



CHILLER

Process Cooling Solutions



**HIGHLY RELIABLE AND
PRECISION COOLING
SOLUTIONS FOR
BUSINESS FACILITIES**



LG SAC CUSTOMER CARE

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To know more about LG, visit www.lg.com/in/business/air-solution
For Corporate/Institutional enquiries,
please write to sac.marketing@lge.com



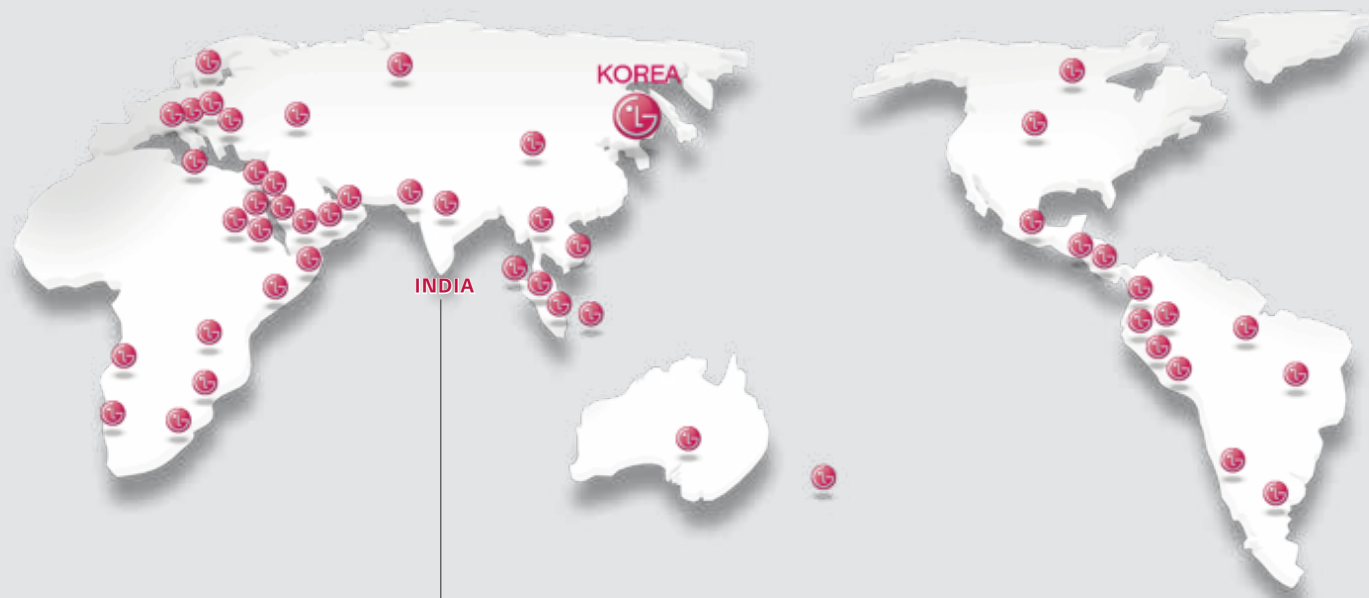
Regd. Office: LG Electronics India Pvt. Ltd., A-24/6, Mohan Cooperative Industrial Estate, Mathura Road, New Delhi-110044 CIN No. U32107DL1997PTC220109
Please contact us at 9899302817 (For Chillers) North: 9953554953, South: 7824805486, East: 7824805486, West: 9923108310

LG AIR SOLUTION

The LG Electronics Air Solution Business Unit is a provider of total HVAC and energy solution. The company offers a broad portfolio of air conditioner products that are compatible with any building anywhere, including compact residences, towering skyscrapers, massive factories and giant concert halls. As a true total HVAC and energy solution provider, LG also supplies even the largest buildings and industrial facilities with central air conditioning systems such as chillers and efficient control solutions.

The history of the business unit goes back to 1968, when LG (then called GoldStar) rolled out Korea's first residential air conditioner. As the company first began making chillers for large commercial buildings in 1970, the commercial air conditioning business has grown exponentially, especially within the last 20 years. In 2008, LG sold its 100 millionth air conditioning unit, becoming the first company in the industry to reach that significant milestone. The success of LG air conditioners has allowed the company to become one of the major players in the highly competitive HVAC industry. By enhancing the industry's B2B infrastructure and finding further solutions for the HVAC sector, LG has risen to become a total HVAC solutions specialist. The company has steadily increased its sales and market share by introducing energy efficient and reliable HVAC solutions and actively pursuing new opportunities wherever they arise. This sustained, excellent performance is built on a solid foundation of global R&D and advanced manufacturing capabilities.

GLOBAL PRESENCE



Gr. Noida Factory Pune Factory Noida Innovation Gallery Pune Academy



CHILLERS : PRODUCTION FACILITIES



South Korea :
Chiller (Pyeongtaek)

Location : Gyunggi-do, Pyeongtaek
Type of product :
- Centrifugal, Absorption, Screw, Scroll, AHU
Manufacturing Capacity :
- 2,000EA per year
Test facilities
- For Manufacturing : 6EA(50~3,500RT)
- For R&D : 4EA (50~1,000RT)



South Korea :
Chiller (Changwon)

Location : Changwon
Type of product :
- Scroll, Heat pump



China :
Chiller (Qingdao)

Location : Qingdao
Type of product :
- Centrifugal, Absorption, Screw, Scroll, Heat pump
Manufacturing Capacity :
- 1,000EA per year
Test facilities
- For Manufacturing: 3EA (50~3,000RT)

RELIABILITY

Proven Performance

With the components and parts certified by 3rd party organizations, product reliability during installation and operation has been confirmed, even at sites that require the highest degree of durability and stability (ex. nuclear power plants).

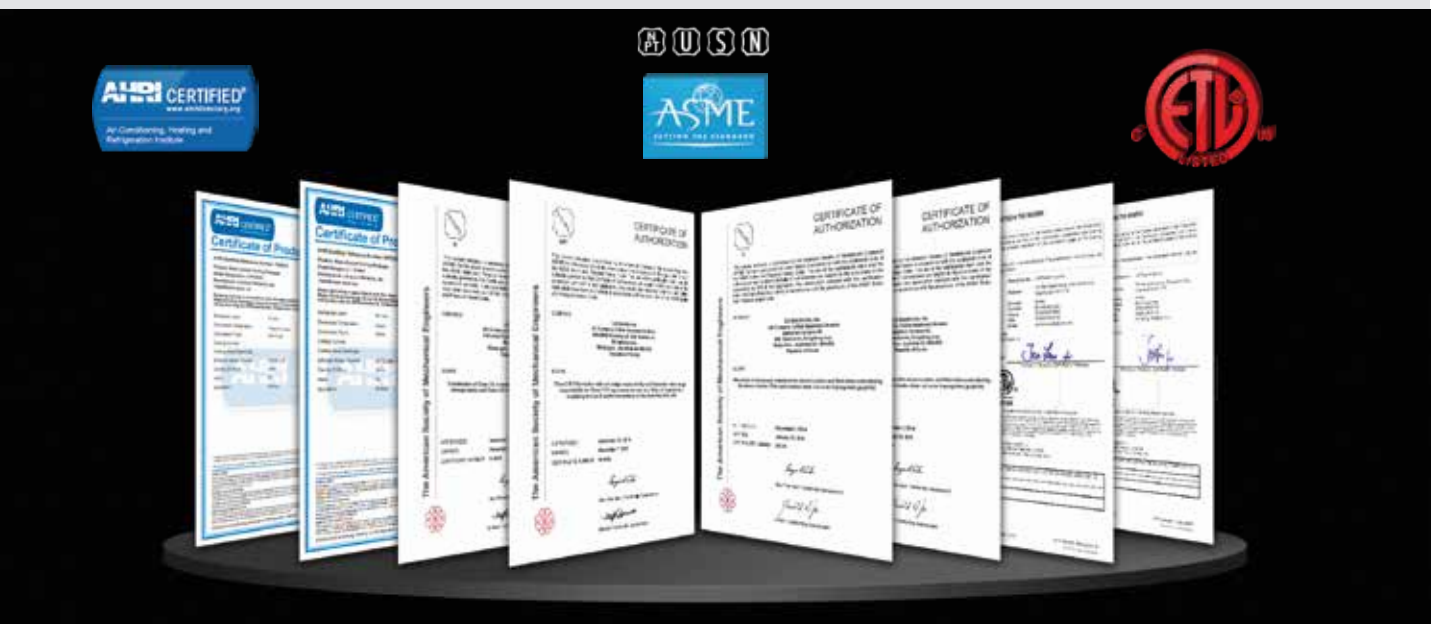
AHRI 550/590 Standard

- Centrifugal Chiller / Heat pump
- Water-cooler

ASME Section VII Boiler and Pressure Vessel code

ETL Certification

- ANSI / UL 1995
- CAN/CSA C2



COOLING APPLICATION**FOOD**

01

Food processing production process, fisheries/livestock Industry Maintaining quality in the primary treatment process.

PHARMACEUTICALS

Controlled Environment is key for manufacturing Process of Pharmaceutical industries. Heat Rejected from exothermic reaction to be Handled with cooling systems.

02

**PRESERVATION**

03

Cool storage generally refers to storage at temperatures above freezing, from about 16°C down to -2°C.

**MACHINERY/
MANUFACTURING**

Manufacturing facilities, test equipment, etc. proper temperature and Productivity improvement through humidity management.

04

**PETROCHEMICALS**

05

Removal of unwanted heat from the process.

COOLING APPLICATION**PLASTIC MOLD
ETCHING**

06

Cooling water for cooling of the etching machine in all seasons should be supplied stably.

FISHERIES

Ice slurry / chilled water are used in cooling freshly harvested fish in thermally insulated boxes onboard boats at sea and long distance transportation.

07

**SMART FARM**

08

Maintain Green house temperature and humidity.

VEHICLE TESTING LAB

Controlled Environment for Test chamber.

09

**ENTERTAINMENT**

10

Keep ice skating rings strong for events. Maintain Temperature for new fill and keep the temperature stable.

CHILLERS : PRODUCT LINE-UP



AIR COOLED INVERTER SCROLL CHILLER

Available Capacity SINGLE 20 30 40 50 60 TR Inverter (cooling Only)
 MULTIPLE ~300 TR (60TR*5EA)

Temperature range : -10 deg C to 20 deg C | Ethylene glycol : 35% by Volume

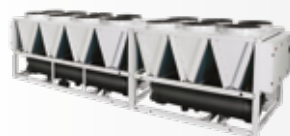
Available Capacity SINGLE 20 40 60 TR Inverter (heat pump)
 MULTIPLE ~300 TR (60TR*5EA)



WATER COOLED SCREW CHILLER

Available Capacity 80-500 TR

Temperature range : -25 deg C to 20 deg C | Ethylene glycol : 35% by Volume



AIR COOLED SCREW CHILLER

Available Capacity 80-500 TR

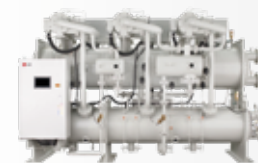
Temperature range : -25 deg C to 20 deg C | Ethylene glycol : 35% by Volume



