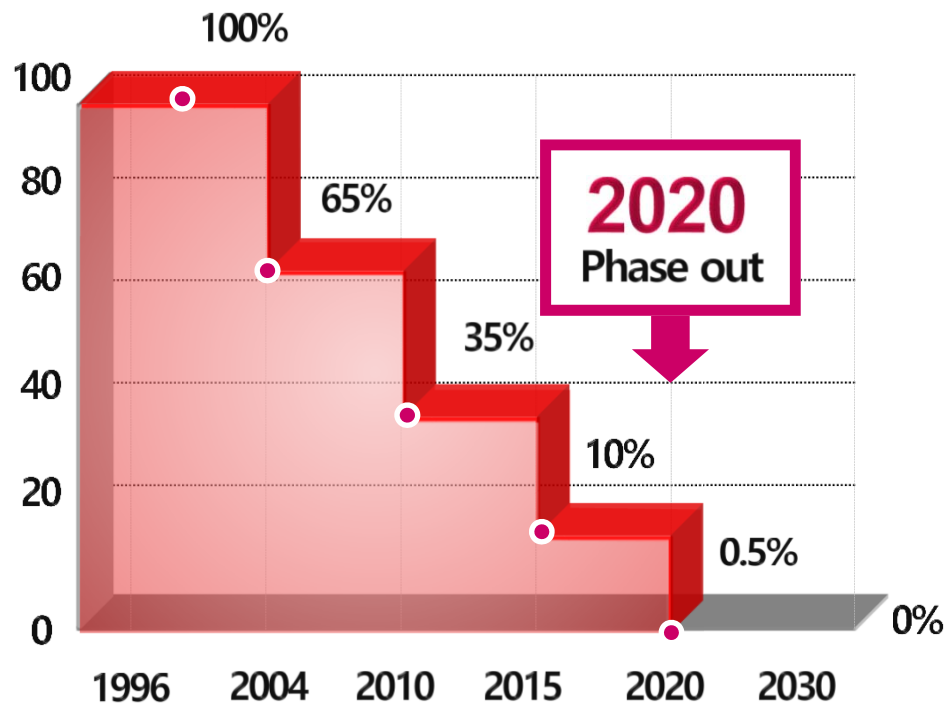
Check reverse phase and  
phase loss



## ❖ ODP Free R-134a Refrigerant

### HCFC phase out schedule

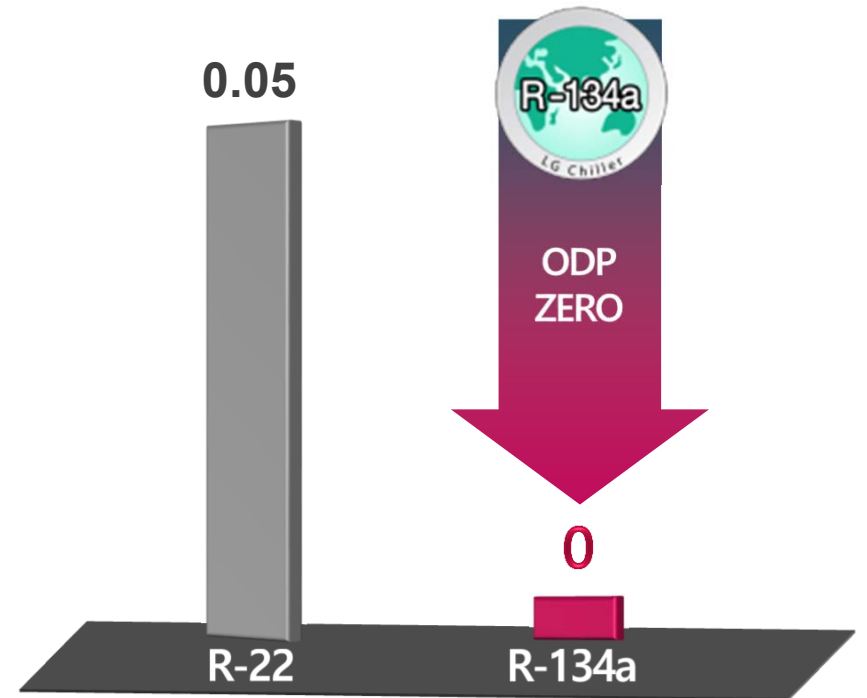
According to Montreal Protocol, R-22 shall be phased out Developed Countries by 2020, Developing Countries by 2030



### ODP (Ozone Depletion Potential)

R-134a ODP Value is "0".

