

SAMJUNG ENC

H2 CHILLER



SAM JUNG ENC SPEED CHILLER

The company, developing along with customers

We play a key role to develop domestic industry and to improve the productivity of your company by satisfying various specifications for all kinds of industrial equipments required by information oriented and digital industry in this rapidly changing twenty-first century, domestically producing various freezing equipments, that were mostly depend on import, with our own technique, and improving them as the best products group.

Company Introduction



SAMJUNG ENC, Korea's greatest and long-lived company specializing in producing the air-cooled H₂ CHILLER.

Since SAMJUNG ENC has been established in May 30, 1993, it is a company that specializes in producing only industrial coolers for 29 years.

Development, mass-production, and commercialization of GLOBAL's best cooling devices for hydrogen gas chargers are helping to revitalize the Korean hydrogen economy, and SAMJUNG ENC realizes many achievements such as development of CHILLER testing system for GLOBAL's best hydrogen charging system with technology.

SAMJUNG ENC is a future-oriented company that leads in cooling equipment technology and aims to "innovate" customer satisfaction through technology development and quality-first principles of meeting and keeping promises of "fidelity" with customers.



Social Contribution

SAMJUNG ENC tries to take the social responsibility of a company by practicing regular donations and voluntary services under the leadership of the Management Planning Office Head to help the socially weak and unfortunate neighbors.



H2 Station Speed Chiller System

GLOBAL highest technology for the air-cooled H2 CHILLER.

Founded SAMJUNG ENC in 1993

Developed the principle of constant technological development and quality-first principles into motto Establish a leadership position in industrial coolers.

SAMJUNG ENC was not satisfied with that. Since 2017, SAMJUNG ENC has developed the Hydrogen Charging Chiller requiring higher stability and efficiency than an ordinary industrial Chiller through the H2 CHILLER R&D and facility investment and succeeded in developing the H2 STATION CHILLER SYSTEM applying its patent technologies to the GLOBAL highest technological level.

The SAMJUNG ENC's H2 STATION CHILLER SYSTEMS have been delivered to the 130 Hydrogen Charging Stations nationwide and operated as stable continuous charging systems (continuous charging was verified for the 5kg/3min 12 vehicles and the 33kg/20min 3 hydrogen buses). Consequently, its stable technology has been confirmed.

SAMJUNG ENC is not satisfied with this, and will take advantage of the next generation of technology SAMJUNG ENC promise to share the vision with the client company.



Water-cooled H2 MAIN CHILLER



Air-cooled H2 SUB CHILLER



Movable Type H2 CHILLER



Air-Cooled Integral Type H₂ CHILLER



Air-Cooled All-In-One Type H₂ CHILLER



THE AIR-COOLED ALL-IN-ONE TYPE H2 CHILLER ACQUIRED THE CE CERTIFICATION

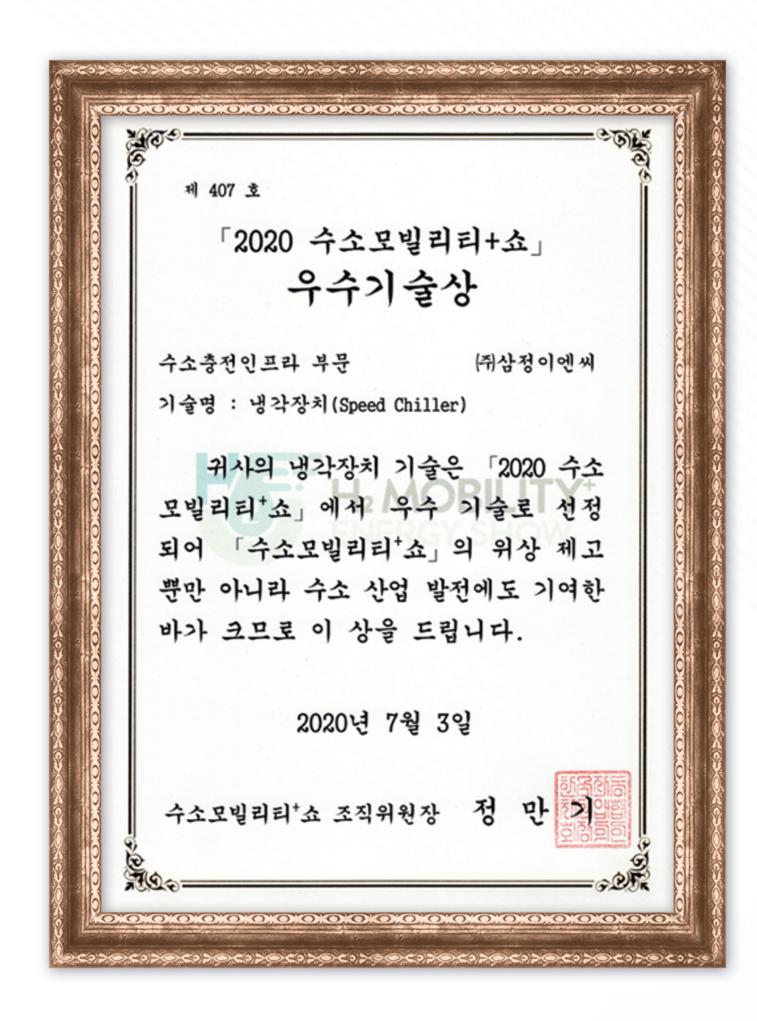


HYDROGEN SPECIALIZED COMPANY CERTIFICATE

H2 CHILLER Accolddes



AWARD CERTIFICATE FROM THE MINISTER OF SMES AND STARTUPS



2020 H₂ MOBILITY + ENERGY SHOW, EXCELLENT TECHNOLOGY AWARD



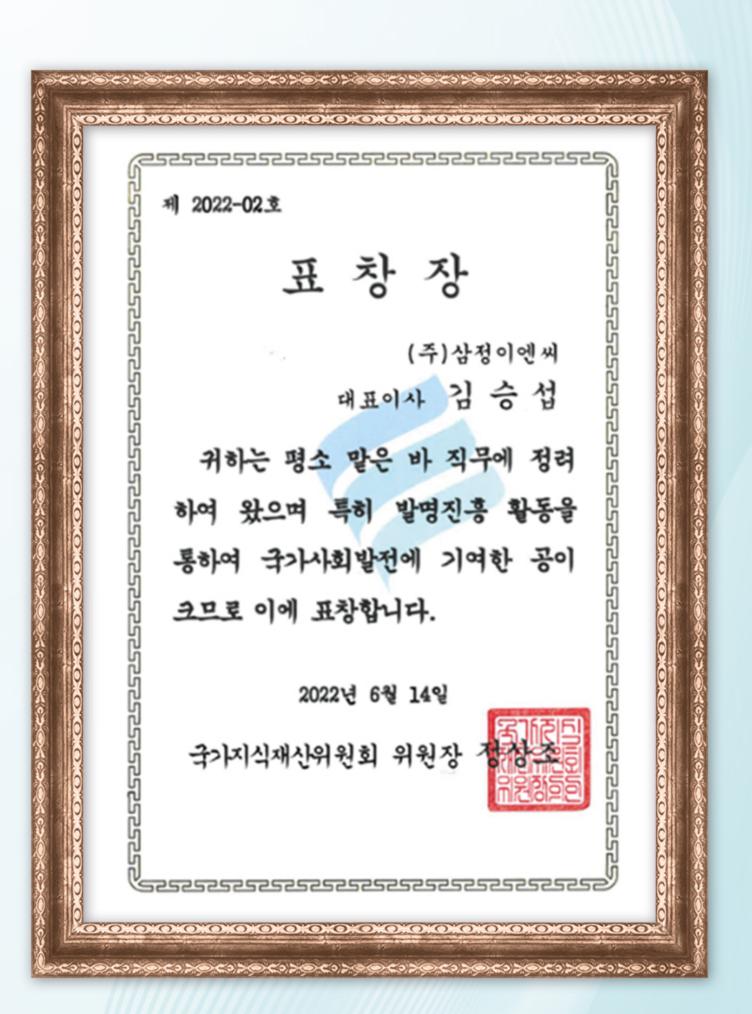
2021 H₂ MOBILITY + ENERGY SHOW, EXCELLENCE AWARD



2021 PATENT TECHNOLOGY AWARDS, HONG DAE-YONG PRIZE



2021 4IR AWARDS GRAND PRIZE



AWARD CERTIFICATE FROM
THE PRESIDENTIAL
COUNCIL ON INTELLECTUAL
PROPERTY

R&D and Certifications

Supply stabilization and localization of the Air-Cooled H2 CHILLER

2022

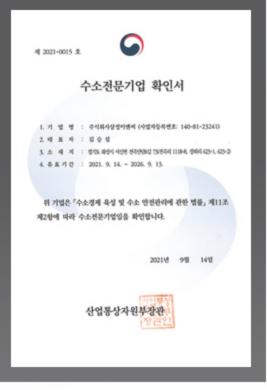
Supply Stabilization

Localization



H₂ CHILLER Stabilization

H₂ CHILLER **Mass Production** (87% localization)



Hydrogen Specialized Certificate of Root En-Company Certificate terprise

소재·부품·장비 전문기업확인서

1, 기 업 명 : 주식회사 삼점이엔씨 (사업자등록변호) 140-81-23241

소 재 지 : 경기도 화성시 사산면 전곡산단8길 73 전곡리 1118-6

위 기업은 「소재·부품·장비산업 경쟁력강화를 위한

특별조치법」 제14조제2항 및 같은 법 시행규칙 제4조

한국산업기술평가관리원

Certificate of spe-

cial enterprise for

materials, parts,

and equipment

4. 品級기간: 2020. 05. 15 ~ 2023. 05. 14

제2항에 따라 전문기업임을 확인합니다.

