Wytwórnia Urządzeń Chłodniczych "PZL-Dębica" S.A.

Catalogue of Products and Co-operative Services

Dębica 2019

General Information about the Company

Abbreviated History of the Company:
Refrigeration Equipment Factory PZL - Debica S.A. was established in 1938 within the Central Industrial Zone, as a branch of Walcownia Metali Kolorowych S.A. in Czechowice - Dziedzice, which produced for the defence industry. Till 1960 the company operated under the name of the Transportation Equipment Factory - WSK and supplied products for aircraft industry and achieved a high technological level. In 1961 the PZL - Dębica was assigned the status of an industrial refrigeration equipment producer - the first producer of this kind in Poland. In 1972 the name of the company was changed and since then the firm has operated as Wytwórnia Urządzeń Chłodniczych (Refrigeration Equipment Factory). In 1995 WUCH PZL - Dębica became a stock company.

Kind of Performed Activities:
- production of equipment,
- assembling of refrigerating systems,
- guarantee and post-guarantee service,
- overhauls and modernisation of used refrigerating systems and equipment,
– designing and technical counselling,
- refrigeration training courses for customers and users of industrial refrigerating equipment

Production Offer:
- screw and piston compressors as well as compressor units on the basis of these compressors designed for refrigerants and gases: CNG and LPG,
- units for ice water and chillers,
- air-condition units for mines,
- air and liquid coolers,
- spray-and-evaporative condensers, vertical and horizontal shell-and-tube condensers
- tank apparatus,
- refrigerating valves, level indicators, filters and breathers,
- cooling and refrigeration tunnels for fruit, vegetables and poultry,
- refrigerating systems,
- air compressors for pneumatic systems of land vehicles and planes,
- production services: making of steel structures and machine parts, machining,
- welding and gas cutting, plastic working and heat treatment.

WUCH PZL - Debica S.A. employs highly specialised technical staff and implements new technologies, thanks to which we guarantee the high quality of manufactured equipment and services. Many years of experience, co-operation with research centres, own design and construction offices as well as extensive technology and production back up facilities make it possible to manufacture products of the highest standard. Since 1998 the company has had the ISO 9001 quality certificate. Since 2005 the System of Quality Management has been certified for the compliance with the EU pressure directive. The equipment delivered on the market meets requirements of European Union directives and is marked with the CE mark.

APPLICATION

Compressor packages ASR are designed for operating in single-stage and two-stage refrigeration plants in booster system or in a system with an economiser.

TECHNICAL DATA

- Displacement capacity: from 293 to 2400 m^3/h.
- Refrigerating capacity:
  from 150 to 1480 kW at t_o = -10°C and t_k = +35°C
- Refrigerant: R717, R404A, R407C

CONSTRUCTION

The compressor package consists of:
- screw compressor with two rotors of assymmetric profile,
- electric squirrel-cage motor,
- flexible metal coupling,
- oil separator, which also forms an oil tank,
- hydraulic system of lubricating, controlling, cooling etc.,
- electric system of controlling and protecting,
- system of oil cooling, as per an individual selection,
- system of stepless capacity regulation within the range of 11-100 %,
- check-measure and protecting equipment
- stop - check servo valve at the suction side of the compressor

The compressor package composes a block unit, functionally adapted to operation in refrigerating systems. Construction of the package is compact and it does not require special foundations or anchor bolts. The shock absorbers, which are delivered together with the package, give high efficiency of damping the vibrations transmitted to the base. When selecting the foundation, it is necessary to take into account static loads only.

The compressor package realises quite automatically, in a programmed cycle, all the start up activities as well as activities related to disengaging the package (including an emergency shutdown).
Screw packages ASR are equipped with microprocessor control system.
Control systems of the package ensure automatic capacity regulation of the compressor depending on assigned working parameters. The current level of capacity is indicated directly on the compressor and on the control panel of the power cubicle. The micro - processor control system can regulate compressor capacity in a function of temperature or evaporating pressure, depending on a kind of an applied sensor. The screw compressor is driven by an electric squirrel-cage motor of power selected in accordance with demand at specified working parameters.

