

PBUCH / CLIMAREM - SUMMER 2020

Newsletter summer 2020

September 2020

Changes, changes, changes!

In this issue of the Newsletter a lot about changes, which you could already noticed in the title.

Transformation

At the beginning of July "Przedsiębiorstwo Budowy Urządzeń Chłodniczych S.A." (PBUCH S.A.) was transformed at CLIMAREM Sp. z o.o.

It is a change of the legal form and the name of the company. Our knowledge, skills, experience, production offer remain. All contracts, agreements concluded by PBUCH S.A. will be continued as agreed.

Formal registration number - please find in the footer.

News

In this issue of the newsletter you will find a lot of projects for the oil & gas industry — pressure equipment and heat exchangers for natural gas extraction plants, gas-water drying installations and gas, hydrocarbon and water separation systems.

Moreover Innoship project, on-board installations of heating, water treatment and HVAC systems.

We hope you will enjoy it.

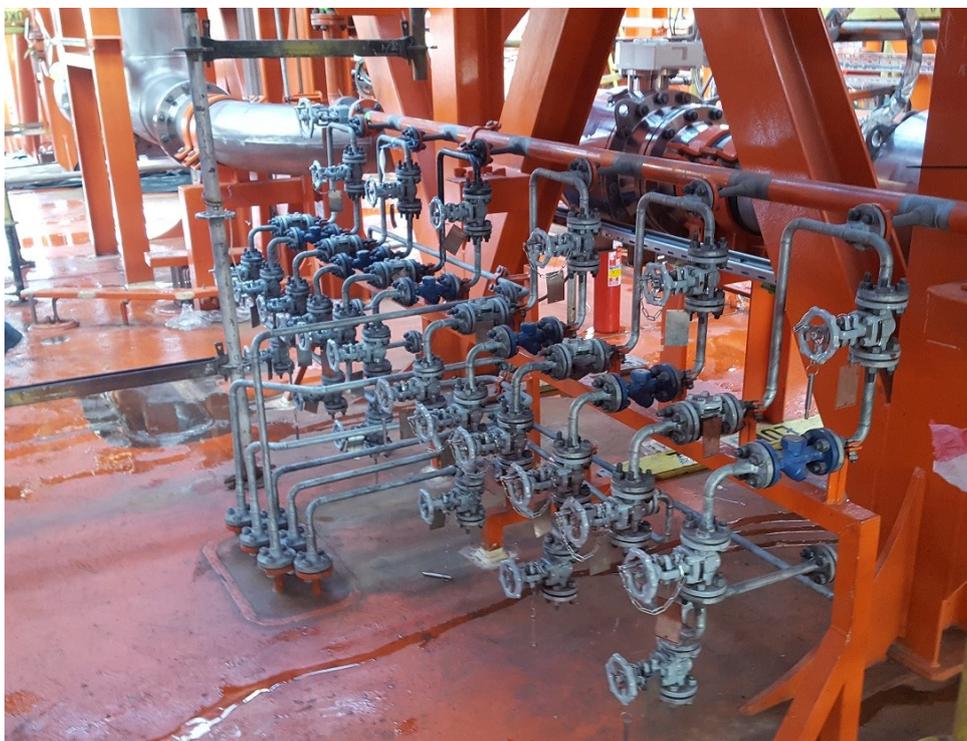
Emilia Węglewska, Trade and Marketing Department Manager

In this issue

- HVAC systems and pipelines assembly
- Launch of Multipurpose vessel: Zodiak II
- Ammonia condenser
- Distillate and glycol coolers
- HEX and pressure equipment for natural gas installations in Bystrowice, Sędziszów and Kamień Mały
- R&D project
- Repair works on vessels
- BWT systems
- New technologies



Multipurpose Vessel Zodiak II with our HVAC system



HVAC assembly, pipeline prefabrication

We invite you to send inquiries to our company to perform HVAC installation and pipelines.