2, 대 표 자 : 김송섭

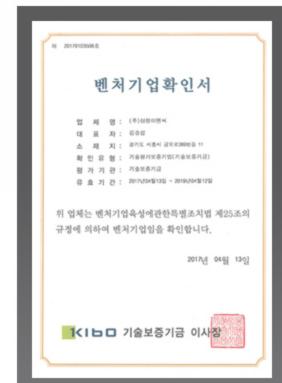




Certificate of construction business registration



Certificate of Company R&D Center



Certificate of Venture Capital

2018

2017

H₂ CHILLER Research/ Development

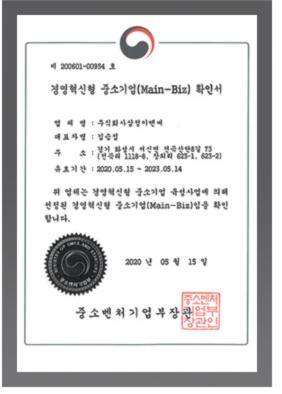


1993

Industrial Chillers



ISO9001/ ISO14001



Certificate of Main-Biz

Certificate of factory

registration



Certificate of IN-NO-BIZ

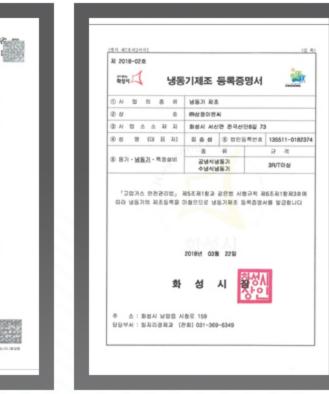


A Utility Model Registration



CE-certified SKID

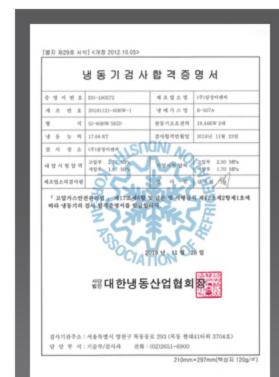




Manufacturing license for chiller

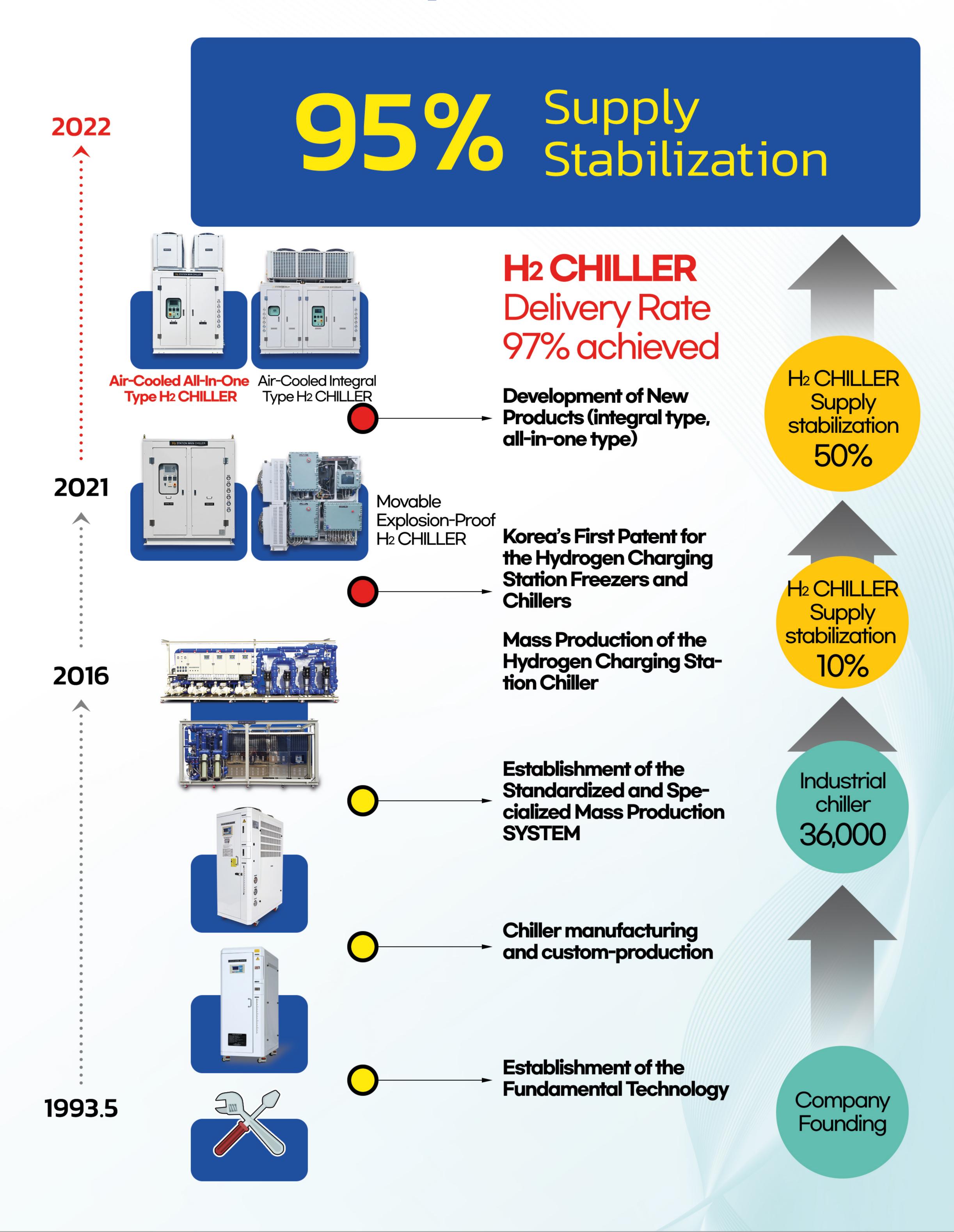


Certificate of special equipment manufacturing registration

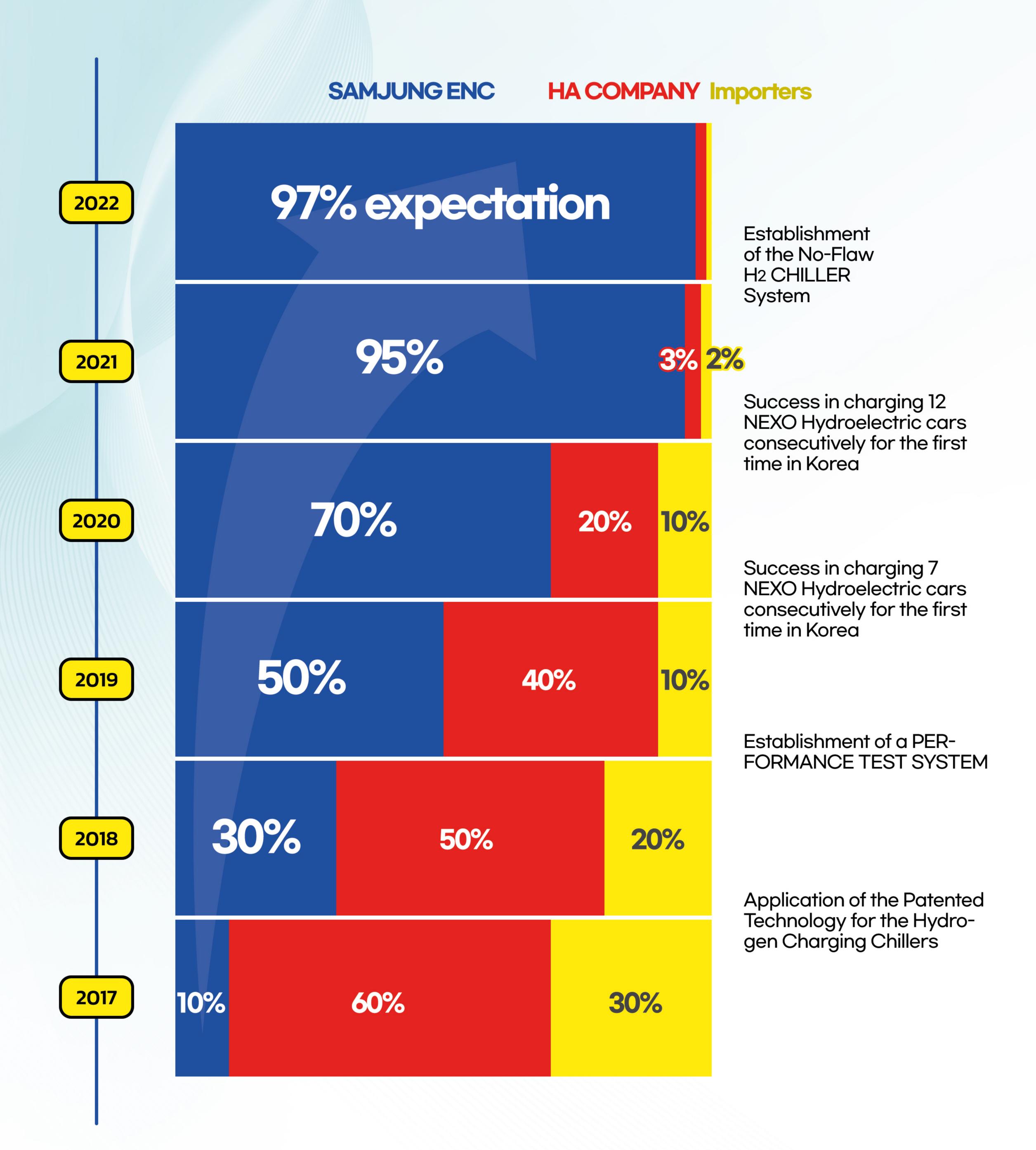


Certificate of chiller test

Product Development FLOW

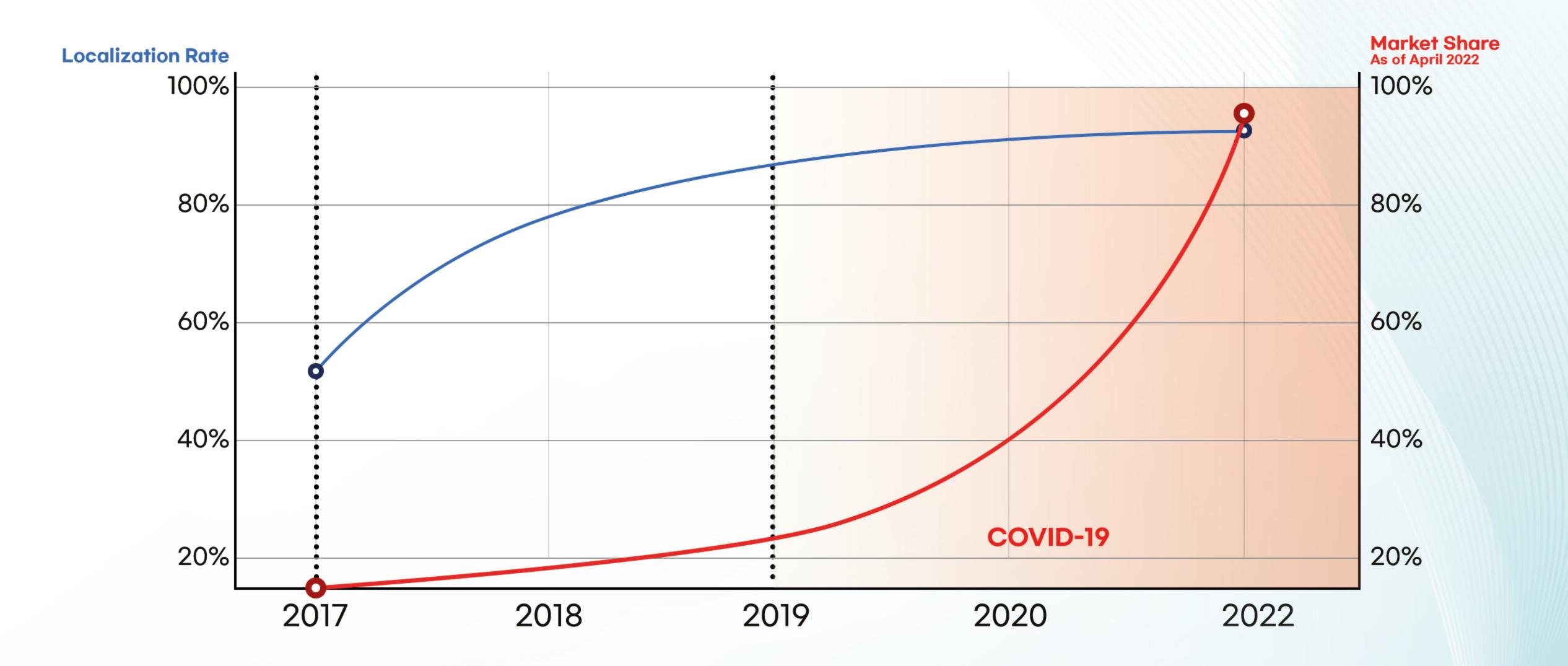


Winning order rate of the SAM JUNG ENC H2 CHILLER



Market Share of SAM JUNG ENC

The H2 CHILLERS have been delivered to the 130+ Hydrogen Charging Stations nationwide and are being operated commercially.