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COMPRESSOR UNITS DESIGNED FOR OPERATION IN GAS COMPRESSOR STATIONS

Screw compressor packages of type ASR/G are designed for compressing natural gas in gas compressor stations.

Technical parameters:

- pressure at suction from 1,7 MPa to 0,5 MPa
- pressure at outlet from the compressor – 2,2 MPa
- capacity: from 2700 to 32000 Nm^3/h

Depending on requirements, the units are equipped with:

- gas cooler – air one or water one (glycol one),
- oil cooler - air one or water one (glycol one),
- control cubicle for the package,
- power cubicle for compressor motor.

COMPRESSOR UNITS DESIGNED FOR FORCING THROUGH LIQUIDS

Screw compressor packages of type ASR/LPG and piston ones of type 6D58LPG 6W92LPG are designed for forcing through liquids and condensed gases (such as propane-butane and ammonia) between vessels, for loading and unloading the liquid, uptake of gas phase to be condensed and for technical needs.

Exemplary application - while unloading of tank cars in an explosion hazard zone.

Functioning of the package is based on the principle of creating pressure difference between emptied tank and a filled up one by sucking off vapours from the filled tank and forcing them through into the emptied tank.
The compressor sucks in gas vapours through the filter and after having compressed, it forces them through an oil separator into the installation. The oil, which is entrained together with medium vapours lubricating and cooling compressor mechanism, is recovered in the oil separator..

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APPLICATION

They are designed for condensing the vapours of refrigerants generally applied in cooling systems and in particular R717, R404A. They are characterised by low water consumption what makes it possible to apply them even in places where there are considerable water consumption limitations.

TECHNICAL DATA

- Refrigerating capacity from 648 to 1470 kW.
- The basic typeseries consists of 12 sizes.

CONSTRUCTION

The SWC condensers have a steel structure completely protected against corrosion by hot galvanising. Side covers are made of galvanised steel sheets. Internal surfaces are additionally covered in paint coating.
The basic assembly of condenser is the lower set with a water tank and fans. On the lower set, there is situated the upper set consisting of condensing sections. Over the batteries, there is mounted the spraying system and a set of highly efficient eliminators.

OPERATION

The operation of spray-evaporative condensers is based on the exchange of heat and mass. Refrigerant vapour is supplied to condensing sections where it is condensed. The condensing heat is carried away to the water and then to the air. Condensed refrigerant flows down to outflow collectors and then it is carried away further to the refrigerating system.
The air flows in a counter-current to water stream forced by silent running drum fans. The heat from water is transmitted to the air by evaporation of water, thanks to that temperature of circulating water remains at a constant level.
The water is to be constantly supplemented due to evaporation of it and in order to maintain concentration of mineral salts at a stable low level. The quantity of water to be supplemented is adjusted with the float valve. This quantity is to be determined depending on water hardness, with assumption that quantity of entrained water is equal to about 2 ÷ 3% of quantity of evaporated water. Maximum theoretical quantity of evaporated water is equal to the quotient of condenser heat capacity and water evaporation heat (2455 kJ/kg). The factual capacity of evaporated water is lower of even 30%.

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SHELL AND TUBE EVAPORATORS - type PPL and PG.

They are applied for cooling the intermediating medium (water, glycol, brine) in ammonia refrigeration system or freon refrigeration system.

- Refrigerating capacity from 26,5 to 2200 kW

The evaporators have the welded structure.
They are built from a rolled shell closed from both sides with perforated bottoms, in which tubes are expanded. The tube inner space is closed with ellipsoidal bottoms.
Liquid refrigerant is supplied to inter-tube space of the evaporator where it is evaporated and vapours are lead out through a stub pipe in the upper part of the evaporator.

SHELL AND TUBE CONDENSERS - type SLB and SG

They are designed for condensing refrigerant vapour by cooling it down by means of water.