WATER COOLED CENTRIFUGAL CHILLER

Available Capacity 250-2000 TR

Temperature range : -4 deg C to 20 deg C | Ethylene glycol : 20% by Volume



OIL FREE AIR BEARING CENTRIFUGAL CHILLER

Available Capacity 80-500 TR

Temperature range : -4 deg C to 20 deg C | Ethylene glycol : 10% by Volume



OIL FREE MAGNETIC BEARING CENTRIFUGAL CHILLER

Available Capacity 200-3000 TR

Temperature range : -4 deg C to 20 deg C | Ethylene glycol : 10% by Volume



ABSORPTION CHILLER

Direct Fired Chiller-Heater

Available Capacity 50-1500 TR

Direct Fired Chiller-Steam Fired

Available Capacity 100-1500 TR

Direct Fired Chiller-Hot Water

Available Capacity 73-1350TR

Low Temperature

Available Capacity 28-1020 TR

PROCESS COOLING CONCEPT

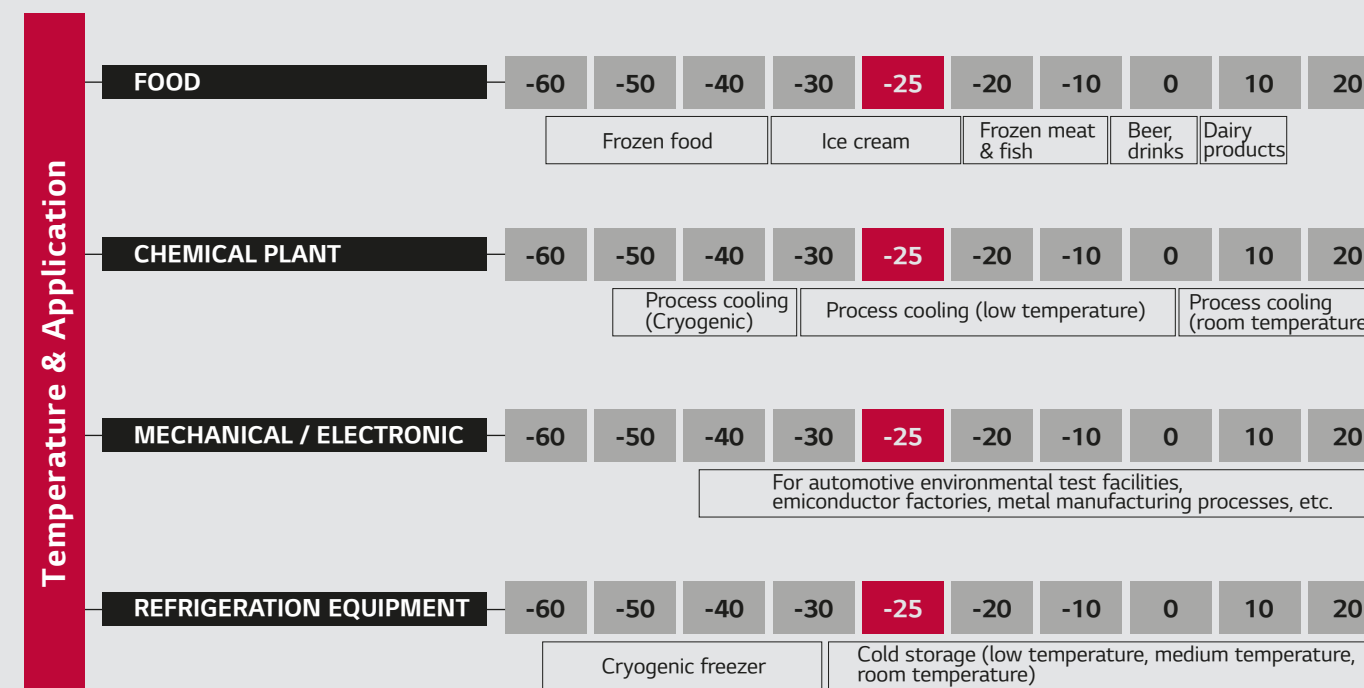
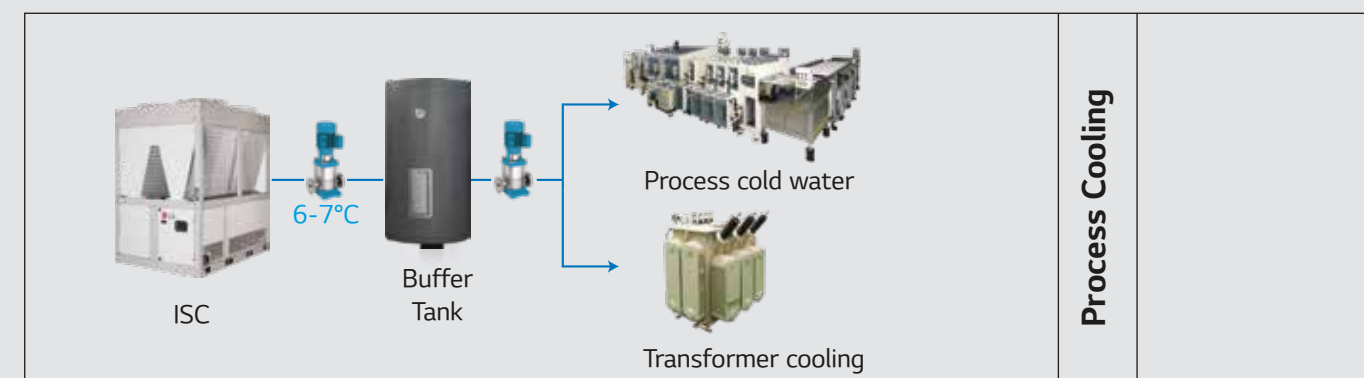
Cooling requirements are widespread in both the industrial and commercial sectors. Cooling is generally split into two categories: Process cooling and Comfort cooling.

Process Cooling

This type of cooling is applied when accurate and constant control of temperature within a process is required. Chillers are commonly used to remove heat from a process due to their ability to provide cooling capacity regardless of changes to the ambient temperature, heat load and flow requirements of the application.

Comfort Cooling/Climate Control

This type of cooling technology regulates the temperature and humidity in a space. The technology is generally simple and used for cooling rooms, electrical cabinets or other places where temperature control does not have to be precise and constant. Air conditioning units fall into this technology group.



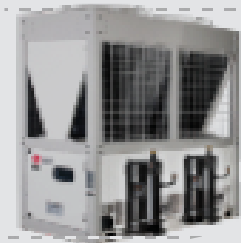
INVERTER SCROLL CHILLERS : ENERGY EFFICIENCY SOLUTION

TWIN ALL INVERTER

Inverter technologies of LG EHP*

- Twin All Inverter and HiPOR™**
- Improved partial load operation
- Wide operation
- Frequency range 30 ~ 127 Hz

* EHP : Electric Heat Pump
** HiPOR™ : High Pressure Oil Return



PRESSURE CONTROL

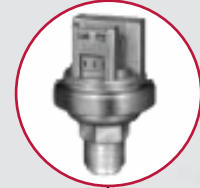
- More precise and reliable operation
- Applied to Multi V control logic

Temperature Sensor



+

Pressure Sensor

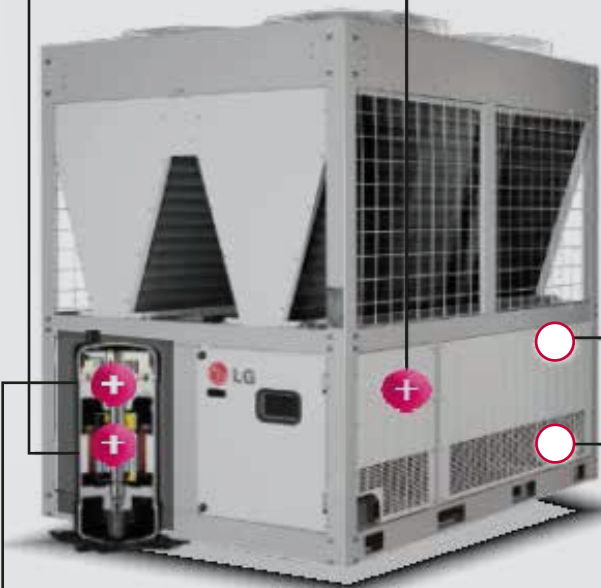


MULTI V™ Tech.



Global Top 5 EHP manufacturer

- Air-cooled VRF*(Multi V) / Single / Multi Split / Water-cooled VRF etc.



DIRECT OIL RETURN

HiPOR™ TECHNOLOGY

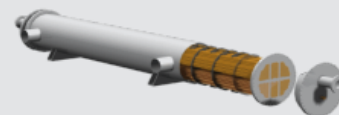
- By accurate oil management and control **Reliability UP**
- Efficiency **15% ↑(30Hz)**

Maximize compressor efficiency by directly returning oil into high pressure compressor

R-410A refrigerant

- ODP* = 0, Eco-friendly refrigerant
- * ODP : Ozone Depletion Potential

DX Shell & tube type evaporator

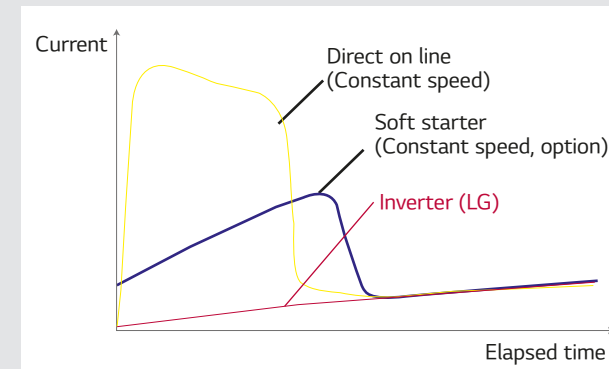


INVERTER SCROLL CHILLER

Inverter Compressor Vs. Constant Speed Compressor

Inverter compressor is more stable and efficient solution than constant speed compressor.

Comparison of starting type



Compressor	Starting type	Starting current (Is / FLA*, %)
Constant speed	Direct on line	About 650 %
	Soft starter	200 ~ 350 %
Inverter (LG)	Inverter	No inrush current

* FLA : Full load ampere

Inverter's feature & benefits

When starting

- Reduce starting torque below full load torque → **Mechanical wear ↓**
- Decrease starting current under FLA → **Circuit breaker capacity ↓**

When operating

- Low electric loss due to high value of the power factor** → **Energy efficient**
- Low power input in part load → **High IPLV**
- Continuously adjust compressor output according to the load (Compressor 30~127Hz) → **Save energy**

** Power factor : Ratio between active power(kW) and total power(kVA)

Reliable With Corrosion Resistance 'Black Fin'

'Black Fin' heat exchanger is highly corrosion resistant, designed to perform in corrosive environments such as contaminated and humid condition.

- Longer Lifespan, Lower Operational Costs
- Strengthened corrosion resistant coating

Black Fin

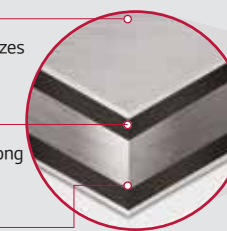
Hydrophilic Coating

The Hydrophilic coating minimizes moisture build-up on the fin.

Corrosion Resistant Black Coating

The Black coating provides strong protection from corrosion

Aluminum Fin



Corrosion Resistance Proven By Certified Tests



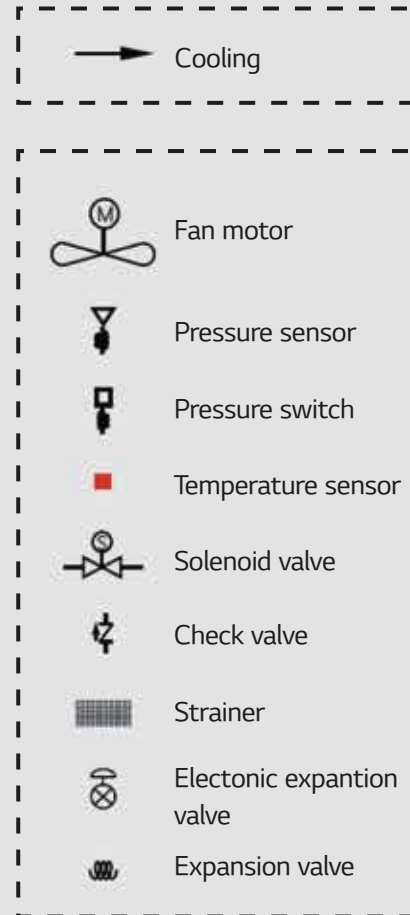
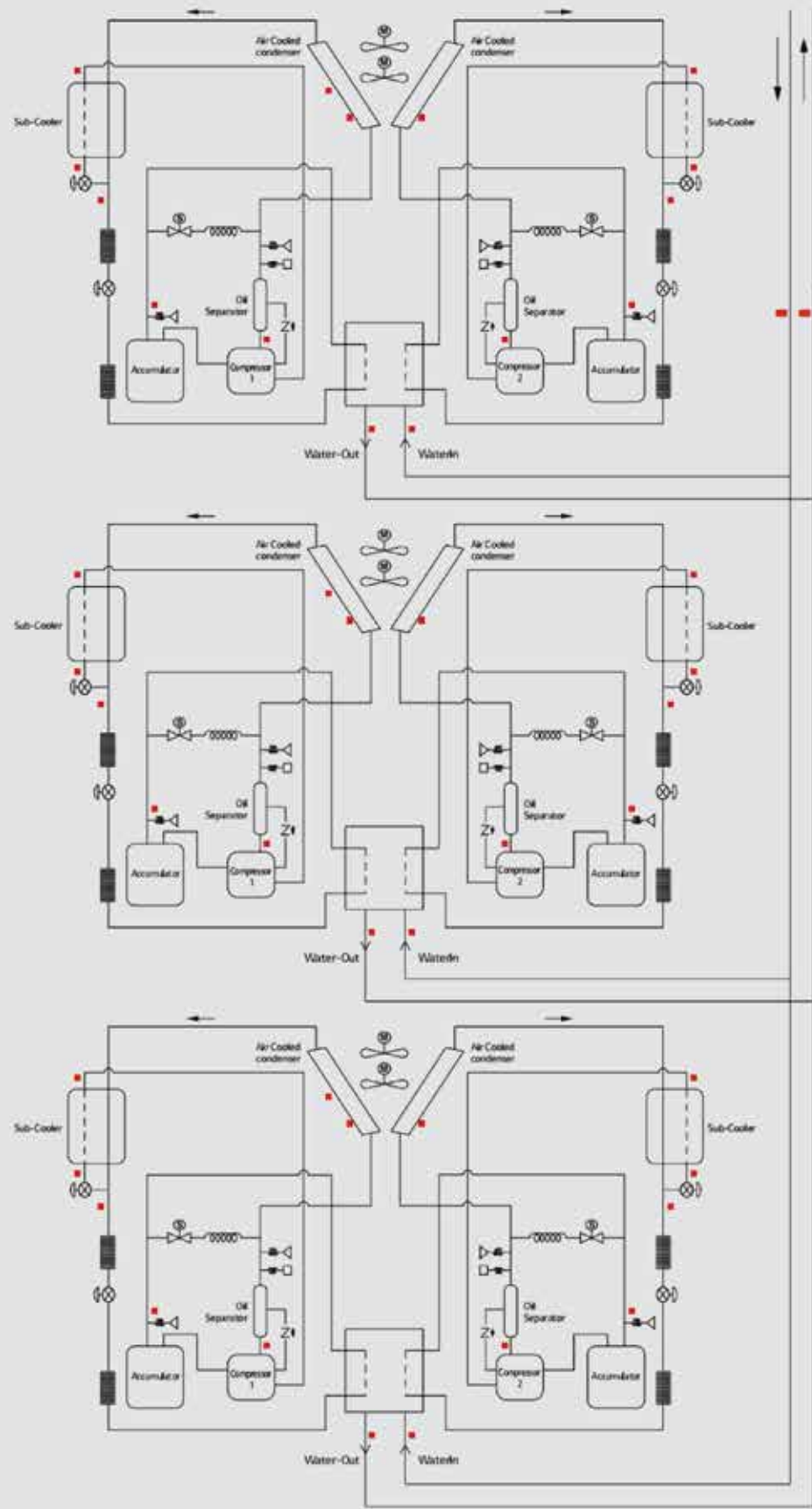
LG Corrosion Resistance solution passed ISO accelerated corrosion test conducted by an independent test organisation and the result has been certified by prestigious global certification organisation, TÜV.