Localization Rate

Supply Stabilization

Strong Points of SAMJUNG ENC

- Core technology leading the Hydrogen Charging Station chillers
 - The Hydrogen Charging Station chiller applied the five Invention-Patented Commercial technologies possessed by SAM JUNG ENC
 - Korea's best leading technology company in the Hydrogen Charging Station chiller market
- 2. Achievement of supplying more than 36 thousand chillers to industrial complexes throughout Korea, and those chillers are stably operating.
- 3. A Nationwide A/S infrastructure has been constructed and is operating (Rapid recovery capability within 3 hours 90%) (Rapid recovery capability within 5 hours 10%)
- 4. Winning orders and deliveries through securing stable quality/reliability (90% commercial operation stability is maintained) (95% supply stability is achieved)
- 5. Free Preventive Checkup and Post-Service Checkup are provided Preventive Checkup: 6~8 times a year Post-Service: frequent checkups

H2 CHILLER, once SAM JUNG ENC makes, it is the standard.

March 2022

First in Korea, First in the Industry

(Success in Development and Mass Production of the Air-Cooled H2 CHILLER)

(H2 Charging CO2 CHILLER) CE Certification acquired

November 2021

95% supply stabilization to the Hydrogen Charging Station infrastructure for the first time in Korea

October 2020

Achievement of more than 87% localization rate for the Chiller used for hydrogen gas chargers for the first time in Korea

(It was acknowledged by the companies that constructed the Hydrogen Charging Station infrastructure, Korea Gas Technology Corporation, Gwangshin, Hyosung, and JNK.)

August 2018

Construction of a GLOBAL facility to test chillers for hydrogen gas chargers for the first time in Korea

(As it enables thorough verification through demonstrating Chiller products, the stability effect of commercial operations of Hydrogen Charging Stations grows.)

April 2015

Localization, Development, and Mass Production of the Thermal Shock Cooling-Heating System for the first time in Korea

(It is a CHILLER used for measurement while giving enforced Thermal Shock stress to a test device. It was the motivation for this company to localize the high-priced imported Chiller.) (Invention Patent No.10-1511693 Thermal Shock

Cooling-Heating System)

November 2021

SAMJUNG ENC received the Hong Dae-Yong Prize of the Patent Technology Awards for the first time in Korea

(The first of the Korean freezer and chiller industry and the first of the Hydrogen Economy Industry)

September 2021

Certified as a specialized hydrogen company for the first time in Korea

(For the first time in the Korean freezer and chiller industry)

March 2019

Success in charging 7 NEXO Hydroelectric cars consecutively for the first time in Korea

(West-Busan NKTech; officially the first in Korea, unofficially the first in the world)

September 2017

Development of the Hydrogen Gas Chiller for the first time in Korea

October 2011

All Chiller products acquired the Europe CE Certification for the first time in Korea

(As all machine types acquired the European Certification CE, the indirect export has increased by 50%.)

November 2021

Dominant preoccupancy of Korea's Hydrogen Charging Station chillers for the first time in Korea

(Winning order rate 98% / commercial operations at 46 locations / Waiting for production at 70 locations)

June 2021

Success in charging 12 **NEXO Hydroelectric cars** consecutively for the first time in Korea

(Chuncheon Dongrae Charging Station: officially the first in Korea, unofficially the first in the world)

February 2019

The first invention-patent in Korea for the CHILLER used for hydrogen gas chargers

(For the first time in the Korean freezer and chiller industry) (Invention Patent No. 10-1949490; A Chiller for Hydrogen Gas Chargers)

January 2016

Development and mass production of the SKID Chiller for the first time in Korea

(It is an energy-saving high-profit Chiller that profoundly solved the non-efficiency of dispersed installation of plant utilities and is still a profitable product of SAM JUNG ENC.) (Invention Patent No. 10-1589225; A SKID rapid chiller with the function of preventing dripping water)

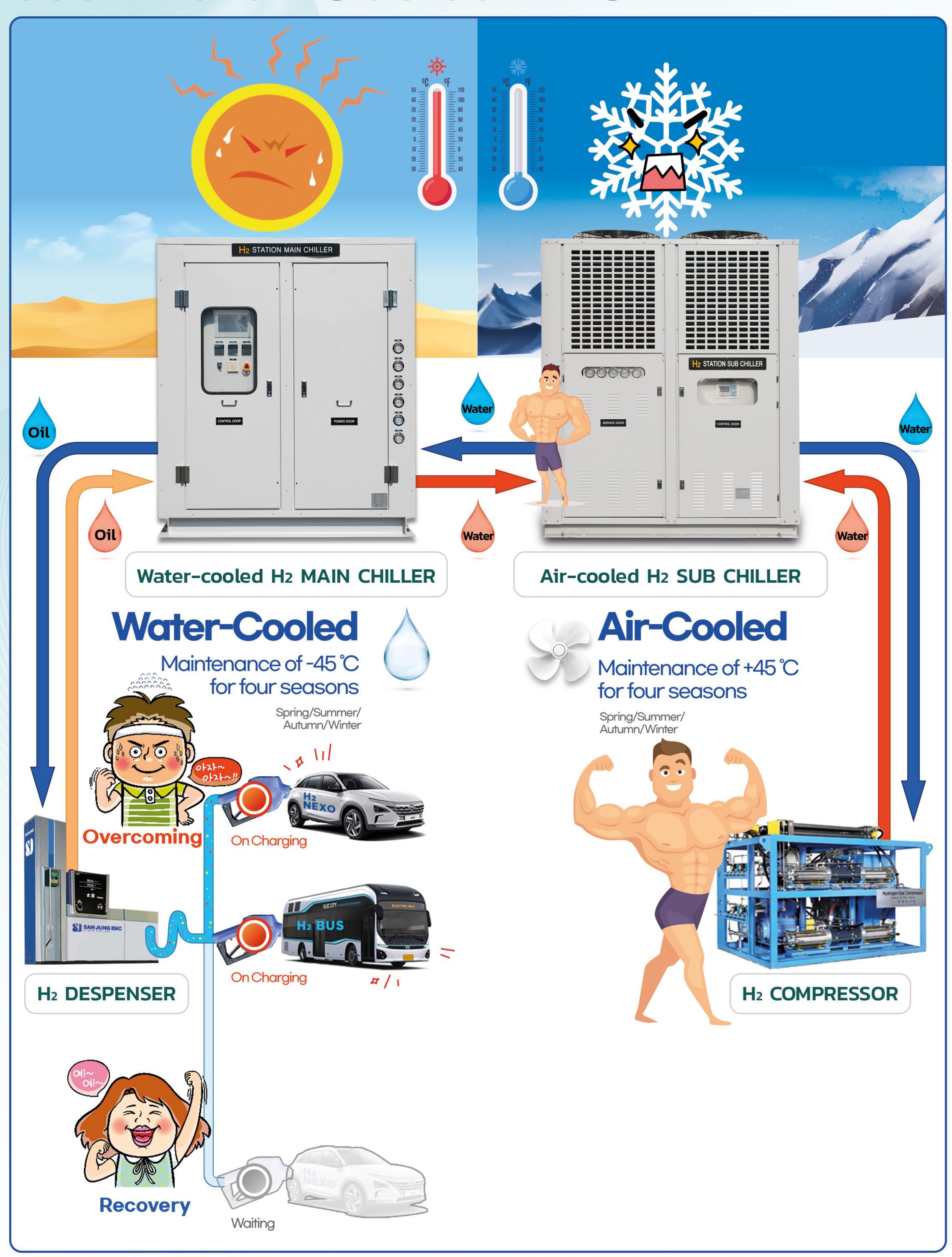
October 2005

Production and Delivery of the Polishing Chiller for the first time in Korea

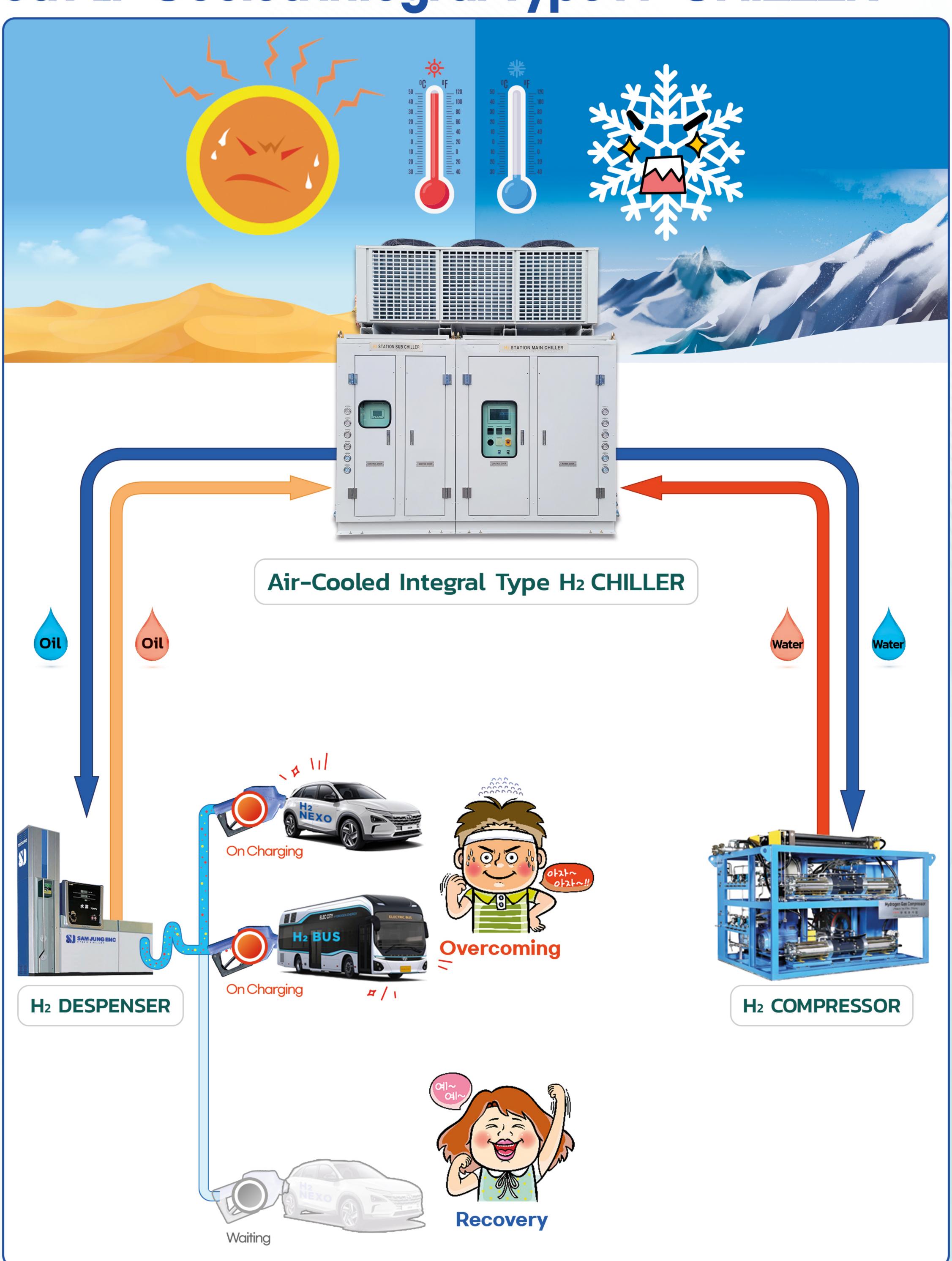
From the 1st to 3rd delivery to Samsung

(Korea's first Chiller permitted for use in the 10 CLASS cleanliness semiconductor clean room.)

