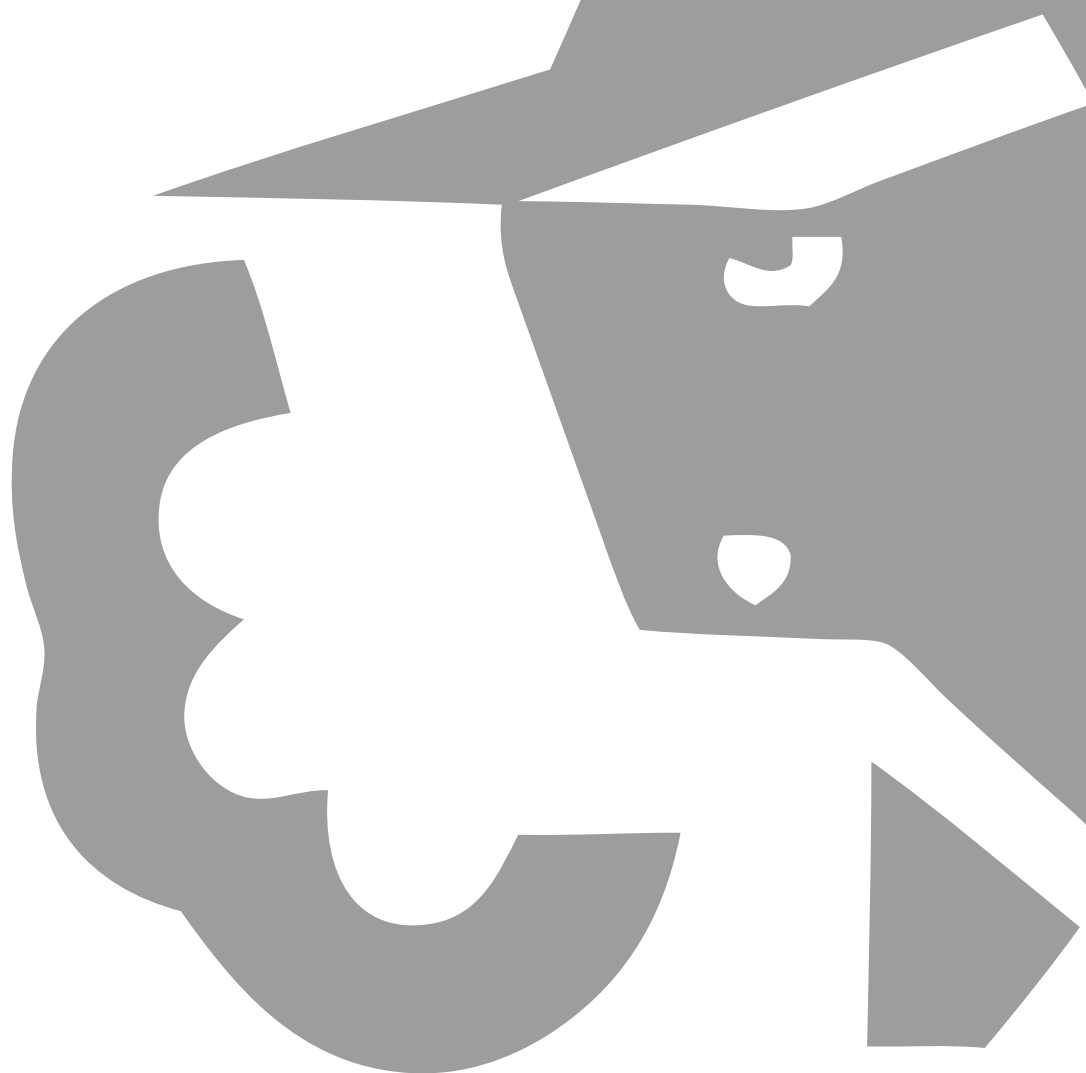


# 2017



## CATALOGUE



CHELYABINSK  
COMPRESSOR  
PLANT

[CHKZ.RU](http://CHKZ.RU)



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# General Information

## Domestic compressor manufacturing leader!

Chelyabinsk Compressor Plant was founded in 1999 and since that time has covered a long way from rotary plate manufacturing compressors to modern screw compressor units production.

Nowadays CHKZ manufactures screw compressor units with electric and diesel drives, medium and high pressure compressors, compressor block-modular stations, nitrogen membrane units and stations, gas compressor units and stations, multifunctional pumping stations, blower machines, air vessels, capacitive equipment, autonomous dieselgenerator units and compressed air treatment equipment.

Many customers highly assess all the advantages of the CHKZ compressor units for excellent quality and competitive prices allow.

The company has strong presence on the Russian market as one of the main manufacturers of screw compressors with diesel and electric motors. Chelyabinsk Compressor Plant improves its manufacturing facilities constantly and expands the product range.



| CHKZ today      | 2012                 | 2013                 | 2014                 | 2015                 | 2016                 |
|-----------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Annual turnover | 2,1 billion rubles   | 2,6 billion rubles   | 2,6 billion rubles   | 2,6 billion rubles   | 3,0 billion rubles   |
| Facility        | 22000 m <sup>2</sup> | 22000 m <sup>2</sup> | 22000 m <sup>2</sup> | 22000 m <sup>2</sup> | 25000 m <sup>2</sup> |
| Staff           | 400                  | 415                  | 455                  | 430                  | 469                  |

## Our company values:

- Ethics. We do our business pursuing high ethical principles and our partner's interests. We are known for our enthusiasm and fair play in competitive struggle.
- Customer focus. We work for and thanks to our clients. Every day we use all our knowledge and experience to help our client to solve any problem and find the best solution.
- Innovation. We strive for exceeding our customer's expectations by means of innovation as our main challenge. We encourage innovation and creativity of every employee, in every department. Our enjoy their competitive advantages.
- Integrity. Close-knit team of professionals and their permanent growth for all employees are our key to success.
- Corporate responsibility. We take active part in the social life. Our compressors and equipment are produced in compliance of all modern ecological requirements.
- Right for honest mistake. We accept honest mistakes which may occur during the development and experiment process. We consider failures as inevitable expenses for moving forward.

## Our clients:

### Oil and gas industry:

«Eurasia» Ltd.  
«Syrgytnftegaz» OJSC  
«Rosneft» OJSC  
«Gazprom» OJSC  
«Tatneft» OJSC  
«Sibir Service Company» CJSC  
«Lukoil» OJSC  
«Bashneft» OJSC  
«KazTransOil» JSC

### Mechanical engineering:

«Volgograd Drilling Equipment Plant» Ltd.  
«Uralvagonzavod» OJSC  
«Sinara» Group  
«Russia Helicopters» OJSC  
«Russian Transport Engineering Corporation» OJSC

### Metallurgy industry:

«Severstal» OJSC  
«Magnitogorsk Metallurgical Plant» OJSC  
«Mechel» OJSC  
«CHTPZ» Group  
«Joint Metallurgical Company» CJSC  
«Asha Metallurgical Plant» OJSC

### Energy industry:

OGK-2  
«RusGidro» OJSC  
OGK-3  
«Fortum» OJSC  
TGK-13  
«TVEL» OJSC  
«Rosatom» State Corporation

### Mining industry:

«AK Alrosa» OJSC  
«SYEK» OJSC  
«Kuzbass» Ltd.  
«Belon» OJSC  
«Uzhkuzbassugol» OJSC  
«Kazahmys» Corporation  
«Malomyrskiy Rudnik» OJSC  
«Mihailovskiy GOK» OJSC

### Railway:

«Russian Railways» OJSC  
«Kazakhstan Temir Zholy» JSK  
«Uzbekiston Temir Yullari»  
«Tajikistan Railway»

Our mission is to provide our customers with effective engineering solutions, high quality equipment and service by means of accurate understanding of the modern industry needs and the national producer value establishing at the international market.

# General Information

CHELYABINSK COMPRESSOR PLANT PRODUCTS ARE MANUFACTURED FROM THE COMPONENTS OF THE WORLD LEADING PRODUCERS AND WITH MORE MODERN EQUIPMENT.

CHKZ suppliers:



Air ends (Germany)



Boosters (Germany)



Diesel engines



Electric motors



Couplings (Germany)



Controllers (Belgium)



Air valves (Italy)



Air treatment



Machine workshop



Vessels workshop



Assembly area



Block modular workshop





Laser cutting equipment



Sheet-bending press



Welding equipment



Powder painting line



Shot blasting chamber



Test and Areasearch



Plasma cutting machine



Roll-bending machine

## Service Comprehensive Approach



Chelyabinsk Compressor Plant LLC specializes in complete compressed air supply systems solutions meeting the clients requirements. The main target to guarantee the most economically profitable result in short terms due to the competent components selection.



## Comprehensive customer service:

### 1. Pneumatic audit

**Integrated study of a compressed air supply system at a customer enterprise:**

- Preliminary analysis
- Measurement of compressed air consumption
- Analysis of Measurement results
- Equipment selection
- Planning solutions development
- Technical–economical analysis

### 2. Packaged supply

### 3. Precomissioning and commissioning

- Contract supervision.
- Training.
- First start up.
- Individual operation parameters setting.
- Commissioning

### 4. Warranty maintenance

### 5. Service and repair



## Main advantages of a comprehensive customer service:

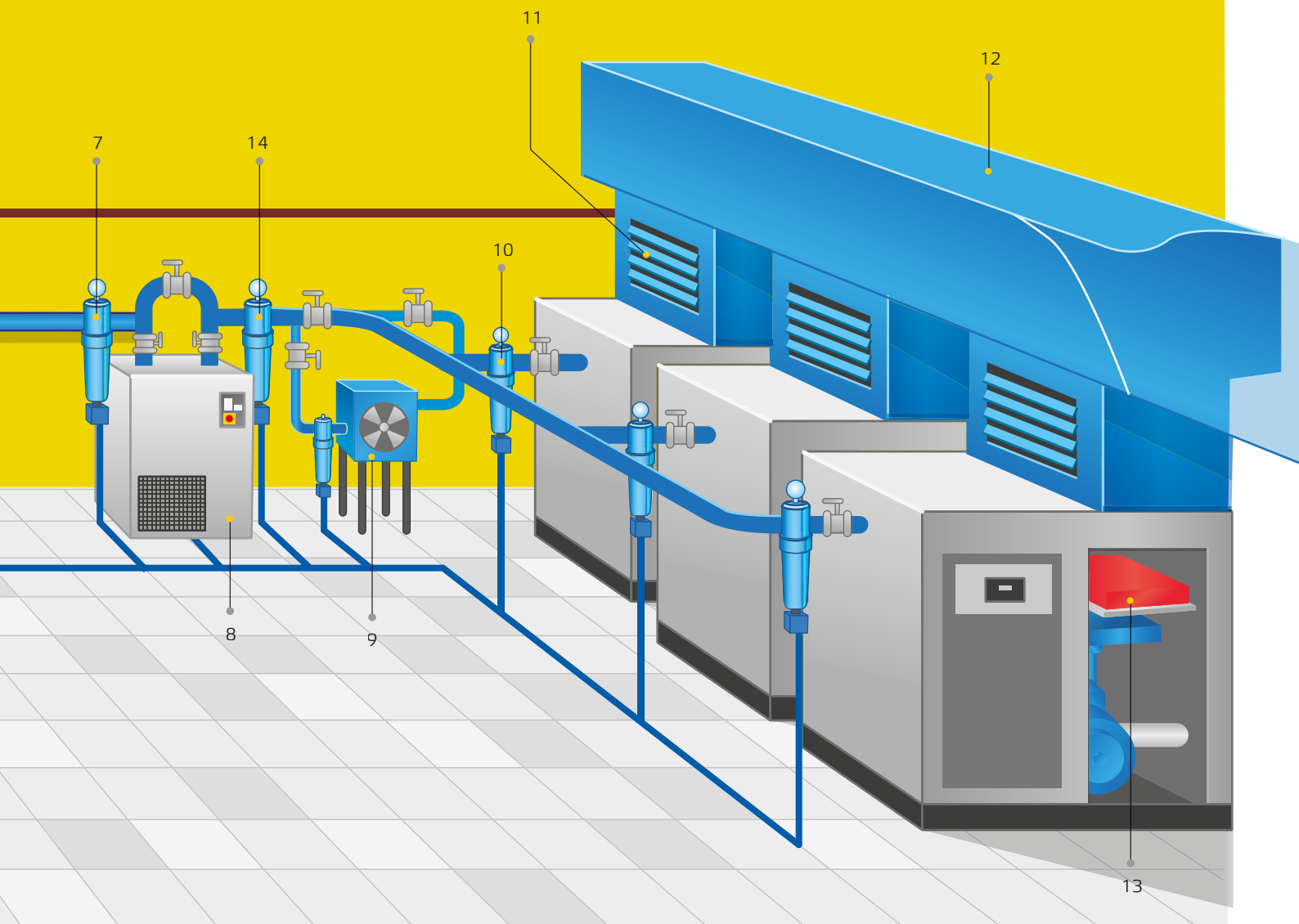
- a complete solution for a customer;
- high power efficiency of a realized projects;
- guaranteed quality of compressed air and stable working pressure;
- the heat discharged from a compressor cooling system is used for the heating the compressor or nearby room;
- full automation of the pneumatic equipment.