Scope of work

We offer component deliveries and installation of:

- ship general ventilation, engine room ventilation (including air handling units, fans, ducts, fire dampers, ventilation accessories, design, certification)
- chilled water installations (including chiller, fan coils, valves, pipelines, design, certification)
- air conditioning (condensing units, AHU, ducts, cabin units, grilles, etc., design, certification)
- cold stores (with condensing units, coolers, pipelines, design, certification)
- refrigeration systems
- pipe lines, including:
 - ballast water treatment systems,
 - sanitary installations,
 - fire fighting and sprinkler installations,
 - steam installations,
 - compressed air, heating installations
 - power hydraulics, mapress, Viega, GF +

Materials: steel, 316L, duplex, SMO, Cu, CuNiFe10Mn, PE

We provide design for the above-mentioned installations.





New building B618/1 „Zodiak II ” handed over

On 20th of August, Zodiak II - a multi-purpose vessel ordered by the Maritime Office in Szczecin (UMS)- left the Remontowa Shipbuilding SA shipyard. The vessel has been handed over to the Owner and will be operated by the maritime administration in Gdynia.

Zodiak II from the shipyard sailed to the Navigation Base in Gdańsk, where it moored at the Five Whistles Turn, at the Mew Quay, next to the previously operated Zodiak vessel. The official handover of the ship to the Maritime Office in Szczecin took place. UMS ordered two twin units: for the Maritime Office in Gdynia (Zodiak II) and the Maritime Office in Szczecin (Planet I).

Both ships, 60 m long, almost 13 m wide and with a draft of 3.5 m, will reach a speed of 13 knots. They are equipped with a diesel-electric drive system that allows for flexible use of power to fulfill various functions. They are intended, among others for transport, service, replacement and control of sea buoys, hydrographic measurements, towing works, remove oil spills and breaking ice. In addition, they will be able to serve as units supporting other services in sea rescue and fire fighting.

The new ships will replace the two existing, 38-year-old Planeta and Zodiak units, which were commissioned in 1982.

The scope of works performed by CLIMAREM

CLIMAREM has completed a General contract for design, equipment delivery, and montage of whole HVAC system with commissioning.

HVAC system included:

- General ship ventilation
- Engine room ventilation
- Air conditioning
- Provision cooling plant



Chiller for air-conditioning system on Zodiak II



Technologies accepted by TÜV

The qualified metal cutting technology has been recognized by the TÜV Notified Body.

The technology was accepted for the material group S355J2, thickness 3.0-20.0 mm and the plasma-cutting machine type ECKERT TOPAZ HD 200.

The technology of brazing copper pipes CuDHP R220, R290 (310) for pipes with diameters from 9.52 to 76.1 mm was also recognized by the TÜV under PN-EN 13134: 2004.

Vertical ammonia condenser

Technical data

Heat exchange surface: 131 m²

Number of $\varnothing 57 \times 3.2$ tubes in the tube plate : 208 pcs.

Design pressure ammonia side: 18 bar

Design pressure on the water side: atmospheric

Min / Max temperature: 0°C / 100°C (water) and 0°C / 150°C (ammonia)