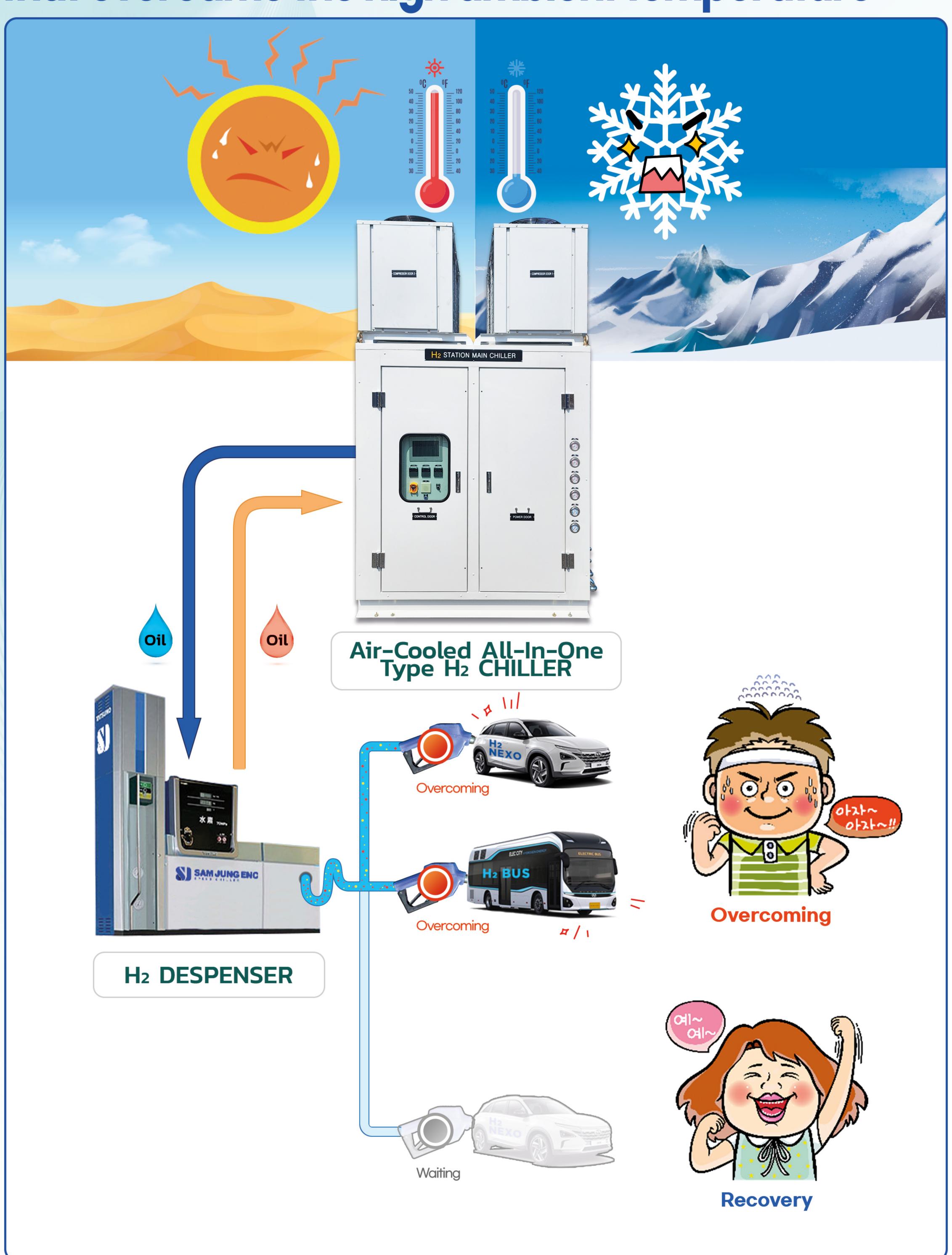
The Block Diagram of the GLOBAL best Water-Cooled H2 CHILLER



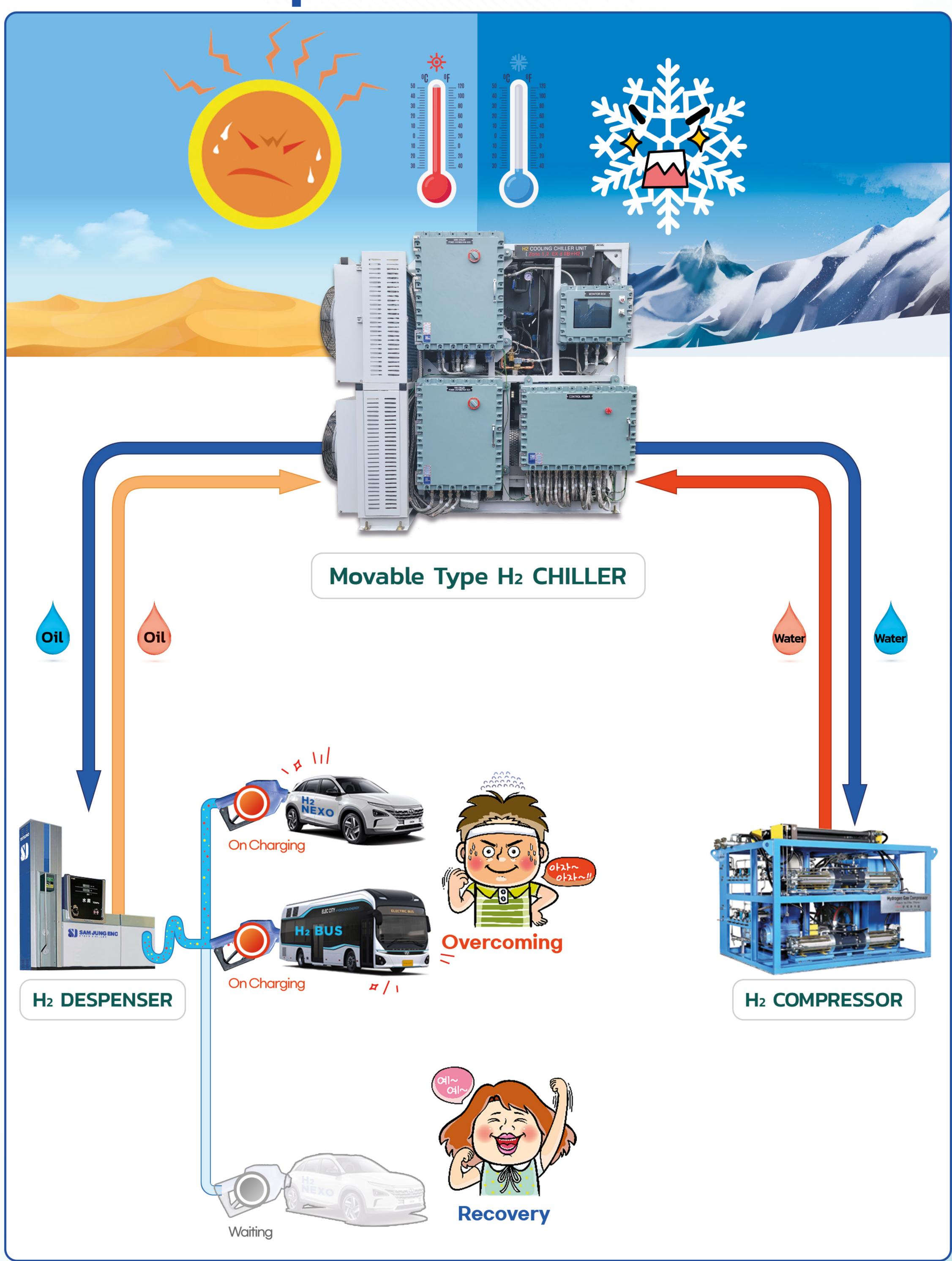
The Block Diagram of the customer-oriented Air-Cooled Integral Type H2 CHILLER



The block diagram of the All-in-One H2 CHILLER that overcame the high ambient temperature



The Block Diagram of the specialized Movable Explosion-Proof H2 CHILLER

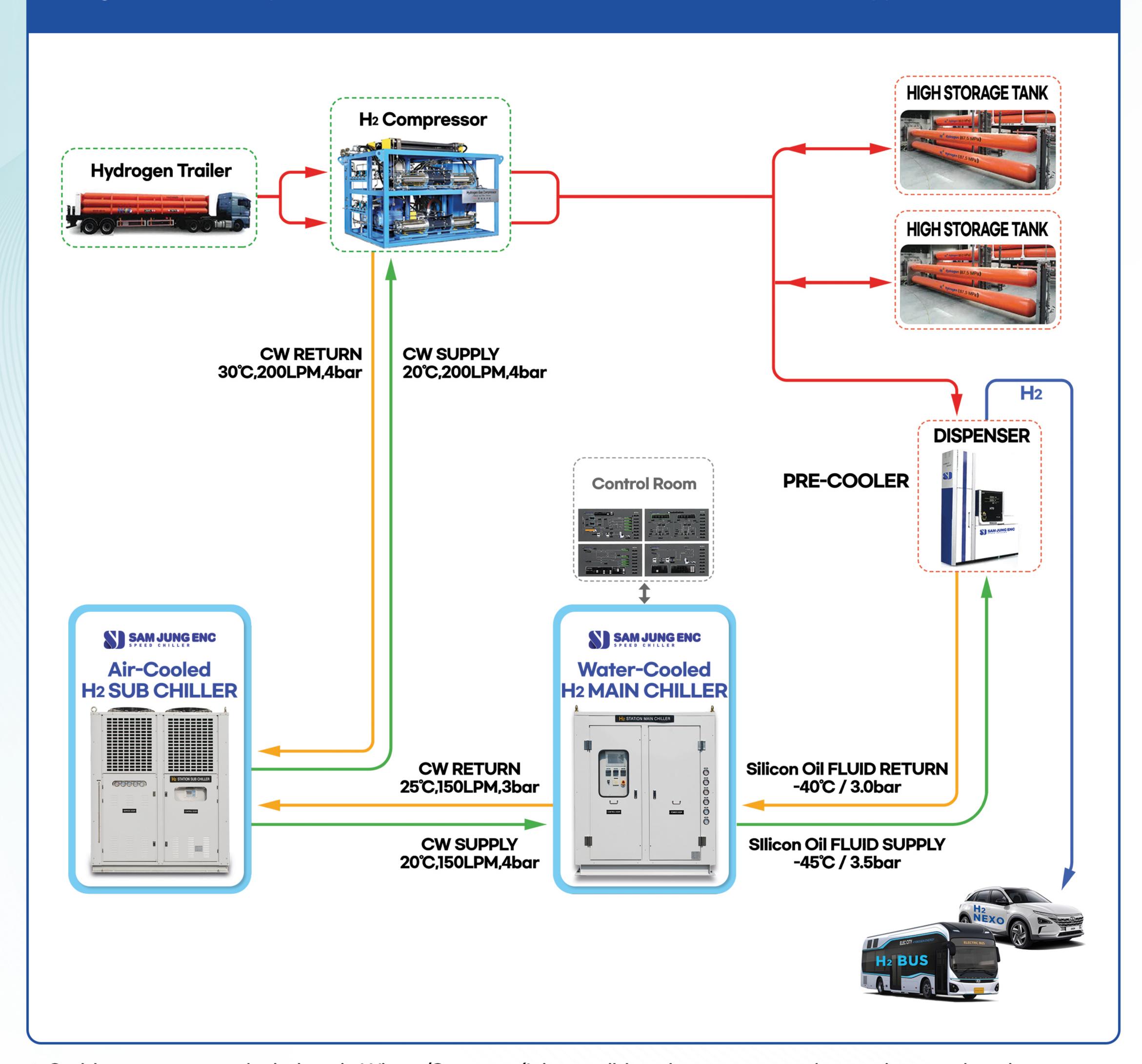


Composition of the cooling system for the Water-Cooled H2 CHILLER (The first cooling system composed in the world)

The Water-Cooled H2 CHILLER is a representative product operating commercially at over 130 Hydrogen Charging Stations in Korea.