An example of a complete compressor station with several compressor units, including air treatment equipment, main piping, remote control system of more than (1000 m distance), compressed air consumption control, hot airway from the compressors used for heating of industrial rooms and domestic water.

CHKZ developed a range technical solutions for the high quality compressed air supply in order to meet the customers possible needs for the following application:

- mechanical engineering;
- mining;
- food;
- oil and gas;
- energy;
- construction;
- Russian Railways JSCO.



- |                                                  |                                                           |
|--------------------------------------------------|-----------------------------------------------------------|
| 1 Operator working place                         | 9 Aftercooler                                             |
| 2 Air vessels                                    | 10 Oil-water separator with an automatic condensate drain |
| 3 Compressed air consumption controller          | 11 Automatic air valves with electric drive               |
| 4 Remote control unit for a group of compressors | 12 Hot airways                                            |
| 5 Oil water separator                            | 13 Oil-water heat exchanger                               |
| 6 Flow meter                                     | 14 Prefilter                                              |
| 7 Compressed air fine filter                     |                                                           |
| 8 Dryer                                          |                                                           |



Chapter

03

## DEN Screw Compressor Units With Electric Motor





## RELIABILITY AND EFFICIENCY

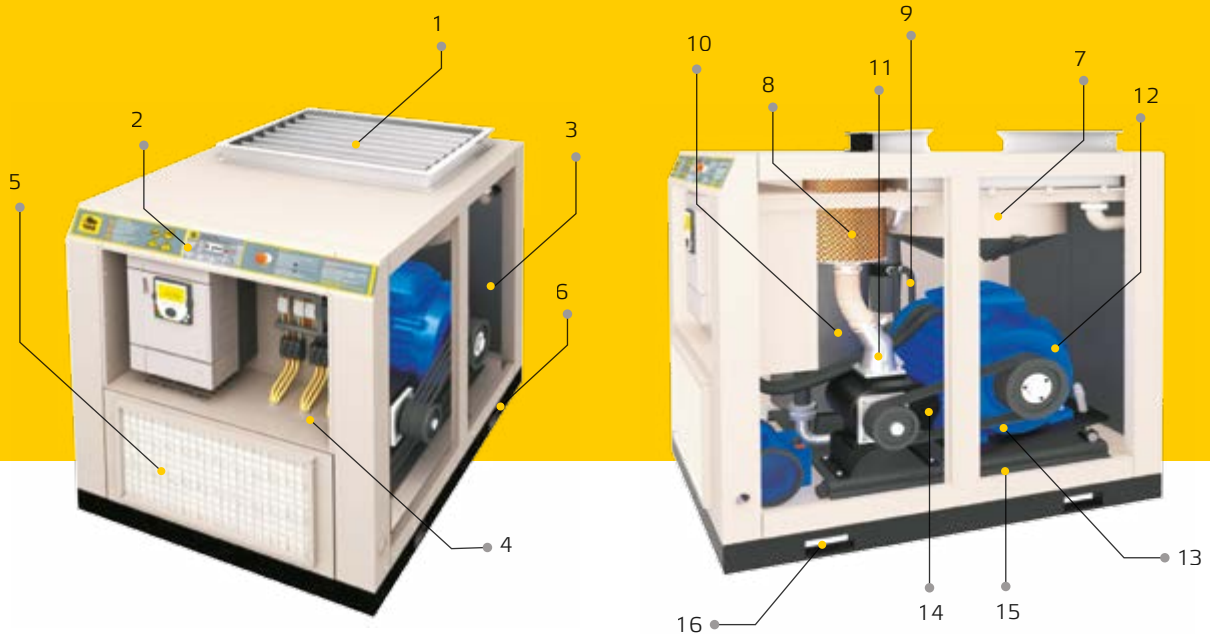
Electric driven screw compressor units type DEN, with an efficiency from 10,6 up to 1942,6 CFM (0,3-55 m<sup>3</sup>/min) and working pressure 101,5-188,5 psig (7-13 barg) are used in all manufacturing sectors.

DEN compressor units are a prefabricated, ready for operation package installed on a frame with no foundation required, equipped with a sound-proof housing and an automatic control system. It is built on a basis of a screw compressor with a service life of 40000 operating hours. The core of the automatic control system is a CMC Air-Master Q1 (or S1) microprocessor control unit. For a remote control of a compressor

group a Metacentre system is applied (option). The DEN compressor units are produced with an air (standard) or liquid cooling system (DEN «Dew»).

## Standard scope

- |                               |                                               |                                 |
|-------------------------------|-----------------------------------------------|---------------------------------|
| 1 Automatic shutters (option) | 7 Cooling air system                          | 13 Belt gear                    |
| 2 Controller                  | 8 Air filter                                  | 14 Air end                      |
| 3 Sound-proof housing         | 9 Oil filter                                  | 15 Vibration-isolating supports |
| 4 Power switchboard           | 10 Oil separator                              | 16 Holes for a fork lift        |
| 5 Prefilter (option)          | 11 Intake valve                               |                                 |
| 6 Frame                       | 12 Driving electric motor / flexible coupling |                                 |



### DEN COMPRESSOR UNITS OPERATE AT A WIDE RANGE OF CLIMATIC CONDITIONS:

- from +33,8°F up to +95°F (from +1°C up to +35°C) (standard version),
- from +33,8°F up to +113°F (from +1°C up to +45°C), high humidity («Tropic» special version),
- from -31°F up to +95°F (from -35°C up to +35°C) (special northern version).

Upon a special request DEN compressor units can be produced with 362,6 psig (25 barg) working pressure.

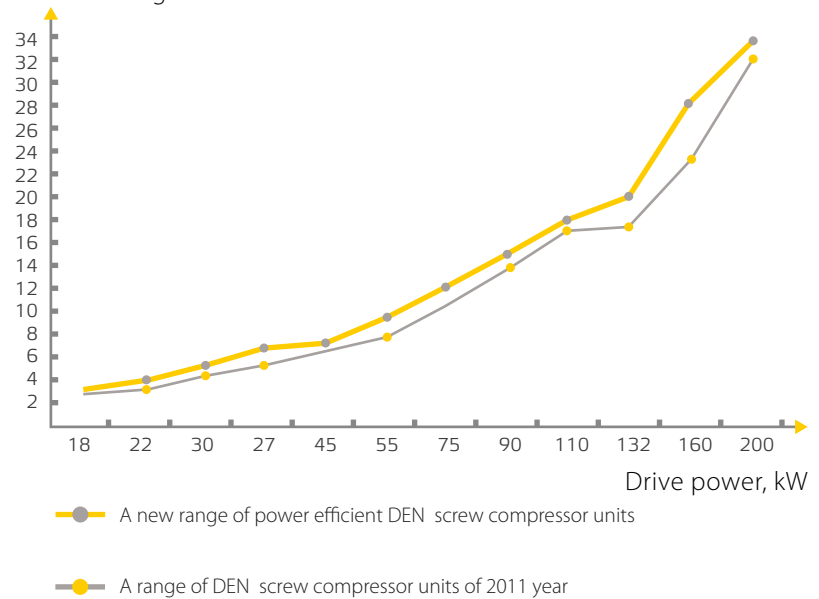
**DEN COMPRESSOR UNITS WARRANTY PERIOD IS 3 YEARS.**

## DEN compressor units range

### More compressed air – less power consumption!

Since 2012 CHKZ, LLC offer a new range of DEN compressor units. The modified design allowed to enlarge the compressor units' capacity at the same energy consumption level. As a result the new power efficient DEN screw compressor units enable to reduce your power expenses.

Delivery, m<sup>3</sup>/min, with working pressure 10 barg



#### Compressor controller Airmaster S1 (CMC, Belgium)

- Allows to set up main operation parameters and to control them automatically by means of LED display.
- Ensures the entire compressor protection against pressure, temperature and overload by means of switching off the electric circuit that prevent the equipment from breakage.
- Enables uninterruptible compressor operation at the unstable voltage supply.
- Counts the moto hours and informs about the regular maintenance necessity .



#### Compressor controller AirmasterQ1 («CMC», Belgium)

Modern and hi-tech compressor controller. .

##### Main features of Airmaster Q1:

- Graphic interface available in the Russian language.
- Errors description.
- Real time clock.
- Errors and events register with indication of their date and time.
- Automatic start of a compressor unit at a specified time.

## DEN Screw Compressor Units



### DEN-4 – DEN-11 «Econom»

This is economy-size compressor unit with small efficiency. A unit is installed on a frame without a housing on the basis of a VMC compact module, which includes a screw compressor, inlet valve, oil separation system and controller. The compact unit allows air flow optimization and the whole unit reliability increase due to the components quantity reduce.



### DEN-5,5Sh - DEN-30Sh

The compressor can operate at the most extreme conditions round-the-clock. High and stable compressed air quality is guaranteed. The control system is fully automatic. Three versions are available: on a frame, on a receiver, on a receiver with a dryer. The unit can be optionally supplied with a group of oil and dust filters. The highest capacity is provided at low cost.



### DEN-37Sh – DEN-55Sh

This type of compressor is an ideal solution for a small production or workshop (area, customer) using a decentralized compressed air supply system. The maintenance is rather simple thanks to optimal design and easy access to all the main assemblies.



### DEN-30Sh «Plus», DEN-55Sh «Plus» - DEN-90Sh

These are highly effective screw compressor units with entirely automatic control system, low noise level which can be operated continuously for 24 hours and be easily serviced.



### DEN-45ShM «OilField»

This compressor version is specially designed for oil application to ensure high reliability in the most extreme conditions.





## DEN-90Sh «Plus» - DEN-110Sh

These are the industrial compressors that satisfy the highest requirements – power efficiency, reliability, long operating life. The units are specially designed for a high load operation in a workshop of middle and large-scale productions. Neither special foundation no permanent presence of staff is needed. The noise level of the units allows their installation near the working places.



## DEN-55ShM – DEN-250ShM

Is a perfect blend of technologies satisfying a large consumers needs and appropriate for construction of centralized compressor stations. The ready to operate units are supplied with a soft start device, which limits the starting current and reduce mechanical load on all the compressor components at the start and increase the number of starts per hour. As a result – the operation life extends.



## DEN-315ShM – DEN 400ShM

Nowadays this is the most high-performance and power efficient compressor unit produced by CHKZ, which is considered to be the combination of the highest skills in design and production. A module design, consisting of a compressing, cooling and control modules enables to meet the highest clients requirements in the process of a compressor station reconstructing or building and to reduce the cooling system pipelines length.