※ Verification of corrosion resistance performance
- Test Method B of ISO21207
- ASTM B117 / ISO 9227 (10,000 hours)

INVERTER SCROLL CHILLER

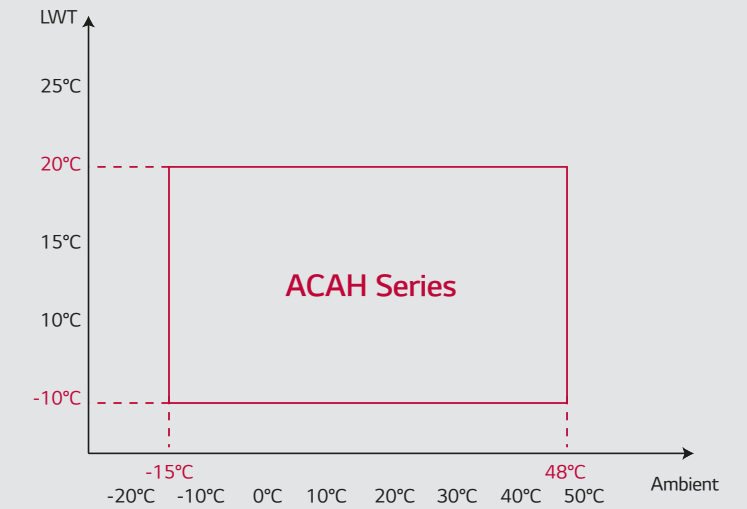
Inbuilt Redundancy with Multiple Refrigerant Circuit



INVERTER SCROLL CHILLER

Operating and Water Outlet Temperature Range

Chilled water temperature range is -10°C~20°C
Ambient temperature range is -15°C~48°C



Specifications

Inverter Scroll Chiller (Cooling only model)		Units	ACAH020(L,H)ETB	ACAH023(L,H)ETB	ACAH033(L,H)ETB	ACAH040(L,H)ETB
Power	Phase,Wire,V		L : 3,4,380-415	L : 3,4,380-415	L : 3,4,380-415	L : 3,4,380-415
Capacity	TR		18.5	21.0	32.4	37.0
Input Power	kW		21.5	28.5	36.2	43.0
Compressor	Type	-	Scroll	Scroll	Scroll	Scroll
	No. of Compressor	EA	2	2	4	4
Refrigerant	Type	-	R410A	R410A	R410A	R410A
	Charge Amount	kg	6.5*2	6.5*2	6.5*4	6.5*4
Evaporator	Type	-	Shell & Tube	Shell & Tube	Shell & Tube	Shell & Tube
	Pressure Drop	kPa (ftH2O)	38.8 (13.0)	49.2 (16.5)	29.6 (9.9)	38.8 (13.0)
	Water Flow Rate	LPM (GPM)	186 (49.1)	211 (55.7)	327 (86.4)	372 (98.3)
	Inlet/Outlet Diameter (Water pipe)	mm (inch)	50 A (2 B)	50 A (2 B)	65 A (2-1/2 B)	65 A (2-1/2 B)
Fan	Motor Type	-	BLDC	BLDC	BLDC	BLDC
	No. of Fan	EA	2	2	4	4
Expansion Device	-		EEV	EEV	EEV	EEV
Shipping Weight	kg		520	520	970	970
Dimension	W x H x D	mm	765 x 2293 x 2154	765 x 2293 x 2154	1528 x 2293 x 2154	1528 x 2293 x 2154

Inverter Scroll Chiller (Cooling only model)		Units	ACAH045(L,H)ETB	ACAH050(L,H)ETB	ACAH060(L,H)ETB	ACAH067(L,H)ETB
Power	Phase,Wire,V		L : 3,4,380-415	L : 3,4,380-415	L : 3,4,380-415	L : 3,4,380-415
Capacity	TR		42.1	48.6	55.4	63.1
Input Power	kW		57.0	54.3	64.5	85.5
Compressor	Type	-	Scroll	Scroll	Scroll	Scroll
	No. of Compressor	EA	4	6	6	6
Refrigerant	Type	-	R410A	R410A	R410A	R410A
	Charge Amount	kg	6.5*4	6.5*6	6.5*6	6.5*6
Evaporator	Type	-	Shell & Tube	Shell & Tube	Shell & Tube	Shell & Tube
	Pressure Drop	kPa (ftH2O)	49.2 (16.5)	29.6 (9.9)	38.8 (13.0)	49.2 (16.5)
	Water Flow Rate	LPM (GPM)	411 (108.6)	490 (129.4)	558 (147.4)	633 (167.2)
	Inlet/Outlet Diameter (Water pipe)	mm (inch)	65 A (2-1/2 B)	65 A (2-1/2 B)	65 A (2-1/2 B)	65 A (2-1/2 B)
Fan	Motor Type	-	BLDC	BLDC	BLDC	BLDC
	No. of Fan	EA	4	6	6	6
Expansion Device	-		EEV	EEV	EEV	EEV
Shipping Weight	kg		970	1430	1430	1430
Dimension	W x H x D	mm	1528 x 2293 x 2154	2291 x 2293 x 2154	2291 x 2293 x 2154	2291 x 2293 x 2154

WATER COOLED SCREW CHILLER

HIGH ENERGY EFFICIENCY

- High performance screw compressor
- Falling film / Flooded type evaporator

RELIABILITY & STABILITY

- Stable oil recovery system
- Safety control system using various sensors & switches
- Precise capacity control
- R-134a refrigerant, ODP = 0
- AHRI certified model selection program
- AHRI certified factory performance test facility

CONVENIENCE

- User friendly controller with various functions
- Easy BMS interface (Modbus, BACnet, TCP/IP)

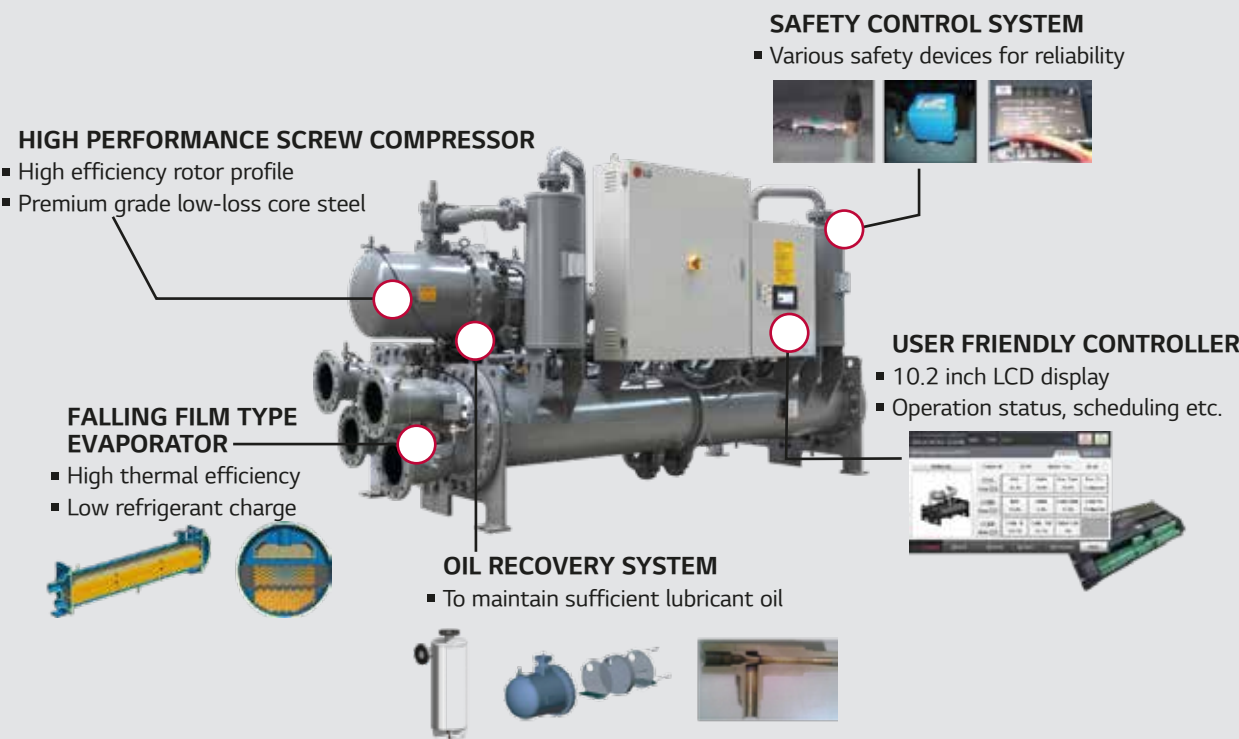


COP 5.4 (@ AHRI condition, 220RT)



Features & Benefits

LG Water Cooled Screw Chiller offers outstanding performance through high efficient evaporator and compressor and also secures reliability via oil recovery system and safety control system.



AIR COOLED SCREW CHILLER

AIR COOLED SCREW CHILLER

- High Efficiency Model COP 3.2 (@AHRI condition, 220RT)
- Standard Efficiency Model COP 2.9 (@AHRI condition, 220RT)

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

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



Features & Benefits

HIGH PERFORMANCE SCREW COMPRESSOR

- High efficiency rotor profile
- Premium grade low-loss core steel



CORROSION RESISTANCE GOLDFIN™



OPTIMIZED REFRIGERANT FLOW CONTROL



USER FRIENDLY CONTROLLER

- 10.2 inch LCD display
- Operation status, scheduling etc.