As a product suitable for the GLOBAL climate properties, four seasons and tropical conditions, it cools the CONDENSER temperature of the refrigerant in the water-cooling method to achieve the ultimate freezing ability.

It is possible to use both the hydrogen compressor Cooling Water and the DISPENSER CHILLER Cooling Water. It is composed so that the MAIN CHILLER and SUB CHILLERS are supplied to 1 SYSTEM.



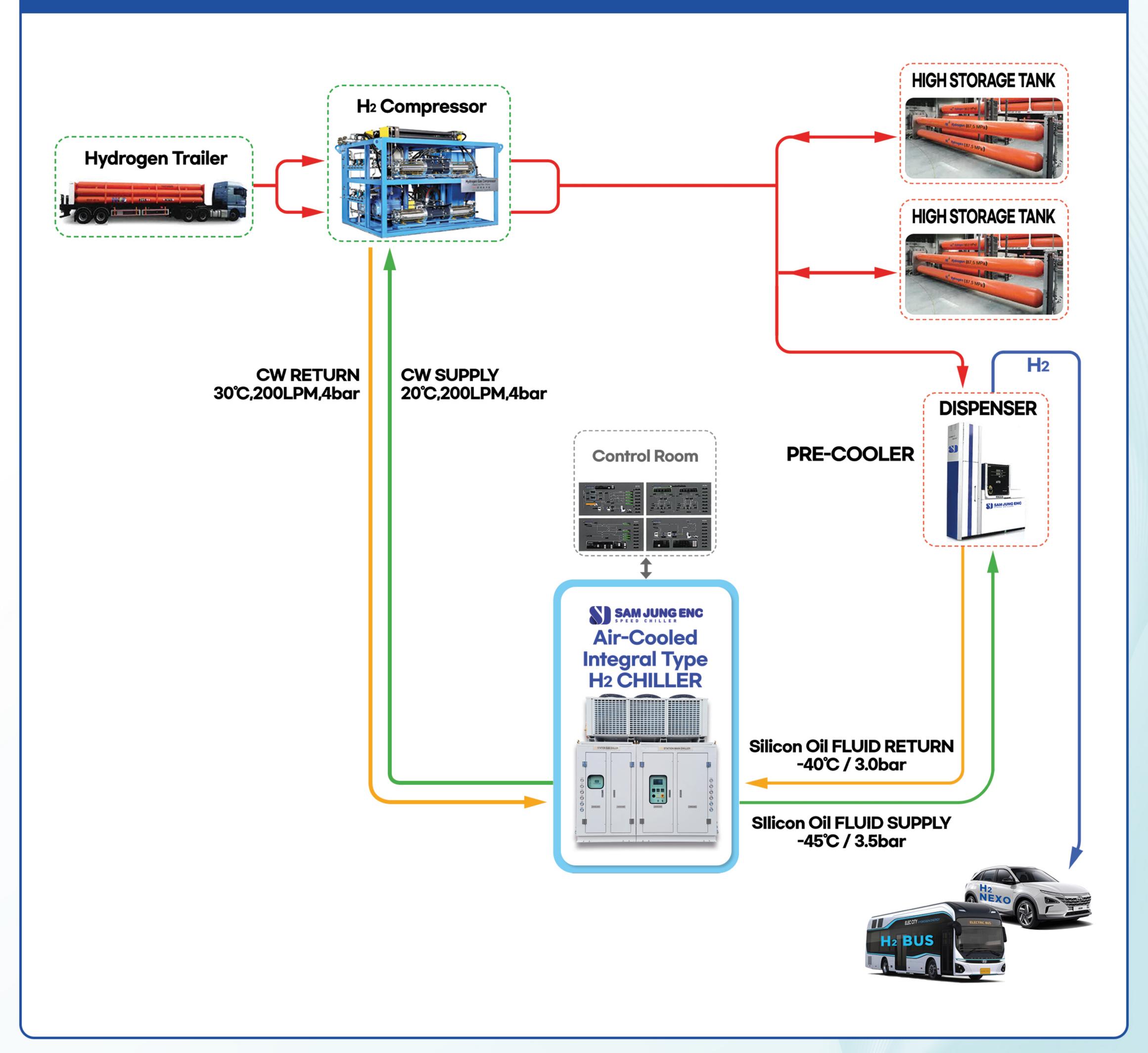
Stable temperature deviations in Winter/Summer. (It is possible to keep constant the continuous charging temperature of the H2 NEXO and H2 BUS regardless of the 365-day ambient temperature and the continuous charging load of the PRE COOLER.)

Composition of the cooling system for an Air-Cooled Integral Type H2 CHILLER (The first cooling system composed in the world)

The Air-Cooled Integral Type H2 CHILLER reduces the UTILITY area of a Hydrogen Charging Station and significantly simplifies the piping facility.

It is one of the products that provide various solutions for minimizing the area of a Hydrogen Charging Station and easy integrated control by using both the H2 COMPRESSOR cooling water and the DIS-PENSER CHILLER cooling water.

In particular, it is suitable for the GLOBAL climate properties, four seasons and tropical conditions.

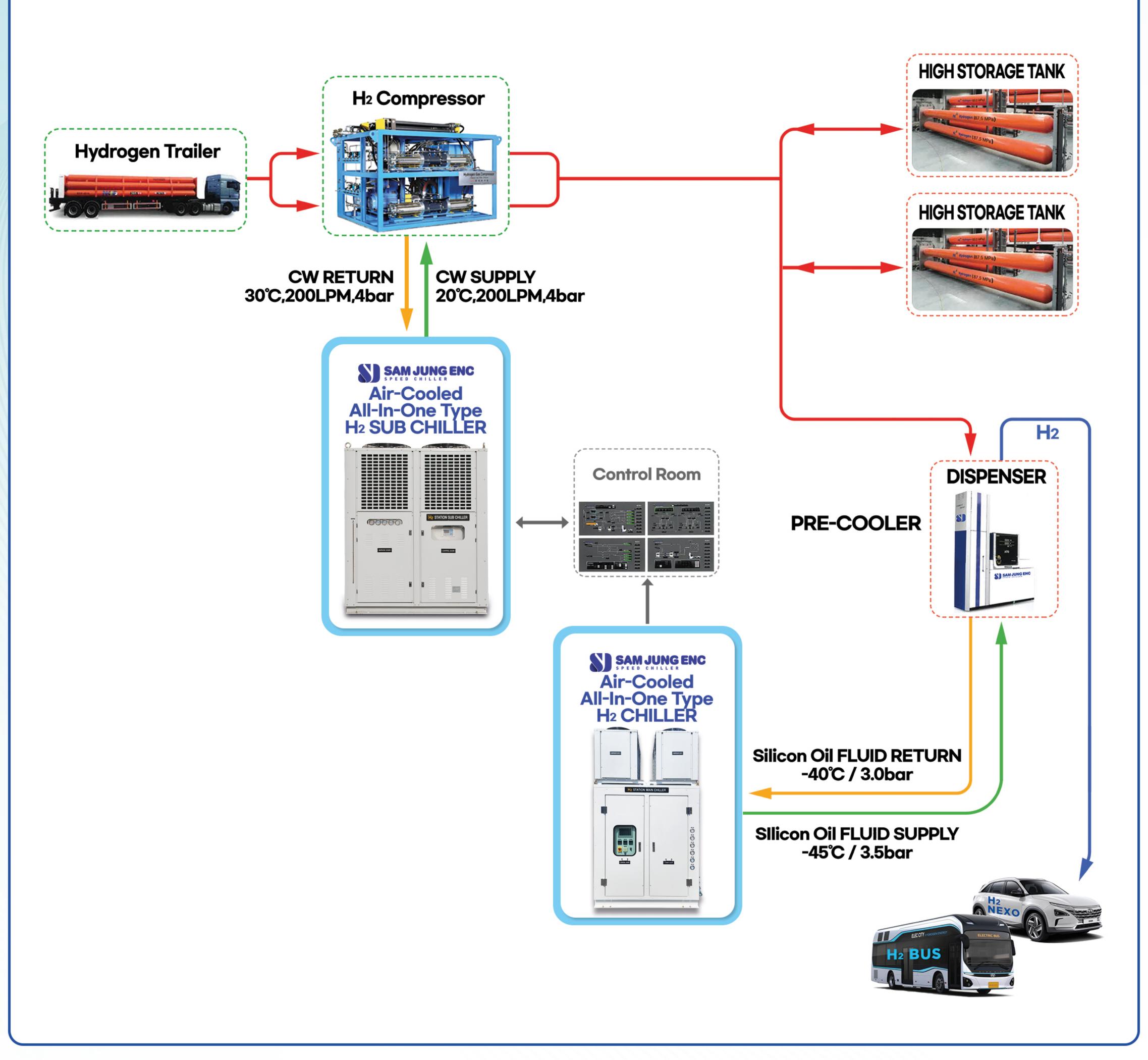


* Stable temperature deviations in Winter/Summer. (It is possible to keep constant the continuous charging temperature of the H2 NEXO and H2 BUS regardless of the 365-day ambient temperature and the continuous charging load of the PRE COOLER.)

Composition of the cooling system for an Air-Cooled All-in-One H2 CHILLER (The first cooling system composed in the world)

It is an H2 CHILLER type that provides high efficiency by cooling only the DISPENSER PCHE of a Hydrogen Charging Station.

The All-in-One H₂ CHILLER, which avoids the water-cooling, is a product with superb energy usability from choosing the Hydrogen Charging Station site. It is a significantly commercialized product that contributed to stabilizing a Hydrogen Charging Station through efficiency increase, decreased electric consumption, and reduced area. It is an All-in-One H₂ CHILLER for the next-generation hydrogen gas chargers that will play a prominent role in the carbon neutral effect.

