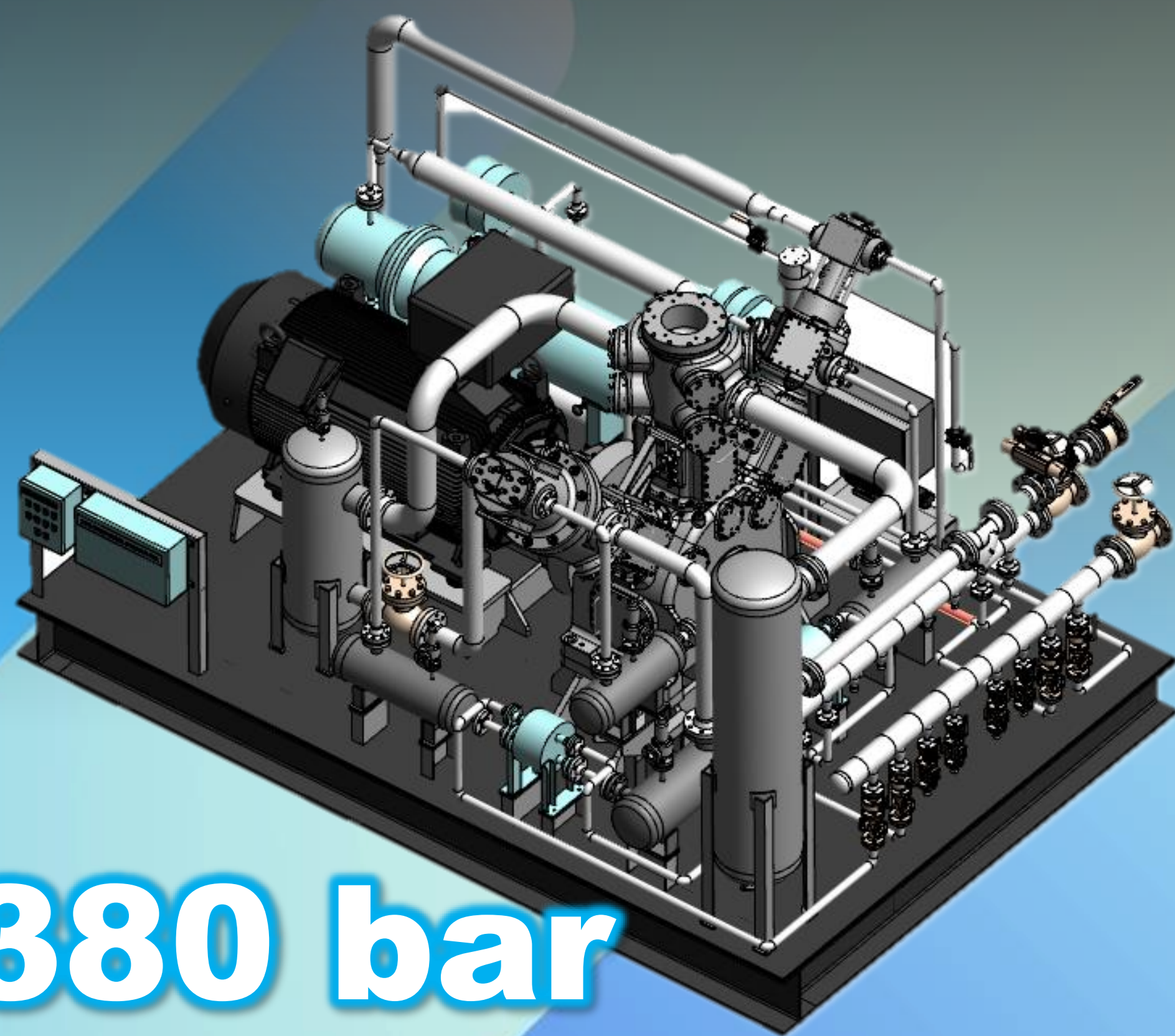
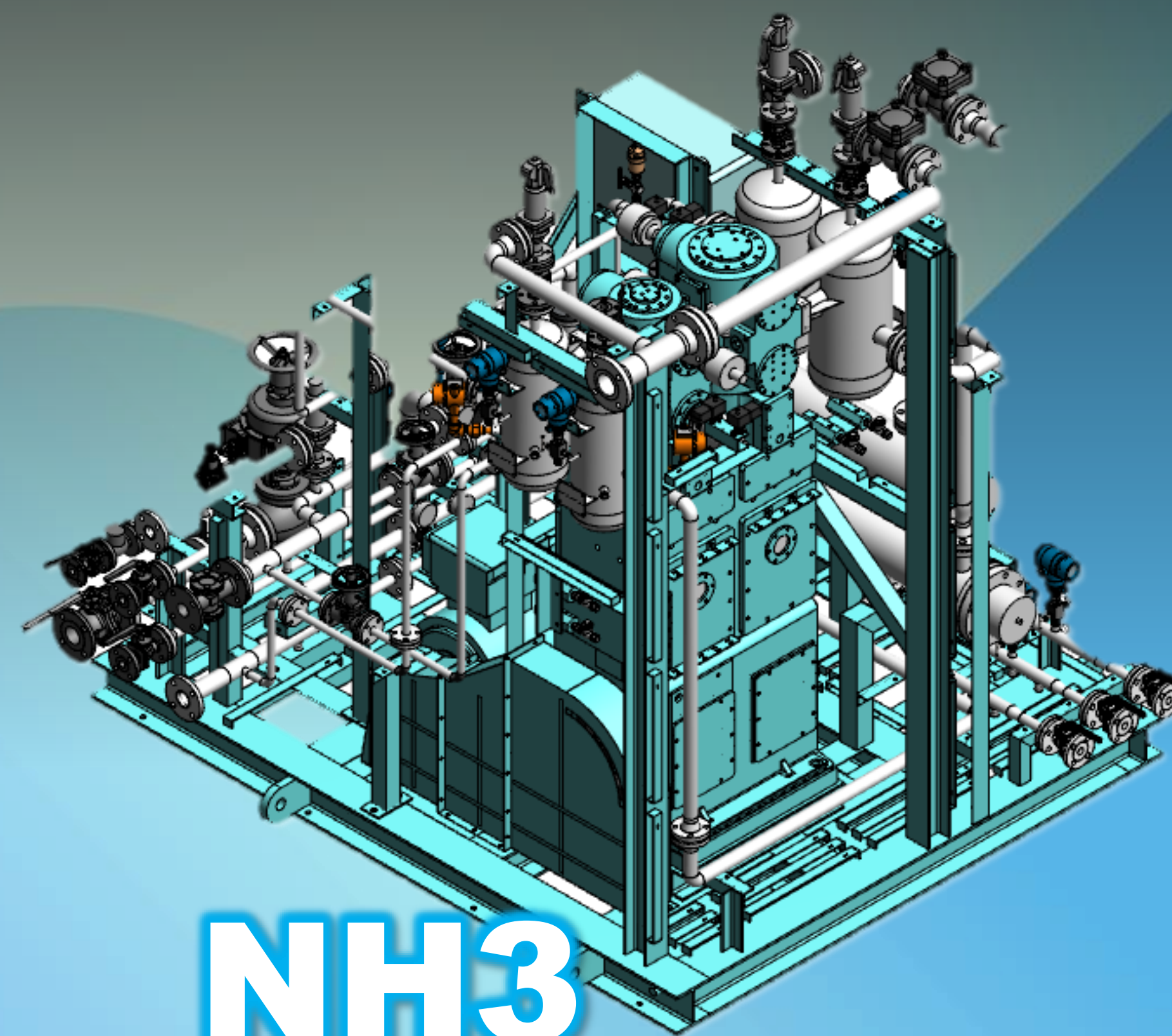


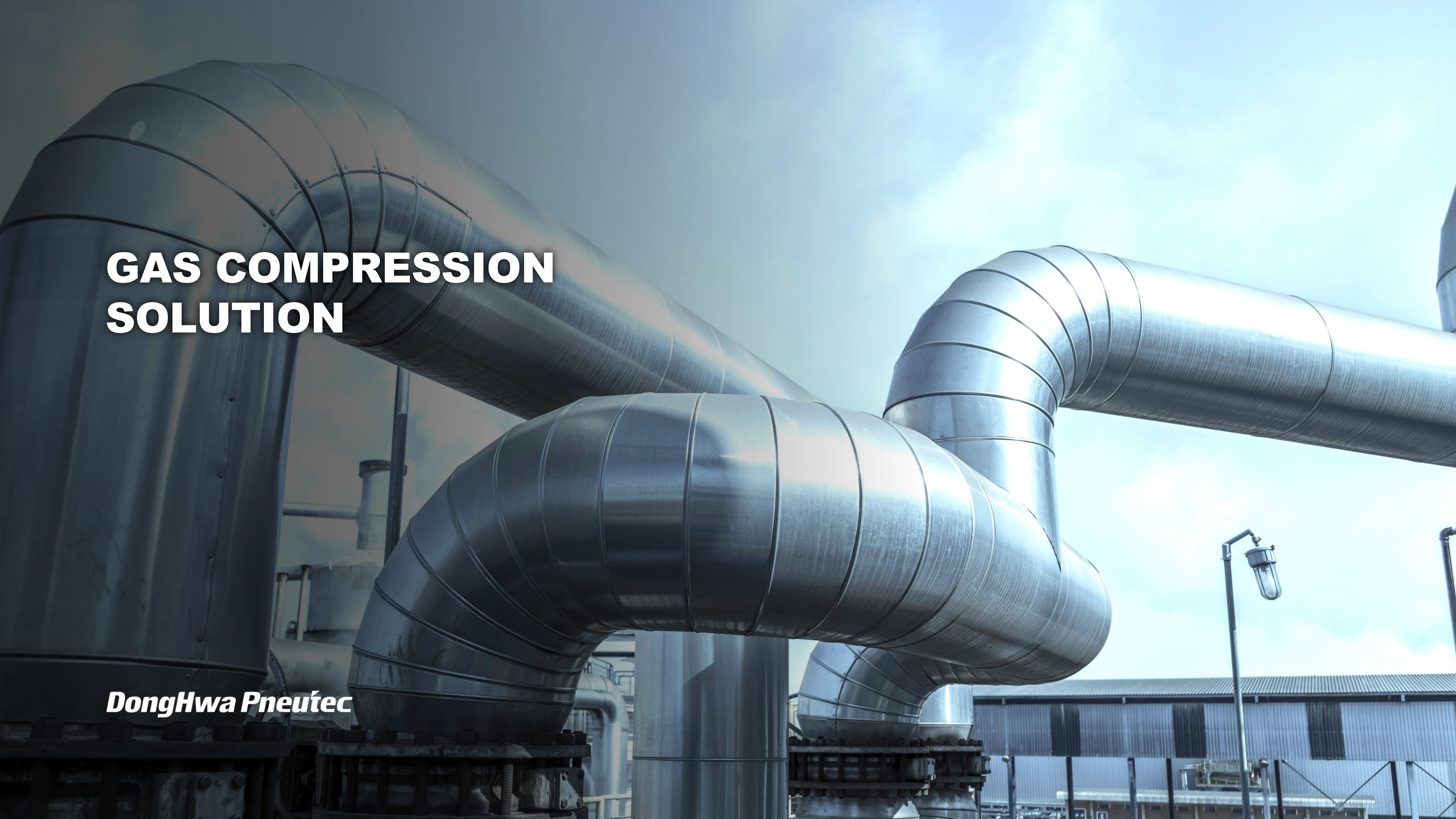
Compressor Skid



380 bar



NH3

A low-angle, close-up shot of a complex industrial gas compression system. The image features several large, dark-colored pipes with prominent circumferential welds, curving and connecting various pieces of machinery. The background shows a clear blue sky with light clouds and a portion of a large industrial building with a corrugated metal roof. A tall, thin light pole with a single lamp is visible on the right side. The overall scene conveys a sense of heavy industrial engineering and infrastructure.