Water side volume: 2230l

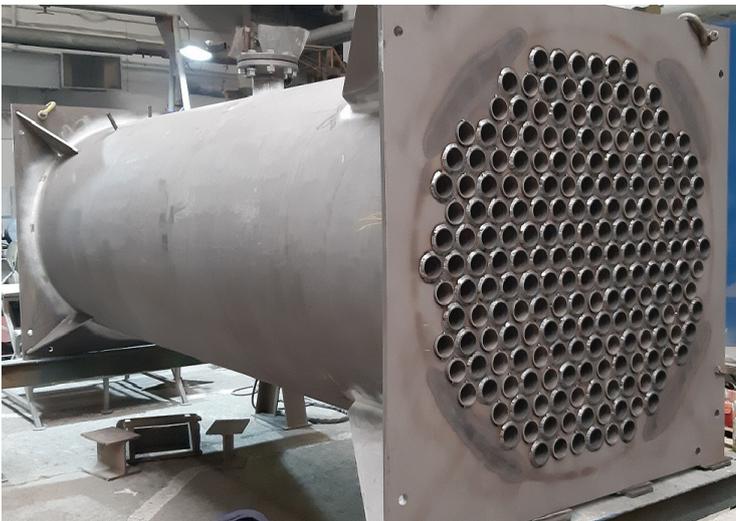
Volume on the ammonia side: 2480l

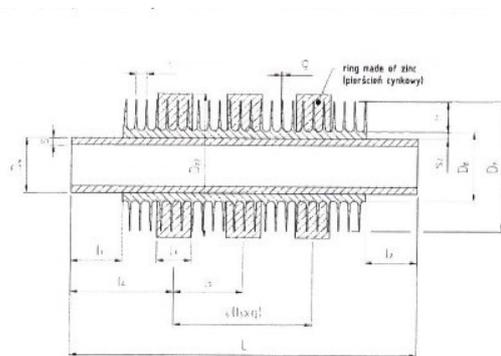
The condenser was made in accordance with the PN-EN 13445-3: 2014-11 standard and was certified by TÜV.

Description

This type of s&t condenser is used in ammonia refrigeration system to condense NH₃ vapours with water flowing through the tubes.

Industria Service / Industrial Services Jednostka Certyfikująca Urządzenia Ciśnieńowe Certification Body for Pressure Equipment		TÜV Rheinland® Precisely Right.	
CERTYFIKAT - CERTIFICATE			
Kwalifikowanie technologii lutowania metali / Brazing Procedure Qualification - Metal (BPQR)			
Wydawca: PBUCH S.A. ul. Hutnicza 4 81-663 Gdynia		Instytucja technologiczna lutowania wyrobów Manufacturers Brazing Procedure pBPS-AP	
Data lutowania / Date of Brazing: 02.08.2025		Nr protokołu / Specimen No: 1/2020	
WARUNKI TECHNICZNE SPECIFICATIONS: PN-EN 13134:2004			
ZŁĄCZE PRÓBNE / TEST PIECE			
Materiał - Oznaczenie (Podtyp wg ISO/TR 15008) Material - Designation (Subtype acc. ISO/TR 15008)		CuDHP R220, R290 (310)	
Średnica zewnętrzna rury / grubość ścianki / Pipe Outer Diameter / Thickness (mm)		1: Rura / Tube $\varnothing 9.52 \times 0.8$ 2: Rura / Tube $\varnothing 20.3 \times 1.5$ 3: Rura / Tube $\varnothing 76.1 \times 2.0$	
ZAKRES KWALIFIKACJI / RANGE OF APPROVAL			
Podtypy materiałów podstawowych / Base Metal Subgroup:		31 ± 31	
Grubość materiału / Wall Thickness (mm)		0.8 - 2.0	
Średnica / Outer diam. (mm)		-	
Średnica zewnętrzna rury / Pipe Outer Diameter (mm)		9.52 - 76.1	
Różnica złącza / Joint Type		Zakładkowe / Overlap Joint	
Proces lutowania (ISO 4063) / Brazing Process (ISO 4063)		912	
Materiał dodatkowy, Specyfikacja/Oznaczenie: Filler metal, Specification/Designation		EN ISO 17872: Ag 244	
Gaz podgrzewający: Heating gas		Acetylen / Acetylene	
Topnik, Specyfikacja/Oznaczenie: Flux, Specification/Designation		-	
Średnica otworu / Hole size (mm)		3.0	
Sposób aplikacji mat. dodatkowego / Application of filler material		Ręczne / manual	
Szczegóły użytkowania ustalonego / Appurtenance details:		Opóźnione lutowanie / retarded brazing	
Sposób czyszczenia przed lutowaniem / Method of pre-brazing cleaning:		Ręczne / manual	
Sposób czyszczenia po lutowaniu / Method of post-brazing cleaning:		Ręczne / manual	
Procedura lutowania / Brazing Procedure:		W pionie od góry / Vertical down-flow (VD) W pionie od dołu / Vertical up-flow (VU)	
UWAGI / REMARKS:			
WYNIK / RESULT: Niniejszym potwierdza się, że próbne złącze lutowane zostało wykonane i zbadane zgodnie z wymaganiami Wymagania technicznych i aplikacji podjętymi. This is to certify that the brazed joint were prepared, tested and tested satisfactorily in accordance with the specifications indicated above.			
Miejsce: Gdynia		Data: 15.07.2020	
Lokalizacja: Gdynia		Jednostka Certyfikująca Urządzenia Ciśnieńowe Certification Body for Pressure Equipment	
Załączniki: 1. Protokół lutowania złącza próbnego / Brazing Test Results 2. Wynik badań / Test Results		M.Sc. Eng. Tomasz Stokłos Jednostka Badawcza, Numer ID: 0039 Notified Body, ID Number 0235	
<small>TÜV Rheinland Industrie Service GmbH Merckstr. 151, 50193 Köln, Germany © 1999-2020 TÜV Rheinland AG, 10000 Köln, Germany www.tuev.com</small>			





