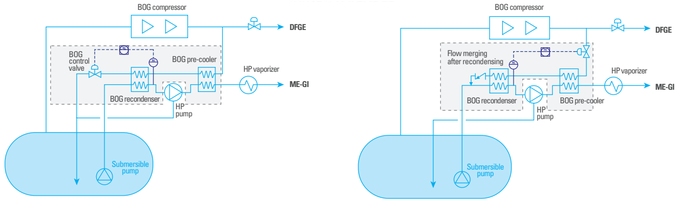
SUN-RS®

BOG Recondensing System

SUNBO PATENDED



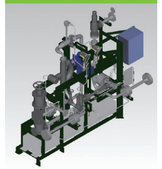
SUN-RS® Gen.1 advantage

· Efficiency: Simply designed with highly robust PCHEs and NO rotating machine required
· Reliability: BOG stream and LNG stream are separated

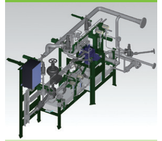
SUN-RS® Gen.2 advantage

Compared to the Gen.1
· Recondensed BOG can be utilized for M/E fuel
· More recondensing amount achievable

Pre-cooler



Recondenser



Main Equipment

· One (1) BOG pre-cooler PCHE
  - Temperature: -165/40°C
  - Design Pressure: BOG-side 15 / LNG-side 350 barG
· One (1) BOG Recondenser PCHE
  - Temperature: -165/40°C
  - Design Pressure: BOG-side 15 / LNG-side 150 barG
· One (1) Control valve
· One (1) Flow control (option)

Fluid

· BOG (Boil Off Gas)
· LNG (Liquified Natural Gas) : Cooling medium

Reliable and Safe Design

· Using LNG COLD POWER to recondenser BOG
· Simple and highly reliable design

Recondensing Capacity

· Abt. 10~13% of M/E LNG consumption

Energy Efficiency

· Using BOG as fuel for either M/E or G/E, Boiler
· Providing additional BOG handling method

Maintenance

· No major periodic replacement required

Product Line-up

Series	LNG consumption in engine	HX Type	Cooling duty		Recondensing amount
			BOG pre-cooler	Recondenser	
SUN-RS® 2000	2,000 kg/h	PCHE	20 kW	30 kW	210 kg/h
SUN-RS® 4000	4,000 kg/h	PCHE	45 kW	75 kW	470 kg/h
SUN-RS® 6000	6,000 kg/h	PCHE	70 kW	115 kW	730 kg/h

Reference: SUN-RS® BOG Recondensing System

Ship No.	Ship owner	Shipyard	Project	Model	Capacity	Status
Two (2)	EPS	SWS	210K BC	SUN-RS® 2000	Max. 190kg/h	In operation
Eleven (11)	EPS	NTS	210K BC	SUN-RS® 2000	Max. 190kg/h	In operation
Fourteen (14)	HMM, KOBC, GLOVIS, SEASPAN	GSI	10,800 CEU PCTC	SUN-RS® 4000	Max. 220kg/h	(2) Completed (12) Ongoing

SUN-RS® Gen. 1 Patent

China

Japan

Korea

SUN-RS® Gen. 2 Patent

China

Japan

Korea

SUNBO

A COMPANY THAT CREATES VALUE OF ECO-FRIENDLY TECHNOLOGY

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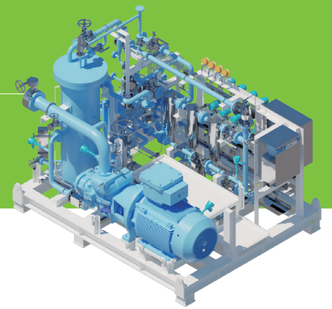
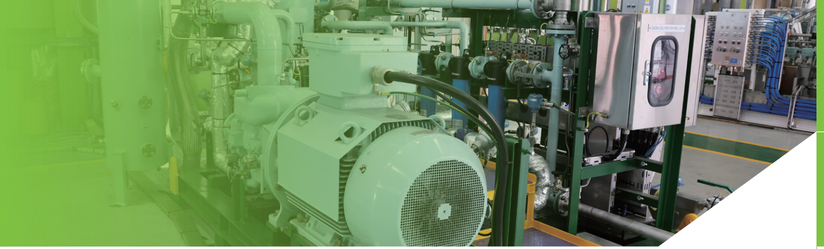
SUN-COM®

BOG Compressor System





Efficient Design

- High-efficiency rotor design
- Compact and robust system design

Reliable and Safe Design

- High-performance bearings and hydraulic axial force compensation for long-lifetime
- Standardized and hermetically sealed slide position indicator