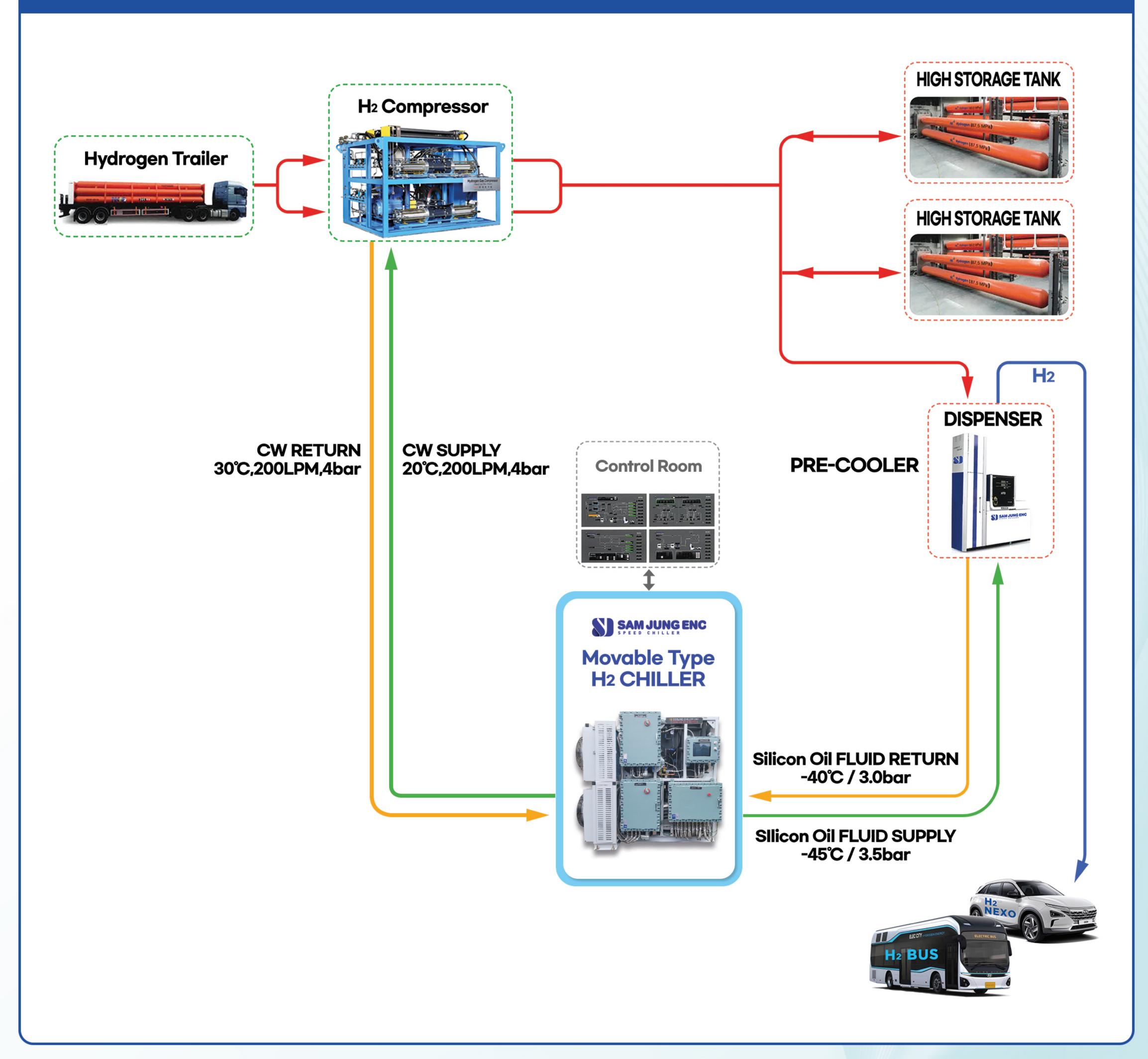


* Stable temperature deviations in Winter/Summer. (It is possible to keep constant the continuous charging temperature of the H2 NEXO and H2 BUS regardless of the 365-day ambient temperature and the continuous charging load of the PRE COOLER.)

Composition of the Movable Type H2 CHILLER System (The first cooling system composed in the world)

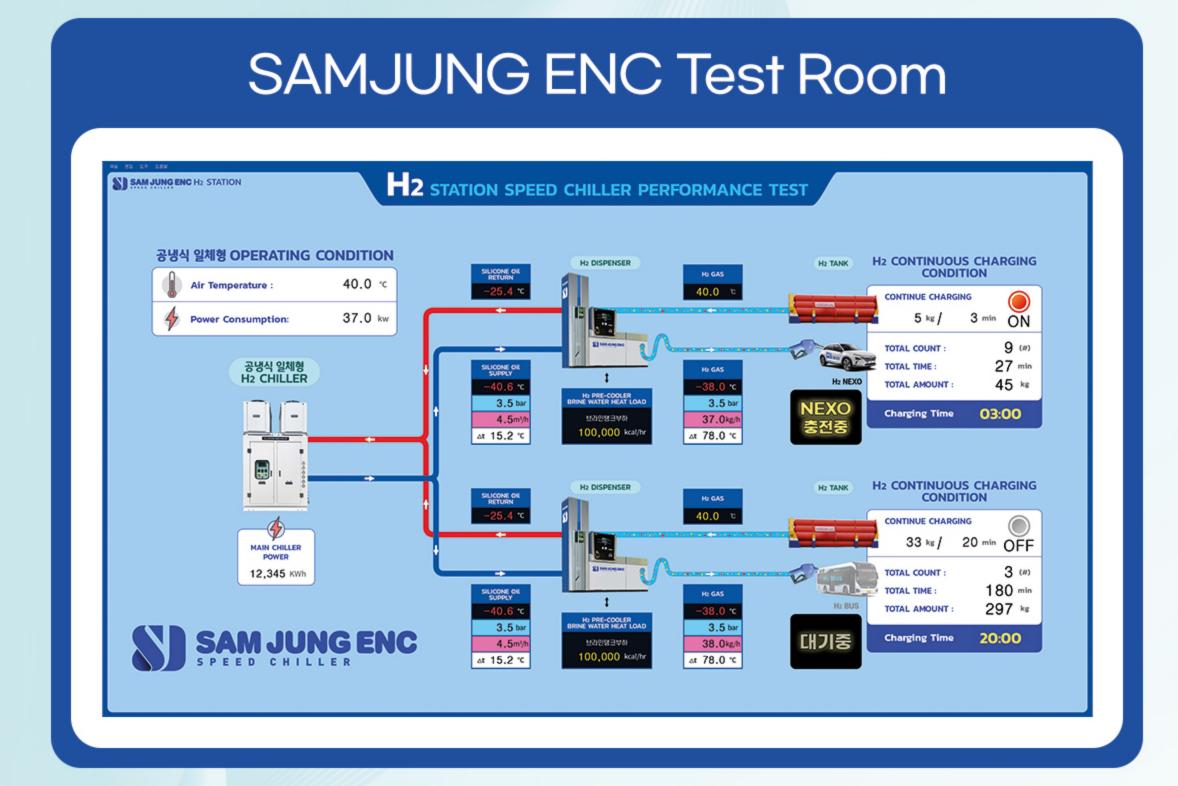
The Movable Explosion-Proof H2 CHILLER (Zone 1,2 EX d IIB+H2) is a product of technology requiring efficient operation and the highest level of safety.

The Movable Explosion-Proof H2 CHILLER is to be installed inside a movable vehicle trailer. It is a specialized H2 CHILLER, for the next-generation hydrogen gas chargers, with the explosion-proof rank, space-optimized design, high-efficiency performance, and durability design against vibration stress.



* Stable temperature deviations in Winter/Summer. (It is possible to keep constant the continuous charging temperature of the H2 NEXO and H2 BUS regardless of the 365-day ambient temperature and the continuous charging load of the PRE COOLER.)

H2 CHILLER BUS SYSTEM



SAMJUNG ENC Constructed the Hydrogen Charging CHILLER PERFORMANCE TEST facility for the first time globally and has been operating the facility since August 2018.

Observing, controlling, and manipulating accurately the whole procedure of overcoming the charging load of the H2 NEXO and H2 BUS and recovering, SAMJUNG ENC made, supplied, and mass-produced the Hydrogen Charging CHILLERS, which maintain the highest condition.

Making a practical H₂ BUS charging TEST at the West-Busan NK Charging Station in August 2019, SAMJUNG ENC succeeded up to the limit of the CHILLER function, perfectly overcoming the long-hours charging load.



Seosan, Asan, Seongju, Daejeon, Cheonan City

Succeeding in charging H2 BUSES and NEXO Vehicles using the DISPENSER at the Seosan Charging Station, Asan Charging Station, Seongju Charging Station, Daejeon Charging Station, and Cheonan City Hall Charging Station, SAM JUNG ENC made the first accomplishment of Korea's commercial operation of Hydrogen Charging Stations by showing the effective charging capacity and overcoming perfectly the charging load of the H2 CHILLER.

The SAM JUNG ENC H2 CHILLER succeeded in **charging 12 H2 NEXO vehicles and 3 BUSES** consecutively and in commercial operation, possessing the GLOBAL best technology and performance.

State of SAMJUNG ENC's supply of the Hydrogen Charging Chillers

Winning orders/Supplies to over 130 Charging Stations nationwide

Metropolitan area (Seoul, Gyeonggi, Incheon)

- · Goyang Wondang Fueling Station · Gwangmyeong Fueling Station
- · Guri Topyeong Fueling Station
- · Gimpo Fueling Station
- · Namyangju Fueling Station
- · Balan Fueling Station
- Bucheon City Fueling Station · Seongnam Fueling Station
- · Suwon (Gwanggyo) Service Area
- · Suwon Tapdong Fueling Station
- · Ansan Sangrok Fueling Station
- Ansan Fueling Station
- · Anseongmatchum Service Area
- · Anseong Fueling Station
- Anseong Service Area
- · Yeoju Service Area
- · Paju Munbal Fueling Station
- · Pyeongtaek Fueling Station
- Pyeongtaekhang Fueling Station-1
- · Pyeongtaekhang Fueling Station-2 Pyeongtaekhang Fueling Station-3
- · Hanam Dream Service Area
- · Hwasung Fueling Station

- · Gangseo Bus Fueling Station-1
- · Gangseo Bus Fueling Station-2
- Gangseo Bus Fueling Station-3
- · Seosomun Service Area
- · Seoul Magok Fueling Station
- · Seoul Ogok Fueling Station
- · Seocho Bangbae Fueling Station
- Jingwan Fueling Station-1
- · Jingwan Fueling Station-2
- · Jingwan Fueling Station-3
- · GukhoeUisadang Fueling Station · Gangnam Segok Fueling Station
- Cheonghwa Dobong Fueling Station
- · Incheon Gyeyang Fueling Station
- · Incheon Seogu(Yeonhui) Fueling Station
- · Incheon Seogu Fueling Station
- · Incheon Songdo Fueling Station
- · Pyeongtaek Wolgok Fueling Station-1 · Incheon Oryu Fueling Station
- · Pyeongtaek Wolgok Fueling Station-2 · Incheon Junggu Fueling Station
 - · IncheonTechnopark Fueling Station
 - Incheonhang Fueling Station-1

· Daejeon Jeonjugi

- · Incheonhang Fueling Station-2
- · Incheonhang Fueling Station-3
- · Hyundai Steel Incheon Fueling Station-1
- · Hyundai Steel Incheon Fueling Station-2

· Daejeon Nangwol Fueling Station-1

· Daejeon Nangwol Fueling Station-2

Daejeon Jungchon Fueling Station

· Daejeon Fueling Station-1

· Daejeon Fueling Station-2

· Daejeon Fueling Station-3

Boryeong Fueling Station-1

· Chungju Fueling Station-1

· Chungju Fueling Station-2

· Chungju Fueling Station-3

· Daejeon Hakha Fueling Station

Boryeong Fueling Station-3

S.