**DEN compressor units are manufactured with a belt or direct drive (with a flexible coupling), and with an air or liquid cooling system.**

## Technical characteristics

| Model                      | Capacity at STP*, m³/min | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm.<br>(Weight, kg) |
|----------------------------|--------------------------|--------------------------------|---------------------|----------------------------------------|
| DEN-4                      | 0,58 / 0,45 / 0,32       | 7/10/13                        | 5,4 (4)             | 750x550x650 (150)                      |
| DEN-5,5                    | 0,75 / 0,6 / 0,47        | 7/10/13                        | 7,4 (5,5)           | 750x550x650 (150)                      |
| DEN-7,5                    | 1,05 / 0,8 / 0,65        | 7/10/13                        | 10,1 (5,5)          | 750x580x650 (170)                      |
| DEN-11                     | 1,75 / 1,4 / 1,1         | 7/10/13                        | 14,8 (11)           | 810x635x650 (190)                      |
| DEN-5,5Sh                  | 0,75 / 0,60 / 0,47       | 7/10/13                        | 7,4 (5,5)           | 1100x650x910 (180)                     |
| DEN-5,5Sh-R (250 l)        | 0,75 / 0,60 / 0,47       | 7/10/13                        | 7,4 (5,5)           | 1183x660x1627 (250)                    |
| DEN-5,5Sh-R (500 l)        | 0,75 / 0,60 / 0,47       | 7/10/13                        | 7,4 (5,5)           | 1797x660x1628 (355)                    |
| DEN-5,5Sh-OR (500 l)       | 0,75 / 0,60 / 0,47       | 7/10/13                        | 7,4 (5,5)           | 1797x660x1628 (405)                    |
| DEN-7,5Sh                  | 1,05 / 0,80 / 0,65       | 7/10/13                        | 10,1 (7,5)          | 1100x650x910 (200)                     |
| DEN-7,5Sh-R (500 l)        | 1,05 / 0,80 / 0,65       | 7/10/13                        | 10,1 (7,5)          | 1797x660x1628 (375)                    |
| DEN-7,5Sh-OR (500 l)       | 1,05 / 0,80 / 0,65       | 7/10/13                        | 10,1 (7,5)          | 1797x660x1628 (425)                    |
| DEN-11Sh                   | 1,75 / 1,4 / 1,1         | 7/10/13                        | 14,8 (11)           | 1100x650x910 (230)                     |
| DEN-11Sh-R (500 l)         | 1,75 / 1,4 / 1,1         | 7/10/13                        | 14,8 (11)           | 1797x660x1628 (505)                    |
| DEN-11Sh-OR (500 l)        | 1,75 / 1,4 / 1,1         | 7/10/13                        | 14,8 (11)           | 1797x660x1628 (555)                    |
| DEN-15Sh                   | 2,0 / 1,85 / 1,55        | 7,5/10/13                      | 20,1 (15)           | 1350x810x1200 (490)                    |
| DEN-15Sh-R (500 l)         | 2,0 / 1,85 / 1,55        | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (685)                    |
| DEN-15Sh-R (900 l)         | 2,0 / 1,85 / 1,55        | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (807)                    |
| DEN-15Sh-OR (500 l)        | 2,0 / 1,85 / 1,55        | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (735)                    |
| DEN-15Sh-OR (900 l)        | 2,0 / 1,85 / 1,55        | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (855)                    |
| DEN-15Sh «Plus»            | 2,7 / 2,4 / 2,1          | 7,5/10/13                      | 20,1 (15)           | 1350x810x1200 (505)                    |
| DEN-15Sh-R «Plus» (500 l)  | 2,7 / 2,4 / 2,1          | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (700)                    |
| DEN-15Sh-R «Plus» (900 l)  | 2,7 / 2,4 / 2,1          | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (822)                    |
| DEN-15Sh-OR «Plus» (500 l) | 2,7 / 2,4 / 2,1          | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (750)                    |
| DEN-15Sh-OR «Plus» (900 l) | 2,7 / 2,4 / 2,1          | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (872)                    |
| DEN-18Sh                   | 3,1 / 2,7 / 2,2          | 7,5/10/13                      | 24,8 (18)           | 1350x810x1200 (515)                    |
| DEN-18Sh-R (500 l)         | 3,1 / 2,7 / 2,2          | 7,5/10/13                      | 24,8 (18)           | 1796x810x1928 (710)                    |
| DEN-18Sh-OR (500 l)        | 3,1 / 2,7 / 2,2          | 7,5/10/13                      | 24,8 (18)           | 2010x820x2092 (832)                    |
| DEN-18Sh-OR (500 l)        | 3,1 / 2,7 / 2,2          | 7,5/10/13                      | 24,8 (18)           | 1796x810x1928 (760)                    |
| DEN-18Sh-OR (900 l)        | 3,1 / 2,7 / 2,2          | 7,5/10/13                      | 24,8 (18)           | 2010x820x2092 (882)                    |
| DEN-22Sh                   | 3,8 / 3,4 / 3,0          | 7,5/10/13                      | 29,5 (22)           | 1350x810x1200 (550)                    |
| DEN-22Sh-R (500 l)         | 3,8 / 3,4 / 3,0          | 7,5/10/13                      | 29,5 (22)           | 1796x810x1928 (745)                    |
| DEN-22Sh-R (900 l)         | 3,8 / 3,4 / 3,0          | 7,5/10/13                      | 29,5 (22)           | 2010x820x2092 (867)                    |
| DEN-22Sh-OR (500 l)        | 3,8 / 3,4 / 3,0          | 7,5/10/13                      | 29,5 (22)           | 1796x810x1928 (795)                    |
| DEN-22Sh-OR (900 l)        | 3,8 / 3,4 / 3,0          | 7,5/10/13                      | 29,5 (22)           | 2010x820x2092 (917)                    |
| DEN-30Sh                   | 4,44 / 3,7 / 3,2         | 7,5/10/13                      | 40,2 (30)           | 1350x810x1200 (550)                    |
| DEN-30Sh «Plus»            | 5,7 / 5,0 / 4,2          | 8/10/13                        | 40,2 (30)           | 1450x890x1370 (713)                    |
| DEN-37Sh                   | 6,5 / 5,7 / 4,7          | 8/10/13                        | 49,6 (37)           | 1770x1200x1690 (1050)                  |
| DEN-45Sh                   | 7,5 / 6,5                | 8/10                           | 60,3 (45)           | 1770x1200x1690 (1050)                  |
| DEN-45ShM                  | 7,0 / 6,5                | 7/10                           | 60,3 (45)           | 1610x1000x1530 (850)                   |
| DEN-55Sh                   | 8,5 / 7,5 / 6,7          | 8/10/13                        | 73,8 (55)           | 1770x1200x1690 (1250)                  |
| DEN-55Sh «Plus»            | 10,0 / 8,85 / 7,8        | 8/10/13                        | 73,8 (55)           | 2100x1350x1630 (1300)                  |
| DEN-55ShM                  | 10,3 / 8,6 / 7,3         | 8/10/13                        | 73,8 (55)           | 2250x1250x1248 (1400)                  |
| DEN-75Sh                   | 11,3 / 10,3 / 8,84       | 8/10/13                        | 100,6 (75)          | 2100x1350x1630 (1300)                  |
| DEN-75Sh «Plus»            | 12,6 / 11,0 / 9,6        | 8/10/13                        | 100,6 (75)          | 2100x1350x1630 (1400)                  |

| Model             | Capacity at STP*, m <sup>3</sup> /min | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm.<br>(Weight, kg)                        |
|-------------------|---------------------------------------|--------------------------------|---------------------|---------------------------------------------------------------|
| DEN-75ShM         | 12,5 / 11,0 / 9,3                     | 8/10/13                        | 120,7 (90)          | 2250x1250x1248 (1450)                                         |
| DEN-90Sh          | 13,8 / 11,7 / 10,2                    | 7,5/10/13                      | 120,7 (90)          | 2100x1350x1630 (1400)                                         |
| DEN-90Sh «Plus»   | 15,5 / 14,0 / 11,6                    | 8/10/13                        | 120,7 (90)          | 1960x1340x1630 (1700)                                         |
| DEN-90ShM         | 15,64                                 | 8                              | 120,7 (90)          | 2512x1510x1967 (1700)                                         |
| DEN-110Sh         | 19,0 / 16,8 / 13,5                    | 8/10/13                        | 147,5 (110)         | 1960x1340x1630 (1800)                                         |
| DEN-132ShM        | 22,5 / 16,5                           | 7/10                           | 177,0 (132)         | 2500x1450x1820 (2400)                                         |
| DEN-132ShM «Plus» | 24,0 / 19,0 / 17,0                    | 8/10/15                        | 177,0 (132)         | 2950x1800x1960 (3100)                                         |
| DEN-160ShM        | 29,0 / 26,5 / 23,0                    | 8/10/13,5                      | 214,6 (160)         | 2950x1800x1960 (3650)                                         |
| DEN-200ShM        | 35,5 / 32                             | 8/10                           | 268,2 (200)         | 2950x1800x1960 (3750)                                         |
| DEN-250ShM        | 42,0                                  | 8                              | 335,3 (250)         | 3400x2100x2100<br>(compressor)                                |
| DEN-315ShM        | 42,0                                  | 10                             | 422,4 (315)         | 1600x1000x1900 (cooling)<br>(4650)                            |
| DEN-315ShM        | 54,0                                  | 7,5                            | 422,4 (315)         | 2900x2100x2100<br>(compressor)                                |
| DEN-400ShM        | 54,0                                  | 10                             | 536,4 (400)         | 1220x1990x2110 (cooling)<br>1020x840x1502 (control)<br>(5170) |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

Sh - sound-proof housing, M – flexible coupling, R – air receiver, O – refrigerated dryer

## Available options

| Option                                                                                       | DEN-4 | DEN-5,5 | DEN-7,5 | DEN-11 | DEN-5,5Sh | DEN-7,5Sh | DEN-11Sh | DEN-15Sh | DEN-18Sh | DEN-22Sh | DEN-30Sh | DEN-37Sh | DEN-45Sh | DEN-45ShM | DEN-55Sh | DEN-75Sh | DEN-90Sh | DEN-55ShM | DEN-75ShM | DEN-90ShM | DEN-110Sh | DEN-132ShM | DEN-160ShM | DEN-200ShM | DEN-250ShM | DEN-315ShM | DEN-400ShM |
|----------------------------------------------------------------------------------------------|-------|---------|---------|--------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|----------|----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| Chassis                                                                                      | -     | -       | -       | -      | -         | -         | -        | -        | -        | -        | +        | +        | +        | +         | +        | +        | +        | -         | +         | -         | -         | -          | -          | -          | -          |            |            |
| Vessel (receiver)                                                                            | +     | +       | +       | +      | +         | +         | +        | +        | +        | +        | -        | -        | -        | -         | -        | -        | -        | -         | -         | -         | -         | -          | -          | -          | -          |            |            |
| Chassis and vessel (receiver)                                                                | -     | -       | -       | -      | -         | -         | -        | -        | -        | -        | +        | +        | +        | +         | +        | +        | +        | -         | +         | -         | -         | -          | -          | -          | -          |            |            |
| "Winter package" (fan heater+automatic shutter)                                              | -     | -       | -       | -      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | -         | -         | -          | -          | -          | -          |            |            |
| Schneider Electric soft start device                                                         | -     | -       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | ST       | +         | +        | +        | +        | +         | +         | +         | ST        | ST         | ST         | ST         | ST         |            |            |
| Remote control                                                                               | +     | +       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Air prefilter                                                                                | -     | +       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Flexible connection to the pneumatic line (high pressure hose) or a high pressure metal hose | RVD   | RVD     | RVD     | RVD    | RVD       | RVD       | RVD      | RVD      | RVD      | RVD      | RVD      | RVD      | RVD      | RVD       | RVD      | RVD      | RVD      | RVD       | RVD       | RVD       | RVD       | MR         | MR         | MR         | MR         | MR         |            |
| Separator                                                                                    | +     | +       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Customized painting*                                                                         | +     | +       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Power factor correction device                                                               | -     | -       | -       | -      | -         | -         | -        | -        | -        | -        | -        | -        | -        | -         | -        | -        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Lifting textile straps                                                                       | -     | -       | -       | -      | -         | -         | -        | -        | -        | -        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |
| Maintenance instruments kit                                                                  | +     | +       | +       | +      | +         | +         | +        | +        | +        | +        | +        | +        | +        | +         | +        | +        | +        | +         | +         | +         | +         | +          | +          | +          | +          |            |            |