R-22 ODP Value is 0.05



※ ODP = 1 (R-11)



# AHRI Performance Certification

Reliability & Stability

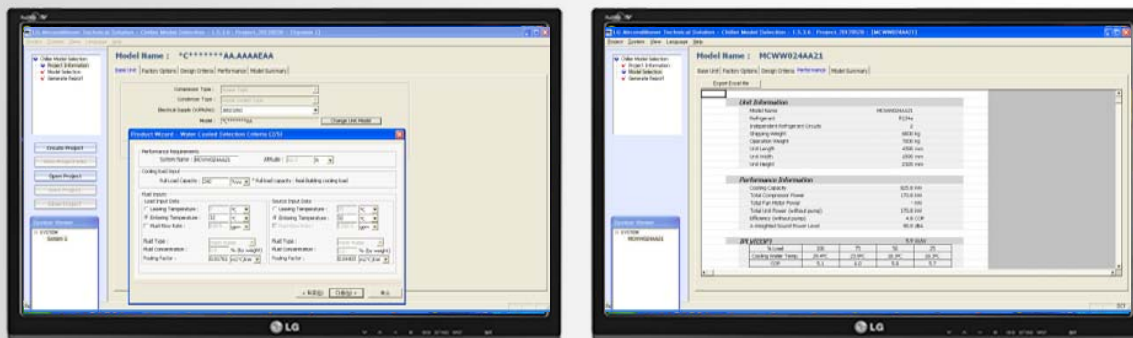


❖ LG Air Cooled Screw Chiller conforms the AHRI performance standard.



## AHRI 550/590 Standard

### Performance Evaluation for Vapor Compression Chiller (50/60Hz)



MSP (Model Selection Program)

**AHRI CERTIFIED**  
www.ahridirectory.org

### Certificate of Product Ratings

AHRI Certified Reference Number: 5497249      Date: 7/18/2012      Status: Active

Product: Water-Cooled Chilling Packages  
Model Designation: MCWW  
Manufacturer: LG ELECTRONICS, INC.  
Trade/Brand name: LG

Rated as follows in accordance with AHRI Standard 550/590-2011 for Water Chilling Packages using the Vapor Compression Cycle (Water-Cooled) and subject to verification of rating accuracy by AHRI-sponsored, independent, third party testing:

Refrigerant Used: R-134a  
Compressor Designation: Screw  
Compressor Type: Screw  
Software Version Number: 1.5.3.6  
Country Of Origin: China

**AHRI CERTIFIED**

† Models with an "Active" status are those that are currently in production. Models with a "Discontinued" status are those that the manufacturer has elected to stop producing, yet does not sell existing models with an "Obsolete" status are those that the manufacturer is required to stop manufacturing due to an AHRI certification program test failure.  
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# Low Noise Fan Module

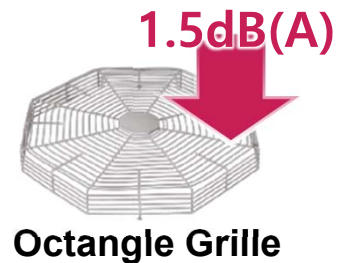
Convenience



- Noise is much reduced up to 6dB(A) utilizing various sound attenuation technologies.

## Low Noise Fan Module

**72dB(A)**  
(@AHRI condition, 80RT)



Octangle Grille

- *Prevent snow accumulation*



New Shroud

- *Prevent eddy current*



Super Aero Fan

- *Minimize flow turbulence in the openings*

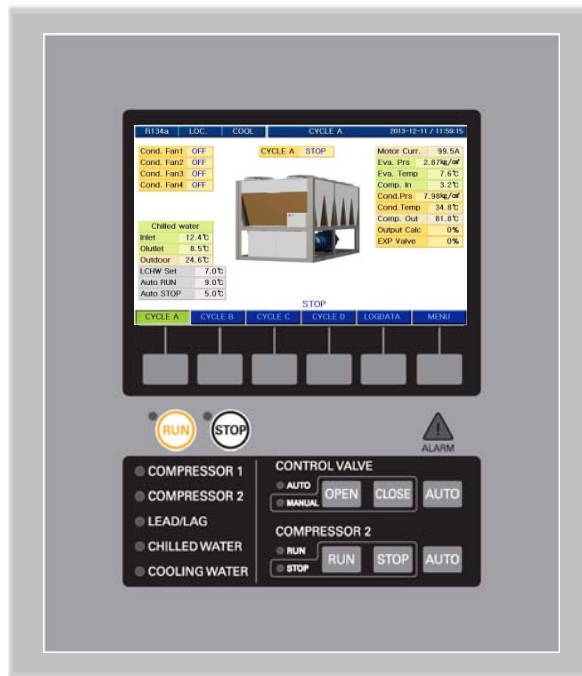
# User Friendly Controller

- High Quality 7" LCD screen offers various functions for easy operation & maintenance.

