

Air Conditioning Systems

CLEAN AIR IS THE LIFE BASE

HAVAYE NABE BARAN



**HAVAYE NABE
BARAN COMPANY**

Designer and Manufacturer
of Air Conditioning Systems



شرکت هوای ناب باران
دانش بنیان



Factory: Phase 4, Payam special economic zone,
Mehrshahr, Karaj, Iran.
+98 26 91091010 (10 Lines)

info@havayenab.com
www.havayenab.com



Havaye Nabe Baran

Designer and Manufacturer of Air Conditioning Systems

Contents

Page 02 Section 01	Page 23 Section 12
CEO MESSAGE	WATER COOLED CHILLER
Page 03 Section 02	Page 25 Section 13
ABOUT US, WHY HNB	AIR COOLED CONDENSING UNIT
Page 05 Section 03	Page 27 Section 14
HNB FACTORY	FAN FILTER UNIT & EXHAUST CABINET FAN
Page 07 Section 04	Page 29 Section 15
CERTIFICATES	EXHAUST UTILITY FAN
Page 09 Section 05	Page 31 Section 16
AIR STARTER & AIR CONDITIONER	PACKAGE UNIT
Page 11 Section 06	Page 33 Section 17
HYGIENIC AIR HANDLING UNIT	COOLING TOWER
Page 13 Section 07	Page 35 Section 18
STANDARD AIR HANDLING UNIT	FILTRATION, ACCESSORIES & BAG-IN/BAG-OUT SYSTEM
Page 15 Section 08	Page 37 Section 19
DESICCANT DEHUMIDIFIER	AUTOMATION & POWER CONTROL PANEL SYSTEM
Page 17 Section 09	Page 39 Section 20
HEAT RECOVERY SYSTEMS	VALUED CLIENTS & PARTNERS
Page 19 Section 10	Page 41 Section 21
AIR WASHER & ECONOPACK UNIT	AFTER SALES SERVICES
Page 21 Section 11	
AIR COOLED CHILLER	



Air pollution, increasing the average global temperature, human use of electrical and mechanical appliances, increasing energy cost and necessity to optimize energy consumption, the needs of pharmaceutical, medical and food industries and also requirement of modern architecture necessitates human beings to use Air Conditioning systems in confined spaces. Nowadays, due to advances of pharmaceutical and medical industries and also increasing construction of hospitals, shopping centers, sport complexes, conference halls and residential apartments, it seems important to pay attention to this necessity more than ever.

In order to meet this fundamental necessity, Havaye Nabe Baran Knowledge-based Company has introduced itself as a leader in design and manufacture of high tech Air Conditioning systems in line with the latest technology in the world by employing the skilled and experienced team in administrative and production sectors, using the advanced machinery and high quality raw materials in production line and relying on strong human capital and former experience of cooperation with international trading partners.

With perseverance, trust in God and increasing efforts on this difficult path ahead, we hope that Havaye Nabe Baran family can play his role in energy efficiency and approaching independence and prosperity of Iran's HVAC industry as much as possible.

01 CEO Message





Havaye Nabe Baran

Designer and Manufacturer of Air Conditioning Systems

About Us

Havaye Nabe Baran Knowledge-based Company (HNB Group) was established relying on many years of successful experience in manufacturing Air Conditioning systems and aims to add dynamics and mobility in this industry and provide updated engineering services, designing, manufacturing and implementation in line with the latest technology in the world.

By applying coherent working methods and regarding the former experiences in cooperation with international trading partners, the company has succeeded in obtaining valid International Certifications such as CE, GMP, IMS, VDI6022, ISO9001, ISO 10002, TS 29001, ISO 14001, ISO 45001 and it has the honor of cooperating with the most known pharmaceutical, food, hospital, medical and military references and administrative, commercial and residential complexes during its activity.

By employing the specialized and experienced technical team and using advanced machinery in the production line, Havaye Nabe Baran Company has taken an effective step towards improving the quality of its products such as Hygienic and Standard types of Air Handling Unit, Dehumidifier, Chiller, Condensing Unit, VRF Unit, Data Center and Server Room ventilation system, Fan Coil Unit, etc. and it can undertake all the steps of HVAC project including engineering design and calculations, production, installation, commissioning and maintenance.

Havaye Nabe Baran Company's priorities are quality, expertise, commitment, honesty and customer satisfaction and all the personnel in different organizational levels are committed and adhere to these principles.

WHY HNB?

- Knowledge-based company which is known as a pioneer of innovation in design and manufacture of Hygienic Air Handling Units
- Production in line with the latest technology in the world
- The products are made by latest (2021) European machinery.
- All the products are designed & manufactured according to international certificates as EN 1886, DIN 1946-4, EUROVENT, VDI 6022-1 & EN 13053.
- Cooperation with prominent foreign companies in HVAC industry
- High experienced managers and technical team
- Skilled labor in production and after sales services
- High proficiency and experience in the highest level of cleanliness in pharmaceutical, hospital and food industry
- A-Z services in air conditioning, including initial design, calculations, manufacturing, testing, installation and commissioning
- Expanded capacity and flexibility for the better response to customer's request.
- Offering the highest quality at the competitive price level
- Ability to prepare qualification documents (DQ, IQ, OQ) on pharmaceutical HVAC system
- We love what we do. This is clear in the solutions we produce.





HNB FACTORY

03

Havaye Nabe Baran

Designer and Manufacturer of Air Conditioning Systems

The products are made by the latest technology & European machinery:

05



HNB FACTORY:

Due to the activity of Havaye Nabe Baran Company as Boreas Turkish Company's official agent in Iran and in order to manufacturing top quality products according to the latest world standards, the factory was established in Payam Special Economic Zone located in Mehrshahr, Karaj city to facilitate the supply of raw materials and components from reputable international brands and also Provide the possibility of extensive activities for export to neighboring countries and regional markets.

Our products can be exported to international markets and they are competitive with the most prominent regional brands. In order to extend the production line, next phase of HNB factory is also established with an area of 10,000 square meters in Payam Special Economic Zone.

Certificates



Certificate No: CE-IR1074

CERTIFICATE OF CONFORMITY

Manufacturer	Name	HAVAYE NABE BARAN Co(HNB GROUP)
	Address	No.18, 8th St., Phase 2, Payam Special Economic Zone, Mehrshahr, Karaj, Iran
Relevant product(s) as described to the Technical Construction File No: TF9127988	Product(s) Name	Air Conditioning Unit
	Model	-
Applicable Directive(s)		-
Applicable Standard(s)		VDI 6022:2018

This is to certify that, upon the relevant request of the above company, Certrome has received, archived and proceed to the fullness examination of the Technical Construction File of the above mentioned product(s).
The Technical Construction File has been archived at Certrome records with file no: TF9127988

Following the fullness examination of the Technical Construction File we confirm that it is adequate in respect with the basic health and safety prerequisites.

The manufacturer is obliged to issue a Declaration of Conformity according to the basic requirements of relative standards and places the CE marking with his own responsibility as follows:



All modifications to the Technical File should be first submitted to Certrome to ensure further validity of this attestation.

Date of Issue: 8 Jan 2021
Certificate valid up to: 7 Jan 2024



Chiragpasha
Certrome
Certification Services

The authenticity of this certificate can be confirmed online or by e-mail to the Head Office via: info@certrome.com

All the products are designed & manufactured according to international certificates as EN 1886, DIN 1946-4, EUROVENT, VDI 6022-1 & EN 13053.