Maintenance

- Easy replacement of bearings and seal
- User & maintenance friendly design

Reliable and Safe Design

- High efficiency and compact footprint
- Bare compressor supplied by market proven suppliers
- Slide valve control and less control valves
- Control integrated into FGSS control system

Other

- Easy replacement of bearings and seal
- User & maintenance friendly design

System specification

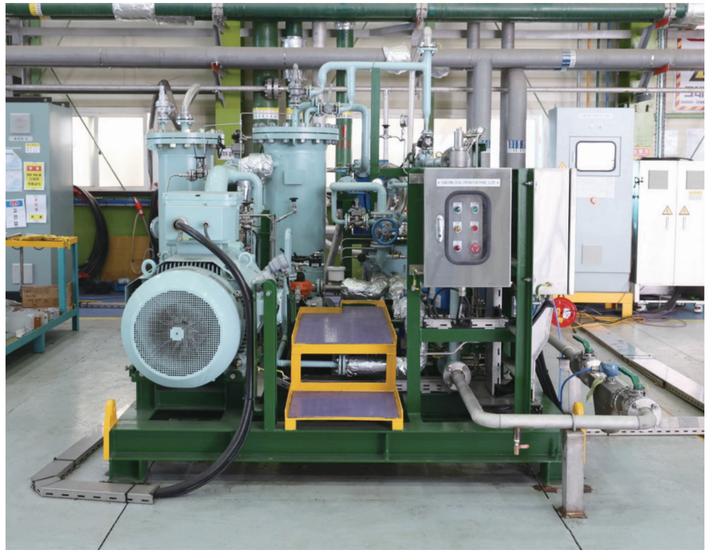
- Type: Oil-injected Screw Compressor
- Fluid: Boil Off Gas (CH_4, N_2, etc.)
- Capacity: 300~1,000 kg/h
- Discharge pressure: ~16 barG
- Suction/Discharge temperature: 10 / 45°C
- Load control by: Slide valve and/or VFD
- Heat exchanger: Gas intercooler and oil cooler
- Oil content: <0.01 mg/m³ (complying with DF engine requirement)

Product Line-up

Series	Swept volume (m³/h)			Max. design pressor (barG)	Load control
	2940 rpm	3550 rpm	4500 rpm		
SC-300	321	388	491	28	Slide valve and/or VFD
SC-350	372	449	569	28	Slide valve and/or VFD
SC-400	471	569	721	28/52	Slide valve and/or VFD
SC-450	471	569	721	28/52	Slide valve and/or VFD
SC-600	708	855	1084	28/52	Slide valve and/or VFD
SC-800	805	972	-	28/52	Slide valve and/or VFD
SC-1000	1290	1558	-	28/52	Slide valve and/or VFD

Reference: SUN-COM® BOG Compressor

Ship No.	Ship Owner	Shipyard	Project	Model	Capacity	Status
PilotPlant	-	-	SUNBO Pilot	SC-450	450 kg/hr	Completed
Ten (10)	EPS (8) & Chandris (2)	GSI	111K Oil Tanker	SC-300	300 kg/hr	(4) Completed (6) Ongoing
Fourteen (14)	HMM, KOBC, GLOVIS, SEASPAN	GSI	10,800 CEU PCTC	SC-300	300 kg/hr	(2) Completed (12) Ongoing
Four (4)	EPS	Xiamen	113.6k Oil Tanker	SC-300	300 kg/hr	(4) Ongoing

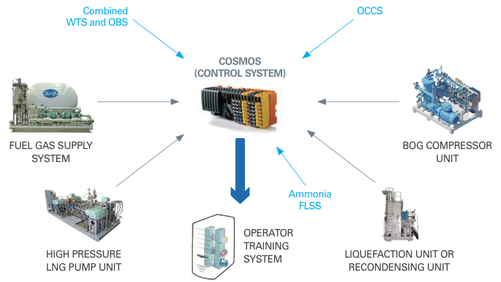


COSMOS®

FGSS Control/ESDS System

- Smart web diagnosis
- Remote program update
- Central data storage
- Real-time monitoring & Fast CPU cycle time
- Smart management for major equipment
- Interface with programming environment (AMS & LC)

Reference: COSMOS® FGSS Control/ESDS System

Ship No.	Ship owner	Shipyard	Project	Status
Ten (10)	EPS (8) & Chandris (2)	GSI	111K Oil Tanker	(4) Completed (6) Ongoing
Four (4)	HMM	GSI	10,800 CEU PCTC	In progress
Four (4)	EPS	Xiamen	113.6K Oil Tanker	In progress
Four (4)	Minerva	NTS	112.5K Oil Tanker	In progress

The control system runs on a DCS (Distributed Control System) with having a various controllers handling a given I/O module simultaneously.