Number of finned tubes: 216 pcs

Number of rows: 6

Finns: AL. 1060

Pipe material: P275NL1

Pipe length: 3384 mm

Glycol cooler during production

Glycol cooler

Glycol cooler described below was produced in CLIMAREM for the project: "Development of the Gilowice gas well" commissioned by the General Contractor. Technical parameters are given below.

Technical data:

Cooling capacity: 101 kW

Heat exchange surface: 519m²

Maximum allowable pressure: 11 bar

Design temperatures: -29°C / + 50°C

Outer diameter of pipes / thickness: 16mmx2mm

Medium: Ethylene glycol 50%

Capacity: 140l

Fan diameter: 1000mm

Fan capacity: 33,500 m³ / h

Fan static pressure: 220 Pa

Quantity of fans: 2



Water absorption by glycol

When extracting a gas containing H_2S or CO_2 , the water present in the gas can cause corrosion in the collection piping and form hydrates that block its flow. Accordingly, the standards impose limits on the water content of the gas.

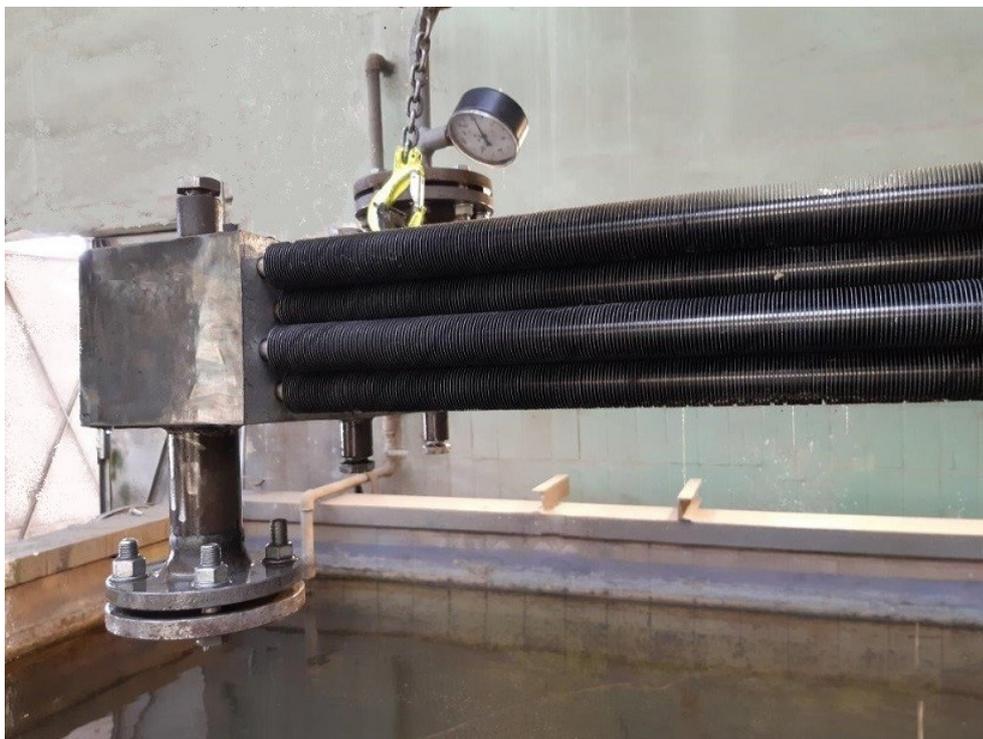
TEG (triethylene glycol) is commonly used to dry natural gas.