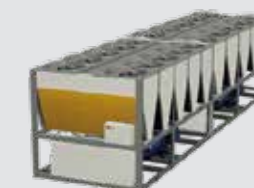


FALLING FILM TYPE EVAPORATOR

- High thermal efficiency
- Low refrigerant charge



MULTI CIRCUIT



CENTRIFUGAL CHILLER

WORLD CLASS 2 STAGE CENTRIFUGAL CHILLER

- Cooling Capacity : 1000RT @AHRI Condition (6.67°C/35°C)
- COP : 6.5 (0.54kW/RT, with Single unit)
- COP : 6.8 (0.51kW/RT, with Series Counter Flow)



OVERVIEW

- | | |
|--|---|
| <p>HIGH ENERGY EFFICIENCY</p> <ul style="list-style-type: none"> ▪ Optimized 2 stage compressor cycle ▪ Economizer with variable refrigerant control ▪ High efficiency heat exchanger design | <p>STABLE OPERATION</p> <ul style="list-style-type: none"> ▪ 2 stage refrigerant cycle with variable diffuser or 2nd I.G.V ▪ Oil reservoir against sudden power failure |
| <p>RELIABILITY</p> <ul style="list-style-type: none"> ▪ AHRI performance certified program ▪ World class factory performance test facility ▪ ASME and PED high pressure vessel code | <p>ECO-FRIENDLY</p> <ul style="list-style-type: none"> ▪ Ozone free R-134a refrigerant ▪ Less CO2 emission by high energy performance <p>CONVENIENCE</p> <ul style="list-style-type: none"> ▪ Compact design ▪ User friendly Controller ▪ Easy BMS interface |

Features & Benefits

LG CAN PROVIDE VARIOUS VALUE WITH KEY TECHNOLOGY FOR CUSTOMERS

2STAGE COMPRESSOR(HIGH EFFICIENCY)

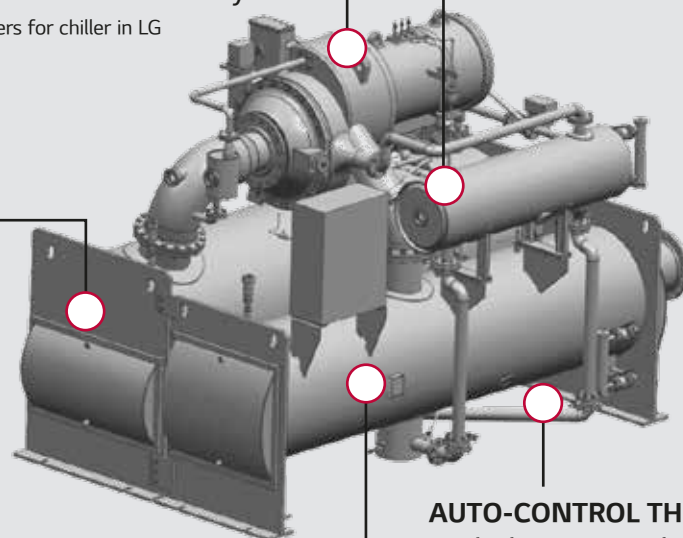
- Compressor Designed and manufactured by LG
 - More than 50 R&D engineers for chiller in LG
- Compressor Designed and manufactured by LG
 - More than 50 R&D engineers for chiller in LG

OPTIMUM DESIGN FOR ECONOMIZER

- Using perforated plate, Manage the flow of the refrigerant
 - Minimize the size of the economizer
 - Reduced the charging amount of the refrigerant
 - Patent for structure of economizer

COMPACT UNIT

- Small foot print
- Light weight ode



HEAT EXCHANGER(HIGH EFFICIENCY)

- Optimum design of Shell & Tube heat exchanger and flow rate(refrigerant) with tube arrangement and refrigerant distributor design
 - Patent for heat exchanger design

AUTO-CONTROL THE LEVEL OF THE REFRIGERANT

- Applied automation butter fly V/V and level sensor
 - High efficiency in the Part load(IPLV or NPLV)

ABSORPTION CHILLER

DIRECT FIRED ABSORPTION CHILLER : COP 1.51 TEMPERATURE CONDITION

- Evaporator : 12°C → 7°C
- Condenser : 32°C → 37°C
- Fouling Factor : 0.086 m².°C/kWt

HIGH ENERGY EFFICIENCY

- Develop COP 1.51 absorption chiller
- Economical operation with high part load efficiency

RELIABILITY & STABILITY

- Adopt stainless steel tube
- Gravity loading tray type dropping
- Series flow with inverter pump control
- Self-diagnosis functions, Safety functions (Crystallization prevention, Freezing prevention, Leakage detection)

CONVENIENCE

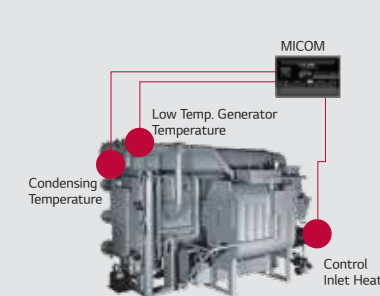
- Multi-sectional shipment
- Easy maintenance (Simple pipe cleaning)
- Digital pressure transmitter
- Easy BMS Interface (Modbus, TCP/IP, BACnet, Lonwork)



Features & Benefits

ABSORBENT CONCENTRATION CONTROL

- Crystallization prevention control
- Precision temperature control using PID control



MARINE TYPE WATER BOX

- Simple & convenience pipe cleaning

USER FRIENDLY CONTROLLER

- LCD display : easy to check status
- Various control functions



STAINLESS STEEL TUBE (HOT WATER DRIVEN ONLY)

- LCD display : easy to check status
- Various control functions



AUTO PURGE SYSTEM (OPTION)

- Oil separator for protecting machine
- Absorbent separator for protecting vacuum pump



Vacuum pump



Purge system

SERIES SOLUTION FLOW

- Inverter pump : easy & reliable flow control
- Simple piping line : maintenance convenience



Inverter pump

OIL FREE MAGNETIC BEARING CHILLER WITH VSD

LG two-stage centrifugal chiller with magnetic bearing technology is new solution for saving energy. Non contact magnetic bearing and direct connection structure between impeller and drive shaft is able to reduce lubrication losses by 2 ~ 3% as compared with conventional oil lubricated system, which increases energy efficiency. These chillers are equipped with LG's own active magnetic bearing.

- 260-1100TR → Single Compressor
- 520- 2200TR → Double Compressor

Features & Benefits

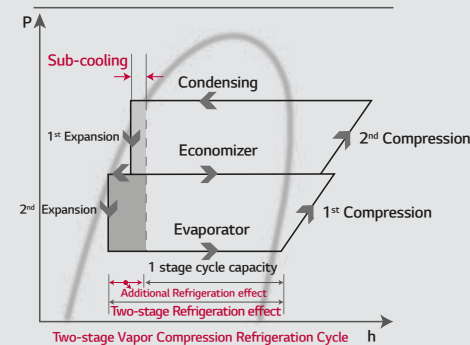
Magnetic bearing system with a proven technology from aerospace, air-compression industry. The LG's magnetic bearings have an extremely long life because there is no physical contact between the bearings and the shaft at operating speed. Non-contact and direct driven system can reduce the friction loss during the compression process. LG RCWFL chillers adopt two-stage compression cycle with the flash type economizer from the existing line up of centrifugal chillers.

FRICTIONLESS COMPRESSOR + OPTIMIZED TWO-STAGE CYCLE

ADVANTAGES



- **ZERO FRICTION MAGNETIC BEARING**
 - Improves lubricating loss
 - Increase energy efficiency
- **SECURED STABLE OPERATION RANGE**
 - Improved I.G.V and 2nd I.G.V performance
 - Improved energy efficiency at low load condion
- **SIMPLE STRUCTURE WITH OIL FREE**
 - VSD driven high speed motor
 - Improved part load efficiency at off-design condition



Diverse GLOBAL REFERENCE by Application



LS CABLES INDIA, BAWAL PLANT



Summary

Site Name : LS Cable Bawal Plant
Type : Process cooling
Purpose : Water Processing (Process cooling)
Product : ISC 40RT x 1EA

Project Feature

Building Features

To maintain the air temperature & RH level in the laboratory room, so that the testing of electronic components can be performed without any impact.

Implication

A site where for the first time Inverter Scroll was used for a lab air-conditioning system.

Needs

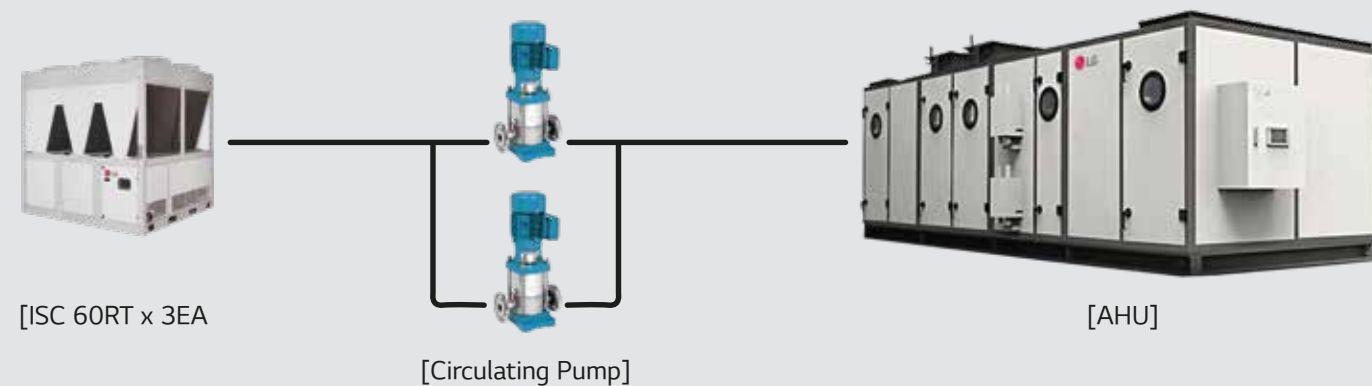
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool water down to 6.67°C

Reliability : Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Selected based on the load (chilled water) temp and flow rate conditions



Using the water at 6.67 °C to maintain the temperature and RH of the laboratory room

HAVELLS INDIA LIMITED, ALWAR PLANT



Summary

Site Name : Havells India Ltd Alwar Plant
Type : Process cooling
Purpose : Water Processing (Process cooling)
Product : ISC 40RT x 1EA

Project Feature

Building Features

To maintain the water temperature, which is fed to wiring machine, cooling below a fixed temperature is needed. In addition, a small size system that enables easy extension is needed.

Implication

A site where for the first time Inverter Scroll was used for a process cooling system, so the application is expected to be expanded to other similar sites.

Needs

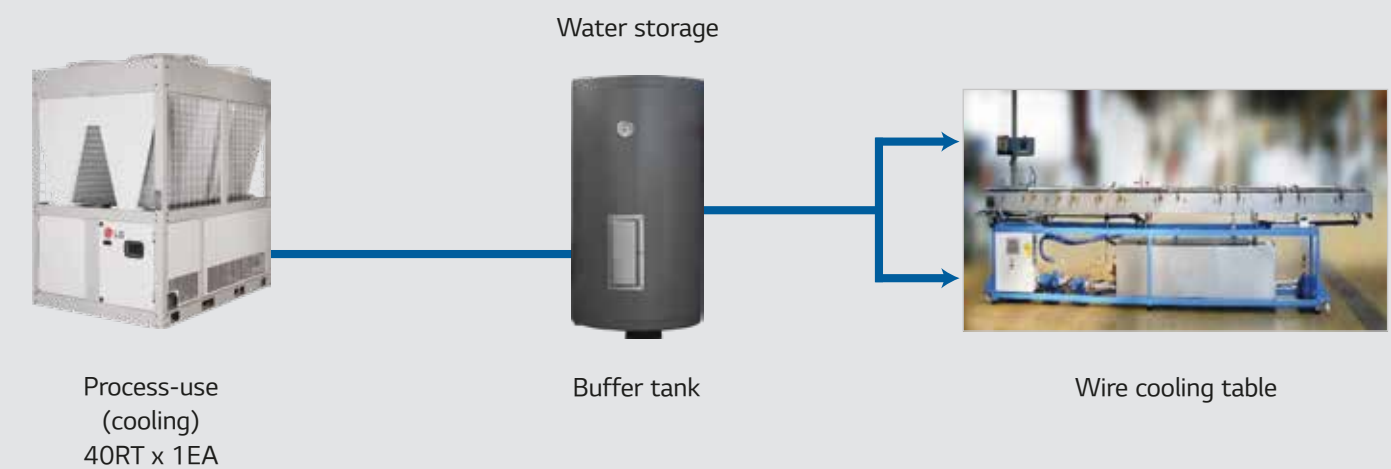
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool water down to 12°C

Reliability : Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Selected based on the load (chilled water) temp and flow rate conditions



Using the water at 12 °C to cool machine for next feed and to remove the moisture

TATA ELECTRONICS LTD, HOSUR PLANT



Summary

Site Name : Tata Electronics Ltd.
Type : Process cooling
Purpose : Air cooling for Temperature & RH control
Product : ISC 60RT x 3EA

Project Feature

Building Features

To maintain the Air temperature & RH level in the laboratory room, so that the testing of electronic components can be performed without any impact.

Implication

A site where for the first time Inverter Scroll was used for a lab air-conditioning system.