GAS COMPRESSION SOLUTION

DongHwa Pneutec

ABOUT US

ESTABLISHMENT | 1974

PRODUCTION LOCATION | REPUBLIC OF KOREA

MARKET AREA | MARINE, INDUSTRIAL FIELD

PRODUCT |

RECIPROCATING GAS & AIR COMPRESSOR (OIL FREE / OIL INJECTION)

SCREW GAS & AIR COMPRESSOR (OIL FREE / OIL INJECTION)



COMPANY HISTORY

1974

Start as
Jonghap
Maritime

1984

first marine
compressor
commissioning

2007

changed to
DongHwa
Pneutec

2015

1st BOG
Compressor
Delivered
(Kangnam SY)

2022

Supplied onshore
N2 system
(ILIJAN project)

2023

- 100th
BOG unit shipped
- 1st NH3
compressor
delivered

2024

Supplied NH3
refrigerant
compressor

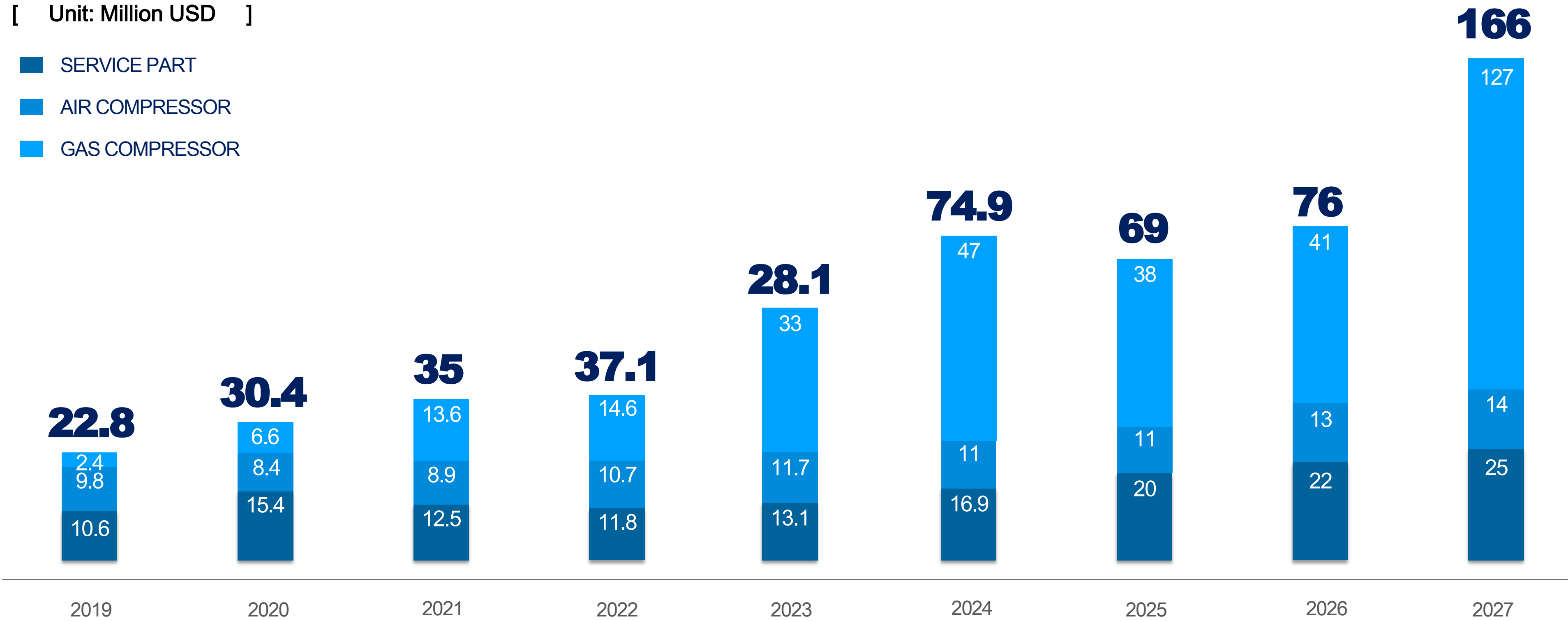
2025

- MSO
Compressor
received order
(LNG Terminal)
- Start HP
Compressor
development

SALES AMOUNT

[Unit: Million USD]

- SERVICE PART
- AIR COMPRESSOR
- GAS COMPRESSOR



250 +
OIL INJECTION SCREW UNITS
SHIPPED BY 2024



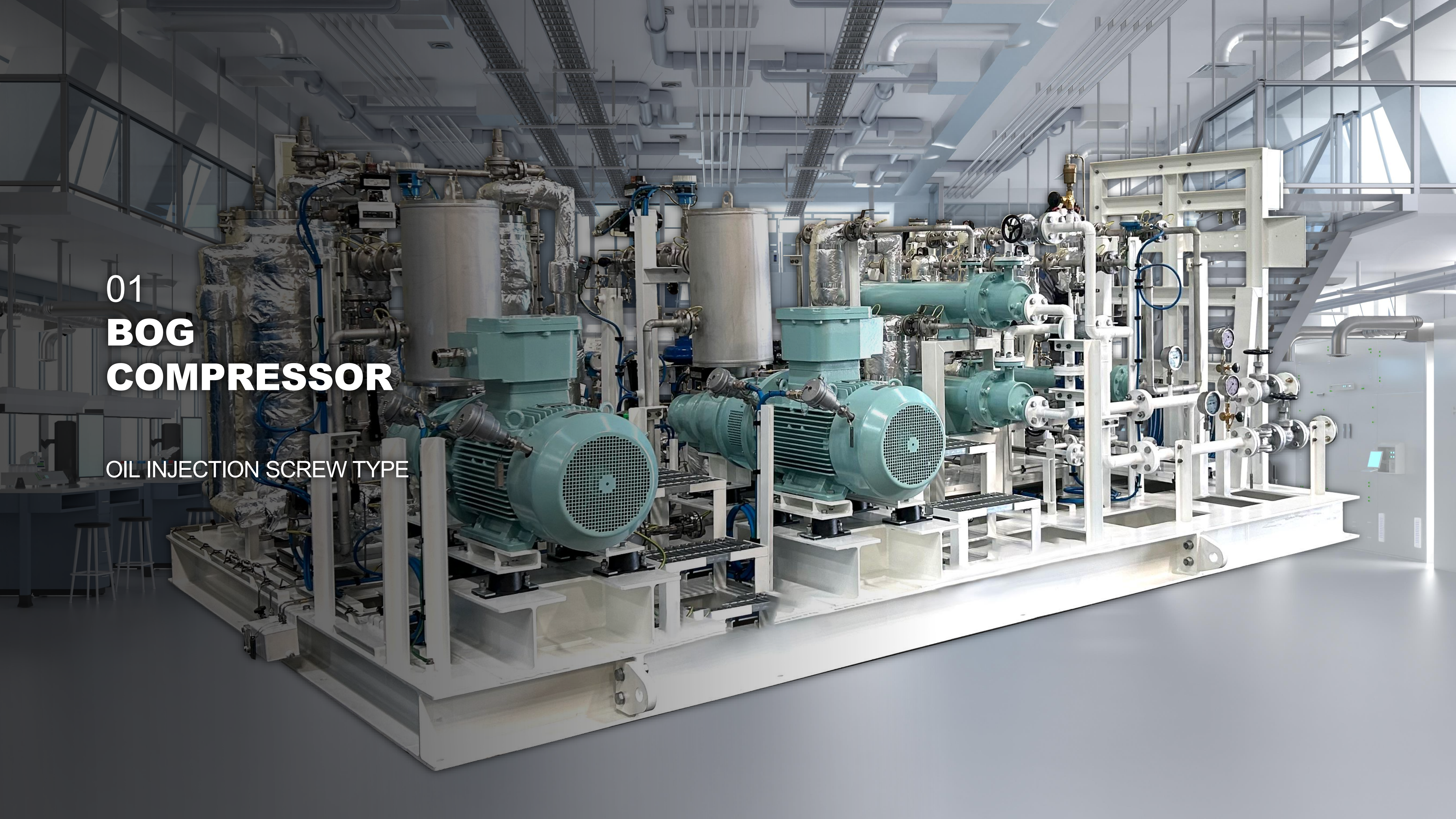
120 +
EMPLOYEES



50 +
YEARS EXPERIENCE

01
**BOG
COMPRESSOR**

OIL INJECTION SCREW TYPE



- ✓ **LOW OPEX, CPAEX**
- ✓ **EASY TO OPERATE**
- ✓ **EXTREMELY DURABLE & ROBUST**

COMPRESSOR TYPE		Oil Injection Screw With Filtering System
CAPACITY		Max. 10,000 kg/h
DISCHARGE PRESSURE		Max. 52 Bar g
APPLICABLE FLUID		CH4, NH3, CO2, etc.,
SUCTION TEMPERATURE		-40°C ~ +50°C