## Control panel

### • Various Protocol

- Standard : MODBUS
- Option : BACnet, TCP/IP



## Various functions



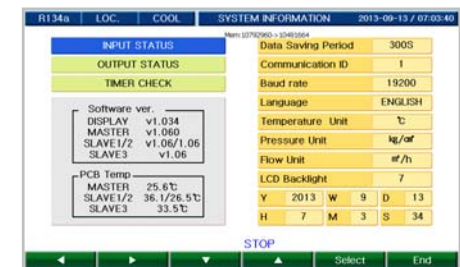
**Trend Display**  
(Easy to check operation status)



**Scheduling**  
(Automatic operation)



**Log Data**  
(Save operation record)

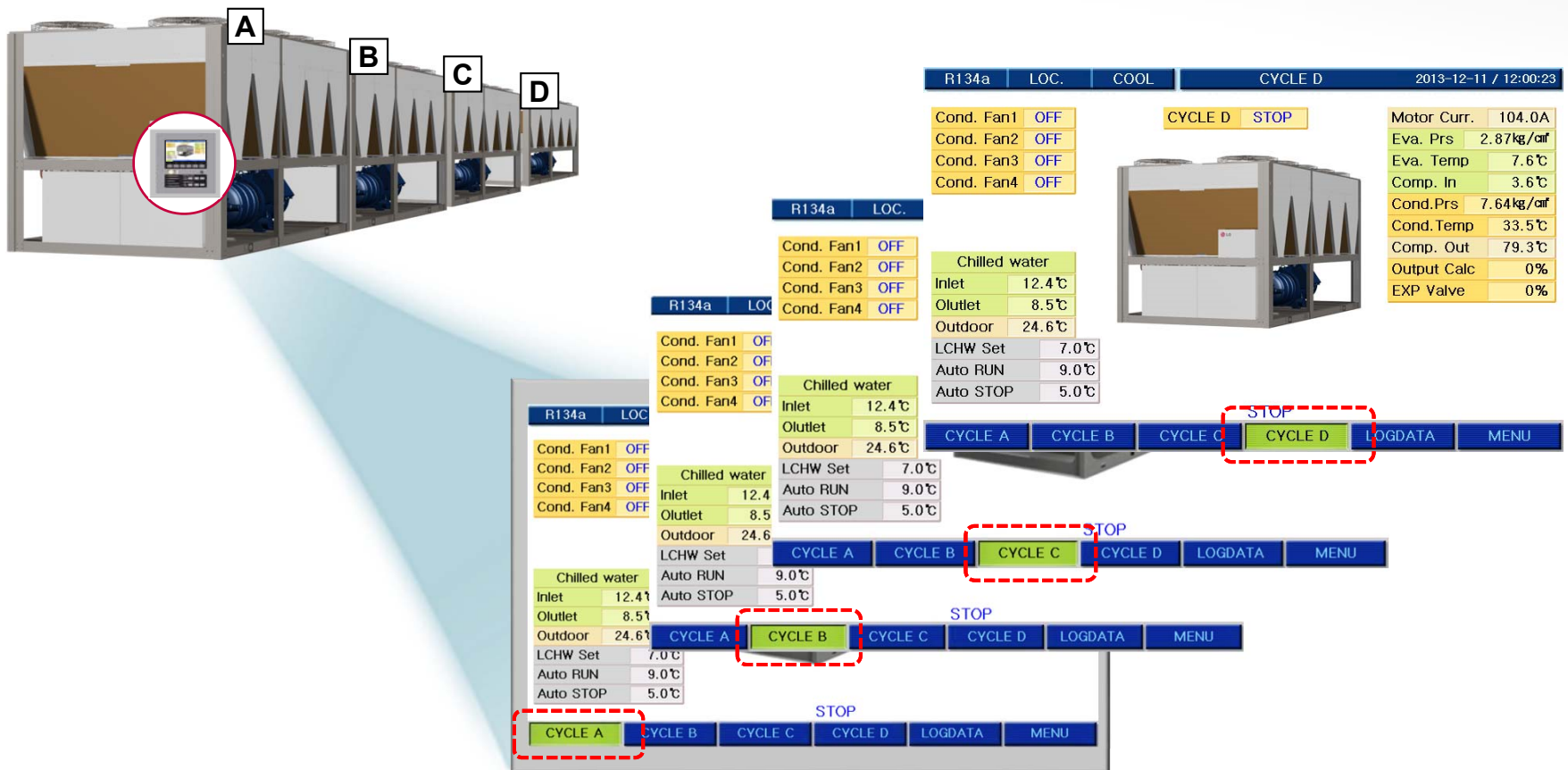


**System Information**

# Easy Multi Control

- One integrated controller can monitor and control whole units

## Modular configuration

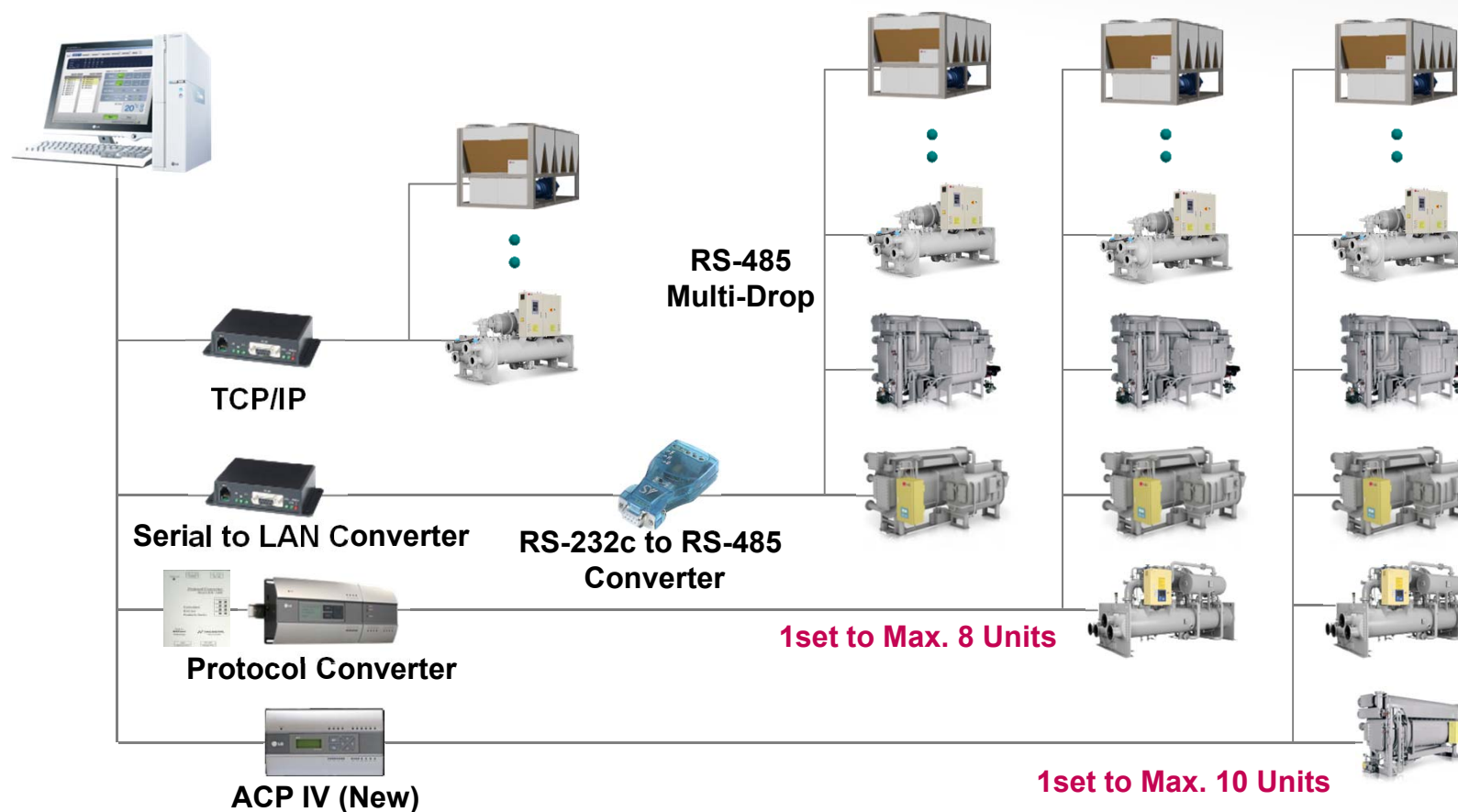


# Easy BMS Interface

Convenience



- Intelligent building management system with BMS communication function



# Thank you



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# Appendix

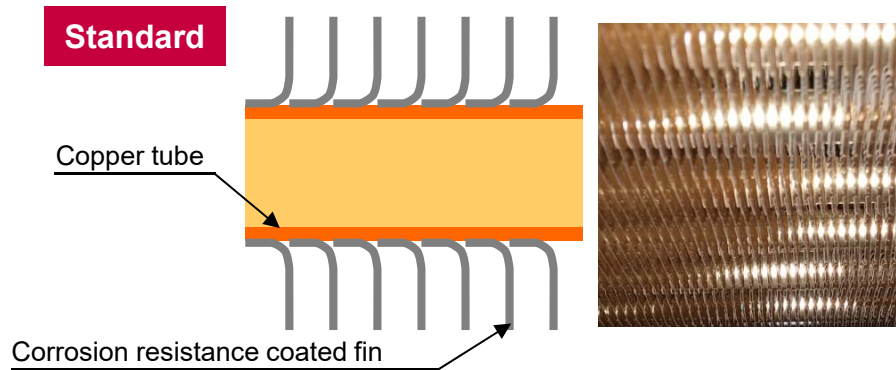