Heat exchange surface from 10 to 1100 m^2.

The condensers are built from a rolled shell, perforated bottoms and set of tubes.
The tube inner space of condenser is closed with ellipsoidal bottoms.
Tubes in condensers of type SG have a developed outside surface.

The exchangers are executed in accordance with pressure directive 97/23/EU and marked with CE mark.

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APPLICATION

The chillers are designed for application in the industry as the source of the cold in processing production lines of food industry, chemicals, electronics, pharmaceuticals, at processing plants of plastics, in processes of galvanic treatment and for air-conditioning centres of large buildings, for air- conditioning of mines, etc.

TECHNICAL DATA

- Refrigerating capacity: 300 to 3000 kW
- Refrigerant: R717, R404A, R407C
- Cooled medium – technological water, glycol

Possible configurations with a water condenser, air condenser or spray-evaporative condenser.

ADVANTAGES

- Ideal for industrial installations
- High quality components
- High efficiency and reliability of working
- Easy configuring and assembling
- Easy operating and servicing
- Silent running
- Microprocessor control with possibility to use different applications
- Possibility of remote control of chiller work
- Complete equipment and compact structure
- Positioning on vibro-insulators, it does not require foundations and anchor bolts

CONTROL SYSTEM FUNCTIONS

The applied control system enables the user to set parameters easily and to control the work of equipment, and especially it ensures:

- Continuous monitoring of equipment working parameters
- Optimisation of equipment working by means of automatic capacity regulation basing on temperature or evaporation pressure in relation to the limitation of motor current rise above the permissible value
- Running diagnostics of equipment working, display of occurring disturbances and emergency states
- Possibility of protecting by means of an access password to controller against unauthorised persons
- History of alarms (register of 200 latest alarms - it includes time, date and kind of alarm)
- Possibility of remote communication and co-operation with automatics systems through industrial networks

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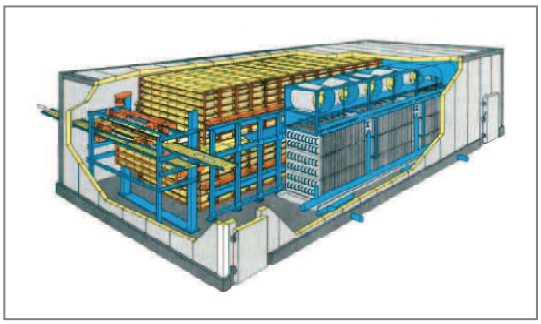
FREEZING TUNNELS FOR POULTRY – type TD

Catalogue of Products

APPLICATION

Tunnels of type TD are designed for freezing of carcasses and elements of chickens packed into plastic bags, delivered to the tunnel in cartons, in a continuous way from a technological line of poultry abattoir. In tunnels TD, it possible to freeze other products with freezing parameters similar to poultry.

FREEZING CAPACITY



- chickens - from 2300 to 6000 kg/h,
- Turkeys - from 3400 to 6000 kg/h.

Type-series of sizes: TD-2,5; TD-3,75; TD-5; TD-6,25.

FREEZING CYCLE

Inside the tunnel, the carrying structure is set up in which, over roller tracks situated on two levels, racks shift around with frozen poultry in cartons.

Mechanisms for shifting the racks in the tunnel and for moving them from one level to the other make it possible to get circular movement of racks.

Cartons of fresh poultry are delivered onto the upper level of the tunnel and loaded on racks; cartons of frozen poultry are unloaded from the racks and collected from the lower level.

Freezing of poultry packed in plastic bags and arranged in cartons is performer in one freezing cycle lasting about 7 to 10 hours.

REFRIGERATING CYCLE

The task of product freezing rests on the refrigeration block, situated along the rack tracks, consisting of batteries as well as fans. Refrigerant NH_3, CO_2 or others after having been agreed upon.

The whole tunnel is enclosed in insulated casing.