Table symbols: (+) - option is available; (-) - option is not available; ST – option is available in a standard version;

\* - for more than 10 pieces order

## DEN «OPTIM» Compressor Units With Variable Frequency Drive

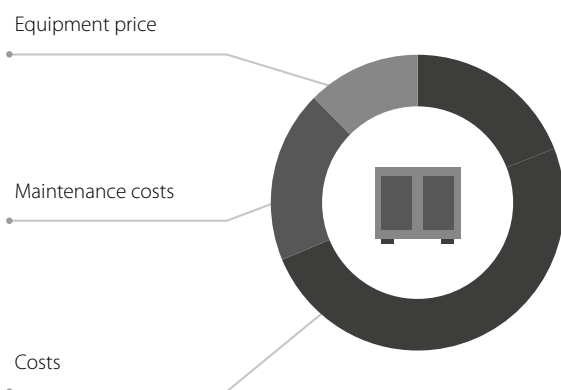


Compressors DEN «OPTIM» are equipped with a variable speed drive which allows to save power sufficiently .

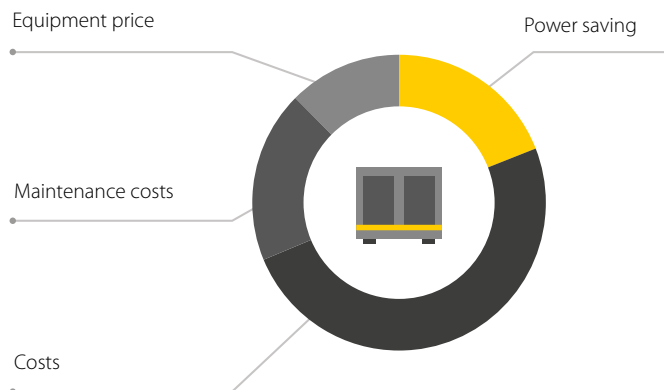
Purchasing new equipment great attention should be paid to initial investment and operation costs. The main part of the costs is comprised of energy expenses. Using modern compressors DEN «OPTIM» you will save up to 30% of power with the same maintenance costs and

slightly higher compressor price (compared to standard compressor DEN). Payback period of the compressor DEN «OPTIM» is usually no longer than one year.

Distribution of costs for a compressor unit without variable frequency drive



Distribution of costs for a compressor unit with variable frequency drive



## Frequency drive allows:

To supply the demanded volume of compressed air, to satisfy consumers needs.

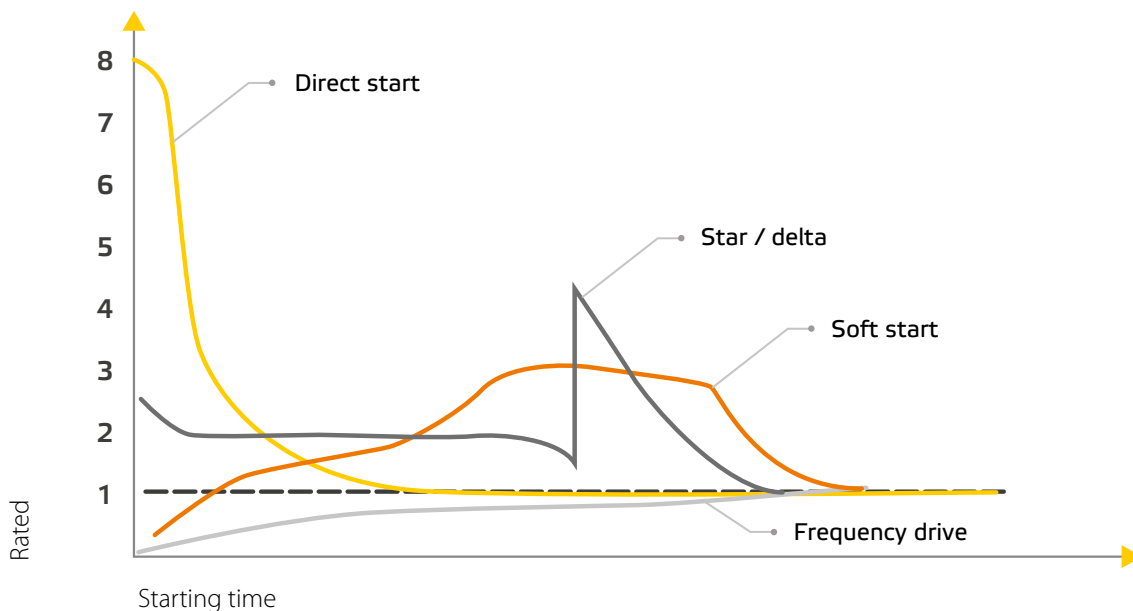
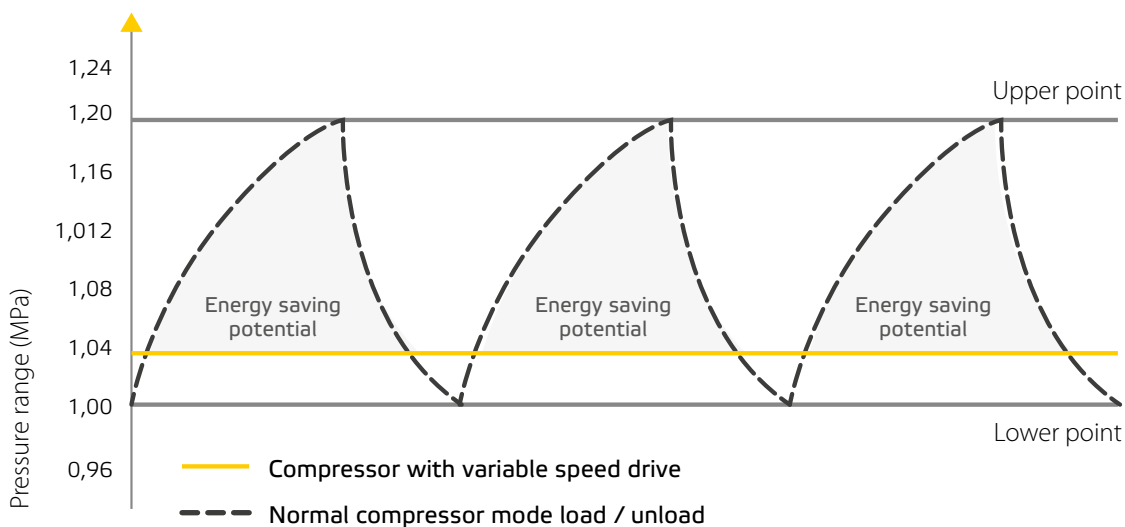
To maintain positive pressure in the pneumatic system with a precision of 0,01 MPa. Pressure increase by 0,1 MPa, results in power consumption growth by 6-8%.

To avoid the standard mode "work - idle - stop" by reducing power consumption in unproductive idle mode.

Energy saving is more than of 30%, depending on the operating mode.

To reduce the load on the enterprises power network, starting current does not exceed the operating parameters.

To extend the life of the compressor by operating the compressor unit at a lowered speed.



One compressor with variable frequency drive is enough to control a group of compressors capacity. The compressor with a variable frequency drive smoothen irregularity in compressed air demand (sustaining stable

pressure in pneumatic circuit) and if necessary switches on or shuts off a compressor without a variable frequency drive.



## Technical characteristics

| Model                              | Delivery at STP*, m³/min        | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm.<br>(Weight, kg) |
|------------------------------------|---------------------------------|--------------------------------|---------------------|----------------------------------------|
| DEN-5,5Sh «Optim»                  | 0,37-0,75 / 0,3-0,6 / 0,23-0,47 | 7/10/13                        | 7,4 (5,5)           | 1100x650x910 (180)                     |
| DEN -5,5Sh -R (250 l) «Optim»      | 0,37-0,75 / 0,3-0,6 / 0,23-0,47 | 7/10/13                        | 7,4 (5,5)           | 1183x660x1627 (250)                    |
| DEN -5,5Sh-R (500 l) «Optim»       | 0,37-0,75 / 0,3-0,6 / 0,23-0,47 | 7/10/13                        | 7,4 (5,5)           | 1797x660x1628 (355)                    |
| DEN-5,5Sh -OR (500 l) «Optim»      | 0,37-0,75 / 0,3-0,6 / 0,23-0,47 | 7/10/13                        | 7,4 (5,5)           | 1797x660x1628 (405)                    |
| DEN-7,5Sh «Optim»                  | 0,52-1,05 / 0,4-0,8 / 0,32-0,65 | 7/10/13                        | 10,1 (7,5)          | 1100x650x910 (200)                     |
| DEN-7,5Sh -R (500 l) «Optim»       | 0,52-1,05 / 0,4-0,8 / 0,32-0,65 | 7/10/13                        | 10,1 (7,5)          | 1797x660x1628 (375)                    |
| DEN-7,5Sh-OP (500 l) «Optim»       | 0,52-1,05 / 0,4-0,8 / 0,32-0,65 | 7/10/13                        | 10,1 (7,5)          | 1797x660x1628 (425)                    |
| DEN-11Sh «Optim»                   | 0,9-1,8 / 0,8-1,6 / 0,7-1,4     | 7/10/13                        | 14,8 (11)           | 1100x650x910 (230)                     |
| DEN-11Sh-R (500 l) «Optim»         | 0,9-1,8 / 0,8-1,6 / 0,7-1,4     | 7/10/13                        | 14,8 (11)           | 1797x660x1628 (505)                    |
| DEN-11Sh-OR (500 l) «Optim»        | 0,9-1,8 / 0,8-1,6 / 0,7-1,4     | 7/10/13                        | 14,8 (11)           | 1797x660x1628 (555)                    |
| DEN-15Sh «Optim»                   | 1,0-2,0 / 0,9-1,85 / 0,75-1,55  | 7,5/10/13                      | 20,1 (15)           | 1350x810x1200 (490)                    |
| DEN-15Sh-R (500 l) «Optim»         | 1,0-2,0 / 0,9-1,85 / 0,75-1,55  | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (685)                    |
| DEN-15Sh-R (900 l) «Optim»         | 1,0-2,0 / 0,9-1,85 / 0,75-1,55  | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (807)                    |
| DEN-15Sh-OR (500 l) «Optim»        | 1,0-2,0 / 0,9-1,85 / 0,75-1,55  | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (735)                    |
| DEN-15Sh-OR (900 l) «Optim»        | 1,0-2,0 / 0,9-1,85 / 0,75-1,55  | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (855)                    |
| DEN-15Sh «Plus» «Optim»            | 1,35-2,7 / 1,2- 2,4 / 1,05- 2,1 | 7,5/10/13                      | 20,1 (15)           | 1350x810x1200 (505)                    |
| DEN-15Sh-R «Plus» (500 l) «Optim»  | 1,35-2,7 / 1,2- 2,4 / 1,05- 2,1 | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (700)                    |
| DEN-15Sh-R «Plus» (900 l) «Optim»  | 1,35-2,7 / 1,2- 2,4 / 1,05- 2,1 | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (822)                    |
| DEN-15Sh-OR «Plus» (500 l) «Optim» | 1,35-2,7 / 1,2- 2,4 / 1,05- 2,1 | 7,5/10/13                      | 20,1 (15)           | 1796x810x1928 (750)                    |
| DEN-15Sh-OR «Plus» (900 l) «Optim» | 1,35-2,7 / 1,2- 2,4 / 1,05- 2,1 | 7,5/10/13                      | 20,1 (15)           | 2010x820x2092 (872)                    |
| DEN-18Sh «Optim»                   | 1,55-3,1 / 1,35-2,7 / 1,1- 2,2  | 7,5/10/13                      | 24,8 (18)           | 1350x810x1200 (515)                    |
| DEN-18Sh-R (500 l) «Optim»         | 1,55-3,1 / 1,35-2,7 / 1,1- 2,2  | 7,5/10/13                      | 24,8 (18)           | 1796x810x1928 (710)                    |
| DEN-18Sh-R (900 l) «Optim»         | 1,55-3,1 / 1,35-2,7 / 1,1- 2,2  | 7,5/10/13                      | 24,8 (18)           | 2010x820x2092 (832)                    |
| DEN-18Sh-OR (500 l) «Optim»        | 1,55-3,1 / 1,35-2,7 / 1,1- 2,2  | 7,5/10/13                      | 24,8 (18)           | 1796x810x1928 (760)                    |
| DEN-18Sh-OR (900 l) «Optim»        | 1,55-3,1 / 1,35-2,7 / 1,1- 2,2  | 7,5/10/13                      | 24,8 (18)           | 2010x820x2092 (882)                    |
| DEN-22Sh «Optim»                   | 1,9-3,8 / 1,7-3,4 / 1,5-3,0     | 7,5/10/13                      | 29,5 (22)           | 1350x810x1200 (550)                    |
| DEN-22Sh-R (500 l) «Optim»         | 1,9-3,8 / 1,7-3,4 / 1,5-3,0     | 7,5/10/13                      | 29,5 (22)           | 1796x810x1928 (745)                    |
| DEN-22Sh-R (900 l) «Optim»         | 1,9-3,8 / 1,7-3,4 / 1,5-3,0     | 7,5/10/13                      | 29,5 (22)           | 2010x820x2092 (867)                    |
| DEN-22Sh-OR (500 l) «Optim»        | 1,9-3,8 / 1,7-3,4 / 1,5-3,0     | 7,5/10/13                      | 29,5 (22)           | 1796x810x1928 (795)                    |