B

Chungcheongdo (Chungcheongbukdo, Chungcheongnamdo, Daejeon)

- · Institute for Advanced Engineering
- · Goesan Fueling Station · Naepo Fueling Station
- Dangjin Fueling Station
- · Eumseong Fueling Station
- · Jugam Service Area-1
- · Jugam Service Area-2 · Jincheon Fueling Station
- · Cheonan Fueling Station-1
- · Cheonan Fueling Station-2
- · Cheongju Expressway Service Area
- · Chungnam Techno Park(Seosan)-1
- · Chungnam Techno Park(Seosan)-2
- · Chungnam Techno Park(Asan)-1
- · Chungnam Techno Park(Asan)-2
 - Jeollado
 - (Jeollabukdo, Jeollanamdo, Gwangju)
 - · Goheung Fueling Station
 - · Gwangyang Fueling Station
 - · Gwangju Fueling Station -1
 - · Gwangju Fueling Station -2
 - · Gunsan Fueling Station
 - · Deogyusan Fueling Station
 - · Mokpo Fueling Station

 - · Buan Gomso Fueling Station

 - · Buan Fueling Station-1
 - · Buan Fueling Station-2
- · Osu Fueling Station
- Iksan Fueling Station
- JangdeungDong Fueling Station-1
- · JangdeungDong Fueling Station-2
- · Jangheung Fueling Station
- Jeonju Songcheon Fueling Station
- · Jeonju Fueling Station-1 · Jeonju Fueling Station-2
- Jeonju Fueling Station-3

Gangwondo

- · Daegwallyeong Fueling Station
- · Donghae Fueling Station

· Wonju Fueling Station

- · Chooncheon Fueling Station-1
- · Chooncheon Fueling Station -2

Gyeongsangdo

00

- · Gyeongsan Fueling Station · East Busan Fueling Station -1
- · East Busan Fueling Station -2
- · East Busan Fueling Station -3
- · West Busan NK Fueling Station
- · Yangsan Fueling Station
- · Ulsan APK Fueling Station
- · Ulsan Maeam-dong Fueling Station
- · Ulsan Changpyeong Fueling Station · Chilgok Fueling Station
- · Jinju Fueling Station
- · Ulsan Hyundai Motors, NEXO LINE -1 · Ulsan Hyundai Motors, NEXO LINE -2
- Korea Automotive Technology Institute(Changwon) -1
- · Korea Automotive Technology Institute(Changwon) -2
- · Korea Automotive Technology Institute(Changwon) -3
- · Korea Automotive Technology Institute(Changwon) -4 · Institute of Daegu Intelligent Auto Parts

(As of April 2022)

· Changwon Fueling Station -1

· Changwon Fueling Station -2

· Haman Service Area

· Daegu Fueling Station -1

Daegu Fueling Station -2

· Daegu Fueling Station -3

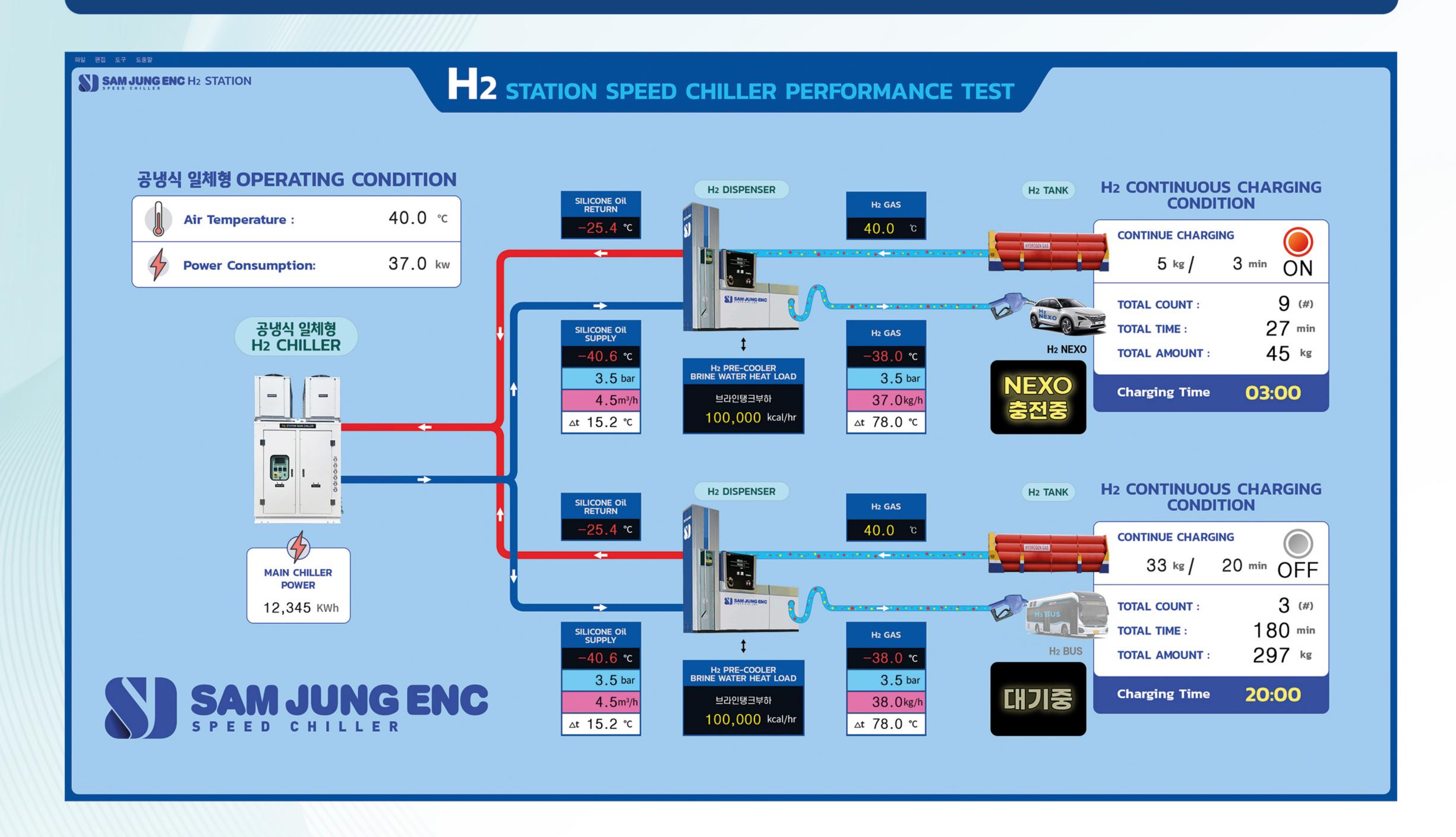
· Daechon Fueling Station

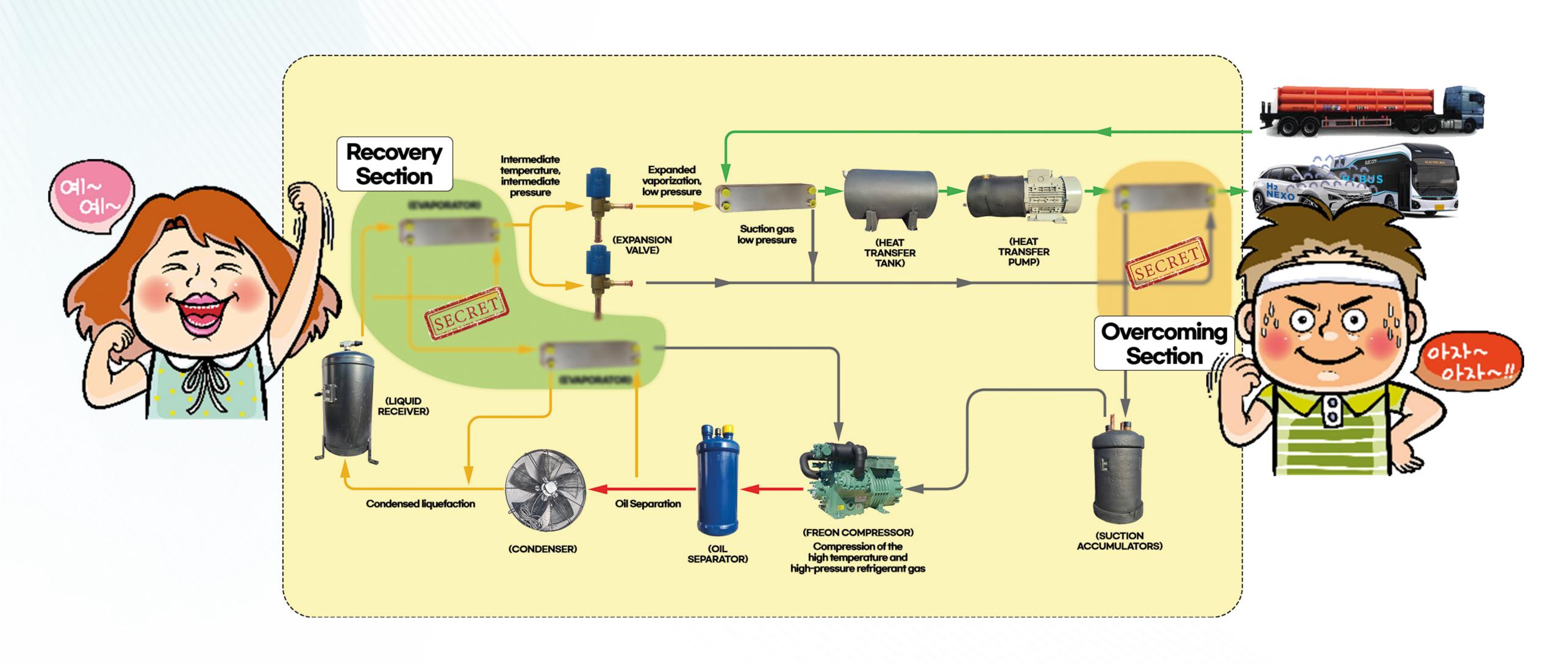
· Seongju Fueling Station

H2 STATION NEXO + BUS

(H2 CHILLER efficiency demonstration video)

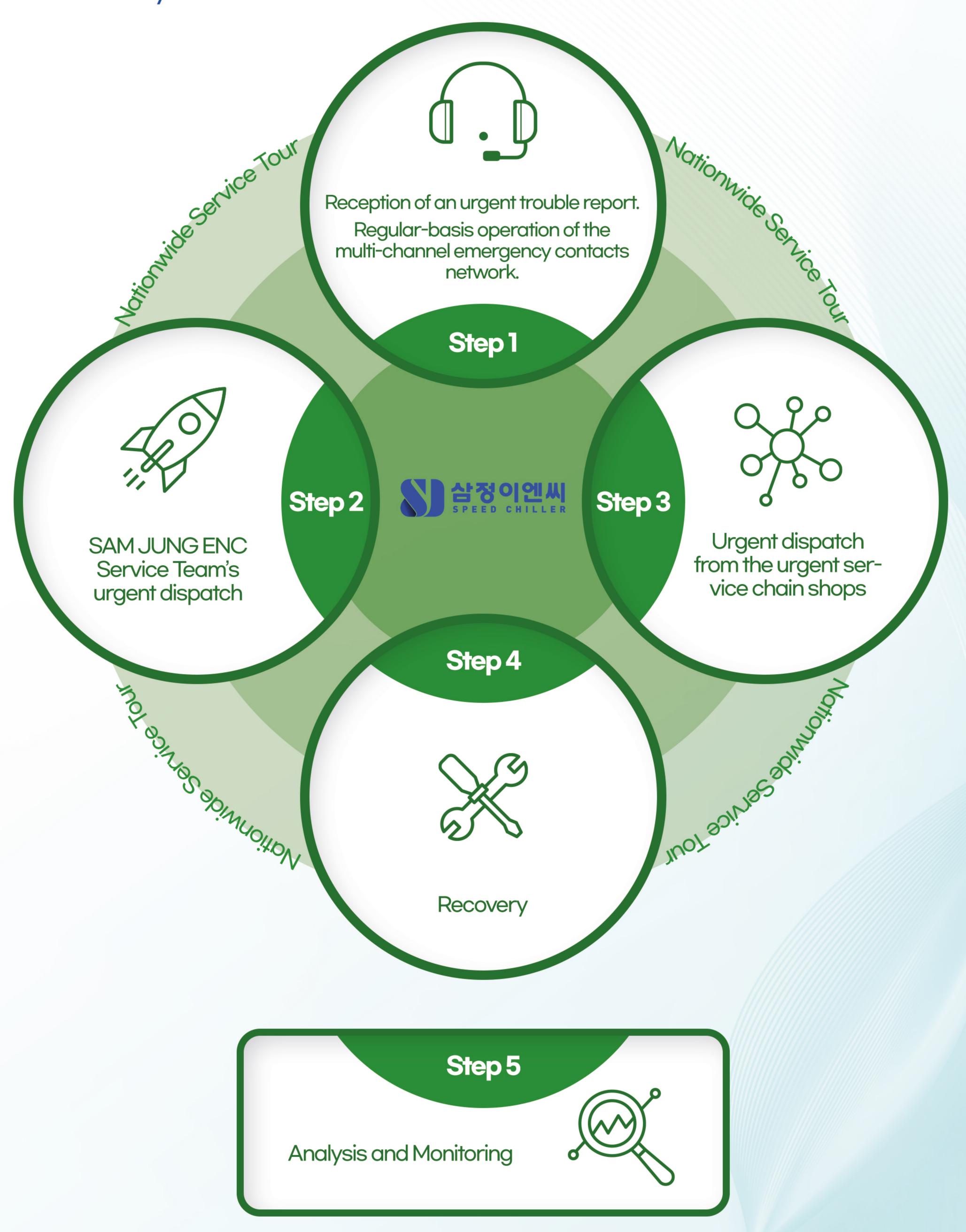
Development of the CLOBAL best Hydrogen Charging CHILLER load measuring equipment