05

AIR STARTER & AIR CONDITIONER

NAB / BARAN SERIES



AIR STARTER / AIR CONDITIONER NAB / BARAN SERIES NOMENCLATURE:

NAB	-	080	S	04	X
01	02	03	04	05	

01: Type:

- NAB: AIR STARTER
- BARAN: AIR CONDITIONER

02: Nominal cooling capacity (TR)

03: Compressor type:

- S: scroll
- C: screw
- R: reciprocating

04: Compressor quantity

05: Refrigerant gas:

- X: R-134a
- D: R-22
- C: R-407c
- Q: R-404a
- Z: R-410a

- Compressor start-up system equipped with Soft Starter to reduce electrical stress and extend compressor lifespan (installed inside the power panel).
- High-performance and low-noise fans by Nicotra-Gebhardt with airfoil blades, delivering variable airflow with minimal noise levels.
- Fully automatic operation, configured based on aircraft type.
- Strong and mobile chassis with four steerable wheels.
- Equipped with towing hook for easy transportation.
- Manual parking brake system.
- Smart PLC (Danfoss MCX or Delta) with custom programming and backup support.
- 7-inch Delta graphical HMI display with multi-level access codes
- Manual and parallel control via physical switches and HMI interface.
- Electric heating coil with special fins for efficient heat transfer.
- Step-based and step less control according to ambient temperature and system output.
- Aluminum Opposed Blade dampers installed on all air inlets and outlets
- Equipped to motorized damper.
- Round air outlet compatible with aircraft portable ducting.
- High-power die-cast aluminum airfoil fan (Rosenberg brand) with anti-turbulence edges and horn-shaped outlet; each circuit includes an independent fan that activates linearly based on ambient temperature.
- 10% overload protection system in case of high ambient temperatures.
- Advanced electrical panel built to meet international standards.
- Internal connection to diesel generator with full diesel engine control via electrical panel.
- Roof-mounted beacon light for visual warning.
- Reflective strips and checkerboard stickers in compliance with airport standards.
- This system, engineered with advanced technology, ensures maximum efficiency, minimal noise, and the highest safety standards for airport operations.

HYGIENIC AIR HANDLING UNIT

NAB SERIES



HYGIENIC AIR HANDLING UNIT NAB SERIES

NOMENCLATURE:

NAB-250 CW H D
01 02 03 04

01: Nominal air flow rate (cfm) / 10

02: Cooling coil:

- CW: chilled water coil
- CX: DX coil
- None

03: Heating coil:

- H: Hot water coil
- E: Electrical coil
- S: Steam coil
- None

04: Dehumidifier (or none)

- Airflow range from 1,000 - 60,000 CFM and pressure range from 0.1 - 6 in.WG (Enable to manufacture air handling units with air flow rates less or more than the defined values according to the customer's request).
- Production in three orientation types of horizontal, vertical and L-type body in different air outlet directions, including front, top and down flow types.
- Designing and manufacturing hygienic Air Handling Units according to DIN 1946-4 and VDI6022 standards
- The structure is made of extruded aluminum thermal break profile with polyamide corners specially designed for our products to support standard class D Eurovent, ensure thermal bridging performance complying with mechanical characteristics as per EN1886 and provide better insulation and energy saving.
- AHU casing is fully air-tightened by the specially designed Thermal Break profile and also injecting PU gaskets by CNC injection machine around the doors to avoid air leakage.
- Double skin construction with insulation made of Polyurethane, Rockwool with 25-50 mm thickness according to customers inquiry.
- Outer skin made of electrostatic powder painted galvanized steel with 80 µm powder painting thickness (D1 grade of body mechanical strength and T1 grade of body thermal insulating in Eurovent certification).
- Feasibility of considering inner skin made of SS304L or SS316L.
- Chassis made of galvanized sheet, punched and blended by TRUMPF branded CNC machinery; Chassis structure in the form of bolts and nuts (according to EN13053 standard).
- Plug fan with static and dynamic balance and the minimum amount of noise and vibration
- Electromotors with high protection and thermal insulation class and also possibility of ordering explosion-proof motors.
- Feasibility of considering droplet eliminator after cooling coil.

- In all the products as Air Handling Unit, Chiller, Condensing Unit, Fan Coil, etc., coil tubes are expanded and fixed in fins and the air barrier between the fins inside wall and copper tube is totally removed in order to create more heat transfer between the tubes and fins and also having higher strength in coil. Also, to clean the oil and chips, the coils are immersed in a tub containing grease traps.
- Coil fins are sinusoidal corrugated and can be ordered with anti-corrosion coating layer, which creates the highest thermal efficiency.
- Dampers made of aluminum with airfoils of Opposed Blade type special for hygienic units in fully sealed condition and enable to connect to motorized damper actuator or ON/OFF.
- Ability to be equipped with sand trap louver to remove dust and coarse particles from entering air.
- Enable to consider different humidification systems.
- Enable to consider Aluminum, pleated, bag, compact, carbon active and hepa filter sections within the unit.
- F9 grade of filter frame leakage in Eurovent certification.
- The filter frames are designed with advanced sealing technology, ensuring zero leakage for maximum efficiency and performance.
- Considering the accessories as sight glass, lightening, UV lamp section, etc. according to customers inquiry.
- Rounded and curved inside sheet metal which prevents dust accumulation.
- Enable to install heat recovery section (including Run Around, Desiccant wheel Rotary and Plate heat exchanger).
- Enable to install magnehelic differential pressure gauges to indicate the amount of pressure drop in accordance with customer's request.
- Enable to install Anti-freeze to lower the freezing point and prevent coil freezing in winter.
- Enable to control temperature and humidity.
- Enable to control 3-way motorized valve.
- Connectable to BMS system.
- Connectable to VFD to change air flow in accordance with customer's request.
- AHUs are designed by the last technology of AHU selection software according to VDI-6022 and Eurovent standards.



STANDARD AIR HANDLING UNIT BARAN SERIES

NOMENCLATURE:

BARAN-250 CW H D
01 02 03 04

01: Nominal air flow rate (cfm) / 10

02: Cooling coil:

- CW: chilled water coil
- CX: DX coil
- None

03: Heating coil:

- H: Hot water coil
- E: Electrical coil
- S: Steam coil
- None

04: Dehumidifier (or none)