CAPACITY CONTROL METHOD

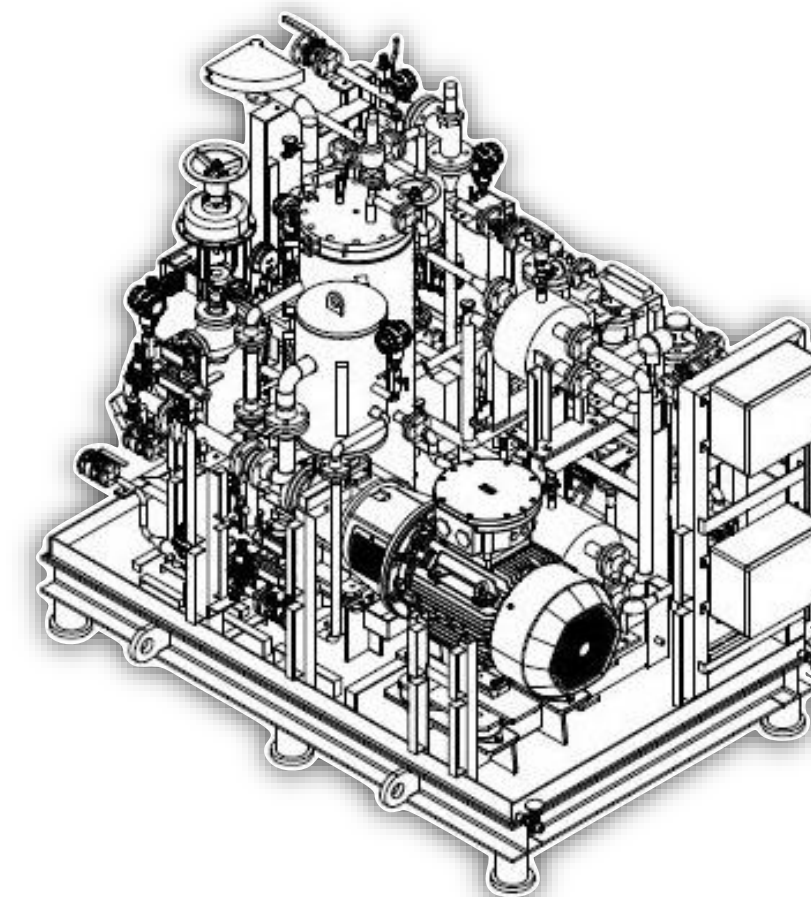
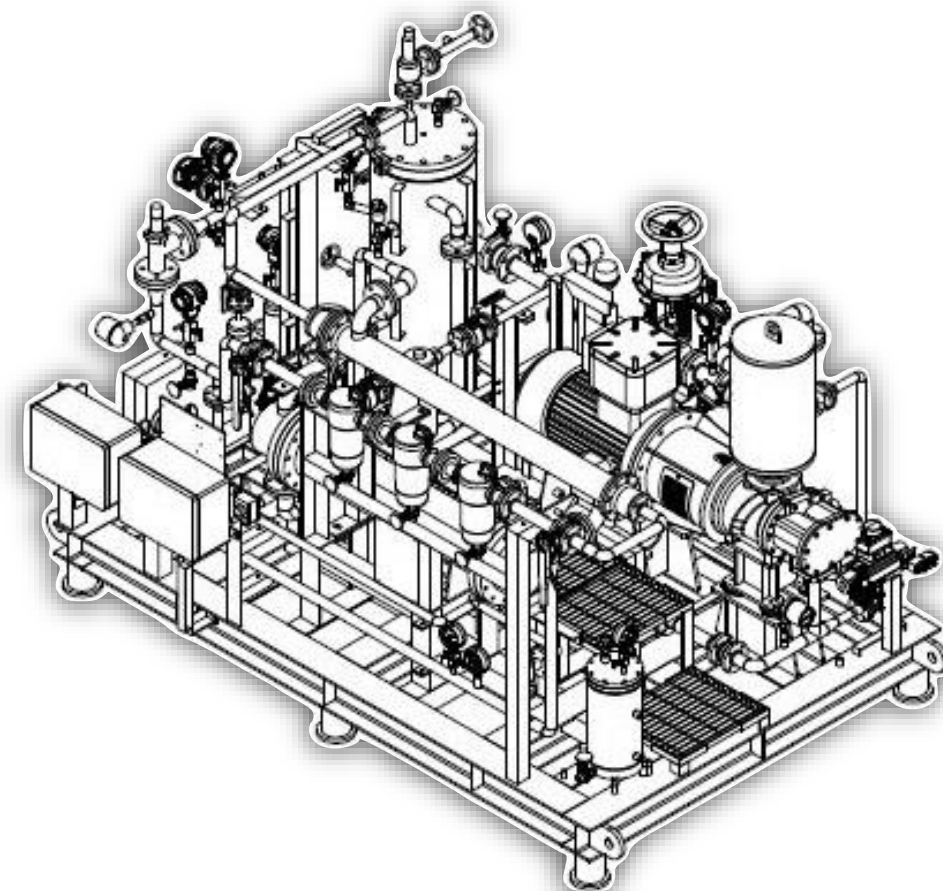
TURN DOWN RATIO :
0 - 100 %

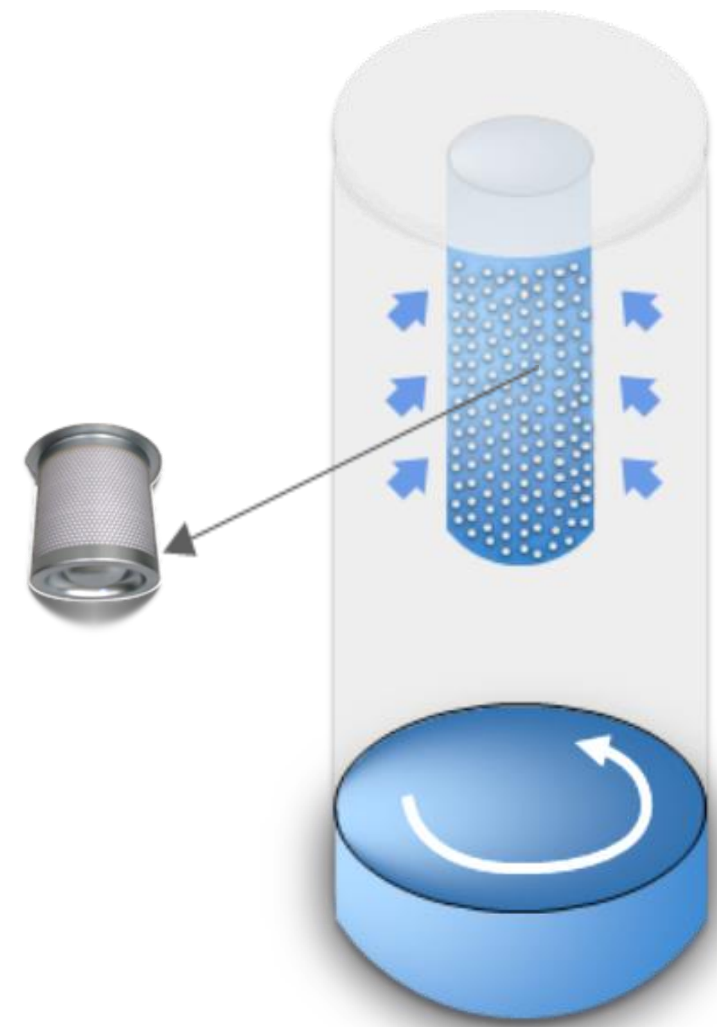
Various configurations can be applied depending on the type of fluid and the overall system design

- ✓ **VFD+RECYCLE** VFD(50-100%), RECYCLE (0-50%)
- ✓ **SLIDE VALVE +RECYCLE** SLIDE VALVE(10-100%), RECYCLE (0-10%)

Example Model : NeX-37WBi

ITEM	STANDARD	COMPACT
SKID Dimensions	2900 × 1900 mm	2350 × 1500 mm
Footprint Area	Approx. 5.51 m ²	Approx. 3.53 m ² (≈36% reduction)
Passage Way	Included in center (improved maintenance access)	Removed (compact layout)
Cooler Type	Shell & Tube Type	Shell & Plate Type
Maintainability	<ul style="list-style-type: none"> ✓ Easy access between components ✗ Larger footprint 	<ul style="list-style-type: none"> ✓ Maximized space efficiency ✗ Potentially limited component access
Layout Approach	Spacious layout with clearances between units	Dense, space-saving layout
Best Suited For	Systems needing frequent maintenance and easy access	Installations with tight space constraints





STEP 1

The liquid-phase oil is initially separated in the oil separator



STEP 2

Both remaining liquid-phase and vapor-phase oil are separated by the coalescing filter



STEP 3

The oil carryover in the discharge gas is 0.01 mg/m³, which is the guaranteed value provided by DongHwa Pneutec



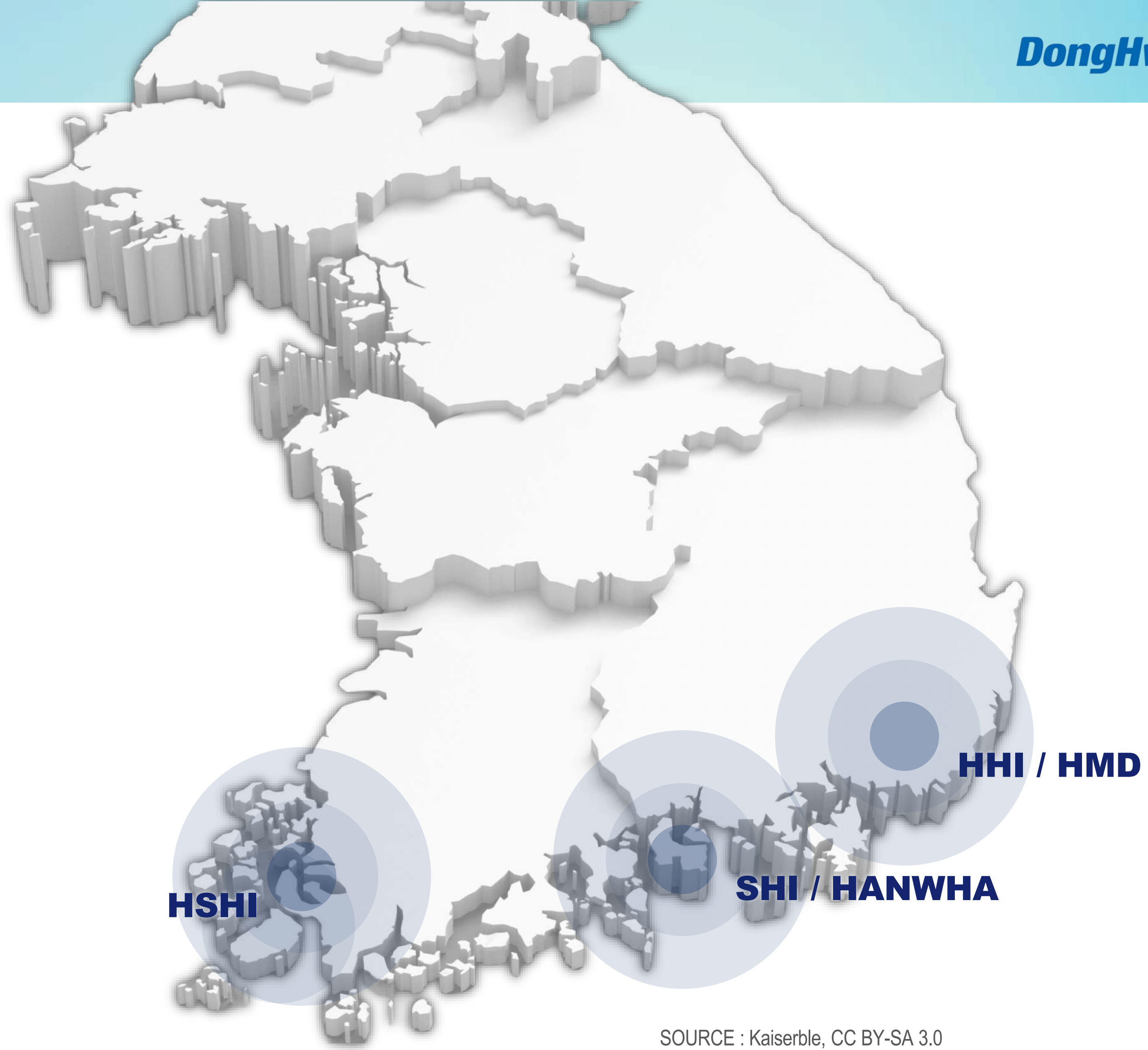
STATUS	Q'TY(SETS)
UNDER OPERATION AFTER SHIP DELIVERY	321
DELIVERED TO SY	69
UNDER FARBRICATION	226
GRAND TOTAL	616



REFERENCE LIST



- ✓ **HYUNDAI HEAVY INDUSTRIES**
26 Ships / 48 Sets BOGC
- ✓ **HYUNDAI SAMHO**
34 Ships / 60 Sets BOGC
- ✓ **HYUNDAI MIPO**
14 Ships / 28 Sets BOGC
- ✓ **SAMSUNG HEAVY INDUSTRIES**
23 Ships / 33 Sets BOGC
- ✓ **HANHWA OCEAN**
22 Ships / 44 Sets BOGC
- ✓ **HJ SY**
2 Ships / 4 Sets BOGC