Needs

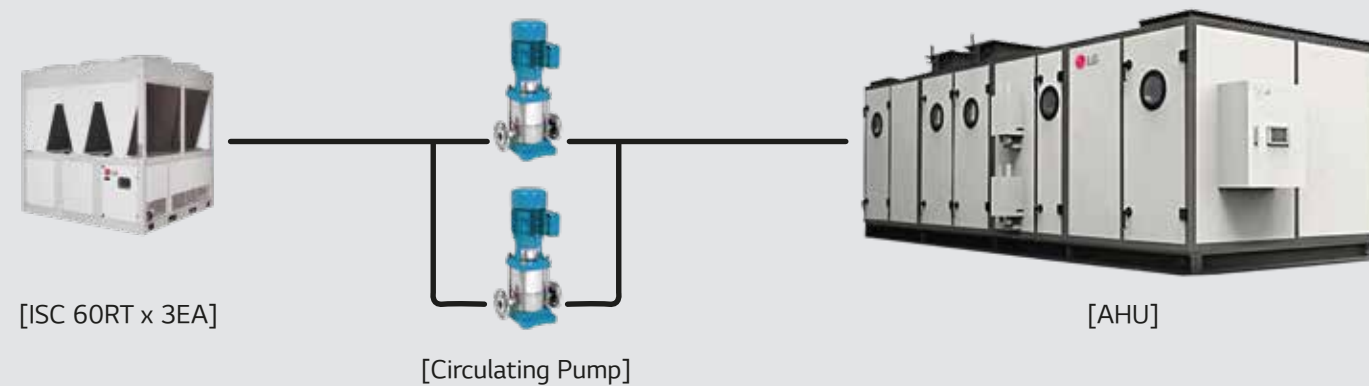
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool water down to 6.67°C

Reliability : Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Selected based on the load (chilled water) temp and flow rate conditions



Using the water at 6.67 °C to maintain the temperature and RH of the laboratory room

CHEM IKSAN PLANT



Summary

Site Name : LG Chem Iksan Plant
Type : Factory
Use : for synthetic pharmaceutical building process / air conditioning
Product
Capacity : 3 low-temperature screw 35RT
 One room temperature screw 120RT
Other : Energy diagnostic site

Project Feature

Building Features

- Low temperature: brine using the existing screw freezer 35 TR × 3 units
- Tank temperature maintenance, used for synthetic pharmaceutical processing
- Room temperature: Used for air conditioning in synthetic medicine building

Implication

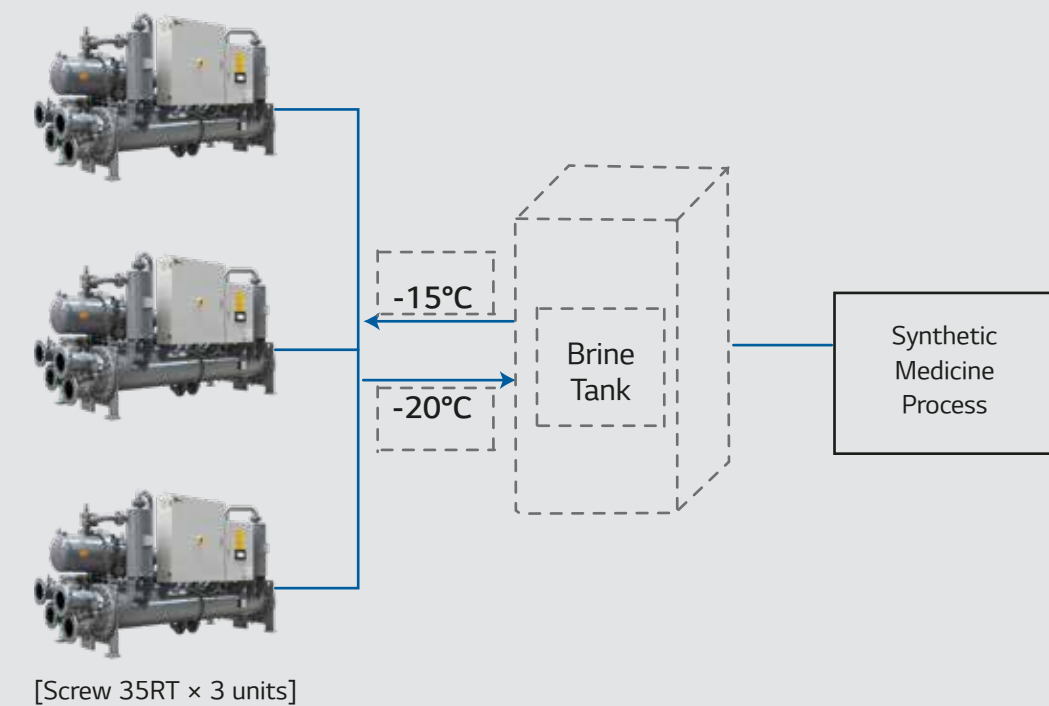
A ref. site for the delivery of precise process cooling water temperature of -20°C
 Due to satisfaction with LG water cooled screw chiller product, the customer wanted to continue using it. Further expansion is expected.

Needs

Energy saving : High-efficiency system to shorten the pay-back period due to initial investment

Failure responsiveness : Excessive time and cost to respond to existing screw products

Operation and management : Control convenience, convenient maintenance



SAMYANG INNOCHEM



Summary

Site Name : Samyang Innochem
Type : Factory
Use : For isosorbide production process
Product capacity : 1 low-temperature screw 110 TR
 One room temperature turbo 660TR

Project Feature

Building Features

- Screw : Maintains the temperature of the crystal riser
- Turbo : For cooling the heat exchanger

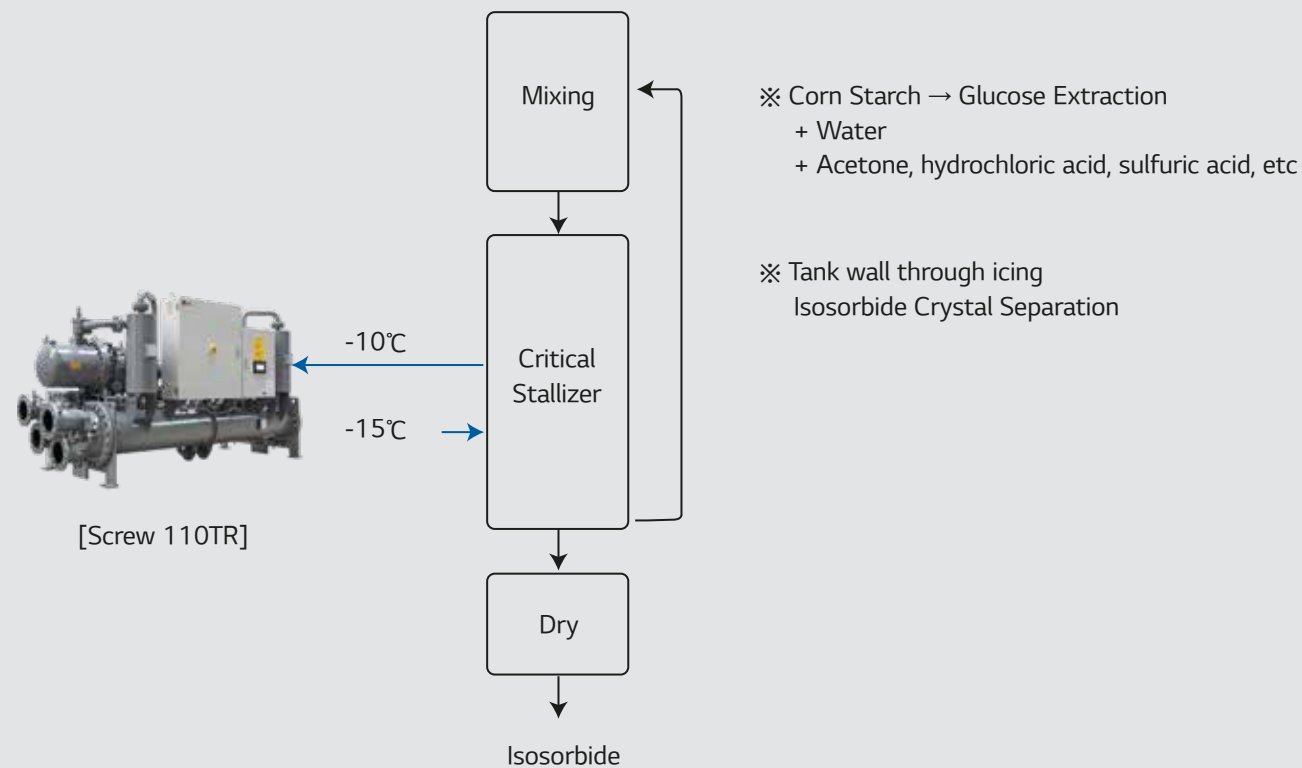
Implication

A ref. site for the delivery of precise process cooling water temperature of -15°C.
 Site with Screw chiller of 110 TR and Turbo chiller of 660 TR.

Needs

Fault responsiveness : 5 years of maintenance

Operation and management : Control convenience, convenient maintenance



BALAJI WAFERS & NAMKEEN, SURAT



Summary

Site Name : Balaji Wafers & Namkeen
Type : Potatoes storage
Purpose : Air cooling for Temperature & RH control
Product : Water cooled screw chiller

Project Feature

Building Features

To maintain the Air temperature & RH level in the Potatoes store room, so that potatoes can be prevented from degradation and sprouting.

Implication

Site with Water Cooled Screw Chiller, having fluid of water with mixture of 20% ethylene glycol solution (by volume).

Needs

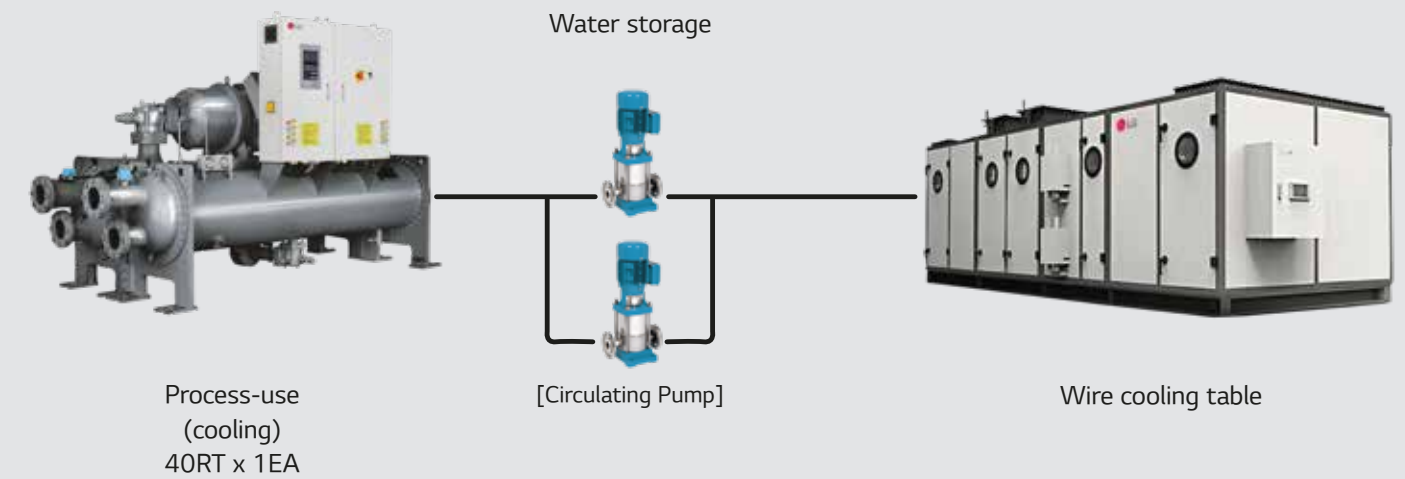
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool water down to 1.8°C

Reliability : Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Selected based on the load (chilled water) temp and flow rate conditions



Using the water at 1.8 °C to maintain the temperature and RH of the Potatoes storage room

CARBONX LIMITED, SURAT



Summary

Site Name : Carbonx limited, Surat
Type : Process cooling
Purpose : Water Processing (Process cooling)
Product : ISC 60RT x 1EA

Project Feature

Building Features

To maintain the water temperature, which is fed to Chemical Vapor Deposition (CVD) machine, cooling below a fixed temperature is needed. In addition, a small size system that enables easy extension is needed.

Implication

A Chemical Vapor Deposition (CVD) site where for the first time Inverter Scroll was used for a process cooling system, so the application is expected to be expanded to other similar sites.