STANDARD AIR HANDLING UNIT BARAN SERIES

FEATURES

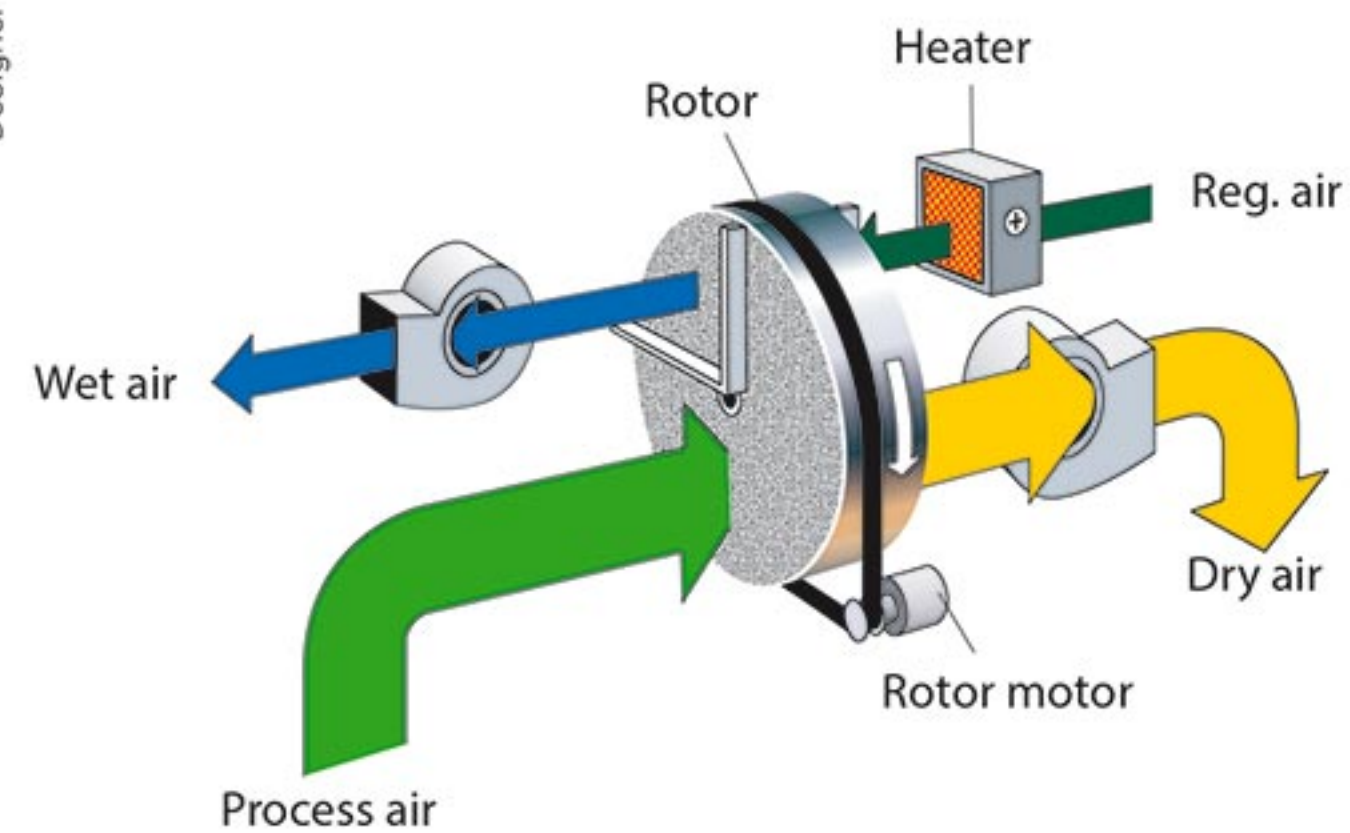
- Available in 15 standard models with air flow rates from 1000 to 60000 CFM (Enable to manufacture air handling units with air flow rates less or more than the defined values according to the customers request)
- Single and multi-zone design.
- Available in three different configuration type (vertical, horizontal and L-type)
- Available in Unitary and Sectional models
- Double skin construction with insulation made of injected polyurethane, Rockwool with 25-50 mm thickness according to customer's inquiry.
- Outer skin made of electrostatic powder painted galvanized steel with 80 µm powder painting thickness.
- Enable to manufacture inner skin from steel or galvanized sheet.
- Centrifugal fans with forward curved, backward curved or airfoil blades
- DX or chilled water type cooling coils
- Ability to have droplet eliminator after cooling coil
- Steam, hot water or electrical type heating coils
- Coil fins are sinusoidal corrugated and can be ordered with anti-corrosion coating layer, which creates the highest thermal efficiency.
- Dampers made of aluminum with airfoils of Opposed Blade type in fully sealed condition and possibility of connecting to damper actuator.
- Ability to be equipped with sand trap louver to remove dust and coarse particles from entering air.
- Ability to be equipped with supply humidifier upon request (steam grid, water spray or electrical).
- Enable to install primary, fine and HEPA & ULPA filters with different efficiencies.
- High technology low leakage filter frames and easy filter change
- Available in different coil casing and drain pan material
- Ability to be equipped with various automation and control instruments
- Energy Recovery Section (run around, desiccant wheel, rotary and plate heat exchanger)
- Ability to be equipped with Sound Attenuator/ silencer
- Ability to be equipped with sight glass and lightening in different sections
- Flexibility in sections for shipment
- Enable to install magnehelic differential pressure gauges to indicate the amount of pressure drop in accordance with costumers request.
- Enable to install Anti-freeze to prevent coil freezing in winter.
- Enable to control temperature and humidity.
- Enable to control 3-way motorized valve.
- Connectable to BMS system.
- AHUs are designed by the last technology of AHU selection software according to Eurovent standard.

DESICCANT DEHUMIDIFIER

DESICCANT DEHUMIDIFIER

Desiccants are materials that have a high attraction to moisture. A typical example of desiccant is the bag of silica gel that comes in the box when you purchase new electronic equipment. Desiccants in comparison to a refrigerant will create the driest air conditions.

The concept of the desiccant dehumidifier is actually very simple compared to a refrigerant dehumidifier. Best way to explain is by looking at the corresponding picture:



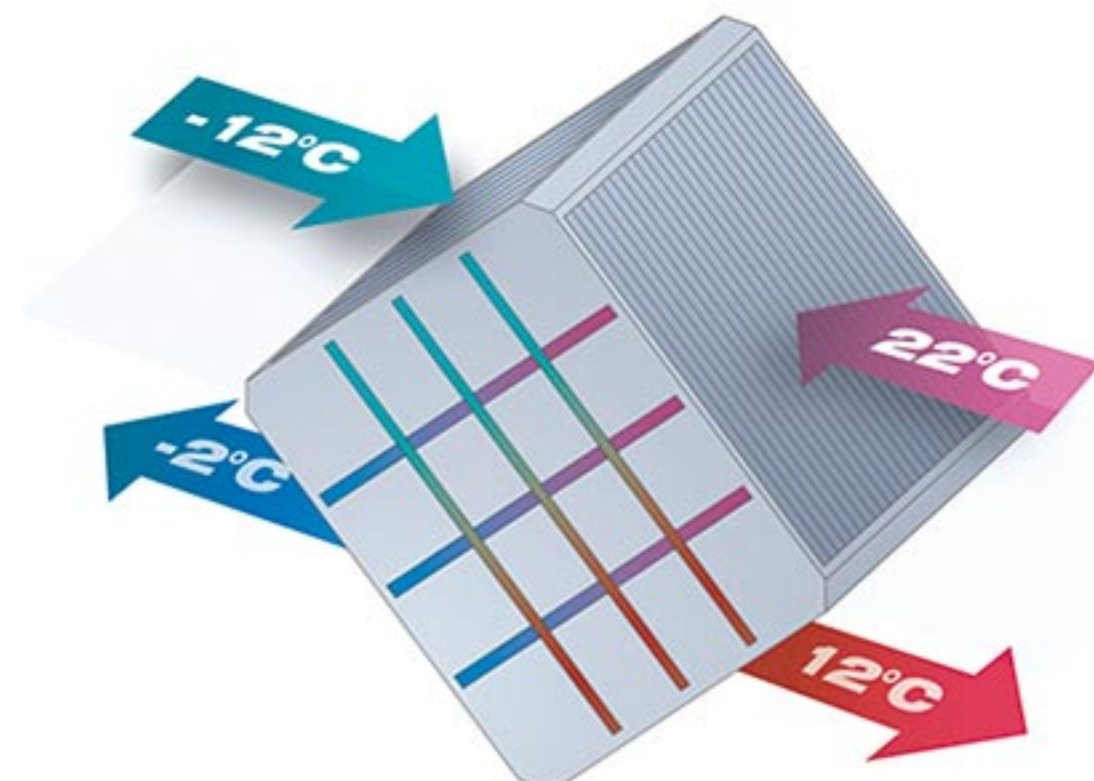
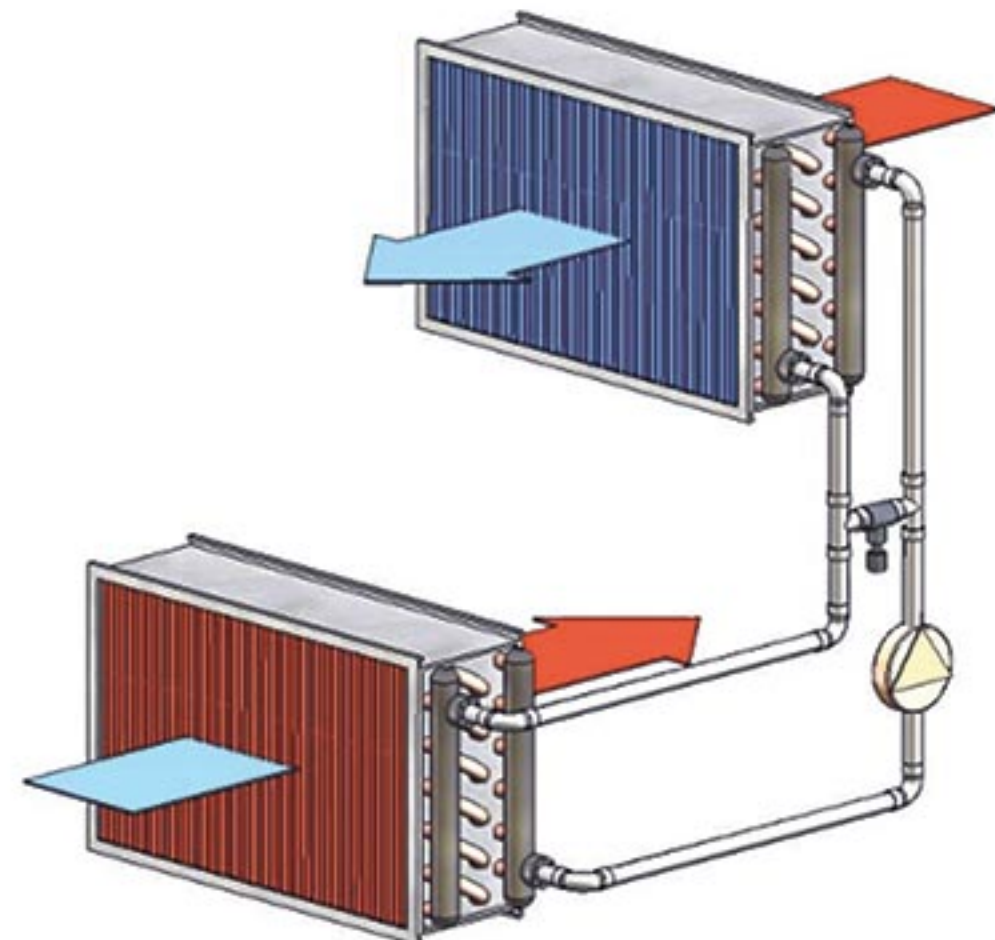
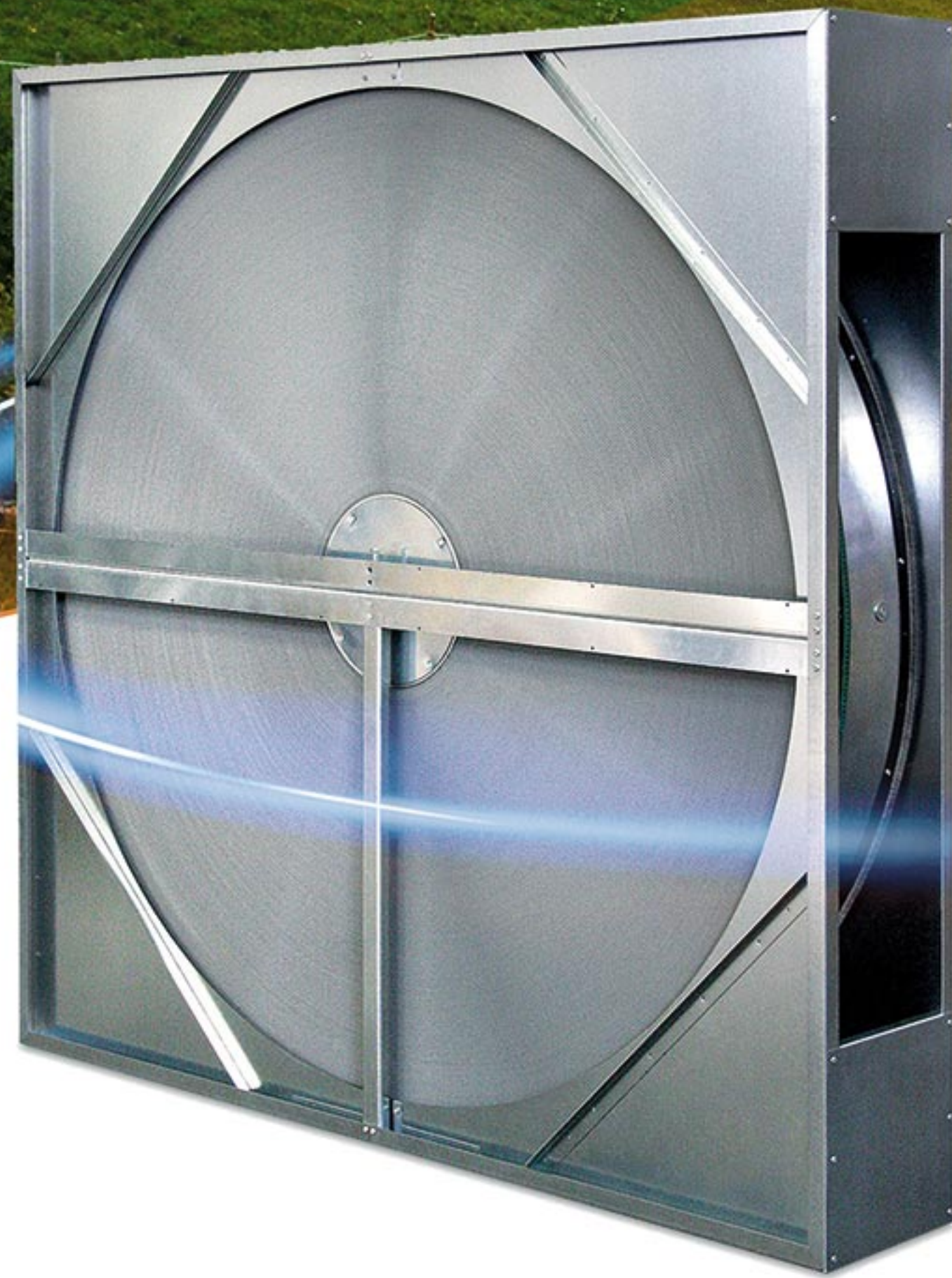
The desiccant is housed in the round rotating wheel. The wet air passes through a section of the wheel and the moisture in the air is deposited onto the desiccant. Now the wheel will rotate and the wet section of the desiccant will be heated in order to remove the moisture out of that slice. The process repeats itself over and over.



Section of a dehumidifier rotor. The high number of channels means that moisture is adsorbed with extra efficiency.



HEAT RECOVERY SYSTEMS



FEATURES

- Available in three types of:
 - 1- Run around coils
 - 2- Fixed plate heat exchanger
 - 3- Rotary thermal wheel (desiccant potter)
- Non-mixing return and supply airflows (in run around and fixed plate heat exchangers).
- Energy saving.
- Environmental protection.
- Increasing the AHU efficiency up to 40-60 percent..reduce energy cost.
- Enable to produce by copper or aluminum anti-corrosion sheets (in accordance with customer's request).
- Using intermediate fluid in run around coils heat recovery in order to avoid any mix of supply and return airflows.
- Compatible to various range of AHU airflows.