| Model                       | Capacity at STP*, m³/min          | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm.<br>(Weight, kg)                        |
|-----------------------------|-----------------------------------|--------------------------------|---------------------|---------------------------------------------------------------|
| DEN-22Sh-OR (900 l) «Optim» | 1,9-3,8 / 1,7-3,4 / 1,5-3,0       | 7,5/10/13                      | 29,5 (22)           | 2010x820x2092 (917)                                           |
| DEN-30Sh «Optim»            | 2,22-4,44 / 1,85-3,7 / 1,6-3,2    | 7,5/10/13                      | 40,2 (30)           | 1350x810x1200 (550)                                           |
| DEN-30Sh «Plus» «Optim»     | 2,85-5,7 / 2,5-5,0 / 2,1-4,2      | 8/10/13                        | 40,2 (30)           | 1450x890x1370 (713)                                           |
| DEN-37Sh «Optim»            | 3,25-6,5 / 2,85-5,7 / 2,35-4,7    | 8/10/13                        | 49,6 (37)           | 1770x1200x1690 (1050)                                         |
| DEN-45Sh «Optim»            | 3,75-7,5 / 3,25-6,5               | 8/10                           | 60,3 (45)           | 1770x1200x1690 (1050)                                         |
| DEN-45ShM «Optim»           | 3,5-7,0 / 3,2-6,5                 | 7/10                           | 60,3 (45)           | 1610x1000x1530 (850)                                          |
| DEN-55Sh «Optim»            | 4-8,0 / 3,5-7,0 / 2,95-5,9        | 8/10/13                        | 73,8 (55)           | 1770x1200x1690 (1250)                                         |
| DEN-55Sh «Plus» «Optim»     | 5-10,0 / 4,42-8,85 / 3,9-7,8      | 8/10/13                        | 73,8 (55)           | 2100x1350x1630 (1300)                                         |
| DEN-55ShM «Optim»           | 5,15-10,3 / 4,3-8,6 / 3,6-7,3     | 8/10/13                        | 73,8 (55)           | 2250x1250x1248 (1400)                                         |
| DEN-75Sh «Optim»            | 5,65-11,3 / 5,15-10,3 / 4,4-8,84  | 8/10/13                        | 100,6 (75)          | 2100x1350x1630 (1300)                                         |
| DEN-75Sh «Plus» «Optim»     | 6,3-12,6 / 5,5-11,0 / 4,8-9,6     | 8/10/13                        | 100,6 (75)          | 2100x1350x1630 (1400)                                         |
| DEN-75ShM «Optim»           | 6,25-12,5 / 5,5-11,0 / 4,65-9,3   | 8/10/13                        | 100,6 (75)          | 2250x1250x1248 (1450)                                         |
| DEN-90Sh «Optim»            | 6,9-13,8 / 5,85-11,7 / 5,1-10,2   | 7,5/10/13                      | 120,7 (90)          | 2100x1350x1630 (1400)                                         |
| DEN-90Sh «Plus» «Optim»     | 7,75-15,5 / 7,0-14,0 / 5,8-11,6   | 8/10/13                        | 120,7 (90)          | 1960x1340x1630 (1700)                                         |
| DEN-90ShM «Optim»           | 7,82-15,64                        | 8                              | 120,7 (90)          | 2512x1510x1967 (1700)                                         |
| DEN-110Sh «Optim»           | 9,5-19,0 / 8,4-16,8 / 6,75-13,5   | 8/10/13                        | 147,5 (110)         | 1960x1340x1630 (1800)                                         |
| DEN-132ShM «Optim»          | 11,2-22,5 / 8,2-16,5              | 7/10                           | 177,0 (132)         | 2500x1450x1820 (2400)                                         |
| DEN-132ShM «Plus» «Optim»   | 12,0-24,0 / 9,5-19,0 / 8,5-17,0   | 8/10/15                        | 177,0 (132)         | 2950x1800x1960 (3100)                                         |
| DEN-160ShM «Optim»          | 14,5-29,0 / 13,2-26,5 / 11,5-23,0 | 8/10/13,5                      | 214,6 (160)         | 2950x1800x1960 (3650)                                         |
| DEN-200ShM «Optim»          | 17,75-35,5 / 16,0-32,0            | 8/10                           | 268,2 (200)         | 2950x1800x1960 (3750)                                         |
| DEN-250ShM «Optim»          | 21,0-42,0                         | 8                              | 335,3 (250)         | 3400x2100x2100 (compressor)                                   |
| DEN-315ShM «Optim»          | 21,0-42,0                         | 10                             | 422,4 (315)         | 1600x1000x1900 (cooling)<br>(4650)                            |
| DEN-315ShM «Optim»          | 27,0-54,0                         | 7,5                            | 422,4 (315)         | 2900x2100x2100 (compressor)                                   |
| DEN-400ShM «Optim»          | 27,0-54,0                         | 10                             | 536,4 (400)         | 1220x1990x2110 (cooling)<br>1020x840x1502 (control)<br>(5170) |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)  
Sh - sound-proof housing , M – flexible coupling, R – air receiver, O – refrigerated dryer

## DEN «VOLT» Compressor Units Operation at 6kV (10kV)



### Screw compressor units DEN «VOLT» give our clients the following benefits:

No need to install PTS (package transformer substation) which steps down the voltage from 6 (10)kV to 0,4kV.

Power costs reduction (because the power rates in 6kV network is lower).

Increase of compressor unit electric motor life due to low starting currents.

| Model                | Capacity at STP*,<br>m <sup>3</sup> /min | Rated Operating<br>Pressure, barg | Drive power<br>HP (kW) | Dimensions, LxWxH<br>mm                                    | Weight<br>kg |
|----------------------|------------------------------------------|-----------------------------------|------------------------|------------------------------------------------------------|--------------|
| DEN-160ShM<br>«VOLT» | 29,0 / 26,5                              | 8,0 / 10,0                        | 214.6 (160)            | 2950x1800x1960                                             | 3650         |
| DEN-200ShM<br>«VOLT» | 35,5/32,0                                | 8,0 / 10,0                        | 268.2 (200)            |                                                            | 3750         |
| DEN-250ShM<br>«VOLT» | 42,0                                     | 7,0                               | 335.3 (250)            | 3400x2100x2100<br>(compressor)<br>1600x1000x1900 (cooling) | 4650         |
| DEN-315ShM<br>«VOLT» | 42,0                                     | 10,0                              | 422.4 (315)            |                                                            |              |
| DEN-315ShM<br>«VOLT» | 54,0                                     | 7,0                               | 422.4 (315)            | 3560x2250x2200 (compressor)<br>1220x1990x2100 (cooling)    | 5170         |
| DEN-400ShM<br>«VOLT» | 54,0                                     | 10,0                              | 536.4 (400)            |                                                            |              |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)



Upon clients demand Chelyabinsk Compressor Plant LLC together with Chelyabinsk Electric Equipment Plant LLC can supply single-end service assembled chamber (KSO-203) for DEN compressors connection to 6kV (10kV) network.

KSO-203 is manufactured according to the Technical Requirements No. 3414-007-65711427-2010 and designed for acceptance and distribution of three phase, 50 – 60 Hz frequency and 6 (10) kV voltage alternating current in a circuit with an isolated and arc-suppressing reactor grounded neutral.

KSO consists of the most contemporary components, including commutation devices, isolators, overvoltage stoppers and

modern microprocessor protection units. It provides supply reliability of the compressor units taking their peculiarities into account.

Chelyabinsk Electric Equipment Plant LLC  
454085, Chelyabinsk, prospect Lenina, 2b,  
post office box 8814  
Phone: 8-351-777-34-64, 247-65-94, 239-90-31.  
Fax: 8 (351) 246-15-18, 246-15-19  
E-mail: info@chelzeo.ru

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## Liquid Cooled DEN «DEW» Compressor Units



The type of compressor units is designed for the companies which already use liquid cooled compressor equipment and have water cooling tower. DEN "DEW" compressor units can also be applied when air pipelines construction is impossible or unreasonable.