TUNNEL WORKING CONTROL

The system of control and monitoring of tunnel working parameters is on the basis of Siemens microprocessor with a possibility to data transfer to User's system.

Tunnels of type TD are modern tunnels for freezing of poultry in completely automatic continuous movement.

DELIVERY as per an individual project adjusting the tunnel to the existing or designer development.

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Horizontal receivers - type ZLU

They are designed to accumulate refrigerants in liquid state in land-based, stationary refrigerating equipment.
Total cubic capacity of apparatus from 0,63 to 20 m^3.

Liquid separators - type OCA and OCG

They are designed for pump refrigerating systems performing the following functions:
- to separate the liquid from saturated vapour stream returning from the evaporator in the form of two- phase mixture,
- to compensate changeable filling of evaporators which results from changeability of thermal loads.

Total cubic capacity of the separators from 0,63 to 25 m^3.

Driers - type OSs

They are applied in ammonia pressure refrigerating systems to separate liquid phase from vapour sucked in by the compressor.
The driers are built within the range of suction duct diameters from DN32 to DN200.

Oil separators with filling rings - type ORA

They are applied in compressor ammonia refrigerating systems to catch oil carried away by compressed refrigerant.
Total volume of oil separators from 0,027 to 0,9 m^3.

Horizontal interstage coolers - type CML and CMLU

They are designed for cooling refrigerant vapour compressed to the interstage pressure in pump two-stage ammonia systems as well as for separating liquid refrigerant from vapour at saturation temperature at interstage pressure.
The coolers are made with capacities from 1 to 10 m^3.

Vertical interstage coolers - typ CM

They are designed for cooling refrigerant vapour compressed to the interstage pressure in pump two-stage systems of ammonia refrigerating equipment and for subcooling the liquid refrigerant from the condenser to temperature near saturation temperature at interstage pressure.
External surface of coil pipe from 0,9 to 22 m2.
Cubic capacity of the tank from 90 to 5850 dm^3.

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Stop valves - type ZOPb and ZOKb (15 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They may be used wherever a need arises to shut off the flow of refrigerant in vapour or liquid state. The valves of this kind can also be applied in systems of general application on chemically inactive media.

The stop valves are made:

- in diameter range DN from 10 to 300 mm
- in working temperature range from -40 to +135^{o}C
- working pressure max up to 2,5 MPa
- in standard version and semihermetic one

Non return valves - type ZZPb and ZZKb (11 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They may be used wherever a need arises to prevent from the return flow of refrigerant in piping.

The non-return valves are made:

- in diameter range DN from 15 do 150 mm
- in working temperature range from -40 to +135^{o}C
- working pressure max up to 2,5 MPa

Control valves - type ZRPb (14 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They serve for throttling the refrigerant liquid from condensing pressure to evaporating pressure and for control of quantity of liquid flowing to the evaporator.

The control valves are made:

- in diameter range DN from 10 do 50 mm
- in working temperature range from -40 to +135^{o}C
- working pressure max up to 2,5 MPa
- in standard version and semihermetic one

Safety valves - type ZBKk (7 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They serve for protecting vessels and refrigerating systems against excessive rise in pressure.

The safety valves are made::

- in diameter range DN from 10 do 50 mm
- in working temperature range from -40 to +135^{o}C
- working pressure max up to 2,5 MPa

Three-way valves- type ZTb (8 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They serve for alternating cutting off the refrigerant inflow to safety valves.

The three-way valves are made:
- in diameter range DN from 10 do 65 mm
- in working temperature range from -40 to +135°C
- working pressure max up to 2,5 MPa

Pressure gauge valves - typeseries ZMP, ZMK, ZMT

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

These valves make it possible to connect a pressure gauge in order to measure the refrigerant pressure in systems or equipment.

The pressure gauge valves are made:
- with diameters DN-4 mm
- in working temperature range from -40 to +135°C
- working pressure max up to 2,5 MPa

Venting valves - type ZOA and ZOX

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 (type ZOA) and R22 (type ZOX). They serve for periodical removing the air and non-condensing gases from apparatus and ducts.