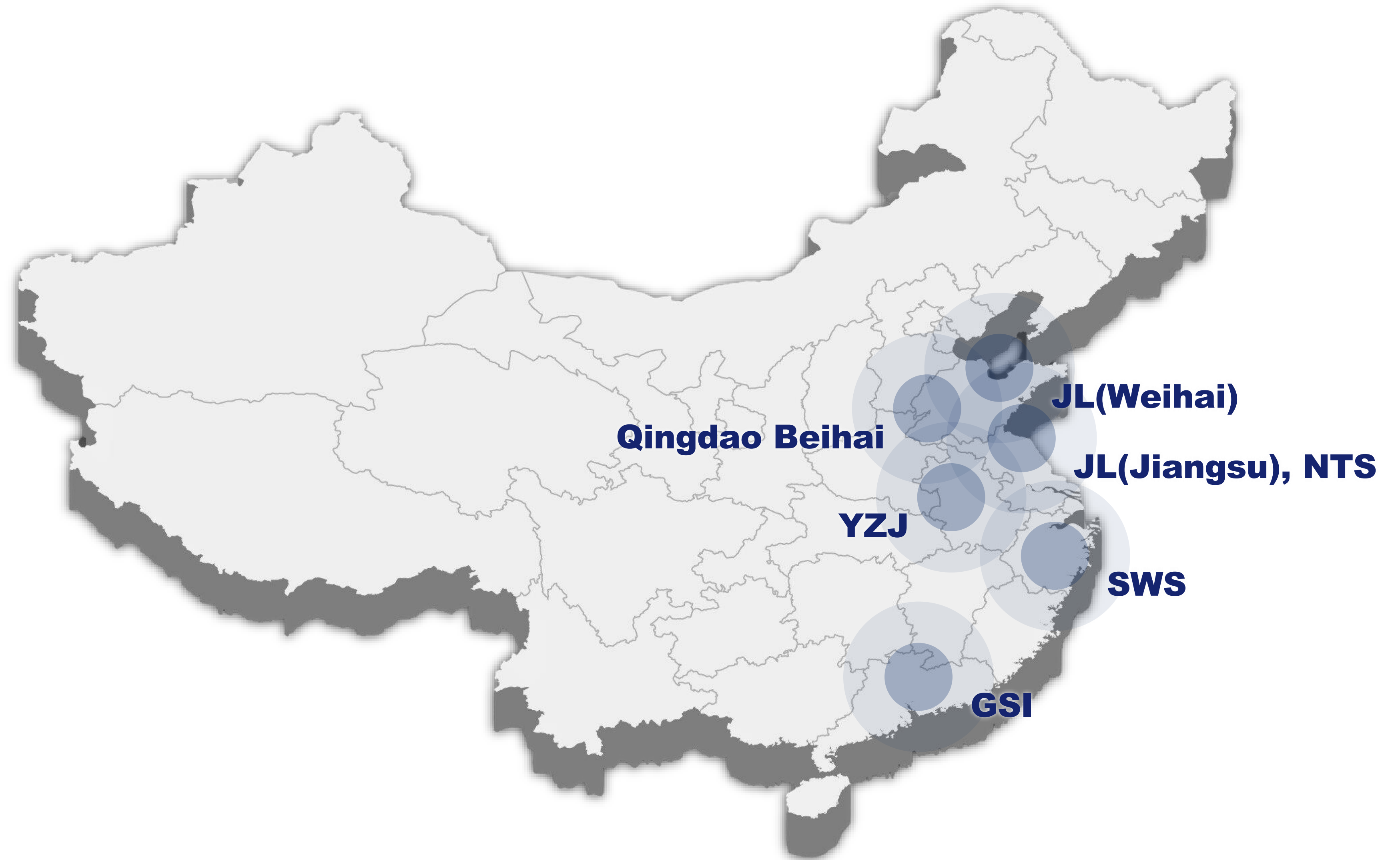
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REFERENCE LIST



- ✓ **SWS**
2 Ships / 4 Sets BOGC
- ✓ **GSI**
12 Ships / 24 Sets BOGC
- ✓ **JINLING JIANGSU**
12 Ships / 24 Sets BOGC
- ✓ **NTS**
31 Ships / 62 Sets BOGC
- ✓ **Qingdao Beihai**
3 Ships / 6 Sets BOGC
- ✓ **YZJ**
12 Ships / 24Sets BOGC
- ✓ **JINLING WEIHAI**
6 Ships / 12 Sets BOGC
- ✓ **PAX OCEAN**
1 Ships / 2 Sets BOGC
- ✓ **HUDONG ZHONGHUA**
5 Ships / 10 Sets BOGC