AIR WASHER & ECONOPACK UNIT

ABSHAR / AMVAJ SERIES



AIR WASHER & ECONOPACK UNIT ABSHAR / AMVAJ SERIES

NOMENCLATURE:

ABSHAR-250	AW8	H
01	02	03 04

01: Type:

- ABSHAR: AIR WASHER
- AMVAJ: ECONOPACK

02: Nominal air flow rate (cfm) / 10

- AW8: AIR WASHER class 8
- AW6: AIR WASHER class 6

04: Heating coil:

- H: Hot water coil
- E: Electrical coil
- S: Steam coil
- None

FEATURES

- Available in different models with air flow rates from 1000 to 60000 CFM in 4, 6 and 8 classes (Enable to manufacture air washers with air flow rates less or more than the defined values according to the customers request).
- Centrifugal fans with forward curved, backward curved or airfoil blades.
- Opposed blade low leakage dampers (ability to be equipped with continuous or on/off motorized damper).
- Ability to be equipped with humidifier.
- Equipped with electro pump system special for air washers with protective panel.
- Equipped with floater to control the water level.
- Steam, hot water or electrical type heating coils.
- Enable to install primary, fine and HEPA & ULPA filters with different efficiencies.
- Using spray nozzles designed similar to Lechler brand from Germany with high efficiency.
- Using tube system of high-pressure Polypropylene.
- Enable to install Anti-freeze to prevent coil freezing in winter.
- Enable to control temperature and humidity.
- Enable to control 3-way motorized valve.
- Connectable to BMS system.
- Flexibility in sections for shipment.
- Furnace provides efficient heating by delivering consistent, evenly distributed warm air, ensuring optimal comfort and energy savings in any environment.
- Optional burner installation for EconoPack systems.



AIR COOLED CHILLER KASRA SERIES

NOMENCLATURE:

KASRA-080 S 04 X
01 02 03 04

01: Nominal cooling capacity (TR)

02: Compressor type:

- S: scroll
- C: screw
- R: reciprocating

03: Compressor quantity

04: Refrigerant gas:

- X: R-134a
- D: R-22
- C: R-407c
- Q: R-404a
- Z: R-410a

AIR COOLED CHILLER

KASRA SERIES

FEATURES

- Production in capacity range of 3-560 TR in a single unit (production in below 3 TR as mini chiller).
- Enable to modulate chillers to each other up to 5 units.
- Most known European brands of compressor (Bitzer, Danfoss, Copeland, etc.) with high efficiency and special to tropical weather condition.
- Enable to use Economizer system in screw type compressor according to customers inquiry.
- Enable to consider three refrigerants of R134a, R407C and R22 in the units.
- Enable to use two evaporator types of DX (Plate or shell & tube) and flooded according to customers inquiry.
- High efficiency evaporators according to ASME standards.
- Structure made of galvanized sheet with appropriate thickness. All the cutting, punching and bending of metal components are done by TRUMPF branded advanced CNC machinery according to confirmed drawings.
- Body is made of appropriate thickness of galvanized steel which is electrostatic powder painted with 80 µm thickness.
- Chassis and profile painting by Polyurethane liquid with 120 µm thickness.
- Up to 80 TR capacity, chassis made of galvanized sheet connected by bolts and nuts. In higher capacities in order to have more strength, chassis is made of standard girder and channel beam.
- Installing the Receiver Heat Exchanger.
- Electrical components of high quality brands as Siemens, Danfoss, Schneider, LS, Hyundai, Finder, Autronics, Technology.
- Valves of refrigeration line are used of West European high quality brands as Caster, Gmc, Alco.
- Equipped with controllers of high/low pressure, oil pressure and oil level to protect the compressor.
- Condensers Fans of axial type with maximum airflow and minimum noise.
- Equipped with PLC based controller as carel, danfoss, etc.
- Equipped with electronic expansion valve.
- Enable to install canopy to reduce compressor noise.
- Enable to install silencer on condenser fans to reduce fan noise.
- Step or Step-less controlling of the system in accordance with costumers request.
- Enable to install winter start system to ensure safe performance of system in winter.
- The ability to manufacture system for industrial applications (outlet water temperature to -10°C) and air conditioning.
- Use of corrugated fins to generate highest level of thermal efficiency.
- Enable to use anti-corrosion coating fin in condenser's coils.
- Enable to be equipped with PLC and pressure and temperature controller.
- Enable to control air flow on condensers fans using VFD according to the load of condenser.
- The ability to receive reports from alarms appeared in the performance process of the unit.
- Enable to indicate compressor performance duration.

12

WATER COOLED CHILLER

KARIZ SERIES



WATER COOLED CHILLER KARIZ SERIES

NOMENCLATURE:

KARIZ- 080 S 04 X
01 02 03 04

01: Nominal cooling capacity (TR)

02: Compressor type

- S: scroll
- C: screw
- R: reciprocating

03: Compressor quantity

04: Refrigerant gas:

- X: R-134a
- D: R-22
- C: R-407c
- Q: R-404a
- Z: R-410a



FEATURES

- Production in capacity range of 3-720 TR in a single unit
- Most known European brands of compressor (Bitzer, Danfoss, Copeland, etc.) with high efficiency and special to tropical weather condition.
- Enable to consider three refrigerants of R134a, R407C and R22 in the units.
- Enable to use two evaporator types of DX (Plate or shell & tube) and flooded according to customer's inquiry.
- High efficiency evaporators according to ASME standards.
- Using shell&tube condenser.
- Tubes of CLF type (highest cooling efficiency) in Shell&Tube condenser.
- Chassis painting by polyurethane liquid with 120 µm thickness.
- Up to 80 TR nominal capacity, chassis made of galvanized sheet connected by bolts and nuts. In higher capacities in order to have more strength, chassis is made of standard girder and channel beam.
- Electrical components of high quality brands as Siemens, Danfoss, Schneider, LS, Hyundai, Finder, Autronics, Technology.
- Valves of refrigeration line are used of West European high quality brands as Castel, Gmc, Alco.
- Equipped with controllers of high/low pressure, oil pressure and oil level to protect the compressor.
- Equipped with PLC based controller as Carel, Danfoss, etc.
- Equipped with electronic expansion valve.
- Enable to install canopy to reduce compressor noise.
- Step or Step-less controlling of the system in accordance with customer's request.
- Enable to install winter start system to ensure safe performance of system in winter.
- The ability to manufacture system for industrial applications (outlet water temperature to -10°C) and air conditioning.
- Enable to be equipped with PLC and pressure and temperature controller.
- Connectable to BMS system.
- The ability to receive reports from alarms appeared in the performance process of the unit.
- Enable to indicate compressor performance duration.