The units are supplied with high-efficient stainless steel plate heat exchangers made. Their compact sizes allows to integrate the exchangers into the compressor units. Heat exchanger material and design guarantee long life service. Self-cleaning technology provide minimal maintenance costs.

| N                       | Capacity at STP*, m <sup>3</sup> /min | Rated Operating Pressure, barg | Drive power HP (kW) | Cooling water consumption, gal./h (m <sup>3</sup> /h) | Dimensions, LxWxH, mm. (Weight, kg)                                                                       |
|-------------------------|---------------------------------------|--------------------------------|---------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| DEN-75Sh «DEW»          | 12 / 9,7 / 7,8                        | 8/10/13                        | 100,6 (75)          | 792,5 (3,0)                                           | 1620x1200x1480 (1300)                                                                                     |
| DEN-75Sh «Plus» «DEW»   | 13,5 / 11,5 / 9,8                     | 8/10/13                        | 100,6 (75)          | 1109,5 (4,2)                                          | 1960x1340x1630 (1400)                                                                                     |
| DEN-90Sh «DEW»          | 13,8 / 11,7 / 10,2                    | 7,5/10/13                      | 120,7 (90)          | 1109,5 (4,2)                                          | 1960x1340x1630 (1400)                                                                                     |
| DEN-90Sh «Plus» «DEW»   | 15,5 / 14,0 / 11,6                    | 8/10/13                        | 120,7 (90)          | 1109,5 (4,2)                                          | 1960x1340x1630 (1700)                                                                                     |
| DEN-110Sh «DEW»         | 19,0 / 16,8 / 13,5                    | 8/10/13                        | 147,5 (110)         | 1109,5 (4,2)                                          | 1960x1340x1630 (1800)                                                                                     |
| DEN-132ShM «Plus» «DEW» | 24,0 / 19,0                           | 8/10                           | 177,0 (132)         | 1452,95 (5,5)                                         | 2950x1800x1960 (3100)                                                                                     |
| DEN-160ShM «DEW»        | 29,0 / 26,5                           | 8/10                           | 214,6 (160)         | 1637,87 (6,2)                                         | 2950x1800x1960(3650)                                                                                      |
| DEN-200ShM «DEW»        | 35,5 / 32                             | 8/10                           | 268,2 (200)         | 1981,3 (7,5)                                          | 2950x1800x1960 (3750)                                                                                     |
| DEN-250ShM «DEW»        | 42,0                                  | 7                              | 335,3 (250)         | 2377,55 (9,0)                                         | 3400x2100x2100 (compressor), LxWxH of cooling - at the customer's request (4650)                          |
| DEN-315ShM «DEW»        | 42,0                                  | 10                             | 422,4 (315)         | 2800,2 (10,6)                                         |                                                                                                           |
|                         |                                       | 7,5                            | 422,4 (315)         |                                                       | 3450x2100x2100 (compressor), LxWxH of cooling - at the customer's request, 551x1310x2307 (control) (5170) |
| DEN-315ShM «DEW»        | 54,0                                  |                                |                     | 2800,2 (10,6)                                         |                                                                                                           |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

Compressor units DEN-132, 160, 200,250, 315 ShM - are equipped with a soft start device. The electric motor soft start device can be supplied for DEN-18Sh and up.

Sh - sound-proof housing, M – flexible coupling

## Explosion Proof DEN Screw Compressor Units

IN ORDER TO SATISFY CUSTOMERS NEEDS CHKZ SPECIALISTS HAVE DEVELOPED AND CERTIFIED SEVERAL EXPLOSION-PROOF SERIES OF DEN SCREW COMPRESSORS.

### DEN «MINER» Compressor Units

Screw compressor units DEN "MINER" have explosion protection marking RV ExdIasI according to the Certificate of Conformity to the requirements of Technical Regulations of the Customs Union "For equipment safety in explosion hazardous areas" (TRCU 012/2011).



The units are used for providing compressed air to pneumatic tools, pneumatic drilling rigs and mechanisms drives in underground mines and pithead buildings: gas-, vapor- and dust- nonehazardous - "RN" version (normal mining design) as well as gas-, vapor- and dust- hazardous - "RV ExdIasI" version.

On customer request CHKZ LLC can produce explosion-proof compressor units in with capacity ranged 17,66 -1483,44 cfm (0,5 - 42 m<sup>3</sup>/min).

The model range complies with the Industrial Safety Rules and Regulations «Coal Mines Safety Rules».

| Model               | Capacity at STP*, m <sup>3</sup> /min | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm.   | Weight kg |
|---------------------|---------------------------------------|--------------------------------|---------------------|--------------------------|-----------|
| DEN-5,5ShM «Miner»  | 0,8                                   | 7                              | 7,4 (5,5)           | 1210x590x1205            | 350       |
| DEN-7,5ShM+ «Miner» | 1,3                                   | 7                              | 10,1 (7,5)          | 1340x600x740             | 370       |
| DEN-45ShM «Miner»   | 6,5                                   | 7                              | 60,3 (45)           | 1970x900x1100            | 1300      |
| DEN-455ShM «Miner»  | 7,1                                   | 7                              | 60,3 (45)           | 1700x900x1100            | 1150      |
| DEN-75ShM «Miner»   | 11,0                                  | 7                              | 100,6 (75)          | 2300x1050x1100           | 1770      |
| DEN-110ShM «Miner»  | 15,4                                  | 7                              | 147,5 (110)         | 2910x1100x1395           | 2600      |
| DEN-132ShM «Miner»  | 22,0                                  | 7                              | 177,0 (132)         | 3080x1476x1802           | 3600      |
| DEN-200ShM «Miner»  | 33,0                                  | 7                              | 268,2 (200)         | 2980x1800x2400<br>(4300) | 4300      |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)



### Options:

- Wheel pair (standard scope of supply – on sledge)
- Electric motor voltage 660/1140 (standard voltage- 380/6600)
- Explosimetric sensor, dry-powder fire-extinguishing system

## DEN «Ex» Compressor Units

The DEN Ex compressor units are used in such industries as chemical, oil and gas, for operation either in dangerously explosive conditions of 1 class, categories IIA, IIB with explosion proof grades 1Ex d IIB T4 Gb or 1 Ex d ia IIB T4 Gb or in dangerously explosive conditions of 1 and 2 class, categories IIA, IIB, IIB+H2 with explosion proof grade 1Ex d ia IIB+H2 T4 Gb in accordance with the Customs Union Technical Regulations «About equipment safety during operation in dangerously explosive environment» (TP TC 012/2011).

Upon customer demand "EX" compressor with capacity range d 17,66 -1907,01 cfm (from 0,5 to 54 m<sup>3</sup>/min) can be supplied by CHKZ LLC.

The model range corresponds to the Industrial Safety State Rules and Regulations of «Coal Mines Safety Rules».



| Model                | Capacity at STP*, (m <sup>3</sup> /min) | Rated Operating Pressure, barg | Drive power HP (kW) |
|----------------------|-----------------------------------------|--------------------------------|---------------------|
| DEN-5,5Sh Ex         | 0,8 / 0,63 / 0,54                       | 7/10/13                        | 7,4 (5,5)           |
| DEN-7,5Sh Ex         | 1,16 / 0,82 / 0,71                      | 7/10/13                        | 10,1 (7,5)          |
| DEN-11Sh Ex          | 1,85 / 1,6 / 1,4                        | 7/10/13                        | 14,8 (11)           |
| DEN-15Sh Ex          | 2,7 / 2,4 / 2,1                         | 7,5/10/13                      | 20,1 (15)           |
| DEN-18Sh Ex          | 3,1 / 2,7 / 2,2                         | 7,5/10/13                      | 24,8 (18)           |
| DEN-22Sh Ex          | 3,8 / 3,4 / 3,0                         | 7,5/10/13                      | 29,5 (22)           |
| DEN-30Sh Ex          | 4,6 / 3,9 / 3,4                         | 7,5/10/13                      | 40,2 (30)           |
| DEN-30Sh «Plus» Ex   | 5,7 / 5,0 / 4,2                         | 8/10/13                        | 40,2 (30)           |
| DEN-37Sh Ex          | 6,5 / 5,7 / 4,7                         | 8/10/13                        | 49,6 (37)           |
| DEN-45Sh Ex          | 7,5 / 6,5 / 5,2                         | 8/10/13                        | 60,3 (45)           |
| DEN-45ShM Ex         | 7,0 / 6,5                               | 7/10                           | 60,3 (45)           |
| DEN-55Sh Ex          | 10,0 / 8,85 / 7,8                       | 8/10/13                        | 73,8 (55)           |
| DEN-75Sh Ex          | 12 / 9,7 / 7,8                          | 8/10/13                        | 100,6 (75)          |
| DEN-75Sh «Plus» Ex   | 13,5 / 11,5 / 9,8                       | 8/10/13                        | 100,6 (75)          |
| DEN-90Sh Ex          | 13,8 / 11,7 / 10,2                      | 7,5/10/13                      | 120,7 (90)          |
| DEN-90Sh «Plus» Ex   | 15,5 / 14,0 / 11,6                      | 8/10/13                        | 120,7 (90)          |
| DEN-110Sh Ex         | 19,0 / 16,8 / 13,5                      | 8/10/13                        | 147,5 (110)         |
| DEN-132ShM Ex        | 22,5 / 16,5                             | 7/10                           | 177,0 (132)         |
| DEN-132ShM «Plus» Ex | 24,0 / 19,0                             | 8/10                           | 177,0 (132)         |
| DEN-160ShM Ex        | 29,0 / 26,5                             | 8/10                           | 214,6 (160)         |
| DEN-200ShM Ex        | 35,5 / 32                               | 8/10                           | 268,2 (200)         |
| DEN-250ShM Ex        | 42,0                                    | 7                              | 335,3 (250)         |
| DEN-315ShM Ex        | 42,0                                    | 10                             | 422,4 (315)         |
| DEN-315ShM Ex        | 54,0                                    | 7,5                            | 422,4 (315)         |
| DEN-400ShM Ex        | 54,0                                    | 10                             | 536,4 (400)         |

\* - STP stands for temperature of 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

*Dimensions are in accordance with customer's requirements*

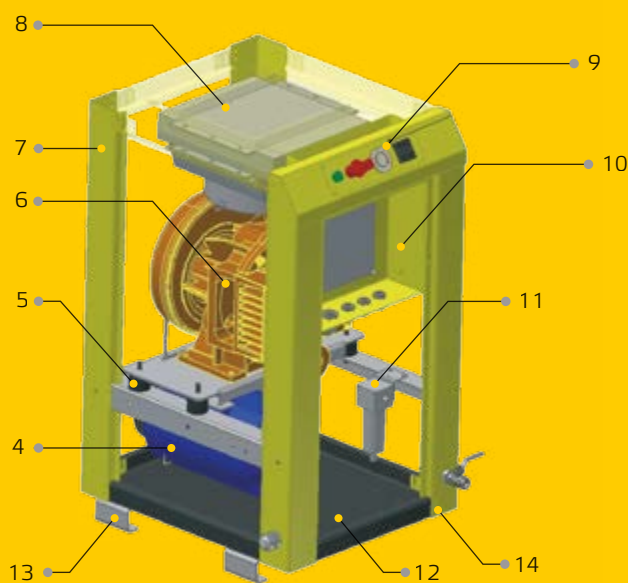


# KS Oil Free Compressor Units

## Oil free compressor unit KS-5,5

- 1 cable entry;
- 2 dispensing valve;
- 3 front panel;
- 4 drive motor;
- 5 isolation pad;
- 6 compressor;
- 7 hood support rod;

- 8 cooling unit;
- 9 control panel;
- 10 electric panel;
- 11 mist filter (option);
- 12 bottom;
- 13 support;
- 14 frame.



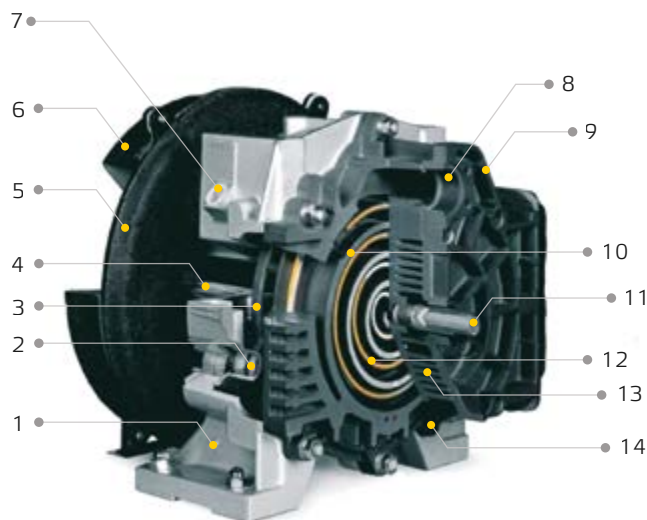
Since January 2014 the oil-free scroll compressor units KS are in CHKZ LLC product range. These state-of-the-art units are designed using advanced technologies and high-quality components from the leading manufacturers.

KS oil free scroll compressors produced by CHKZ LLC are designed for applications with high requirements to the air purity. High quality of compressed air (100% oil free air) and operational reliability can be also guaranteed by a scroll compressor.