Needs

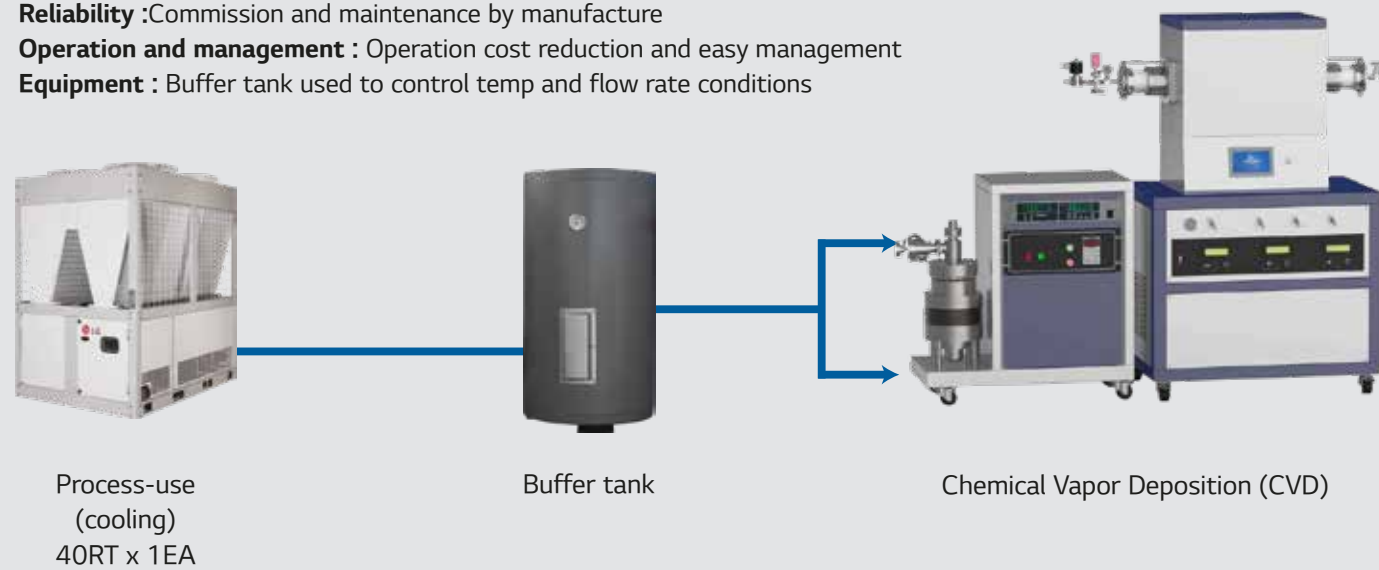
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool water down to 14°C

Reliability :Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Buffer tank used to control temp and flow rate conditions



Using the water at 12°C to cool machine for next feed and to remove the moisture

YEOSU PLANT



Summary

Site Name : Yeosu Plant
Type : Factory
Size : 1st floor
Purpose : Water Processing (Low temp. cooling)
Product : ISC 40RT x 1EA

Project Feature

Building Features

To condensate and discharge the moisture mixed with the nitrogen that is used in the process, cooling below a fixed temperature is needed. In addition, a small size system that enables easy extension is needed.

Implication

A site where for the first time Inverter Scroll was used for a low temperature cooling system, so the application is expected to be expanded to other similar sites.

Needs

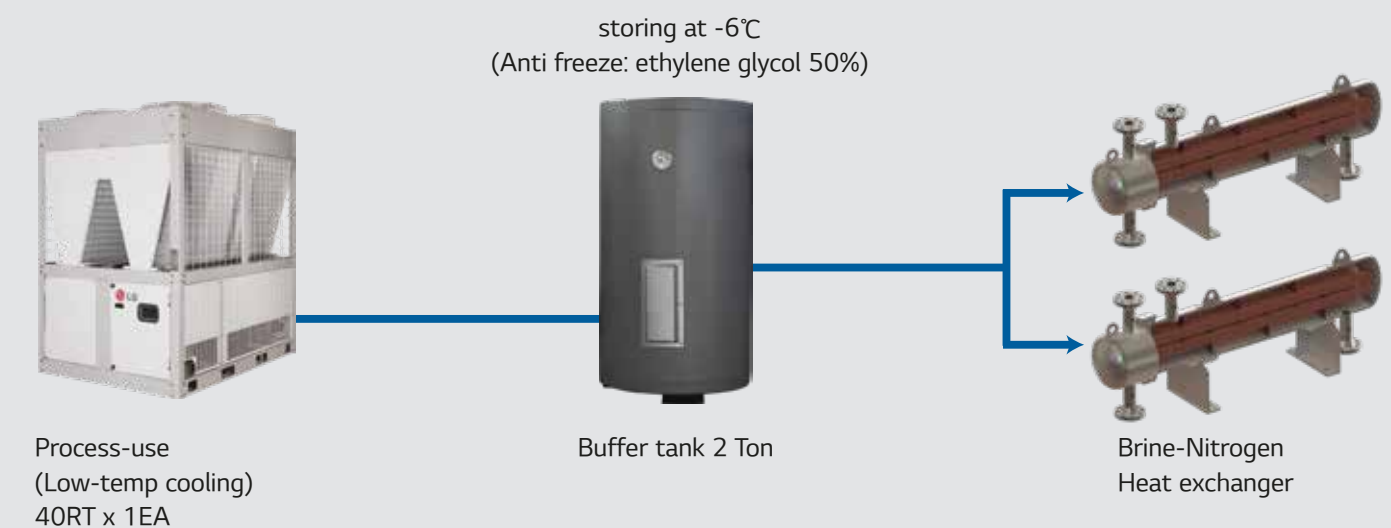
Environment : A region of factories that uses chilled water for processing

Condition : Using low temp. cooling function to cool brine down to -6°C

Reliability : Commission and maintenance by manufacture

Operation and management : Operation cost reduction and easy management

Equipment : Selected based on the load (Nitrogen) temp and flow rate conditions



Using the stored brine at -6°C to cool the nitrogen from 40°C to 0°C and to remove the moisture

MOTOR NAMYANG BATTERY MATERIAL DEVELOPMENT LAB.



Summary

Site Name : Motor Namyang Lab.
Type : Factory
Size : 1st floor
Purpose : Dehumidification equipment (dry room)
Product : Inverter Scroll Chiller 60TR x 7EA

Project Feature

Building Features

- Very satisfied with the 400RT ISC system delivered and used in the module test building of the same site
- Dehumidifiers of the 2 cooling coils of the water heat source (dew point temperature -60°C condition)
 → Inspecting Multi V+DX ISC, spec-in and awarding with the highly competitive ISC

Implication

A ref. site for the first delivery of precise dehumidification equipment for DP (Dew point temp.) -60°C. Due to satisfaction with LG ISC product, the customer wanted to continue using it. Further expansion is expected.

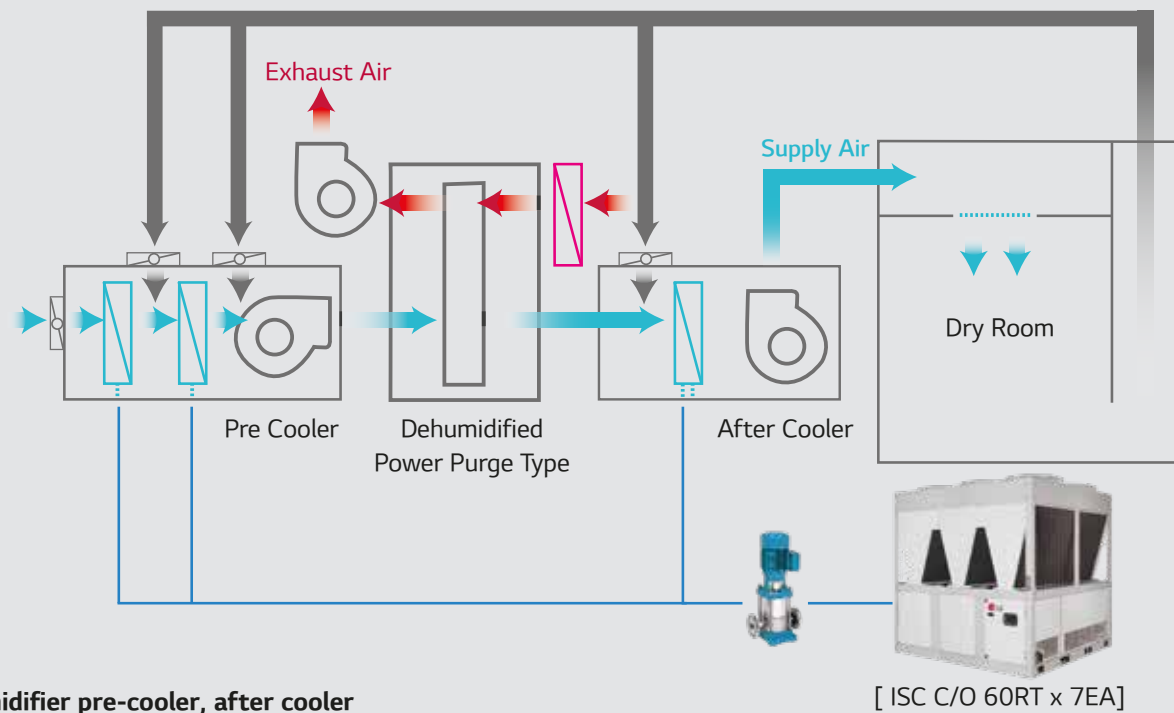
Needs

Initial investment cost:

Reliability : Verified system, commission & maintenance by manufacturer

Convenient use: Central control via Modbus

Service/maintenance: LGE thorough quality management system and quick response via service infra



Dehumidifier pre-cooler, after cooler

[ISC C/O 60RT x 7EA]

MOLD FACTORY



Summary

Site Name : Mold Factory
Type : Factory
Purpose : Cooled water supply to etching machine
Product : ISC (Cooling Only) 20TR x 2EA

Project Feature

Building Features

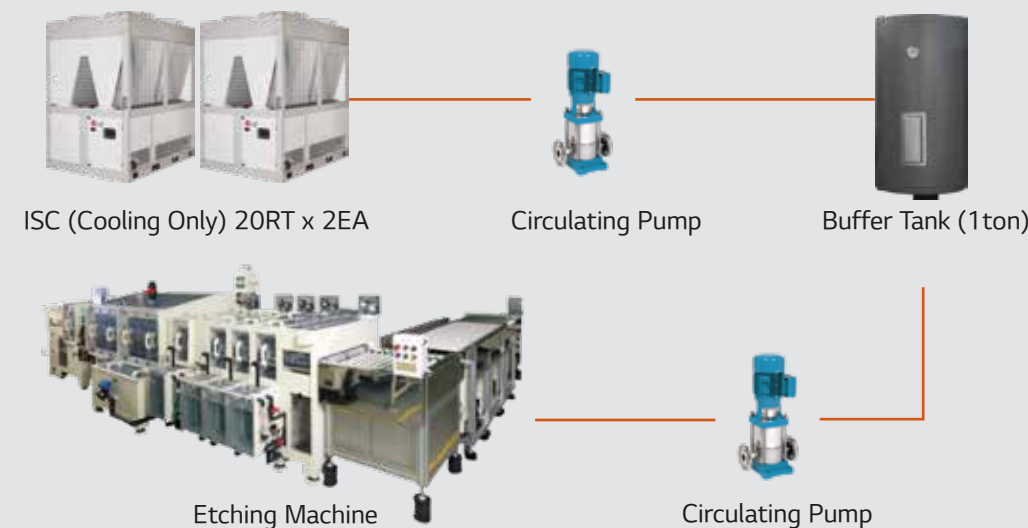
- Cooling water for cooling of the etching machine in all seasons should be supplied stably
- Service / performance improvement is required
- Concerns about piping freezing during cooling cycles in winter

Implication

- Utilize reference site for applying the cooled water system in small factories
 → There are many future sites around, so the market can be expanded
- Service response / operation management is important
 → It is possible to target the market with its strengths compared to competitors
- Higher efficiency / prevention from freezing and bursting in winter compared to third-party products

Needs

- Application of high-efficiency products to reduce operating costs
- Systems that enable quick response to service
- Stable cooled water supply
- Solutions for protection against freezing in winter



Using the stored brine at -6°C to cool the nitrogen from 40°C to 0°C and to remove the moisture

GIMHAE READY-MIX CONCRETE REPLACEMENT SITEZ



Summary

- Site Name** : Gimhae Ready-Mix Concrete Replacement Site
- Type** : Factory
- Purpose** : Processing water of cement mixing (cooling/heating)
- Product** : Inverter Scroll Chiller 45TR x 1EA