AIR COOLED CONDENSING UNIT DUMAN SERIES

NOMENCLATURE:

DUMAN- 080 S 04 X
01 02 03 04

01: Nominal cooling capacity (TR)

02: Compressor type

- S: scroll
- C: screw
- R: reciprocating

03: Compressor quantity

04: Refrigerant gas:

- X: R-134a
- D: R-22
- C: R-407c
- Q: R-404a
- Z: R-410a

AIR COOLED CONDENSING UNIT

DUMAN SERIES

FEATURES

- Production in capacity range of 3-560 TR in a single unit.
- Most known European brands of compressor (Bitzer, Danfoss, Copeland, etc.) with high efficiency and special to tropical weather condition.
- Enable to consider three refrigerants of R134a, R407C and R22 in the units
- Structure made of galvanized sheet with 2 mm thickness. All the cutting, punching and bending of metal components are done by TRUMPF branded advanced CNC machinery according to confirmed drawings.
- Body is made of 1.25 mm thickness of galvanized steel which is electrostatic powder painted with 80 µm thickness.
- Chassis and profile painting by polyurethane liquid with 120 µm thickness.
- Up to 80 TR capacity, chassis made of galvanized sheet connected by bolts and nuts. In higher capacities in order to have more strength, chassis is made of standard girder and channel beam.
- Installing the Receiver Heat Exchanger.
- Electrical components of high quality brands as Siemens, Danfoss, Schneider, LS, Hyundai, Finder, Autronics, Technology.
- Valves of refrigeration line are used of West European high quality brands as Castel, Gmc, Alco. Equipped with controllers of high/low pressure, oil pressure and oil level to protect the compressor.
- Fans of axial type with maximum airflow and minimum noise.
- Equipped with PLC based controller as Carel, Danfoss, etc.
- Enable to install canopy to reduce compressor noise.
- Enable to install silencer on condenser fans to reduce fan noise.
- Step or step-less controlling of the system in accordance with costumers request.
- Enable to install winter start system to ensure safe performance of system in winter.
- The ability to manufacture system for industrial applications and air conditioning.
- Corrugated fins in coils and enable to order anti-corrosion coating layers to generate highest level of thermal efficiency.
- Enable to be equipped with PLC and pressure and temperature controller.
- Connectable to BMS system.
- Enable to control air flow on condenser fans using VFD according to the load of condenser.
- The ability to receive reports from alarms turned up in the performance process of the unit.
- Enable to indicate compressor performance duration.



14

FAN FILTER UNIT & EXHAUST CABINET FAN

NAB / BARAN SERIES

HYGIENIC / STANDARD FAN
FILTER UNIT & EXHAUST
CABINET FAN
NAB / BARAN SERIES

NOMENCLATURE:
NAB-250
01 02

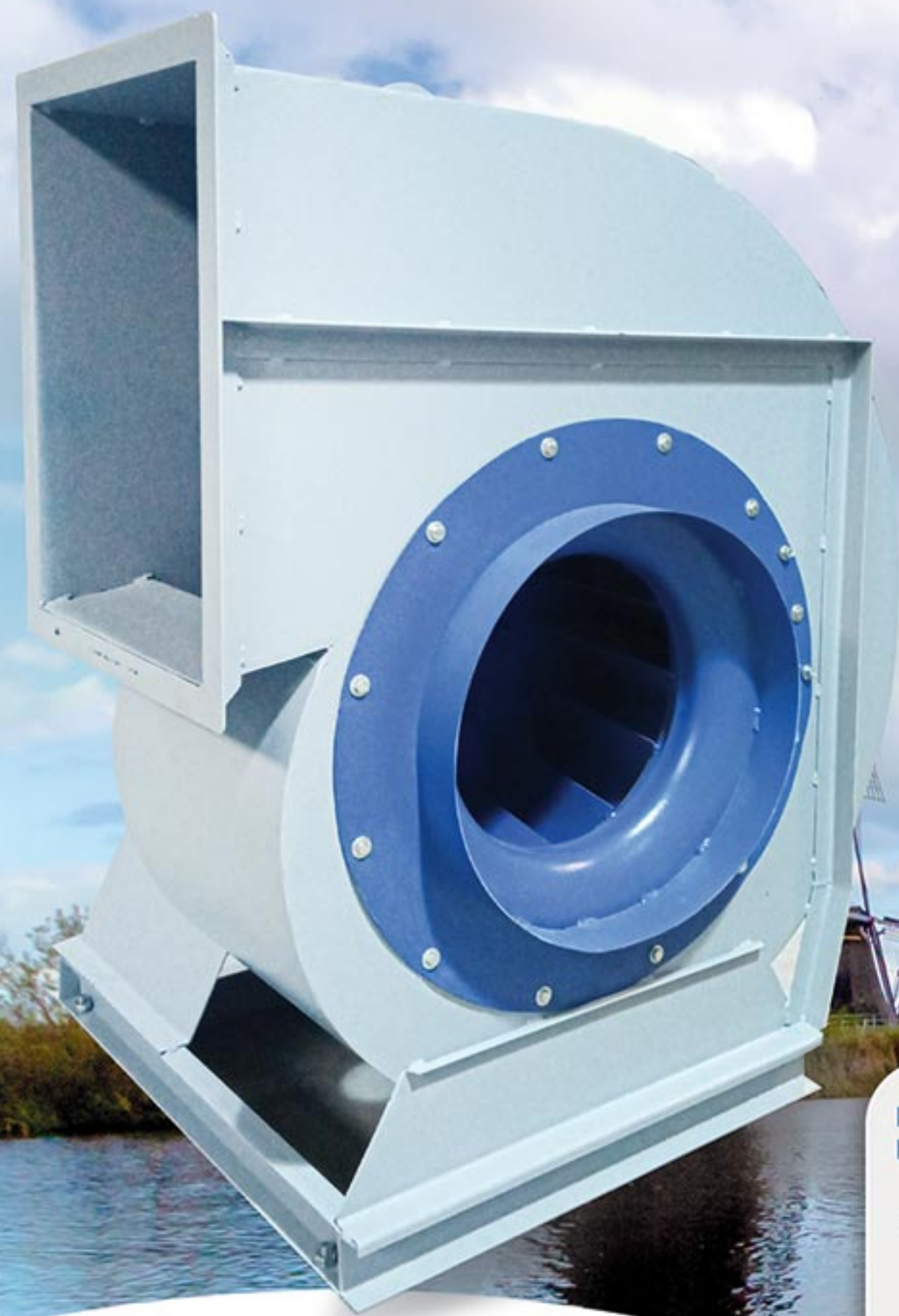
01: Type:

- NAB: hygienic
- BARAN: standard

02: Nominal air flow rate (cfm) / 10

FEATURES

- Available in both standard and hygienic types with airflow rates ranging from 1,000 to 60,000 CFM (custom units with lower or higher airflow capacities available upon request).
- Single and multi-zone design.
- Available in unitary and sectional mode.
- Double skin construction with insulation mode of injection polyurethane, rockwool, with 25-50 mm thickness according customer's inquiry.
- Outer skin made of electrostatic powder painted galvanized steel with 80 µm powder painting thickness.
- enable to manufacture inner skin from steel or galvanized.
- Centrifugal fans with forward-curved, backward-curved, or airfoil blades.
- Aluminum opposed-blade dampers (ability to be equipped with motorized damper).
- Ability to be equipped with sand trap louver to remove dust and coarse particles from entering air.

**EXHAUST UTILITY FAN
BURAN SERIES****NOMENCLATURE:**

BURAN - C 300
01 02

01: Fan type:

- C: centrifugal
- A: axial
- P: plug

02: Nominal air flow rate (cfm) / 10

15

EXHAUST UTILITY FAN

BURAN SERIES

FEATURES

- Production in a variety of airflow capacities according to required pressure drop suitable for air blowing and suction.
- Different types as roof-mounted, wall-mounted and utility exhaust fans.
- Making suitable fans to adapt to humid sites, environments with air polluted by fine particles, kitchens, restaurants and industrial factories.
- Enable to consider spark-proof fans and explosion-proof motors according to ATEX standard.
- Motor insulation class specifies the maximum allowable temperature
- Forward and backward curved impellers according to fan application.
- Power transmission as direct driven or belt-pulley.
- Enable to produce outlet vent in different angles and optional air inlet side for utility fans.
- Enable to consider fan body made of stainless steel, ST-37 steel, galvanized steel, etc depending on the application.
- Static and Dynamic balance of impellers.
- Impeller diameter up to 125 cm.
- High efficiency.
- Appropriate design in order to have low vibration and noise level.
- Enable to consider attenuator, damper, vibration absorber, etc for different types of fans.
- Enable to set fan speed according to airflow and pressure drop.