## Options

Category	Optional list	standard	Option	remark
BMS Interface	Modbus	√		
	BACnet		√	
Condenser corrosion protection	Pre coated fin		√	Polyurethane including aluminum powder
	Copper fin		√	
Protection guard	Full protection grill		√	Wire grill only
	Security grills (upper side)		√	Wire grill or louver panel
	Security grills (lower side)		√	
Evaporator	150 psig	√		
	300 psig		√	
	Flange		√	Exclude counter flange
	Victaulic	√		Exclude coupling
Insulation	Compressor acoustic enclosure		√	
	Double thickness insulation		√	
Others	Step-less control		√	Standard efficiency type only
	Soft starter		√	
	Suction service isolation valve	√		
	Single power point connection		√	
	NFB (Non Fused Breaker) power disconnect switch		√	
	Power factor correction		√	
	Spring isolator		√	
	Flow switch (Pedal type)		√	Field insulation
	Flow switch (Differential pressure switch)		√	Factory insulation
	CE certification		√	

# Appendix - Condenser fin

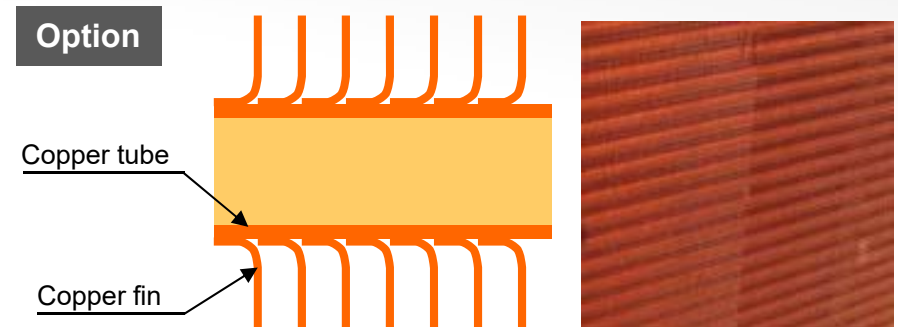
## 1) Gold Fin

Aluminum fin with copper tube, This fin is coated with gold colored, This coating provide corrosion protection to heat exchanger compared with bare fin



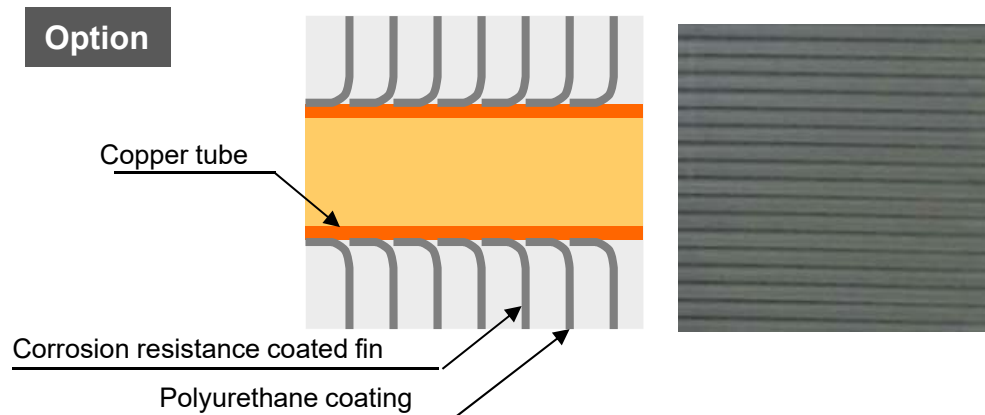
## 2) Cu Fin

Copper material fin with copper tube, To reduce corrosion without reduction of its performance



## 3) PoluAl pre-Coated Fin

Pre-coated heat exchanger that is sprayed coating material called \*PoluAL. This coating provides corrosion protection to heat exchangers without reduction of its performance



\*metallic impregnated polyurethane coating