The venting valves are made:
- with diameter DN - 4mm
- in working temperature range from -40 to +135°C
- working pressure max up to 2,5 MPa

Level indicators - type WPX (7 sizes) and WBX (16 sizes)

They are designed for refrigerating equipment operating on refrigerant R717 and other refrigerants. They serve for indirect indicating the liquid level in apparatus and tanks.

The level indicators are made:
- with indication range from 300 to 1420 mm
- in working temperature range from -40 to -5°C
- working pressure max up to 2,3 MPa

Preliminary filters - type FWPb and FWKb (10 sizes)

They are designed for land-based and marine refrigerating equipment operating on refrigerant R717 and other refrigerants.

They serve for cleaning the refrigerant in the system from after-assembly impurities.

The preliminary filters are made:
- in diameter range DN from 25 do 200 mm
- in working temperature range from -40 do +135°C
- with filtering accuracy 0,5 mm
- working pressure max up to 2,5 MPa

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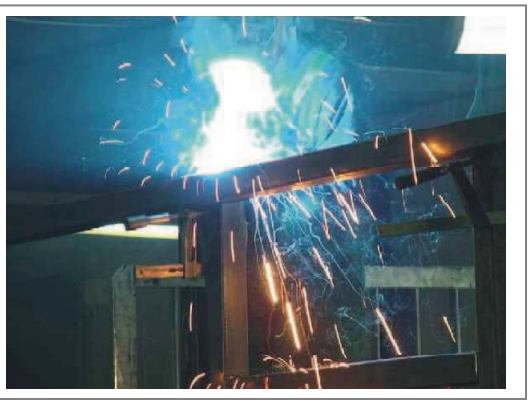
We have got machines and equipment adequate to our production profile, including:

- coiling machines for metal plates (max. plate thickness 22 mm, max. width 3000 mm)
- bending machines for pipes and plates,
- drilling machines,
- centre lathes and vertical ones,
- CNC boring machines and machining centres,
- grinding machines for surfaces, shafts,
- semi-automatics and welding equipment for protective gas-shielded welding with method MIG, TIG and hidden arc,
- furnaces for heat treatment.

We render co-operation services within the scope of:

- coiling of steel plates,
- mechanical and gas cutting,
- coiling of flat bars and sections,
- welding,
- machining,
- heat treatment,
- fitter works,
- paint coat spreading.



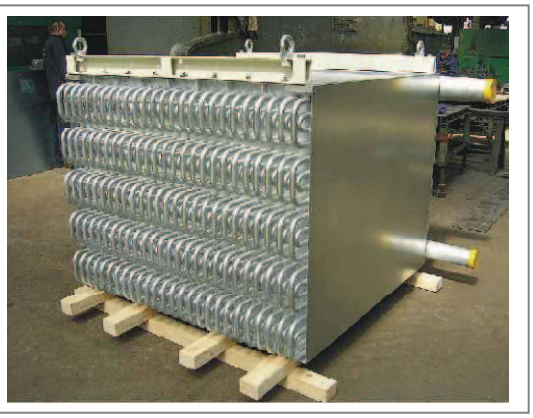
We offer the making of the following assortment of products:

- pressure vessels and non-pressure tanks from carbon steel,
- shell and tube heat exchangers, one-way and multi-way ones with permanent perforated bottoms, with floating head and U-pipe ones,
- pipes finned by means of cold rolling. The technology and equipment which we have make it possible to produce pipes of varied dimensions,
- steel structures,
- wide range of machine parts, assemblies and sub-assemblies for different industry branches,
- elements of equipment and other untypical welded structures.

Main dimensions of manufactured equipment:

- shell thickness - up to do 22 mm,
- diameter of apparatus made as the whole - up to Ø 3800 mm,
- weight of apparatus made as the whole - up to 30 000 kg,
- weight of elements which do not involve manoeuvring – up to 40 000 kg.

Products of larger dimensions and weights – upon individual agreements.



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