Havaye Nabe Baran

Designer and Manufacturer of Air Conditioning Systems

16

PACKAGE UNIT

SABA / SAHEL SERIES

- Available in both hygienic and standard types with airflow range from 1,000 to 60,000 CFM and pressure range from 0.1 to 6 inches of water column.
- Double-skin panel construction with injected polyurethane or rockwool insulation (25 to 50 mm thick) to reduce heat transfer, noise, and vibration.
- Outer casing made of galvanized steel with 80-micron electrostatic powder coating, corrosion- and weather-resistant.
- Inner layer made of stainless steel SS304L/SS316L or galvanized steel upon request, compliant with international standards.
- Use of aluminum or thermal break profiles with polyamide corners for complete thermal and air sealing.
- Plug fans or centrifugal fans with forward-curved, backward-curved, or airfoil blades from reputable brands.



HYGIENIC / STANDARD PACKAGE UNIT SABA / SAHEL SERIES

NOMENCLATURE:

SAHEL - 080 S 04 X
01 02 03 04 05

01: Type:

- SABA: hygienic
- SAHEL: standard

02: Nominal cooling capacity (TR)

03: Compressor type:

- S: scroll
- C: screw
- R: reciprocating

04: Compressor quantity

05: Refrigerant gas:

- X: R-134a
- D: R-22
- C: R-407c
- Q: R-404a
- Z: R-410a

- IP55-rated electric motors from top brands such as Siemens, Electrogen, and Motogen, with optional explosion-proof motors.
- Rubber or electroplated spring vibration isolators specifically designed for hygienic systems to minimize structural vibration.
- Cooling and heating coils available in DX, chilled water, steam, hot water, or electric types, coil's fins made of corrugated wavy aluminum with anti corrosion layer.
- Opposed blade aluminum dampers with complete sealing (ability to be equipped with motorized damper).
- Equipped with anodized aluminum droplet eliminators, sand trap louvers, and various humidification systems (steam grid, water spray, or electric).
- Capable of installing various filter types: aluminum, pleated, bag, compact, activated carbon, HEPA, and ULPA filters with different efficiencies and advanced low-leakage frames.
- Hygienic units feature curved internal surfaces to prevent particle accumulation and facilitate cleaning (compliant with hygiene standards).
- Energy recovery section with rotary, plate run around coil and desiccant wheel exchangers.
- Optional components include silencers, internal lighting, inspection doors, UV lamps, and device control and automation systems.
- Engineering design and selection by specialized software in accordance with VDI 6022 and Eurovent standards.

- Available in cooling capacities ranging from 3 to 560 TR in a single unit.
- Use of high-efficiency European compressor brands (Bitzer, Danfoss, Copeland, etc.) compatible with high efficiency and special to tropical weather condition.
- Each compressor operates in an independent circuit across all units.
- Optional economizer system for screw compressors upon request.
- Compatible with refrigerants R-134a, R-407C, and R-22.
- Structure made of galvanized steel sheet with precise CNC cutting and punching (TRUMPF machinery).
- Body coated with 80-micron electrostatic powder paint.
- Chassis and profiles coated with 120-micron liquid polyurethane paint.
- For units up to 80 TR, chassis made from galvanized sheet with bolted assembly; for higher capacities, made of from standard I-beams and channels.
- Equipped with receiver heat exchanger.
- Electrical component select of high quality brands such as Castel, Gmc, Alco,...
- Valve of refrigerant line are used of west european high quality brands.
- Equipped with high/low pressure, oil pressure, and oil level controllers for compressor protection.
- Use of axial fans with high airflow and low noise.
- Equipped with PLC controllers from Carel, Danfoss, and others.
- Includes electronic expansion valve.
- Optional condenser-mounted sensors for noise reduction.
- Step or step-less controlling of the system in according with costumer's request.
- Enable to install winter start system to ensure safe performance of system in winter.
- Double skin constructed with insulation to improve thermal efficiency.
- Optional PLC integration for refrigerant temperature and pressure control.
- BMS compatibility.
- The ability to receive reports from alarms appeared in the performance process.
- Enable to indicate compressor performance duration.

17

COOLING TOWER

ARKA SERIES



COOLING TOWER ARKA SERIES

NOMENCLATURE:
ARKA - $\frac{C}{01} \frac{80}{02}$

01: type:

- C: cubic type
- R: round type

02: Nominal cooling capacity (TR)

FEATURES

- Enable to produce in cubic, round and metal types.
- Capacity range from 10-700 ton (Capable to produce in higher capacities according to customer's request).
- Production as open-circuit for industrial and non-industrial application.
- Appropriate design in order to have minimum vibration and noise level.
- Smaller dimensions in comparison to similar products.
- Water distribution by anti-fouling nozzles.
- Body made of fiberglass resistant to sun UV rays or galvanized steel.
- Anti-bacterial and anti-fouling louver made of PVC with high durability and maximum cooling and evaporation efficiency.
- Enable to install control panel equipped with inverter in order to control fan speed according to water temperature to optimize energy consumption.
- Selecting the suitable fan on software according to project conditions.
- Using axial fans with maximum efficiency and minimum noise level of impellers.
- equipped with IP55 motors in fiberglass cooling tower.
- Using centrifugal forward fans in galvanized cooling towers.
- Enable to use coal tar epoxy painting of body for galvanized cooling towers according to customers inquiry.
- Using nut and bolts in galvanized cooling towers (no welding).
- Equipped with honeycomb droplet eliminator.
- Enable to use PP packing in cubic and round towers according to customers request.
- Enable to install Splash packing according to customers request.
- Enable to install anti-freeze to prevent water freezing inside the system in winter.

18 Filtration & Accessories

Air filters are known for cleaning the allergens, particles and other impurities out of the air, so they can be used in sensitive areas as clean room, surgery room, etc. There is a great number of air filters on the market, but there are some usual standard types in dimensions Which are installed within the Air Handling Units or they can be installed in terminal boxes, which are explained in this section:

Humidifier



FINE FILTERS

- Bag filters (M5-F9 filters)
- V-type compact filters (F7-F9 filters)



HEPA FILTERS

- H10-H14 HEPA filters



HIGH EFFICIENCY LEAK-PROOF HEPA FILTERS (V-MODULE):

- Service life, less maintenance
- Low pressure drop, less energy consumption
- Guaranteed leak-free
- Compact and strong construction
- Metal Frame, minimum risk of damage



Also relevant differential pressure gauges are used for indicating the filter pollution or filter saturation and other relevant instrument are available same as differential pressure transmitter and switch.