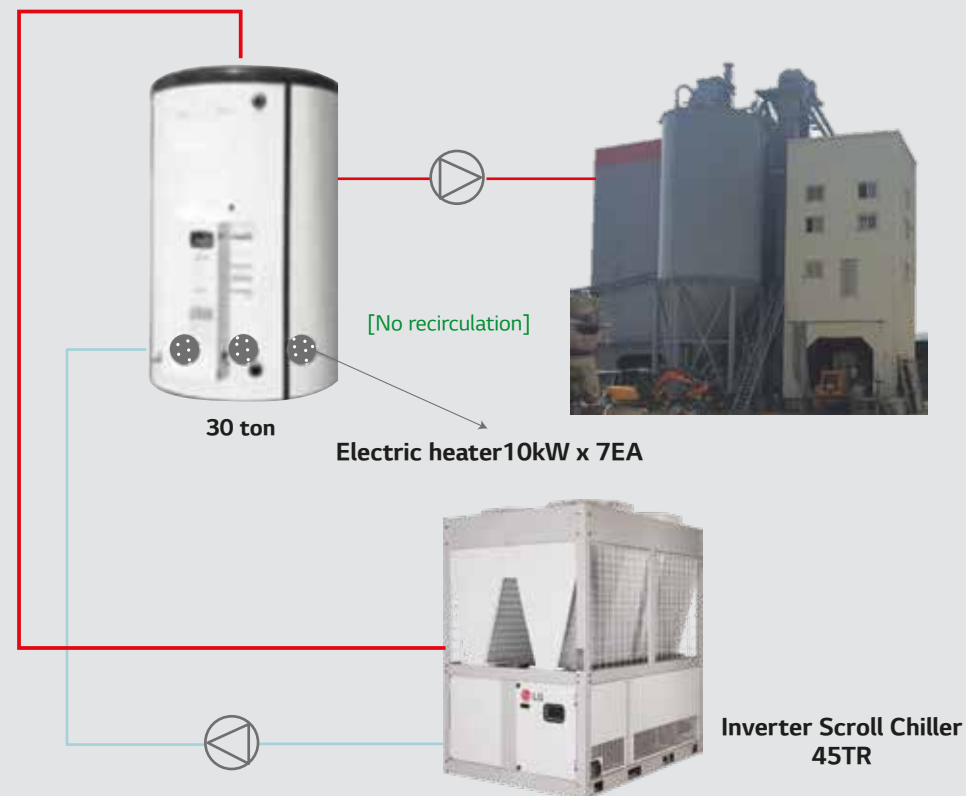
Project Feature

- Supplying hot and cold water for cement mixing process
- Maintaining the required temperature, convenient use and materials carrying are more important than optimizing energy use and reducing operation costs

Needs

- Condition** : Stable hot / cold water supply (Summer: 10°C or less, Winter: 60°C Storage) - Processing water temperature is 18°C in Summer, 20°C in Winter
- Operation and management** : Due to the nature of raw materials, there's a lot of dust hence convenient service is needed.
- Reliability** : Guaranteed performance of an inspected system

System Design



FNC FACTORY



Summary

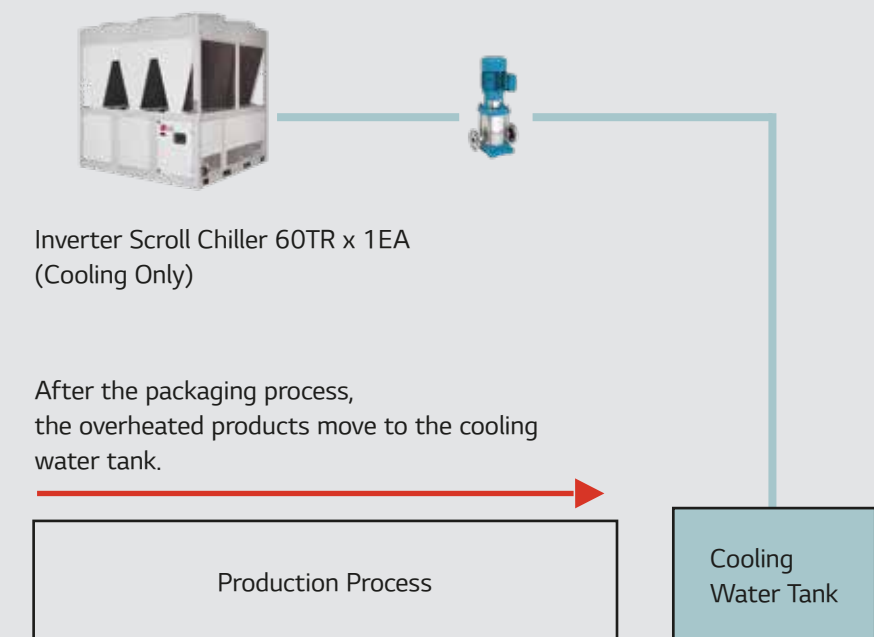
- Site Name** : FNC
- Type** : Factory
- Purpose** : Process water
- Product** : ISC 60TR x 1EA

Project Feature

- Building Features**
- In case of factory facilities, most customers have a facility management team which has expertise, so detailed design is required according to the purpose of use, temperature to be use and outdoor air condition. (Most sites are designed by a design office, and equipment suitable for the load is delivered.)
- This factory processes and produces food products, so the customer prefers systems that operate reliably and are easy to maintain.

Needs

- Equipment of the same level as the installed products
- Low initial cost
- High efficiency product for energy saving
- System for stable cold water supply
- Easy maintenance and quick SVC response



ELECTRIC POWER SUBSTATION



Summary

Site Name : Electric Power Substation
Type : Electric Power Substation
Purpose : Cooling the transformer windings
Capacity : 130kW x 3EA (1EA backup)

Project Feature

- The transformer in the substation is located underground, and a separate cooling tower is placed on the ground to lower the coil temperature in the transformer.
- For year-round operation, it is necessary to establish a backup system.

Needs

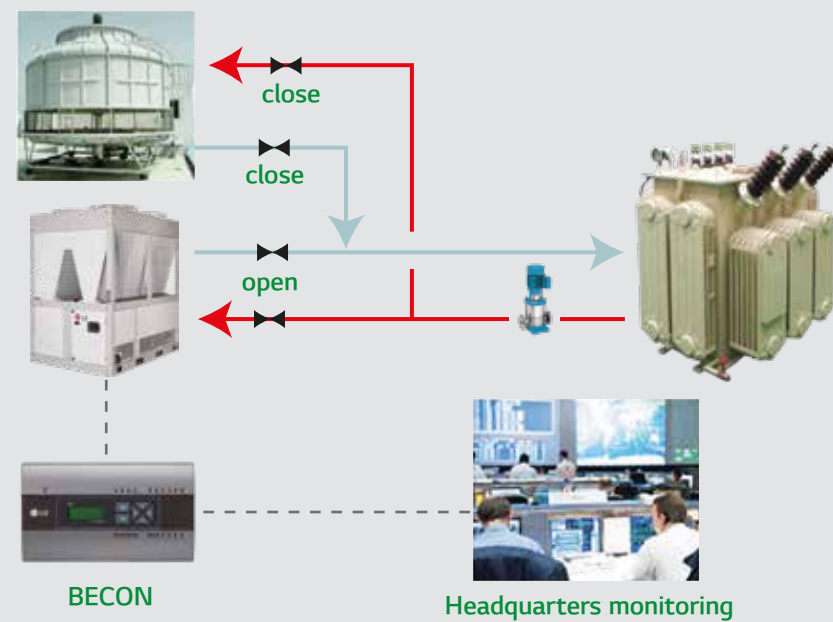
Performance : In the case of conventional cooling towers, the coil temperature rises due to the increase in cooling water temperature in summer, resulting in reduced efficiency.

Noise : Solve complaints caused by cooling tower noise

Control : Real-time monitoring with unmanned substation → Add BECON.

Initial cost : Need to be designed so that existing water pipes can be reused.

- Use the existing cooling tower as a backup.
- Operation status monitoring at headquarters using BECON.
- 40TR x 2EA operation, 1EA backup (Establishment of valve system for backup)



GWANGJU SMART FARM



Summary

Site Name : Gwangju Smart Farm (Eggplant)
Type : Cultivation Facility
Type : Greenhouse cooling and heating
Capacity : ISC 40TR x 1 unit, 20TR x 1 unit

Project Feature

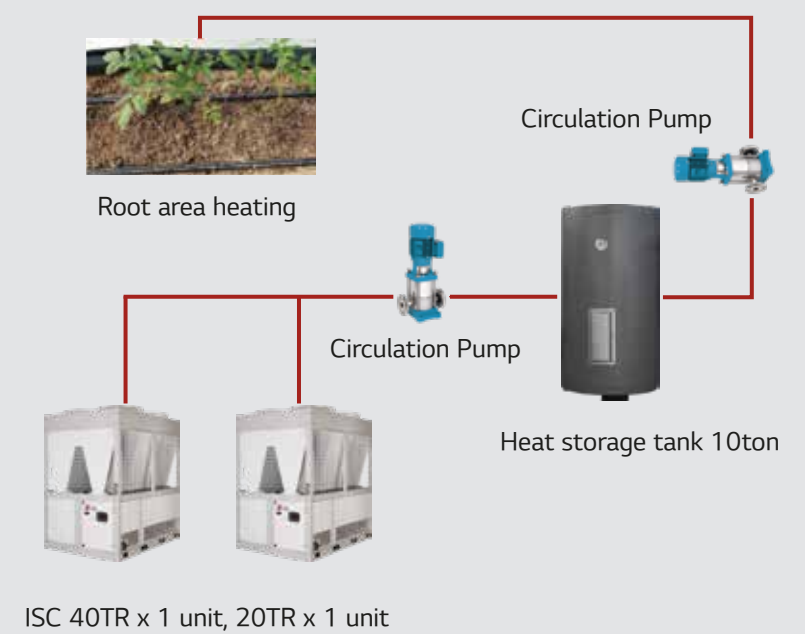
Project Characteristics

- Plant cultivation facility in Gwangju, Gyeonggi-do
- Applying various heating devices to reduce heating costs
 - Kerosene hot air fan 8 mil. won/month, pellet boiler 6 mil. won/month, Electric heating cable 4 mil. won/month
- Customers are interested in reducing greenhouse H/C energy costs

Needs

- Stable supply of hot and cold water: maintaining proper cultivation temperature
- Operation cost reduction compared to existing heating system
- Operation and management: Simple operation control and monitoring using HMI
- Maintenance: Verified system, construction/post management by manufacturer

- Stable hot and cold water supply using 10-ton heat storage tank
 - Replacing the existing heating cable (200kW faucet) for root zone heating with a heat pump (No need for faucet expansion)
 - Existing hot air fan (200,000kcal/h) can be backed up



DANGJIN SMART FARM



Summary

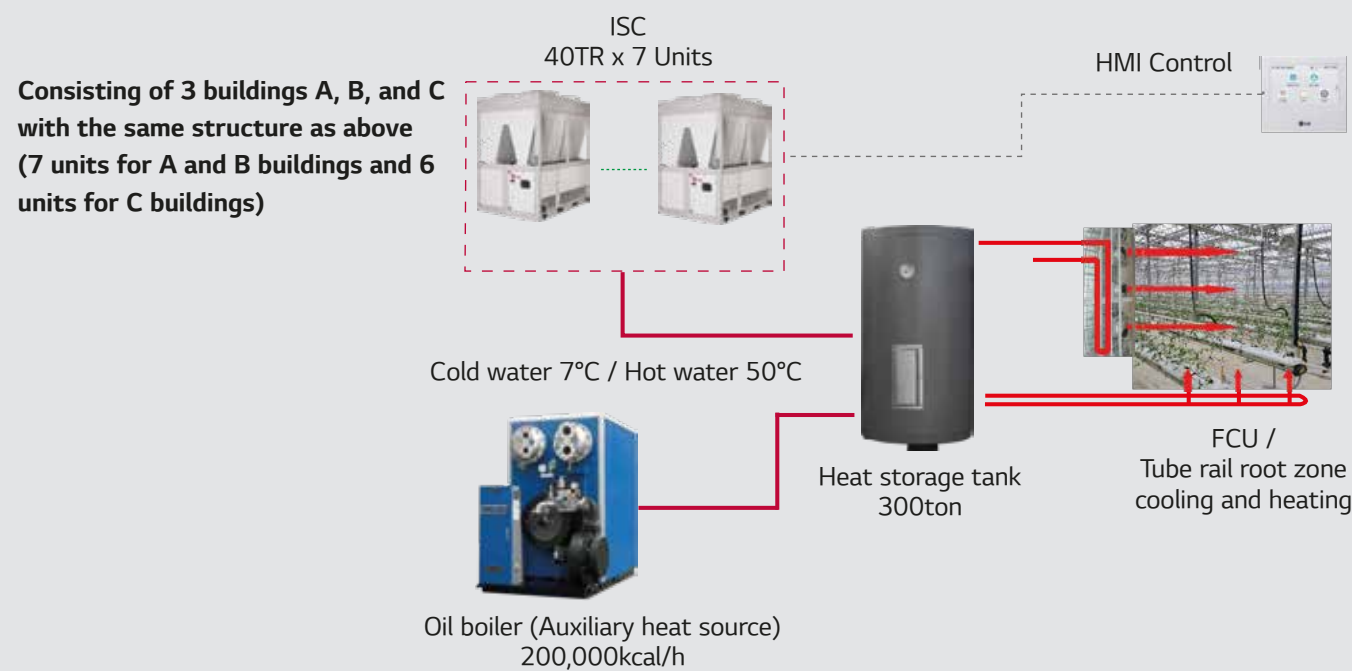
Site Name : Dangjin Smart Farm
Type : Cultivation Facility
Area : 2.77ha
Usage : Greenhouse heating and cooling
Capacity : ISC 40TR x 20 Unit