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REFERENCE LIST



NAMURA

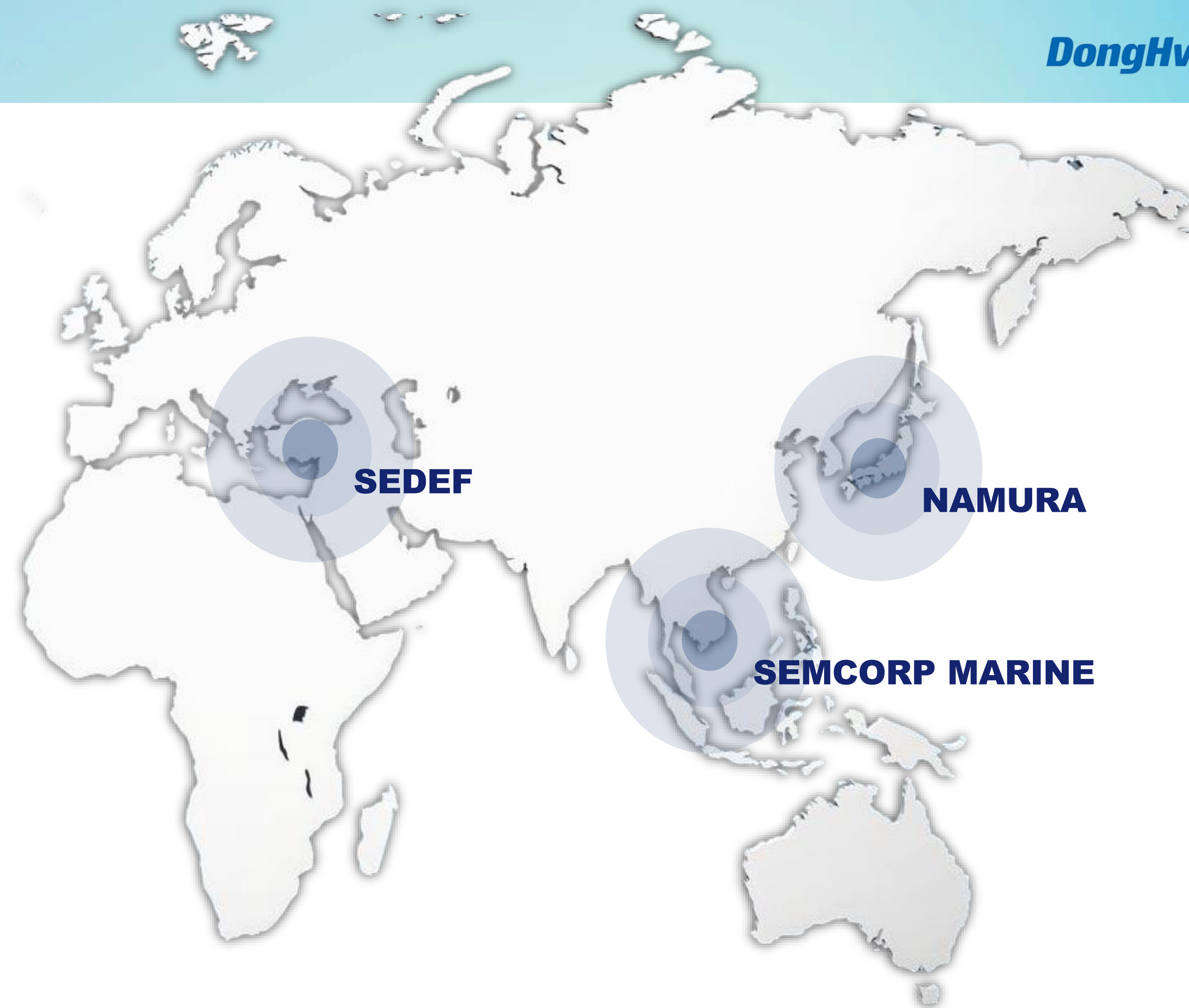
3 Ships / 5 Sets BOGC

SEMCORP MARINE

5 Ships / 15 Sets BOGC

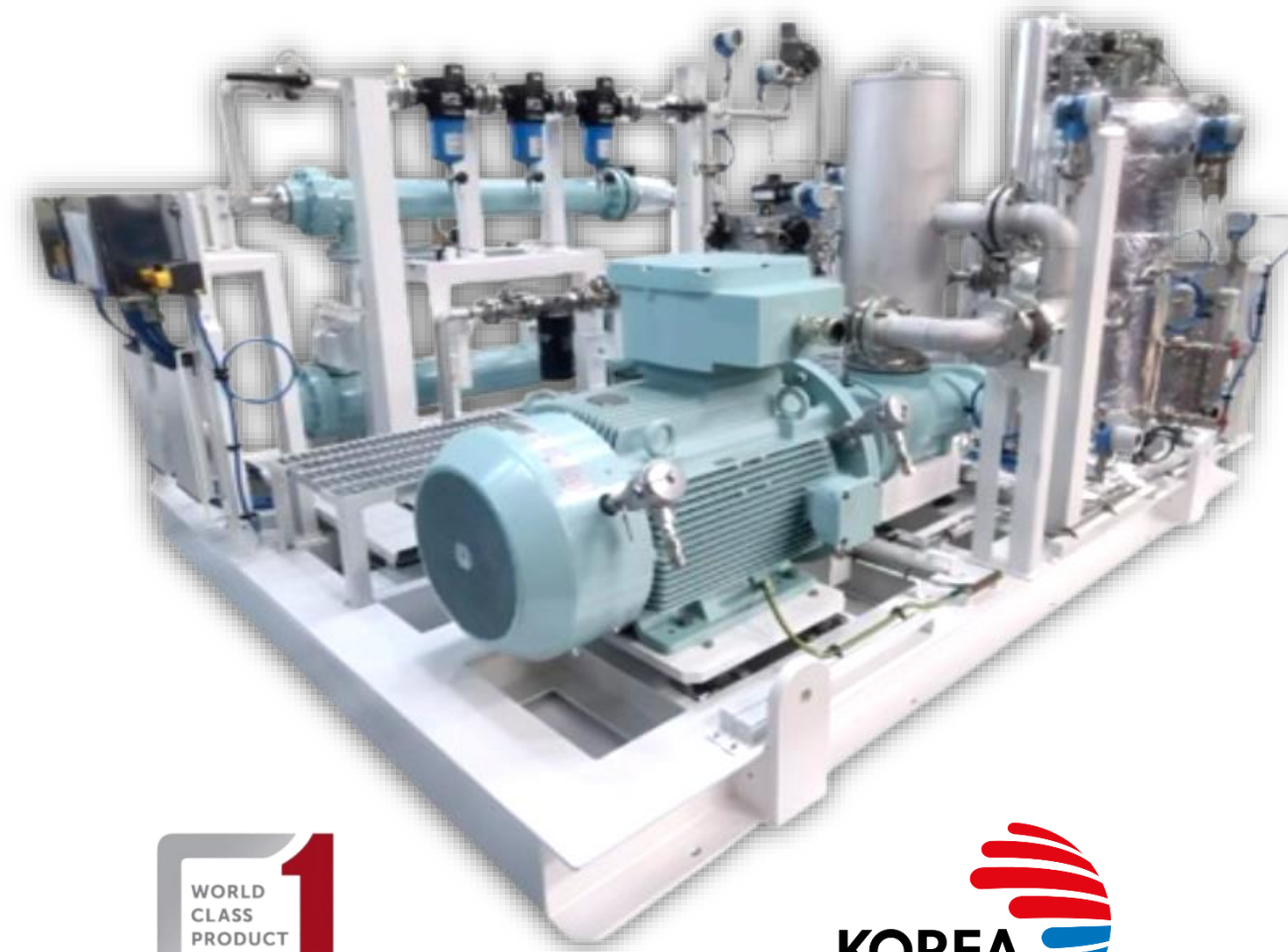
SEDEF

2 Ships / 2 Sets BOGC



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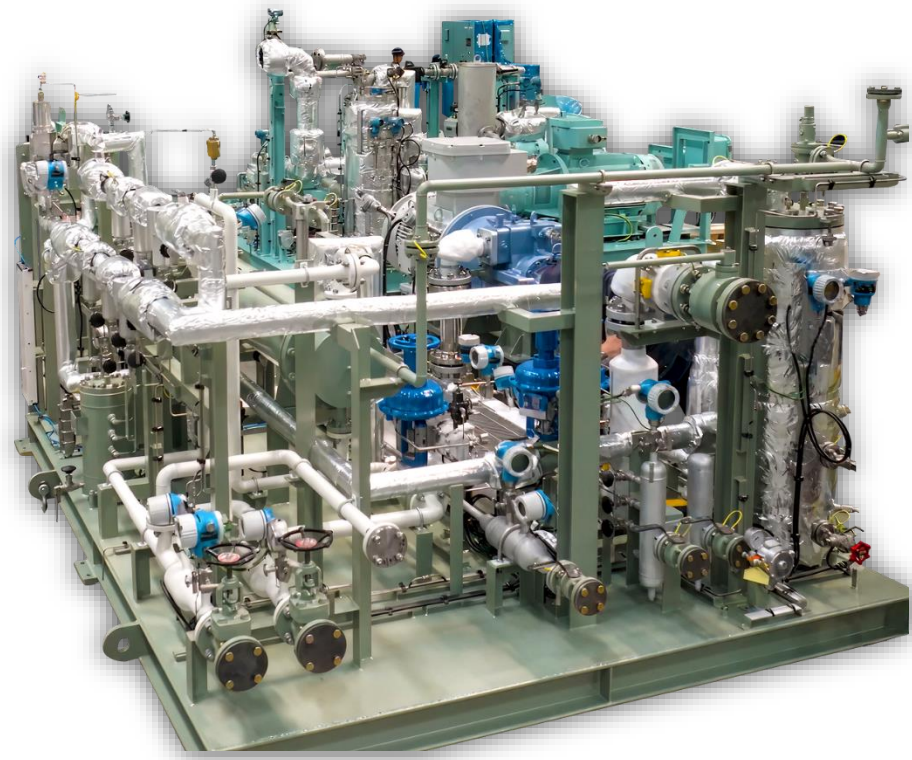
02

COMPLETED DEVELOPED PRODUCT

- AMMONIA COMPRESSOR
- N2 BOOSTING COMPRESSOR
- OIL FREE RECIPROCATING TYPE



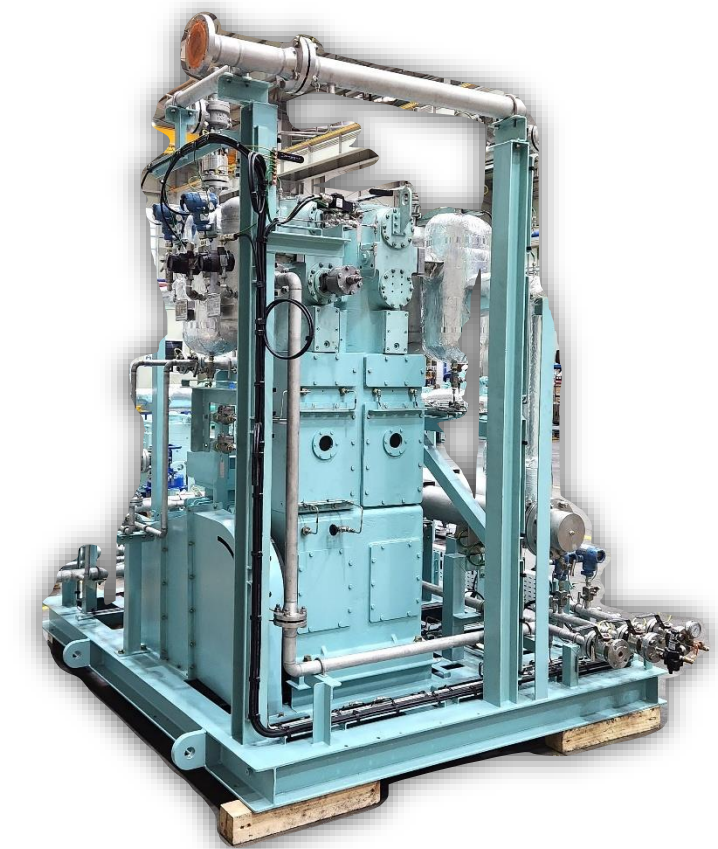
NH3 Compressor for Re-liquefaction	
Type	Oil injection screw
Customer	Samsung heavy industries
Purpose	Testing before onboard installation
Application	As AFSS for NH3 Fueled ship
Status	NH3 performance test completed



NH3 Compressor for Refrigerant	
Type	Oil injection screw
Customer	Hanwha Ocean
Purpose	Testing before onboard installation
Application	As Refrigerant for LCO2 Carrier
Performance Test	Aug. 2025



NH3 Compressor for Re-liquefaction	
Type	Oil Free reciprocating
Customer	National Project
Purpose	Testing before onboard installation
Application	As AFSS for NH3 Fueled ship
Performance Test	Dec. 2025



N2 BOOSTING COMPRESSOR



TYPE	HIGH PRESSURE OIL INJECTION RECIPROCATING
APPLICATION	LEAK TEST FOR ME-GI ENGINE
SPECIFICATION	16m ³ /h, MAX. 350 BAR G
PERFORMANCE RECORD	18 SETS

TYPE	LOW PRESSURE OIL INJECTION RECIPROCATING
APPLICATION	MAINTENANCE OF EQUIPMENTS
SPECIFICATION	20m ³ /h, Max. 30 BAR G
PERFORMANCE RECORD	39 SETS

OIL FREE RECIPROCATING COMPRESSOR

DongHwa Pneutec

CRYOGENIC PILOT MODEL

SPECIFICATION

DESCRIPTION	SUCTION	1 STAGE	2 STAGE	UNIT
MAX. WORKING PRESSURE	2.5	8	10	BAR.G
WORKING PRESSURE	1.7	6.7	8	BAR.G
OPERATING TEMPERATURE	-128 ~ -80			°C
CAPACITY	350			kg/h
STROKE	100			mm
REVOLUTION	670			rpm
REQUIRED POWER	45			kw

Advanced cryogenic technology engineered for extreme low-temperature applications.

PROJECT DESCRIPTION

BUSINESS NAME	INDUSTRIAL CORE TECHNOLOGY DEVELOPMENT PROJECT
PROJECT NAME	BOG HANDLING SYSTEM DEVELOPMENT / 0.35t LNG
APPLICATION	CRYOGENIC CH4 BOG COMPRESSOR
DURATION OF PROJECT	2017. 12 ~ 2020. 12 (37 MONTHS)
LOCATION	KOMERI (KOREA MARINE EQUIPMENT RESEARCH INSTITUTE)

TYPE APPROVAL

Statement of Compliance
 Date: 2020-10-30
 Model No.: BKCCY 0042-20
 Product Name: Nexkomp Air/Gas Compressor
 Test Results: All items passed (OK).
 Issued by: [Signature]
 Date: 2020.10.30

FIELD TEST REPORT

통합 성능 평가 SKID
 Date: 2020-10-30
 Model No.: BKCCY 0042-20
 Test Results: All items passed (OK).
 Issued by: [Signature]
 Date: 2020.10.30

통합 성능 평가 SKID
 Date: 2020-10-30
 Model No.: BKCCY 0042-20
 Test Results: All items passed (OK).
 Issued by: [Signature]
 Date: 2020.10.30

통합 성능 평가 SKID
 Date: 2020-10-30
 Model No.: BKCCY 0042-20
 Test Results: All items passed (OK).
 Issued by: [Signature]
 Date: 2020.10.30

CRYOGENIC TEST



CERT. BY KR

OIL FREE RECIPROCATING COMPRESSOR

Advanced cryogenic technology engineered for extreme low-temperature applications

CRYOGENIC G310160

SPECIFICATION

DESCRIPTION	SUCTION	1 STAGE	2 STAGE	UNIT
MAX. WORKING PRESSURE	2	5.5	10	BAR.G
WORKING PRESSURE	0.1	2.5	7	BAR.G
SUCTION TEMPERATURE		-90		°C
CAPACITY		520		kg/h
STROKE		160		mm
REVOLUTION		560		rpm
REQUIRED POWER		140		kw