The main item of the unit is an oil free scroll compressor that is produced for production of the compressed air of the first class according to ISO.

The working tools of the unit are two steel scrolls which are interposed in each other. Under the influence of eccentric a moving scroll moves in a plane-parallel way towards a fixed scroll.

The nodes and components are installed on a common base plate with account of the free access for maintenance. A unit is placed in a soundproofed hood and powder painted that's why it is safely protected from corrosion during all the period of mechanical life.



- 1 body frame;
- 2 screwdown of moving scroll;
- 3 counterweight;
- 4 pulley bearing and fan support;
- 5 inner fan casing;
- 6 outer fan casing;
- 7 plug;
- 8 upper air purifier tube;
- 9 fix scroll casing;
- 10 fix scroll;
- 11 compressed air outlet;
- 12 moving scroll;
- 13 scroll cooling fins;
- 14 lower intake hose chamber.

Characteristic feature of KS oil free compressor units is a low noise level achieved through compressor balance, antivibration mounts, sound proof housing. Compressor units can be installed in close proximity to operational location.

Another feature of KS oil free scroll compressors is unsurpassed reliability. Relatively small number of rotating parts and low demand for expandable materials allow to optimizing the quantity and intervals of schedule maintenance and to increase compressor lifetime.

| Model           | Minimum capacity<br>at STP*, cfm<br>(m <sup>3</sup> /min) | Output pressure, psig<br>(barg) | Drive<br>power, HP (kW) | Dimensions<br>LxWxH, mm. |
|-----------------|-----------------------------------------------------------|---------------------------------|-------------------------|--------------------------|
| KS-2            | 0,24/0,2                                                  | 8/10                            | 2,95 (2,2)              | 650x650x1010             |
| KS-2R (250 l)   | 0,24/0,2                                                  | 8/10                            | 2,95 (2,2)              | 1310x650x1630            |
| KS-5,5          | 0,6/0,44                                                  | 8/10                            | 7,4 (5,5)               | 650x650x1010             |
| KS-5,5R (250 l) | 0,6/0,44                                                  | 8/10                            | 7,4 (5,5)               | 1310x650x1630            |
| KS-5,5R (500 l) | 0,6/0,44                                                  | 8/10                            | 7,4 (5,5)               | 1800x650x1750            |
| KS-7,5          | 0,85                                                      | 8                               | 10,1 (7,5)              | 800x650x1150             |
| KS-7,5R (250 l) | 0,85                                                      | 8                               | 10,1 (7,5)              | 1310x650x1750            |
| KS-7,5R (500 l) | 0,85                                                      | 8                               | 10,1 (7,5)              | 1800x650x1900            |
| KS-22           | 2,4/1,76                                                  | 8/10                            | 29,5 (22)               | 1610x750x1500            |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)



Chapter

**05**

## KV Screw Compressor Units With Diesel Engine

## ECONOMY, UNPRETENTIOUSNESS, RELIABILITY!

KV compressor units with capacity of 88,29 -1059,44 cfm (2,5-30 m<sup>3</sup>/min), working pressure 87-435,1 psig (6-30 barg) are designed for the compressed air supply to the equipment used in the territories with limited or absent power supply and operation in adverse climatic conditions up to -31°F (-35°C).



Diesel KV compressor units function via three-dimensional compression approach. KV compressor units are based on German or Italian screw air ends and YaMZ, MMZ, Deutz diesel engines. The unit is mounted on a frame in a sound-proof housing with no need for special foundation.

Compressors KV have all-weather, powder-painted housing which protects them against corrosion throughout compressor lifetime

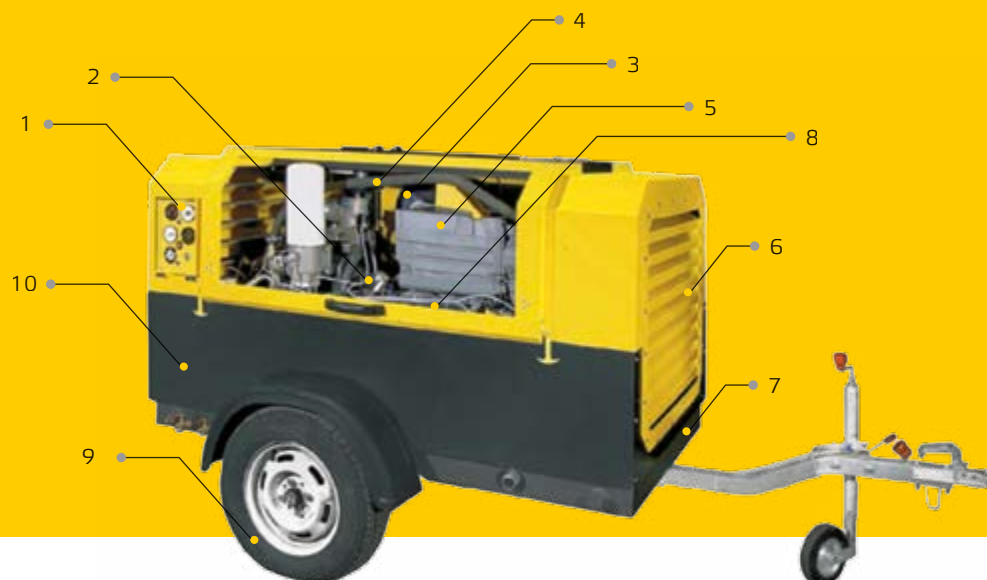
A standard version is designed for operation in climatic category No.1 according to GOST 15150-69 and at the

ambient temperature range 32 °F - 104 °F (0°C - +40°C). If the unit is equipped with a preheater the range of the working temperature is -31°F - 104 °F (-35°C - 40°C).



## Stationary and Mobile KV Compressor Units.

- |   |                  |    |                                                |
|---|------------------|----|------------------------------------------------|
| 1 | Control panel    | 6  | Cooling unit                                   |
| 2 | Screw compressor | 7  | Frame                                          |
| 3 | Fuel system      | 8  | Electric system                                |
| 4 | Oil-air system   | 9  | Chassis or sleigh (mobile version)             |
| 5 | Diesel engine    | 10 | Sound-proof all-weather powder-painted housing |



KV compressor units are equipped with a continuous capacity regulation, that guarantees a reliable and effective operation.

KV compressor units can be optionally supplied with a wide range of additional equipment.

# 40000 hours

Screw compressor average lifetime

KV COMPRESSOR UNIT WARRANTY PERIOD IS 1 YEAR.

## KV Screw Compressor Units



### Compressor units

KV-3/8, KV-5/10, KV-6/7

These compressors are intended for operation of three pneumatic hammers, one perforator or other pneumatic tools. Due to the light weight they can be transported by a car (chassis versions) or in a small truck body (stationary version).



### Compressor units

KV-8/8, KV-10/8, KV-12/10

These compressors are developed to perform the simultaneous operation of up to 10 pick hammers. These units are designed to conduct continuous works of high-capacity sandblasters and concrete pumps.



### Compressor units

KV-10/16, KV-12/12

These compressors are applied for pipeline pressure tests, fiber-optic communication lines laying, compressed air supply for special sandblasters.



### Compressor units

KV-20/30, KV-20/25, KV-24/25, KV-20/16,  
KV-25/16, KV-30/10

These are high-capacity compressors, applied for sandblasting, drilling-and-blasting, pipelines tests, fiber-optic communication lines laying, etc.

These compressor units are equipped with capacity regulation system which functions on the basis of idle - load - idle principle. It is controlled by a VMC (Italy) intake valve, which is sensitive to working pressure changes in the oil separator.

The working pressure can be regulated in the range 87.02- 435.11 psi (6 – 30 bar).

These units proved themselves perfectly both in Russian southern and northern regions, where oilfields, gas fields and diamonds deposits (JSC Alrosa) are being developed.



## Technical characteristics

| Model                           | Capacity at STP*, m³/min | Rated Operating Pressure, barg | Drive power HP (kW) | Dimensions, LxWxH, mm. | Weight, kg |
|---------------------------------|--------------------------|--------------------------------|---------------------|------------------------|------------|
| KV-3/8                          | 2,5                      | 8-12                           | 32,4 (24,2)         | 1718x1214x1020         | 700        |
| KV-3/8M                         | 2,5                      | 8-12                           | 32,4 (24,2)         | 3086x1561x1247         | 750        |
| KV-5/10                         | 5                        | 10                             | 48,0 (35,8)         | 1936x1295x1245         | 750        |
| KV-5/10M                        | 5                        | 10                             | 48,0 (35,8)         | 3200x1560x1478         | 800        |
| KV-6/7                          | 6                        | 7                              | 48,0 (35,8)         | 1936x1295x1245         | 750        |
| KV-6/7M                         | 6                        | 7                              | 48,0 (35,8)         | 3200x1560x1478         | 800        |
| KV-8/8                          | 8                        | 8                              | 79,8 (59,6)         | 2915x1420x1760         | 1500       |
| KV-8/8M                         | 8                        | 8                              | 79,8 (59,6)         | 3970x1840x1920         | 1600       |
| KV-10/16                        | 10                       | 16                             | 177,0 (132)         | 3095x1577x1710         | 2450       |
| KV-10/16M                       | 10                       | 16                             | 177,0 (132)         | 4388x1900x1900         | 2600       |
| KV-10/8                         | 10                       | 8                              | 107,3 (80)          | 2915x1420x1760         | 1500       |
| KV-10/8M                        | 10                       | 8                              | 107,3 (80)          | 3970x1840x1920         | 1600       |
| KV-12/10                        | 12                       | 10                             | 138,1 (103)         | 2915x1420x1760         | 1500       |
| KV-12/10M                       | 12                       | 10                             | 138,1 (103)         | 3990x1840x1920         | 1600       |
| KV-12/12                        | 12                       | 12                             | 177,0 (132)         | 3095x1577x1710         | 2450       |
| KV-12/12 Cummins (without hood) | 12                       | 12                             | 177,0 (132)         | 2605x1237x2435         | 1500       |
| KV-12/12 Cummins                | 12                       | 12                             | 177,0 (132)         | 3095x1577x1730         | 2450       |
| KV-12/12M Cummins               | 12                       | 12                             | 177,0 (132)         | 4388x1900x1920         | 2600       |
| KV-12/12M                       | 12                       | 12                             | 177,0 (132)         | 4388x1900x1900         | 2600       |
| KV-20/25                        | 20                       | 25                             | 325,8 (243)         | 4020x2030x2340         | 3600       |
| KV-20/25M                       | 20                       | 25                             | 325,8 (243)         | 6030x2030x2435         | 4200       |
| KV-24/25                        | 24                       | 25                             | 394,2 (294)         | 4450x2040x2540         | 4800       |
| KV-20/30                        | 20                       | 30                             | 394,2 (294)         | 4020x2030x2340         | 4500       |
| KV-20/30M                       | 20                       | 30                             | 394,2 (294)         | 6030x2030x2435         | 4800       |
| KV-25/16                        | 25                       | 16                             | 325,8 (243)         | 4020x2030x2340         | 4500       |
| KV-25/16M                       | 25                       | 16                             | 325,8 (243)         | 6030x2030x2435         | 4800       |
| KV-30/10                        | 30                       | 10                             | 325,8 (243)         | 4020x2030x2340         | 4500       |
| KV-30/10M                       | 30                       | 10                             | 325,8 (243)         | 6030x2030x2435         | 4800       |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