Project Feature

- Dangjin city local government business
- LG ISC application for cost reduction instead of electric boiler
- Spec-in activity to Dangjin Rural Development Administration

Needs

- Stable supply of hot and cold water : maintaining proper cultivation temperature
- Operation cost reduction compared to existing heating system
- Operation and management : Simple operation control and monitoring using HMI
- Maintenance : Verified system, construction/post management by manufacturer



JANGHEUNG FISHERIES (ALL FISHERIES)



Summary

Site Name : Jangheung Fisheries
Type : Cultivation Facility (Seaweed)
Size : 1F
Usage : Cooling (Dehumidification)
Capacity : 1st Phase ISC 40TR x 1 Unit
 SB 35kW x 3 Units
 2nd Phase ISC 40TR x 1 Unit

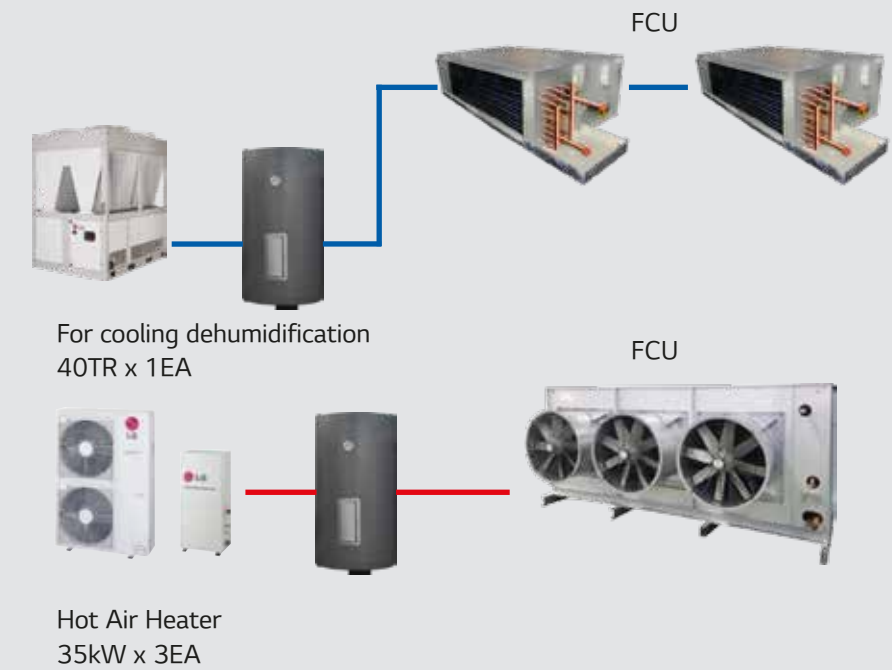
Project Feature

- A heat source of the drying hot air blower is required, and a dehumidification (cooling) system is required to reduce the relative humidity due to evaporated moisture.

Needs

- Environment : Used for seaweed drying process
- Conditions of use : Winter season (December to March) only
- Reliability : Construction/post management by manufacturer
- Operation and management : Reduce operating costs through optimization
- Equipment selection : Expansion equal to the capacity of our existing heat pump

Using hot water supply for hot air heater to dry the seaweed, cooling and dehumidification system to remove moisture generated in the process.



DANGJIN FISHERIES



Summary

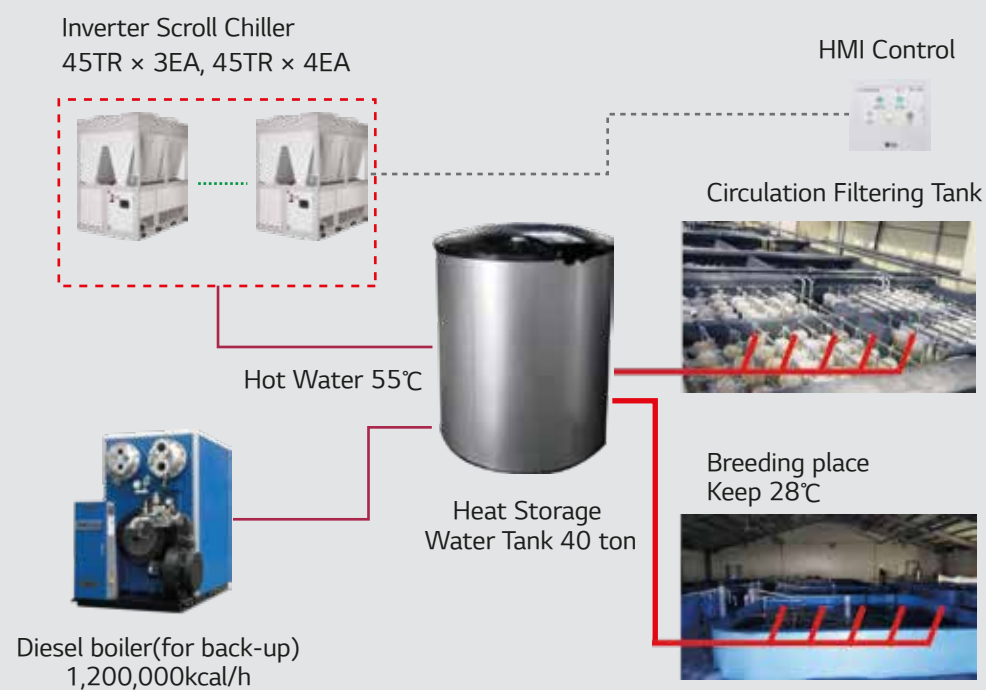
Location : Dangjin
Type : Fish Farm
Size : 2.77ha
Purpose : Eel farm heating
Capacity : ISC 45TR x 7EA

Project Feature

- Use Diesel boiler + Electric boiler to save cost for heating.
 → After installed LG ISC for extra equipment, This site mainly use LG ISC in order to save running cost for heating.

Needs

- Keep the proper temperature from stable warm water supplement
- Energy and money saving through high efficiency
- Easy control and monitoring system from the HMI
- Qualified system, installation and SVC from manufacture company



There are two identical structures as like above design.
 (1 Zone: 4EA of ISC, 2 Zone: 3EA of ISC)

BOUNCE ARENA, MUMBAI



Summary

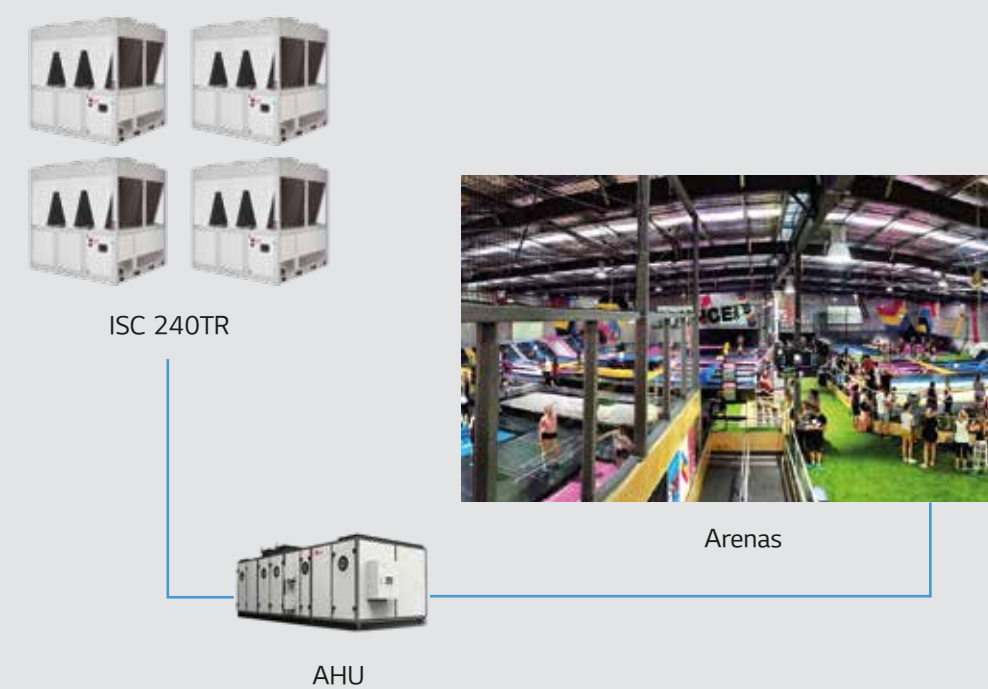
Location : Bounce Arena, Mumbai
Type : Sport Center
Size : Capacity 240 TR
Purpose : Air Cooling
Capacity : ISC 60TR x 4EA

Project Feature

- Variable cooling load due to change in occupancy.
- Redundancy required to ensure the Cooling is maintained at all times.

Needs

- Accurate load design
- Energy and money saving through high efficiency
- Comparison analysis with other competitors (Electric heater, competitive heat pump)
- Providing technical analysis about different products
- Stable system, maintenance, and SVC



YEOSU POOL



Summary

Location : Yeosu Pool
Type : Sports Center
Size : Pool capacity 1,100 ton
Purpose : Hot water supply to the pool
Capacity : ISC 40TR(H/P) x 5EA

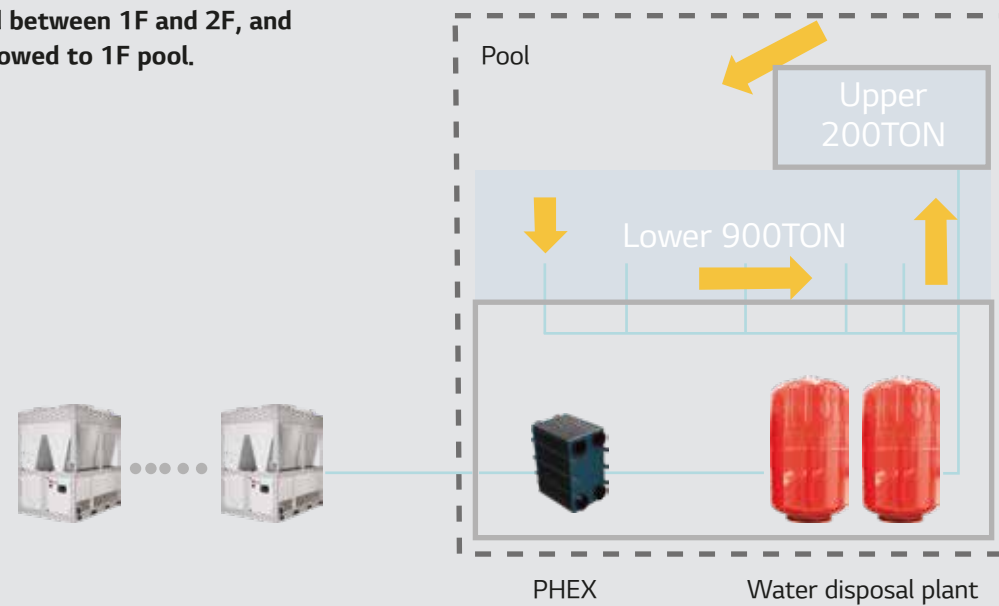
Project Feature

- Initial investment of outdoor pool is cheaper than indoor pool due to the lower indoor water cooling and heating burden.
- Load difference range is wide from a region to another due to the different outdoor temperature and wind speed
 → accurate information of use pattern is important

Needs

- Accurate load design
- Energy and money saving through high efficiency
- Comparison analysis with other competitors (Electric heater, competitive heat pump)
- Providing technical analysis about different products
- Stable system, maintenance, and SVC

* Pool : Separated between 1F and 2F, and 2F water is overflowed to 1F pool.



* Pool : Separated between 1F and 2F, and 2F water is overflowed to 1F pool.

CHUNGNA



Summary

Location : Chungna Center
Type : Sports Center
Size : 3 floor scale
Purpose : FAN Motor for cooling
Capacity : ISC 40TR x 5EA

Project Feature

Buildings Features

- It is composed of unusual facilities/equipment, so it needs accurate checking for the site at the sales stage.
- Sports center needs shower facilities after exercise.

Needs

- Supply cold water stably to the fan motor PHEX for cooling
- Qualified system, commission and maintenance by manufacture
- Design an optimized high efficiency system that meets the customers' needs
- Propose noise solutions for roof top installation