The process of glycol drying is the following:

After regeneration, glycol is pumped to the top of the absorption column. Water-rich glycol is collected at the exchanger outlet. Rich glycol is sent through the regenerator coil, flash tank (where most of the hydrocarbons dissolved in TEG evaporate and can be used as fuel gas), and through a number of filters and exchangers go to the regenerative column with a reboiler, where, as a result of heating, distillation of water from glycol takes place. The highest concentration of TEG that can be obtained during its regeneration at a temperature of $204^\circ C$ and atmospheric pressure is 98.7 - 99.0% by weight. The regeneration process is not carried out at higher temperatures because TEG decomposes at $207^\circ C$.

The regenerated glycol, now called lean glycol, is poured into the surge tank below and from there it flows through the so called: "Lean TEG-Rich TEG" heat exchanger into the glycol cooler and then back to the absorption column. Thus, the glycol cycle is closed.

Followed by Eugeniusz Grynia and John Carroll from Gas Liquids Engineering Ltd. article.



Distillate cooler after pressure test

Distillate cooler

The distillate cooler was delivered to the General Contractor of the project entitled "Development of the Sędziszów 38K, 39K wells", and was produced in accordance with the Pressure Equipment Directive 2014/68 / EU.

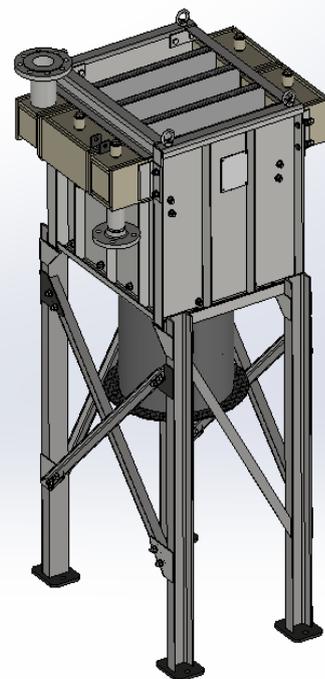
Design temperatures: $-29^\circ C / +200^\circ C$

Test pressure: 2.25 bar

The construction of the cooler is based on a 4-flow heat exchanger made of low-finned tubes and an explosion-proof duct fan with a capacity of $4470 m^3 / h$, plus a supporting structure

The cooler is used in the process of removing water from triethylene glycol (TEG), which, after evaporation in the regenerator at a temperature of $+190^\circ C$, is condensed in the cooler and then directed to the distillate tank.

This cooler is designed for natural gas drying installations.



Distillate cooler - 3D model



LTS V210 separator

Equipment for the natural gas preparation plant

Delivery range

For the General Contractor of the project entitled "Development of the Bystrowice natural gas deposit", CLIMAREM produced the following pressure equipment:

LTS V210 three-phase separator with glycol coil, working pressure: 55 bar

A-300 mercury adsorber, working pressure: 54.7 bar

Two-phase separators V120, V130, V140, working pressure: 107bar, 93 bar, 73 bar

Two-phase separator V110, working pressure: 135bar

LTS E200 heat exchanger, operating pressure: 70 bar on the tubes side and 55 bar on the shell side



Adsorber A300 before shipment



Separators V120, V130

Designing of heat exchangers

CLIMAREM provides engineering and designing of pressure units and heat exchangers.

We perform thermal-flow calculations of shell-and-tube heat exchangers in a professional selection program.