Overview of the SAM JUNG ENC Services

The service system is constructed under the principle of urgently treating the trouble of a Charging Station through the TWO TRACK operation of the urgent dispatch system of the Customer Support Service Team and the dispatch system of the nationwide SAMJUNG ENC's service-chain shops, from the initial measures, when the service necessity occurs.



Cases of installing the H₂ CHILLER at the Charging Stations



APK Fueling Station



Goesan Fueling Station



Dangjin Fueling Station



Seosan Fueling Station



Suwon Gwanggyo Fueling Station



Sintanjin Fueling Station



Asan Chosa Fueling Station



Ansan eroum Fueling Station



Anseong Fueling Station



Anseong Service Area



Ulsan Hyundai Motors Fueling Station



Eumseong Fueling Station



Incheon Seo-gu Fueling Station



Incheon Jung-gu Fueling Station



Jeonbuk Iksan Fueling Station



Chooncheon Fueling Station

Cases of installing the H2 CHILLER at the Charging Stations



Daegwallyeong Fueling Station



Daegu Gwaneum Fueling Station



Gunsan Jigok Fueling Station



Changwon Sarim Fueling Station



Gwangju Wolchul Fueling Station



Ulsan Changpyeong Fueling Station



Chungju Bio Fueling Station



Jeonju Samcheon Fueling Station



Seoul Ogok Fueling Station



Osu Service Area



Deogyusan Service Area



Daejeon NangWol Fueling Station



Gwangju Fueling Station



Wonju Fueling Station



Magok Fueling Station



Daejeon Sindae Fueling Station

Theory and Site Education for the H2 CHILLER





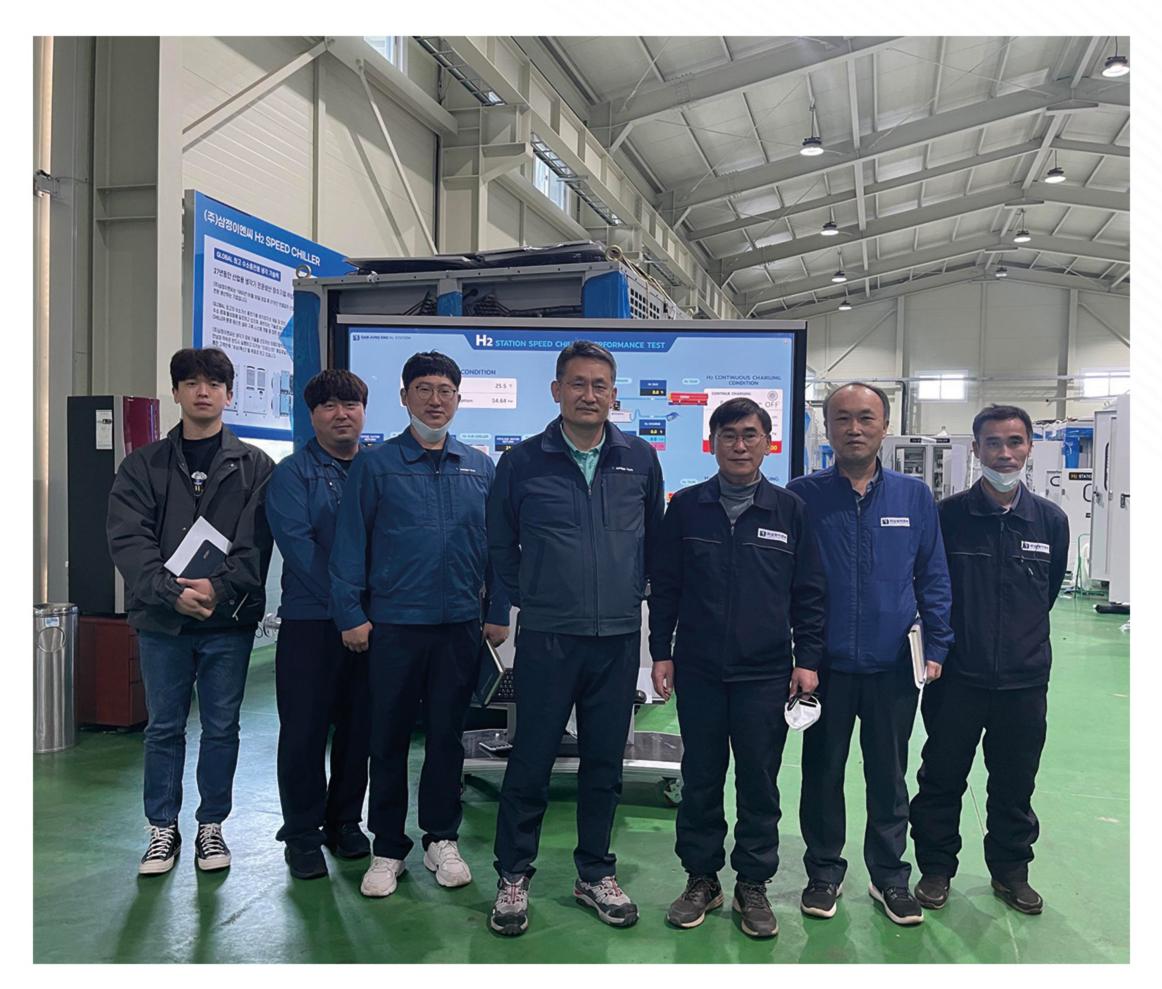








H2 CHILLER demonstration





내화,가스)분야 공동 협력을 위한 업무 I

상광회의소 (주)아이에스티이 (F) (주)아이에스티이

)6. 29(수) AM 9:30 주관: 화성상공회의소 장소: 화성상공회의소









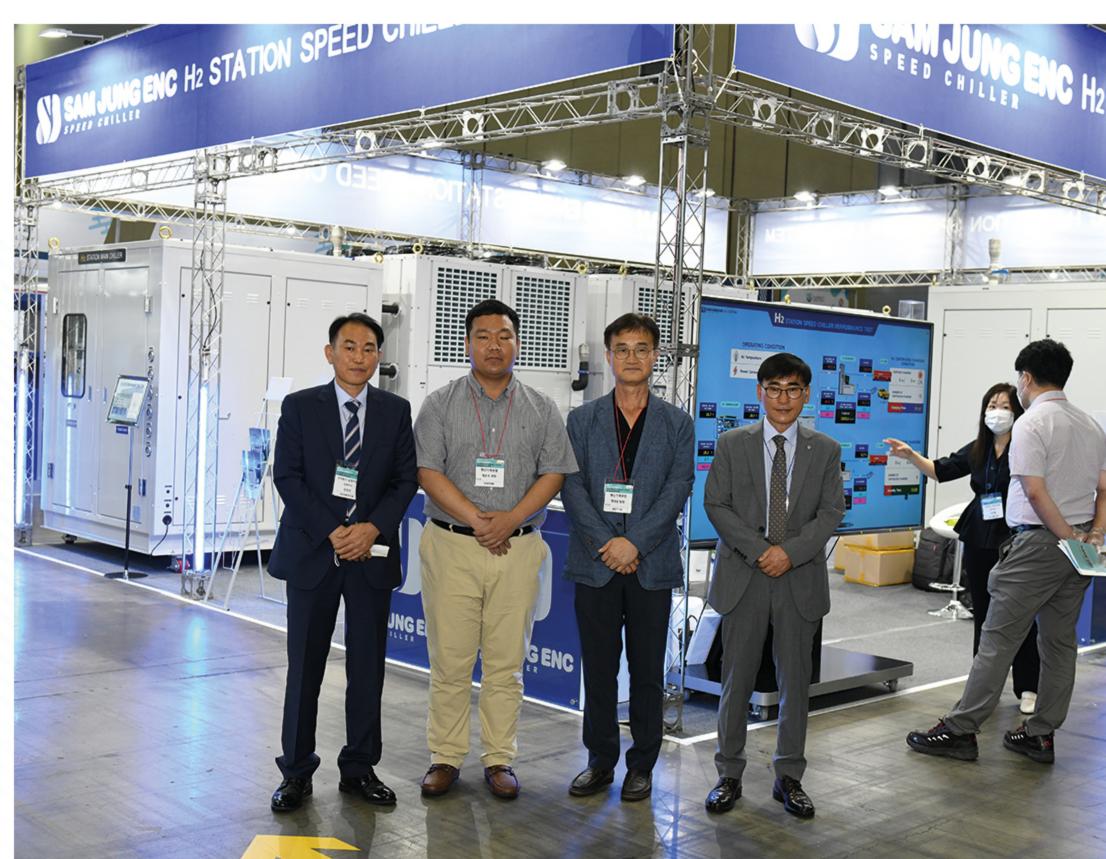
2020 Exhibition. Awards











2021 Exhibition. Awards











H₂ STORY



In celebration of the completed verification of delivery and operation



2021 H2 Mobility + Energy Show (with the member of the National Assembly, Jung Tae-Ho)



2021 H2 Mobility + Energy Show, the introduction of the H2 CHILLER



Hydrogen Charging Station Operator Education



SAMJUNG ENC Technology Institute



The ceremony of the Patent Technology Awards by the Korean Intellectual Property Office



The 7th Nationwide Hydrogen Charging Stations Free-Checkup Tour Kickoff Ceremony



The company, developing along with customers

We play a key role to develop domestic industry and to improve the productivity of your company by satisfying various specifications for all kinds of industrial equipments required by information oriented and digital industry in this rapidly changing twenty-first century, domestically producing various freezing equipments, that were mostly depend on import, with our own technique, and improving them as the best products group.

SAMJUNG ENC promises to grow into a Chiller specialized company performing technology innovations and fulfilling social responsibilities.





Headquarter / R&D Center (Gyungin branch, Factory 1, Factory 2) Address: 73, Jeongoksandan 8-gil, Seosin-myeon, Hwaseong-si, Gyeonggi-do

> Phone: +82-31-358-3338 FAX: +82-31-355-9039 WWW.SPEEDCHILLER.COM