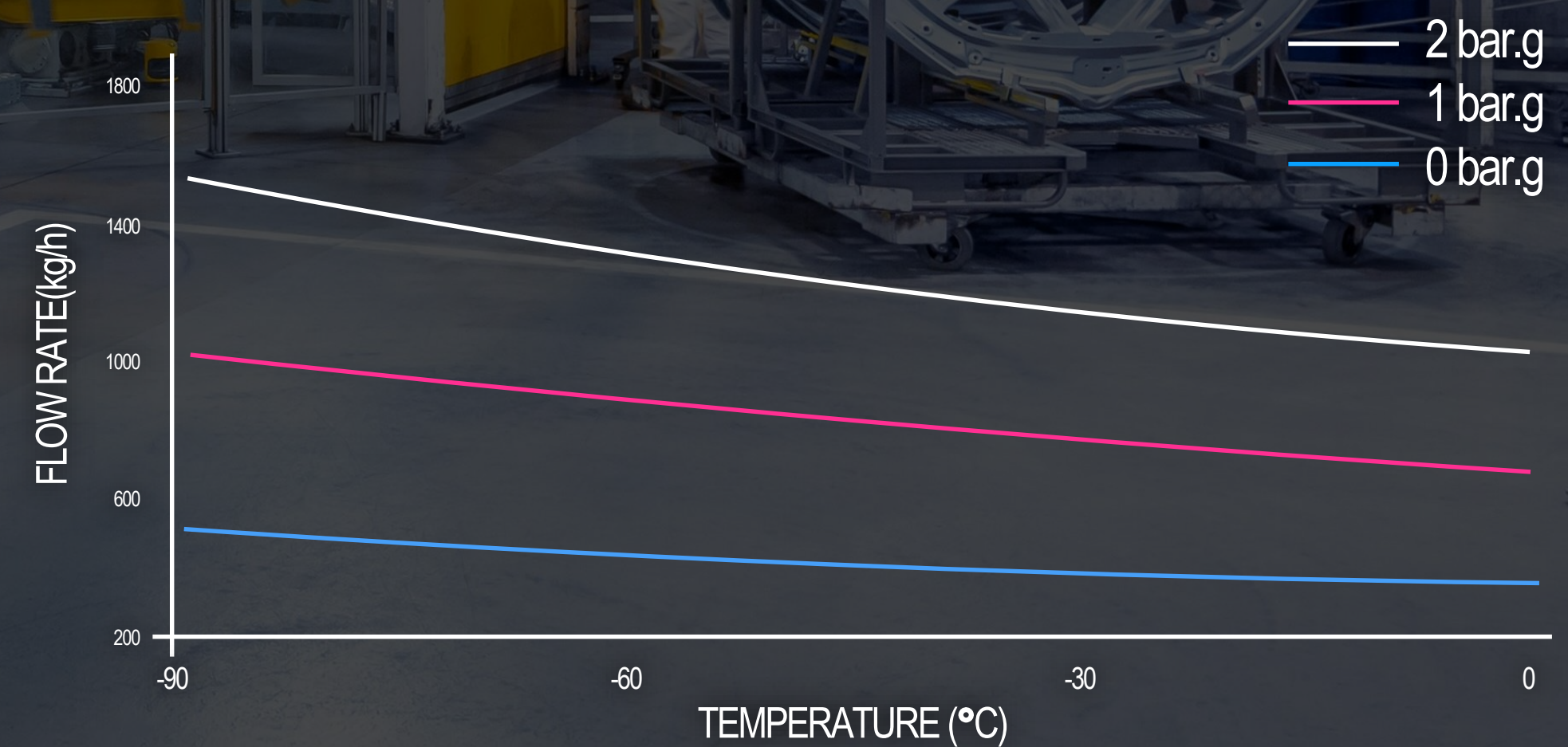
PROJECT DESCRIPTION

BUSINESS NAME	CORE R&D FOR SHIP & MARINE INDUSTRY
PROJECT NAME	0.5T OPTICAL COMPRESSION & BOG SAFETY FOR LNG SHIPS
APPLICATION	FOR BOG TREATMENT ON COMMISSIONED VESSEL
DURATION OF PROJECT	2025. 01. 01 ~ 2026. 12. 31 (2 YEARS)
LOCATION	HYUNDAI HEAVY INDUSTRIES

PERFORMANCE CURVE

	RPM	560	560	560	560
	PISTON SPEED	2.99	2.99	2.99	2.99
SUCTION PRESS(BAR.G)	SUCTION TEMP(°C)	-90	-60	-30	0
0 BAR.G	MASS FLOW RATE (kg/h)	521	448	392	349
1 BAR.G		1035	890	780	694
2 BAR.G		1550	1332	1167	1039

PERFORMANCE CURVE



OIL FREE RECIPROCATING COMPRESSOR



Oil-free reciprocating compressor solution for non-cryogenic gas service

NON-CRYOGENIC G140100

SPECIFICATION

DESCRIPTION	SUCTION	1 STAGE	2 STAGE	UNIT
MAX. WORKING PRESSURE	3.5	14	40	BAR.G
WORKING PRESSURE	2	10	30	BAR.G
SUCTION TEMPERATURE		20		°C
CAPACITY		140		kg/h
STROKE		100		mm
REVOLUTION		450		rpm
REQUIRED POWER		45		kw

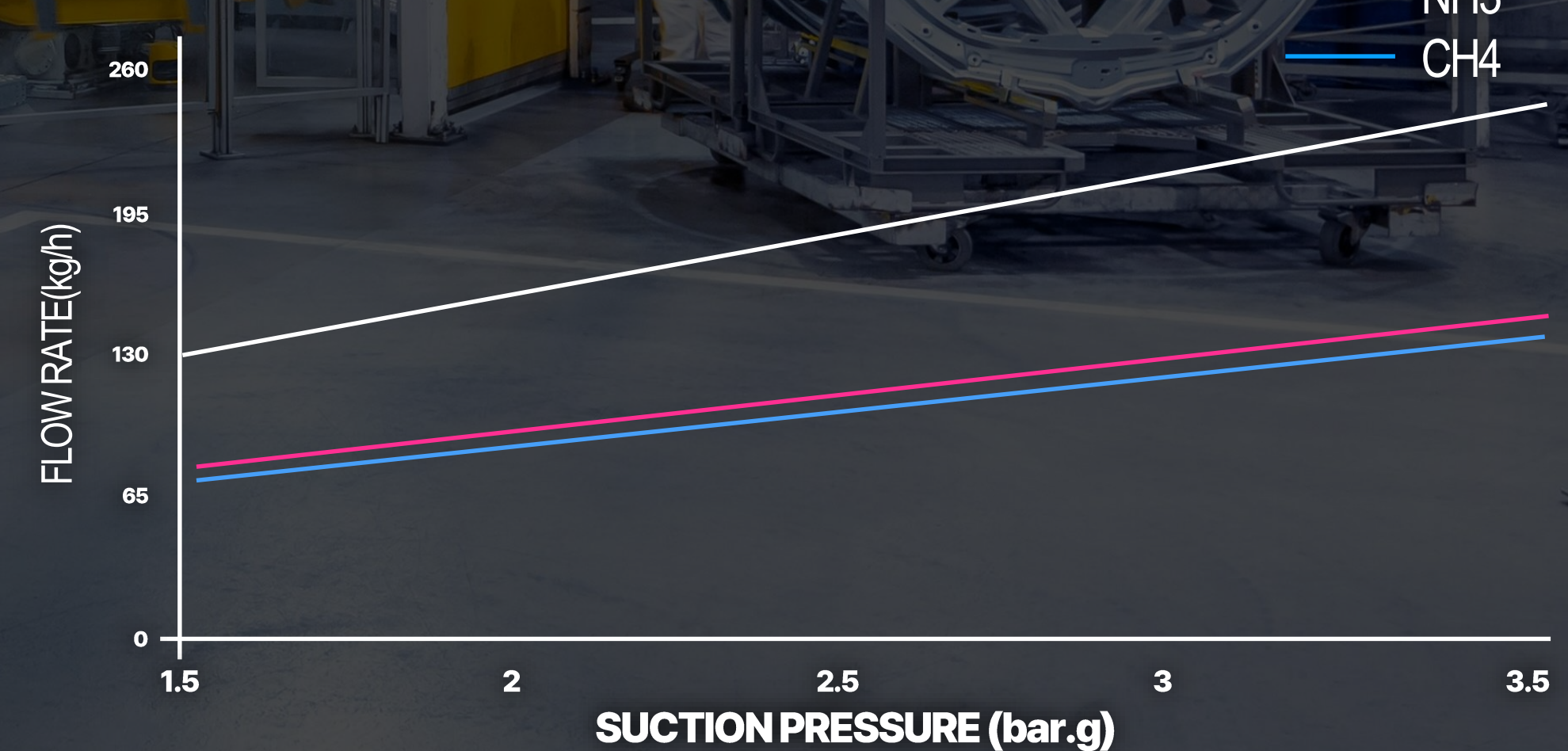
PROJECT DESCRIPTION

CUSTOMER	 
PROJECT NAME	N2 BOOSTING COMPRESSOR
HULL NUMBER	H2512, 13 / H8 196, 8 197
SHIP OWNER	MOL / EPS
DELIVERY DATE	2021.06 ~ 11 / 2023. 09 ~12
QUANTITY DELIVERED	8 SETS

PERFORMANCE CURVE

FLUID	SUCCTION PRESSURE(BAR.G)	RPM				
		450	450	450	450	450
N2	MASS FLOW RATE (kg/h)	135	161	188	215	242
		83	100	116	1323	149
CH4		77	93	108	123	139

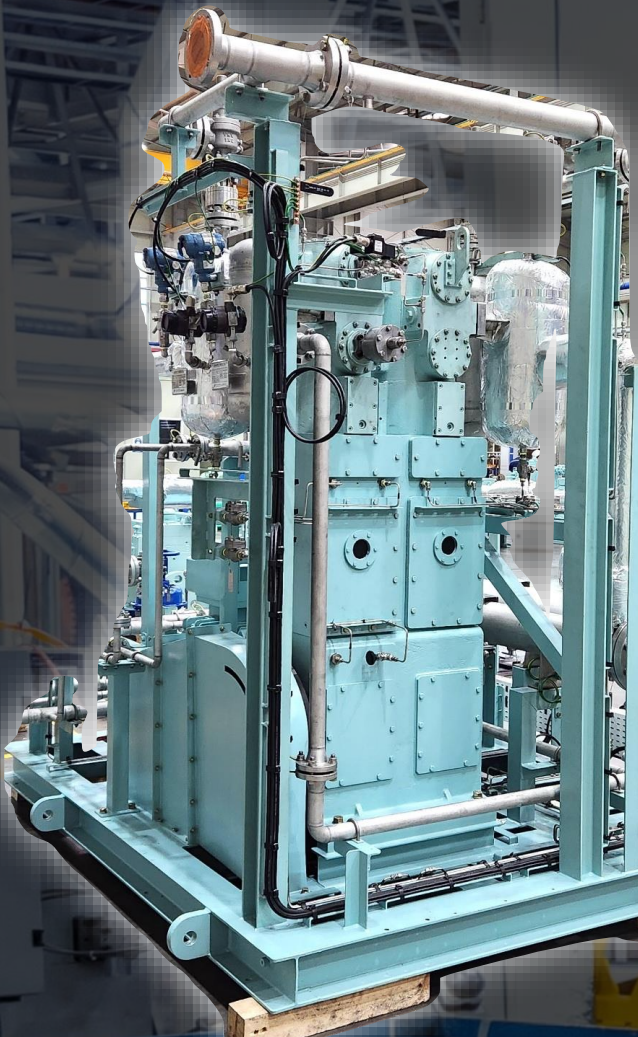
PERFORMANCE CURVE



OIL FREE RECIPROCATING COMPRESSOR

Oil-free reciprocating compressor solution for non-cryogenic gas service

NON-CRYOGENIC G180110



SPECIFICATION

DESCRIPTION	SUCTION	1 STAGE	2 STAGE	UNIT
MAX. WORKING PRESSURE	2.2	11.5	30	BAR.G
WORKING PRESSURE	2	8.7	30	BAR.G
SUCTION TEMPERATURE		20		°C
CAPACITY		150		kg/h
STROKE		110		mm
REVOLUTION		360		rpm
REQUIRED POWER		55		kw