Pressure equipment calculations are performed in the Visual Vessel Design software.

3D drawing documentation is created using the SolidWorks program.



V140 separator



V110 separator

Instalation of the gas storage system in Sędziszów

We have produced the following process equipment for the "Development of wells in Sędziszów":

- TEG filter
- Carbon filter
- Pre-separator S111, S112
- TEG V-301 degasser
- Condensate tank
- Drainage tank
- Storage tank
- W111 and W112 gas heaters
- Heat exchanger TEG-TEG E-301
- R-301A regenerator reboiler
- R-301B distillation column



Gas heaters W111, W112



Drainage tank



TEG V-301 degasser



R&D project

We work on the research project entitled "Development of an innovative, ecological refrigeration equipment for ship applications" as part of the "INNOSHIP" Sectoral Operational Program.

We are currently completing the construction of a stand for testing condensing units operating on natural refrigerants. Most of the refrigeration installation assembly work was completed. The test room was equipped with electrical installations, subassemblies of the main switchgear.

Currently, automation systems that control the cooling installation and monitor the system parameters needed to perform the tests are performed. At the same time, work will be carried out to collect all certificates as well as to perform the necessary calculations required for certifications.

We have equipped the refrigerant test stand with an appropriate industrial gate, which enables the supply of test system components as well as whole cooling units.

A titanium welding chamber has been built and work is currently underway to make approval tests.



Titanium welding chamber



Ship repair works

By the end of the third quarter of 2020, we have performed repair works on the following vessels:

MV Bretagne—Ro-Ro—refrigeration table system

MV Barbara Krahulik—Ro-Ro—overhaul of the supply cooling installation

MV Seven Kestrel—Offshore Support Vessel - overhaul of the refrigeration plant

MV Wawel—Ro-Ro – refrigerant retrofit

MV European Seaway—Ro-Ro—overhaul of refrigeration, chiller, ventilation and air conditioning installations

SY Oceania—Research Vessel—regulation of cold stores and air conditioning,

MV Ile d'Quissant—Cable Layer—air conditioning installation, retrofit

MV Belomorye—Reefer—repair of cargo refrigeration plant

MV Princess Anastasia — Ferry — repair works in the provision rooms

MV Klara — Chemical tanker — assembly of air conditioning equipment

MV Star Stratos– Reefer — overhaul of the cooling system

MV Baie de Seine — Ferry— refurbishment of cold stores

MV May Richard Winters – General Cargo - air conditioning system repair works

MV Kurskaya Kosa — Fishing Vessel — overhaul of the cooling system

MV Willem van Rubroeck — Dredger— rebuilding of the ventilation system and air flow regulation

MV Gothia Seaways — Ro- Ro — overhaul of the air conditioning system

MV Evrotas — Crude Oil Tanker - overhaul of air conditioning installations, overhaul of BWTS in the engine room

MV Amundsen Spirit — Crude Oil Tanker— overhaul of air conditioning installations

MV Tavropos -Crude Oil Tanker — overhaul of the BWTS in the engine room

MV Frances Wonsild — Oil / Chemical Tanker — replacement of cooler units

MV Bastogne — LPG Tanker — demister replacement and tanks tests



Steam system



GRE pipelines





BWT systems for ships

CLIMAREM gained experience in the installation of ballast water treatment systems meeting the new standards of cleanliness recommended by the International Maritime Organization (IMO).

These systems are usually based on filtration and chemical (chlorine, chlorine dioxide, ozone) or physical (UV radiation, ultrasounds, cavitation) disinfection of the ballast water.

Due to the very large amount of ballast water and a relatively short time, in which this water has to be retrieved or returned to the sea, these systems must be efficient and effective.

BWTS operation consists on filtration of water retrieved into tanks to eliminate organisms larger than 50 micrometres, and then disinfection of water, which is to eliminate the remaining, smaller organisms. During the de-ballasting, such disinfection is required so that the water discharged outside the ship meets the IMO convention standards.