SAFE CHANGE FILTER HOUSING (BAG IN – BAG OUT)

FEATURES

- Ability to filtrate suspended particles and aerosols.
- Ability to protect servicing and maintenance staff against unsanitary media and toxins.
- Ability to protect environment against unsanitary media and toxins.
- Ability to consider several filter stages with different efficiencies according to customer's request.
- Ability to replace filters without transferring pollution to the environment and people.
- Ability to filtrate the air in several stages and wide range of air volumes according to customer's request.
- Equipped with magnehelic gauges to display the pressure difference of each filter stage.
- Outer skin made of SS304L or electrostatic powder painted carbon steel according to customer's request.
- Product quality in accordance with ISO-9001 standard.
- Ability to install airborne particle measurement system.
- Ability to use H₂O₂ solution to sterilize filters and prevent transmission of infection and bacteria.
- Humidifier delivers optimal humidity control, enhancing air quality and comfort with efficient, reliable performance designed to meet the highest standards in any environment.
- Bag-in/Bag-out system ensures safe, contamination-free filter changes, offering maximum protection for your ventilation system with seamless, secure filter replacement.



37

AUTOMATION & POWER CONTROL PANEL SYSTEM 19

- PLC module can receive signal from sensors and controlling and processing this signal. This device can send command to other controlling device.
- Optional installation of a Differential Pressure Transmitter (DPT), used for monitoring filter pressure drop and ensuring proper fan operation.
- Optional installation of a Differential Pressure Transmitter (DPT Flow), which enables accurate flow rate monitoring by measuring the pressure difference in the air or liquid flow path. This device plays an important role in the control and monitoring of the system's flow.
- Optional installation of a Differential Pressure Switch (DPS), installed in various sections of the unit to monitor air pressure. In critical conditions (e.g., excessive pressure drop), it can send alarms and affect unit operation accordingly.
- Optional installation of a temperature and humidity sensor, used to accurately measure the relative humidity and air temperature of the airflow passing through the unit. The data is transmitted to the PLC module to adjust environmental conditions and control heating/cooling systems.
- Optional installation of an anti-freeze sensor, designed to prevent freezing in cooling systems. If the coil temperature is lower than critical temperature sensor send a alarm to PLC and stop the system to avoid damage on coil.
- Optional installation of opposed blade motorized dampers, designed to precisely control airflow in the supply and return air paths. The opposed blade design ensures laminar air flow and reduced pressure drop, while the actuator enables laminar and accurate air regulation for optimal environmental conditions.
- Optional installation of a motorized three-way valve, used for regulating the flow of chilled or hot water in thermal coils. The modulating actuator allows for continuous water flow adjustment, enabling optimal temperature control.
- Optional installation of a full-graphic touch screen HMI, which displays all system operating parameters for user-friendly monitoring and control.
- Optional installation of a smoke sensor, designed to detect smoke and hazardous gases in the airflow. If there is smoke on air flow the detector send signal to plc and system change to safe mode.
- The unit is compatible with Building Management Systems (BMS), allowing for smart monitoring and control integration.
- Compatible with Variable Frequency Drive (VFD) for adjusting airflow rates based on customer.



After Sales Services

Considering the importance of respecting to customers, Havaye Nabe Baran Company has hired the best experts and technician in customer service call center offering the required services to customers within the shortest time as follows:

- Consultation on parts design and material in order to adjust the customer's requirements.
- Factory Acceptance Test (FAT) according to FAT protocol to ensure the compatibility of product with the ordered specifications and correct operation.
- Supervision on design and installation of total HVAC parts of the project.
- Installation including preparing the installation location, foundation drawing, etc.
- Commissioning including start-up the unit, refrigerant charging, etc.
- Site Acceptance Test (SAT) according to SAT protocol to ensure the correct operation of the unit at the customer's site.
- Qualification documents (Design Qualification, Installation Qualification, Operation Qualification) along with related measuring and test.
- Supplying spare parts on products.
- Guarantee of all the products in standard working condition.
- training operation and maintenance to operator of the unit.

UNIT CONVERTOR

US and SI Units (Sea Level)

Length (L)

1 mm = 0.001 m = 0.1 cm	1 ft = 12 in.
1 cm = 0.01 m = 10 mm = 0.3970 in.	1 in. = 2.54 cm = 0.0254 m
1 m = 3.280 84 ft = 39.370 in.	1 ft = 0.3048 m
1 km = 0.621 371 mi	1 mi = 1.609 344 km
1 mi = 1609.3 m (US statute)	1 yd = 0.9144 m

Area (A)

1 mm ² = 1.0 × 10 ⁻⁶ m ²	1 ft ² = 144 in. ²
1 cm ² = 1.0 × 10 ⁻⁴ m ² = 0.1550 in. ²	1 in. ² = 6.4516 cm ² = 6.4516 × 10 ⁻⁴ m ²
1 m ² = 10.7639 ft ²	1 ft ² = 0.092 903 m ²

Mass (m)

1 kg = 2.204 623 lbm	1 lbm = 0.453 592 kg
1 tonne = 1000 kg	1 slug = 14.5939 kg
1 grain = 6.479 89 × 10 ⁻⁵ kg	1 ton = 2000 lbm

Density (ρ)

1 kg/m ³ = 0.06242797 lbm/ft ³	1 lbm/ft ³ = 16.018 46 kg/m ³
1 g/cm ³ = 1000 kg/m ³	
1 g/cm ³ = 1 kg/L	

Power (P, W)

1 W = 1 J/s = 1 N-m/s	1 lbf-ft/s = 1.355 818 W
	= 4.626 24 Btu/h
1 kW = 3412.14 Btu/h	1 Btu/s = 1.055 056 kW
1 hp (metric) = 0.735 499 kW	1 hp (UK) = 0.7457 kW
	= 550 lbf-ft/s
	= 2544.43 Btu/h
1 ton of refrigeration = 3.516 85 kW	1 ton of refrigeration = 12 000 Btu/h

Pressure (P)

1 Pa = 1 N/m ² = 1 kg/m-s ²	1 lbf/in. ² = 6.894 757 kPa
1 bar = 1.0 × 10 ⁵ Pa = 100 kPa	1 atm = 14.695 94 lbf/in. ²
1 atm = 101.325 kPa	= 29.921 in. Hg [32°F]
= 1.013 25 bar	= 33.8995 ft H ₂ O [4°C]
= 760 mm Hg [0°C]	
= 10.332 56 m H ₂ O [4°C]	
1 mm Hg [0°C] = 0.133 322 kPa	1 m H ₂ O [4°C] = 9.806 38 kPa

Velocity (V)

1 m/s = 3.6 km/h	1 ft/s = 0.681 818 mi/h
= 3.280 84 ft/s	= 0.3048 m/s
= 2.236 94 mi/h	= 1.097 28 km/h
1 km/h = 0.277 78 m/s	1 mi/h = 1.466 67 ft/s
= 0.911 34 ft/s	= 0.447 04 m/s
= 0.621 37 mi/h	= 1.609 344 km/h

Volume (V)

1 m ³ = 35.3147 ft ³	1 ft ³ = 2.831 685 × 10 ⁻² m ³
1 L = 1 dm ³ = 0.001 m ³	1 in. ³ = 1.6387 × 10 ⁻⁵ m ³
1 Gal (US) = 3.785 412 L	1 Gal (UK) = 4.546 090 L
= 3.785 412 × 10 ⁻³ m ³	1 Gal (US) = 231.00 in. ³

Energy (E, U)

1 J = 1 N-m = 1 kg-m ² /s ²	1 lbf-ft = 1.355 818 J
1 J = 0.737 562 lbf-ft	= 1.285 07 × 10 ⁻³ Btu
1 cal (Int.) = 4.186 81 J	1 Btu (Int.) = 1.055 056 kJ

Temperature (T)

1 K = 1°C = 1.8 R = 1.8 F	1 R = (5/9) K
TC = TK - 273.15	TF = TR - 459.67
= (TF - 32)/1.8	= 1.8 TC + 32
TK = TR/1.8	TR = 1.8 TK