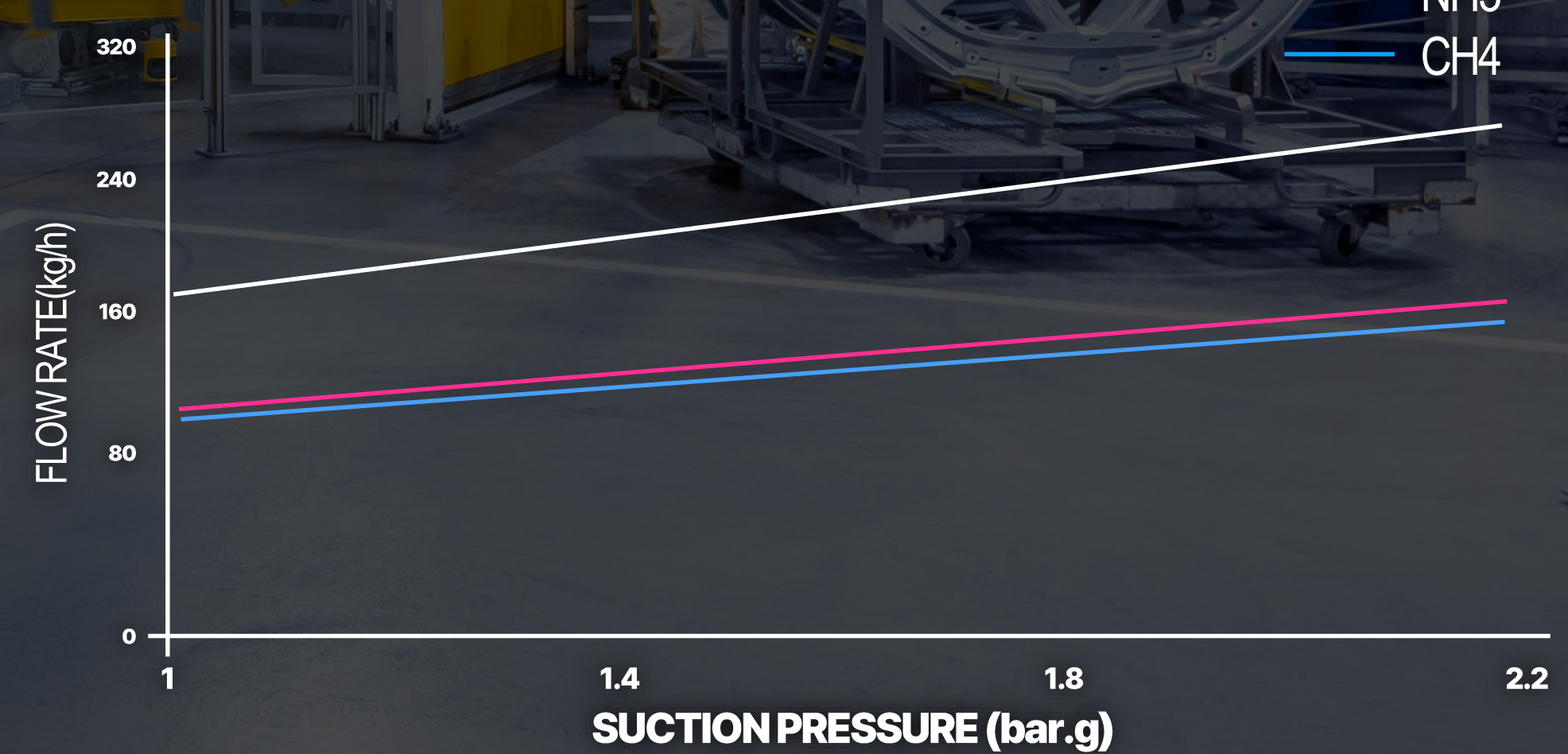
PROJECT DESCRIPTION

BUSINESS NAME	REGIONAL INNOVATION&GROWTH PROJECT(R&D)
PROJECT NAME	DEVELOPMENT OF FUEL SUPPLY SYSTEM & RE-LIQUEFACTION SYSTEM FOR ECO-FRIENDLY SHIP
APPLICATION	NH3 COMPRESSOR
DURATION OF PROJECT	2024. 01. 01 ~ 2024. 12. 31 (1YEAR)
LOCATION	SAMSUNG HEAVY INDUSTRIES TESTING CENTER

PERFORMANCE CURVE

FLUID	RPM	360	360	360	360
	PISTON SPEED	1.32	1.32	1.32	1.32
	SUCTION PRESSURE (BAR.G)	1	1.4	1.8	2.2
N2	MASS FLOW RATE (kg/h)	168	201	235	268
NH3		104	124	145	165
CH4		96	116	135	154

PERFORMANCE CURVE




03 DEVELOPMENT PLANS

- HP COMPRESSOR
- LP CARGO COMPRESSOR




METHANE SLIP



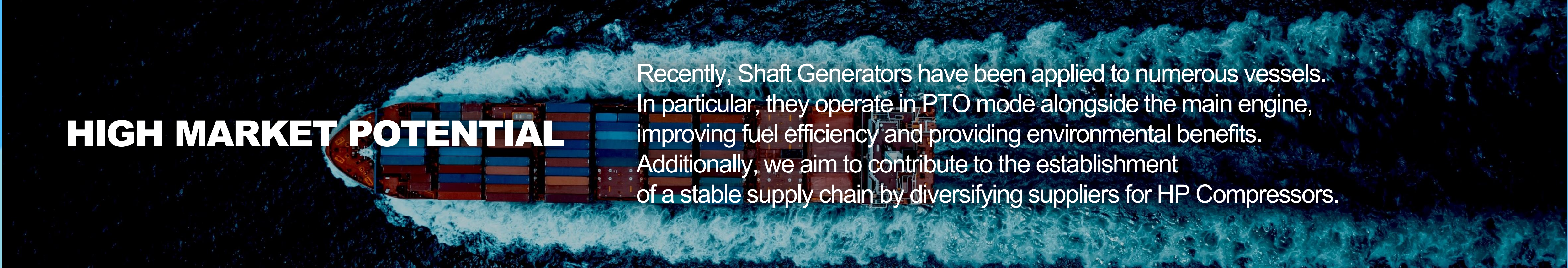
Methane slip is important because methane is a powerful greenhouse gas, with a global warming potential of 28-36 times that of carbon dioxide on a 100-year timescale, according to the IPCC(Intergovernmental Panel on Climate Change). Methane slip reduces the benefit of lower carbon dioxide emissions offered by LNG-fuelled engines.

BOG MANAGERMENTS



The inspection of LNG vessels, including class certification, sea trials, and compliance with safety and environmental standards, is being thoroughly carried out, leading to issues such as delays in entry and additional costs. As a result, BOG management has emerged as a critical issue.

HIGH MARKET POTENTIAL



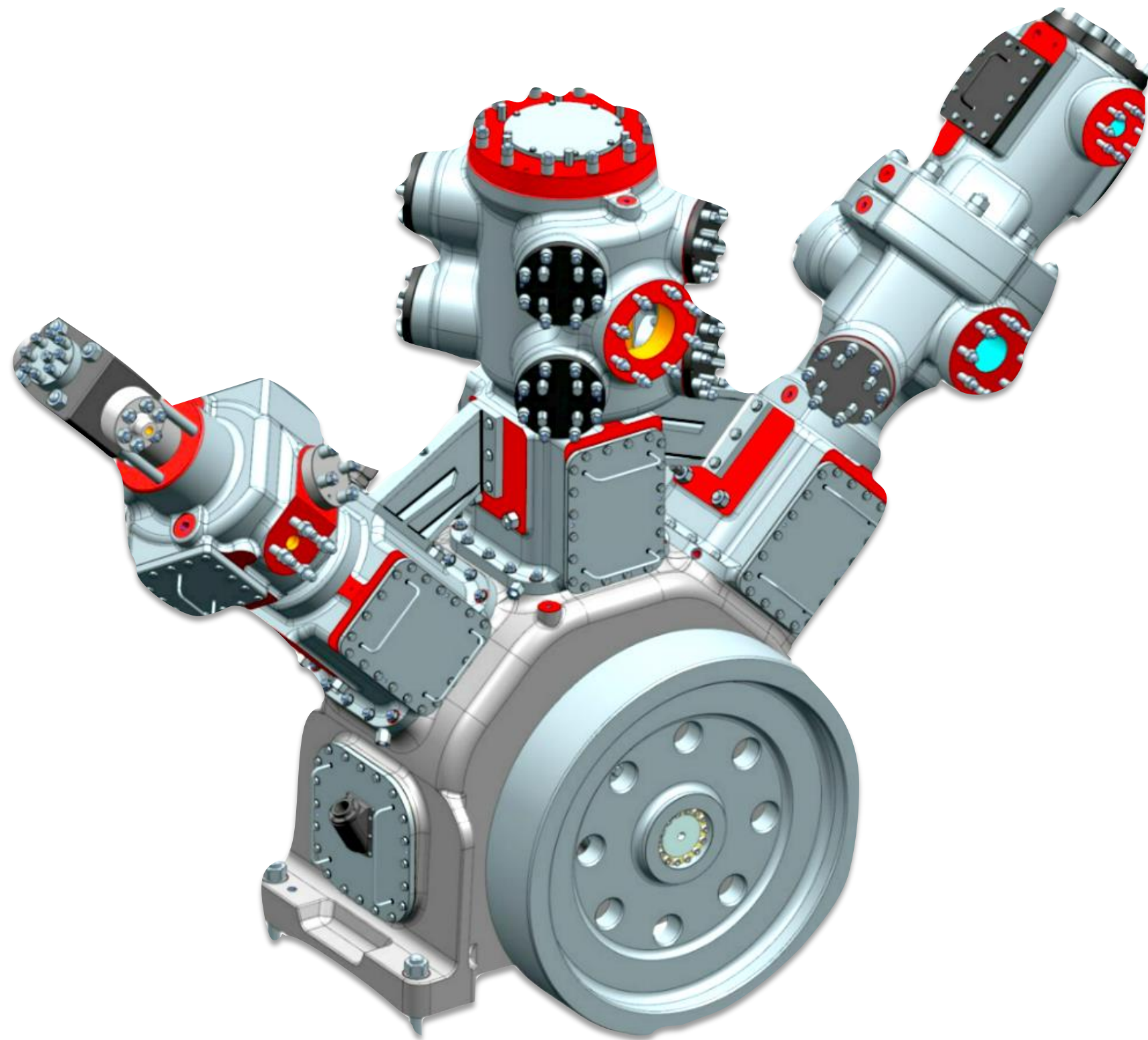
Recently, Shaft Generators have been applied to numerous vessels. In particular, they operate in PTO mode alongside the main engine, improving fuel efficiency and providing environmental benefits. Additionally, we aim to contribute to the establishment of a stable supply chain by diversifying suppliers for HP Compressors.

HP COMPRESSOR FOR LNG FUEL SHIP



HP COMPRESSOR	DESCRIPTION
TYPE	OIL INJECTION, CRYOGENIC, RECIPROCATING
FLUID	LNG BOIL-OFF GAS
CAPACITY	MAX. 600kg/h
INLET PRESSURE	1.03 ~ 1.09 bar A
INLET TEMPERATURE	-140 ~ -90°C
OUTLET PRESSURE	311 ~ 381 bar A

COMPRESSION STAGE	CYLINDER TYPE	VALVE CONFIGURATION
1ST STAGE	DOUBLE ACTING (CRYOGENIC TYPE)	4 SUCTION + 4 DISCHARGE PER END
2nd ~ 3rd STAGE	TANDEM CYLINDER	1 SUCTION + 1 DISCHARGE PER END
4th ~ 5th STAGE	TANDEM CYLINDER	1 SUCTION + 1 DISCHARGE PER END

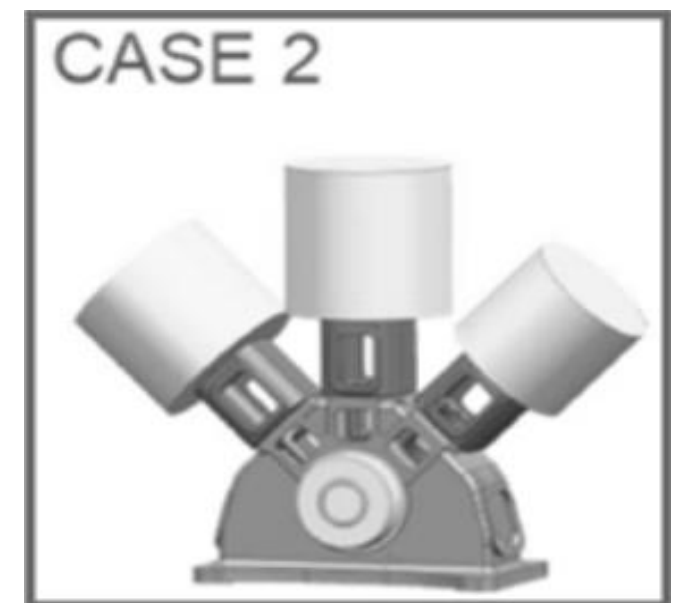


- **Atmospheric suction capability**
 - No need for an upstream screw compressor
- **Cryogenic Suction temperature**
 - No need for an upstream BOG Heater
- **First Compression Stages with State-of-the-Art Plastic Seals**
 - Prevents fuel contamination and simplifies maintenance
- **No First-Stage Cooler Required**
 - Simplifies installation and reduces capital expenditure

- **A Ready for Delivery Pressure up to 380 bar**
 - Suitable for high-pressure fuel supply
- **Low Rotational Speed (600 rpm), Long piston stroke**
 - minimized wear and improved reliability
- **Cylinder Design**
 - Cylinder with replaceable liners for easy maintenance
- **Compact Design**
 - Ideal for marine or space-constrained installations

LP CARGO COMPRESSOR

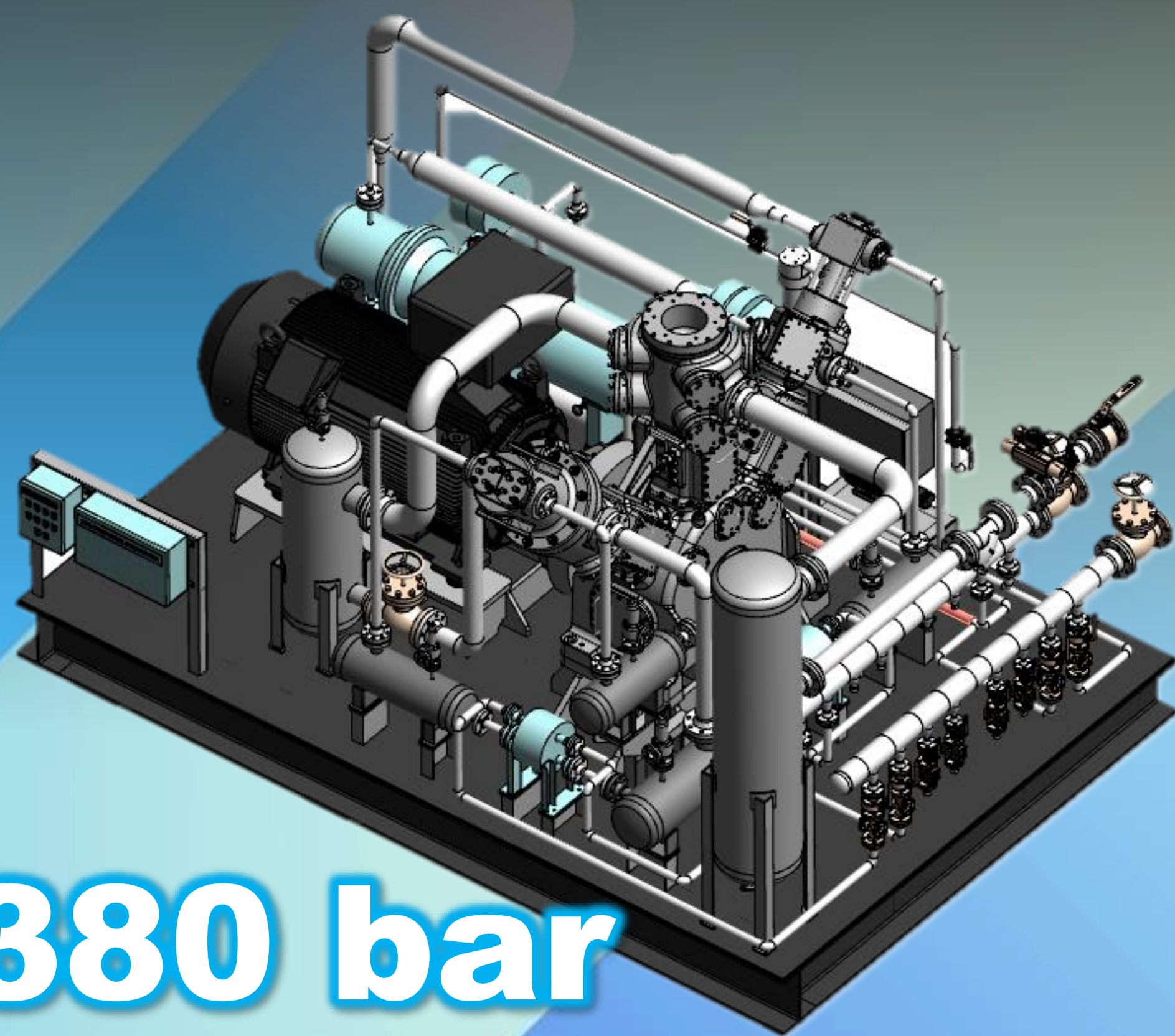
SPECIFICATION	CASE 1	CASE 2	CASE 3
GAS	CO2	LPG	NH3
COMPRESSOR TYPE	OIL FREE RECIPROCATING		
SUCTION TEMP.	40°C	-20°C	-5°C
SUCTION PRESSURE	1.4 BAR A	1.4 BAR A	1.4 BAR A
DISCHARGE PRESSURE	12 BAR A	24 BAR A	15.7 BAR A
CAPACITY / SET	3,200 KG/H	4,380 KG/H	1,680 KG/H
APPLICATION	FOR CCS	FOR LPG CARRIER	FOR NH3 CARRIER
CYLINDER TYPE	BOUBLE ACTING (2 SUCTION + 2 DISCHARGE PER END)		
STAGE	2	3	3



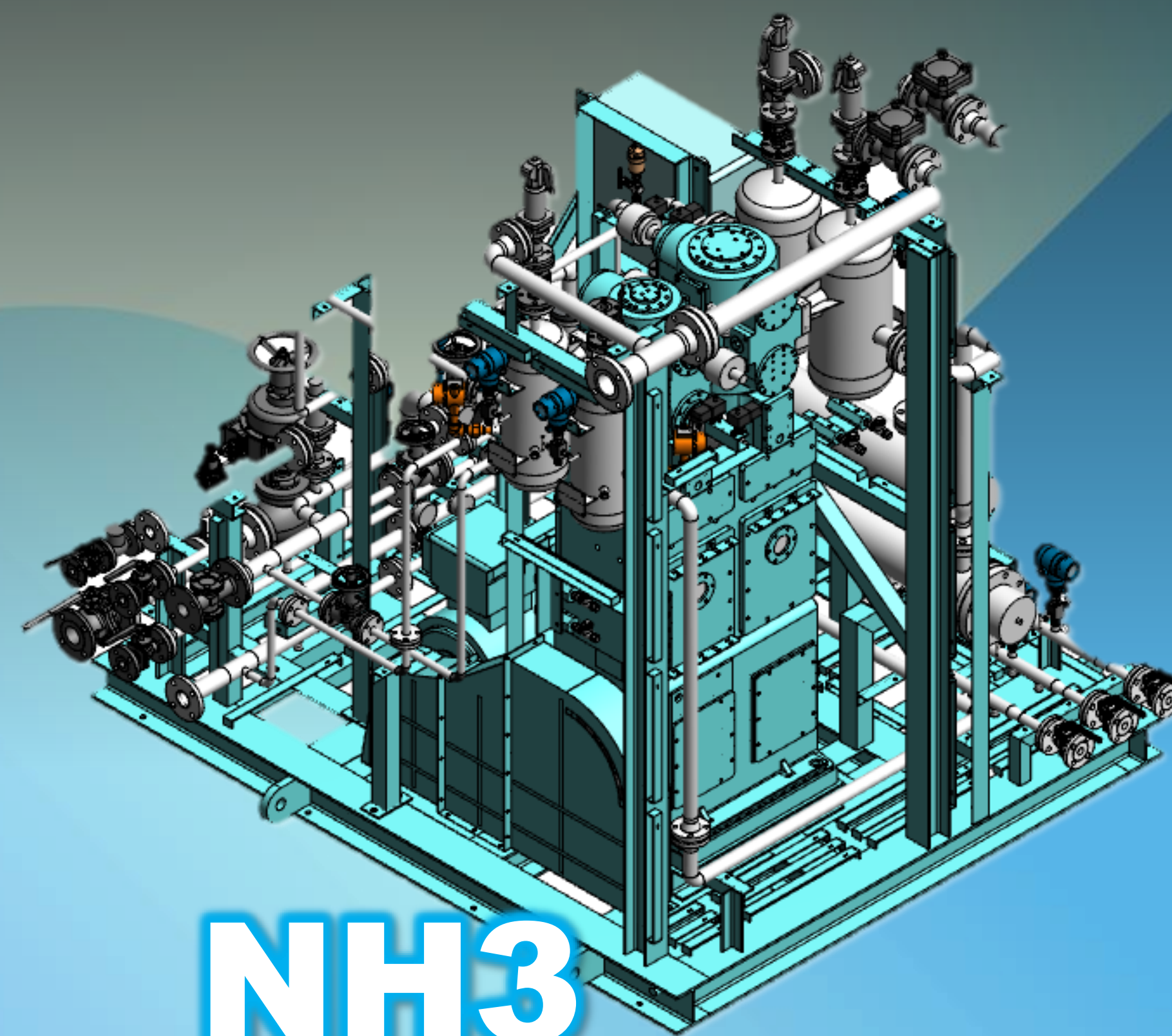
1. Master Plan of HP Compressor Body																						
ACTIVITY	START	END	2025									2026										
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Completion mockup 3D of bare compressor(for reference)	-	2025-04-17	4/17																			
Completion 3D modeling (cylinder, piston, 1st cylinder cover and valve cage)	-	2025-04-30	4/30																			
Completion 3D modeling(crank case, distance piece, cross head)	-	2025-05-15		5/15																		
Manufacturing of casting parts	2025-09-30	2026-01-30											1/30									
Completion of the engineering(2D machining drawing and specifications) and place order for all parts except for the castings	-	2025-10-15									10/15											
Machining of casting parts	2026-01-31	2026-04-30															4/30					
Compressor Body assembly and test	2026-04-30	2026-06-30																	6/30			

2. Master Plan of HP Compressor Skid																							
ACTIVITY	START	END	2025									2026											
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
P&ID of HP COMP. SKID	2025-05-01	2025-05-31		5/31																			
DATA SHEET	-	2025-07-31				7/31																	
3D Modeling of HP COMP. SKID	2025-06-01	2025-07-31				7/31																	
General Arrangement of HP COMP. SKID	2025-06-01	2025-07-31				7/31																	
BOM LIST(1st)	2025-06-01	2025-11-30									11/30												
BOM LIST(2nd)	2025-08-01	2025-11-30									11/30												
BOM LIST(3rd)	2026-01-12	2026-02-13											2/13										
Fabrication DWG for PIPING	2026-12-01	2026-01-09											1/09										
Fabrication DWG for SKID & SUPPORT	2026-01-12	2026-02-20											2/20										
Fabrication DWG for Assembly	2026-02-23	2026-03-27													3/27								
Package Assembly	2026-06-15	2026-08-21																	8/21				
Package Inspection	2026-08-24	2026-08-31																	8/31				
Package Test	2026-09-01	2026-10-31																			10/31		

Compressor Skid



380 bar



NH3