M – mobile

## Available options

| Nº | Options                             | KV-3/8<br>Deutz<br>F02<br>M2011 | KV-5/10<br>Deutz<br>F02<br>L2011 | KV-6/7<br>Deutz<br>F03<br>L2011 | KV-8/8<br>D-243 | KV-10/16<br>YaMZ-<br>236M2 | KV-10/8<br>D-245 | KV-12/10<br>Deutz<br>BFO4M2012C | KV-12/12<br>YaMZ-<br>236M2 /<br>Cummins<br>6BTA5,9<br>- C180 | KV-20/16<br>KV-20/25<br>KV-24/25<br>KV-25/16<br>KV-30/10<br>YaMZ-238D | KV-20/30<br>YaMZ-<br>7511(294) |
|----|-------------------------------------|---------------------------------|----------------------------------|---------------------------------|-----------------|----------------------------|------------------|---------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------|
| 1  | After cooler                        | -                               | ST                               | ST                              | +               | -                          | +                | -                               | -                                                            | -                                                                     | -                              |
| 2  | Moisture separator                  | -                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 3  | Lubricator                          | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | -                                                                     | -                              |
| 4  | Wheel chocks with fixation          | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 5  | Toolbox                             | -                               | -                                | -                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 6  | Optical filter clogging indicator   | ST                              | ST                               | ST                              | +               | +                          | +                | ST                              | +                                                            | +                                                                     | +                              |
| 7  | Antitheft chain with lock           | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 8  | Air treatment filter                | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 9  | Ball / ring mounting                | + / +                           | + / +                            | + / +                           | - / +           | - / +                      | - / +            | - / +                           | - / +                                                        | - / +                                                                 | - / +                          |
| 10 | Winter start-up package             | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 11 | Customized painting*                | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 12 | Air hose reel                       | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |
| 13 | Tool kit for compressor maintenance | +                               | +                                | +                               | +               | +                          | +                | +                               | +                                                            | +                                                                     | +                              |

Symbols in the table:  
(+) – option available  
(-) – option unavailable

ST – option included in standard scope of supply  
\* - for orders of 10 pcs and more

## KV Compressor Units Options

### Additional DEUTZ fuel filter

Removes water and solid particles removal from the fuel and protects engine fuel system if diesel fuel is of low quality.

### «Winter package»

Timed preheater with either warms coolant or heats crankcase assuring stable start up at the ambient temperature up to -31°F (-35 °C).

### Lubricator (main oilier)

Pulverizes oil in the compressed air creating oil mist which provides lubrication of instrument and protects them from covering with ice. The intension of consumption is controlled by stopcock. Oiler volume is enough for one shift of compressor work.

### Toolbox

Double or single box for tools which is kept inside the closed compressor housing.

### Antitheft chain

It is a solid alloy chain in polymeric cover with lock.

### Compressed air treatment equipment

Upon customers' request the KV compressors can be equipped with filters, which purify the compressed air from dust (up to 0,01 mm) and oil (up to 0,003mg/m³). Adsorption air dryer (dew point -94°F (-70°C)) can be installed nearby the compressor.



Chapter

**06**

## Medium and High Pressure Piston Compressors





Chelyabinsk Compressor Plant LLC offers KP, VShV «Powerman» boosters and piston compressors. Upon your request we can supply medium and high pressure compressors and medium and high pressure boosting compressors (boosters).

All the KP, VShV high pressure compressors are equipped with an automatic control system (based on micro-processor controller Airmaster or B-Control). A group of compressors can be controlled remotely. No basement required to start a compressor.



### SV (SVB) series:

- capacity range:  
4,41-462,62 cfm (0,125 - 13,1 m<sup>3</sup>/min);
- working pressure range:  
362,6-5076,3 psi (25 - 350 bar);
- motor direct drive;
- air cooling system;
- the heat released from the cooling system is used for heating the compressor unit and nearby room;
- 2000 operating hours before routine maintenance;
- high efficiency and low noise level.

### Verticus series:

- capacity range:  
3,0-54,03 cfm (0,085 - 1,530 m<sup>3</sup>/min);
- working pressure range:  
362,6-7251,9 psi (25 - 500 bar);
- motor belt drive;
- air or water cooling system;
- packaged version (vertical arrangement of unit assemblies – piston barrel is above motor), occupies about 1 m<sup>2</sup>;
- smart control system;
- effective sound proof housing – optional;
- equipped with additional high-pressure vessels – optional;
- filter system – optional.

### K22 - K52 series:

- capacity range:  
22,95-1010,0 cfm (0,65 - 28,6 m<sup>3</sup>/min);
- working pressure range:  
362,6-7251,9 psi (25 - 500 bar);
- motor belt or direct drive;
- air or water cooling system;
- uninterrupted condensate drain system at every stage (without switching of a unit);
- smart control system;
- operation when 30° heeled;
- frequency regulation drive available;
- effective sound-proof housing – optional;
- filter system – optional;
- diesel engine available (vertical configuration).

**Maximum working pressure 580 psig (40 barg). Compression of atmospheric air.**

| Model      | Capacity at STP*,<br>cfm (m <sup>3</sup> /min) | Minimum working<br>pressure, psig<br>(barg) | Drive power<br>HP (kW) | Dimensions, LxWxH<br>in (mm)    | Weight<br>lb (kg) |
|------------|------------------------------------------------|---------------------------------------------|------------------------|---------------------------------|-------------------|
| KP-125/40  | 4,41 (0,125)                                   | 362,6 (25)                                  | 3,0 (2,2)              | 25,6x19,7x24,0 (650x500x610)    | 235,9 (107)       |
| KP-200/40  | 7,06 (0,200)                                   |                                             | 5,4 (4)                | 25,6x19,7x24,0 (650x500x610)    | 235,9 (107)       |
| KP-245/40  | 8,65 (0,245)                                   |                                             | 5,4 (4)                | 25,6x19,7x24,0 (650x500x610)    | 246,9 (112)       |
| KP-500/40  | 17,66 (0,500)                                  |                                             | 10,1 (7,5)             | 33,5x25,2x27,6 (850x640x700)    | 440,9 (200)       |
| KP-600/40  | 21,19 (0,600)                                  |                                             | 12,1 (9)               | 33,5x25,2x27,6 (850x640x700)    | 440,9 (200)       |
| KP-1100/40 | 38,85 (1,100)                                  |                                             | 24,8 (18,5)            | 51,2x35,4x37,4 (1300x900x950)   | 903,9 (410)       |
| KP-2400/40 | 84,76 (2,400)                                  |                                             | 40,2 (30)              | 57,5x42,5x42,7 (1460x1080x1085) | 1300,7 (590)      |
| KP-2350/50 | 84,76 (2,350)                                  |                                             | 49,6 (37)              | 61,8x42,5x42,7 (1570x1080x1085) | 1477,1 (670)      |
| KP-3020/40 | 106,65 (3,020)                                 |                                             | 60,3 (45)              | 61,8x44,1x42,7 (1570x1120x1085) | 1521,2 (690)      |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)



## Maximum working pressure 914 psig (63 barg). Compression of atmospheric air.

| Model      | Capacity at STP*,<br>cfm (m³/min) | Minimum working pressure,<br>psig (barg) | Drive power<br>HP (kW) | Dimensions, LxWxH<br>in (mm)     | Weight<br>lb (kg) |
|------------|-----------------------------------|------------------------------------------|------------------------|----------------------------------|-------------------|
| KP-210/63  | 7,42 (0,210)                      | 435,1 (30)                               | 5,4 (4)                | 25,6x19,7x21,3 (650x500x540)     | 264,6 (120)       |
| KP-215/63  | 7,59 (0,215)                      |                                          | 4,7 (3,5)              | 44,9x32,7x59,6 (1140x830x1515)   | 760,6 (345)       |
| KP-670/63  | 23,66 (0,670)                     |                                          | 14,8 (11)              | 81,1x28,7x48,8 (2060x730x1240)   | 992,1 (450)       |
| KP-950/63  | 33,55 (0,950)                     |                                          | 20,1 (15)              | 81,1x28,7x48,8 (2060x730x1240)   | 1014,1 (460)      |
| KP-1100/63 | 38,85 (1,100)                     |                                          | 24,8 (18,5)            | 51,2x35,4x37,4 (1300x900x950)    | 903,9 (410)       |
| KP-1350/63 | 47,67 (1,350)                     |                                          | 29,5 (22)              | 88,6x31,5x47,2 (2250x800x1200)   | 1477,1 (670)      |
| KP-1730/63 | 61,09 (1,730)                     |                                          | 40,2 (30)              | 88,6x31,5x47,2 (2250x800x1200)   | 1631,4 (740)      |
| KP-2400/63 | 84,76 (2,400)                     |                                          | 49,6 (37)              | 122,0x49,2x65,2 (3100x1250x1655) | 3152,6 (1430)     |
| KP-2850/63 | 100,65 (2,850)                    |                                          | 60,3 (45)              | 122,0x49,2x65,2 (3100x1250x1655) | 3218,7 (1460)     |
| KP-3400/63 | 120,07 (3,400)                    |                                          | 73,8 (55)              | 122,0x49,2x65,2 (3100x1250x1655) | 3306,9 (1500)     |
| KP-3570/63 | 126,07 (3,570)                    |                                          | 73,8 (55)              | 118,9x51,2x60,0 (3020x1300x1525) | 5511,6 (2500)     |
| KP-5400/63 | 190,7 (5,400)                     |                                          | 120,7 (90)             | 118,9x51,2x60,0 (3020x1300x1525) | 7716,2 (3500)     |
| KP-5900/63 | 208,36 (5,900)                    |                                          | 120,7 (90)             | 122,0x49,2x65,2 (3100x1250x1655) | 4585,6 (2080)     |
| KP-6800/63 | 240,14 (6,800)                    |                                          | 147,5 (110)            | 122,0x49,2x65,2 (3100x1250x1655) | 5136,8 (2330)     |

## Maximum working pressure 1015 psig (70 barg). Compression of atmospheric air.

| Model      | Capacity at STP*,<br>cfm (m³/min) | Minimum working pressure,<br>psig (barg) | Drive power<br>HP (kW) | Dimensions, LxWxH<br>in (mm)    | Weight<br>lb (kg) |
|------------|-----------------------------------|------------------------------------------|------------------------|---------------------------------|-------------------|
| KP-3000/70 | 105,96 (3,0)                      | 725,2 (50)                               | 60,3 (45)              | 59,9x48,0x47,2 (1522x1220x1200) | 187,4 (850)       |

## Maximum working pressure 1088 psig (75 barg). Compression of atmospheric air.

| Model      | Capacity at STP*,<br>cfm (m³/min) | Minimum working pressure,<br>psig (barg) | Drive power<br>HP (kW) | Dimensions, LxWxH<br>in (mm)     | Weight<br>lb (kg) |
|------------|-----------------------------------|------------------------------------------|------------------------|----------------------------------|-------------------|
| KP-130/75  | 4,59 (0,130)                      | 928,2 (64)                               | 2,7 (2)                | 40,2x29,1x51,2 (1020x740x1300)   | 738,5 (335)       |
| KP-170/75  | 6,0 (0,170)                       |                                          | 4,0 (3)                | 44,9x32,7x59,6 (1140x830x1515)   | 749,6 (340)       |
| KP-215/75  | 7,59 (0,215)                      |                                          | 5,4 (4)                | 44,9x32,7x59,6 (1140x830x1515)   | 760,6 (345)       |
| KP-850/75  | 30,02 (0,850)                     |                                          | 20,1 (15)              | 81,1x28,7x48,8 (2060x730x1240)   | 1014,1 (460)      |
| KP-1250/75 | 44,14 (1,250)                     |                                          | 29,5 (22)              | 88,6x31,5x47,2 (2250x800x1200)   | 1477,1 (670)      |
| KP-1700/75 | 60,03 (1,700)                     |                                          | 40,2 (30)              | 88,6x31,5x47,2 (2250x800x1200)   | 1620,4 (735)      |
| KP-2000/75 | 70,63 (2,000)                     |                                          | 49,6 (37)              | 122,0x49,2x65,0 (3100x1250x1650) | 3152,6 (1430)     |
| KP-2600/75 | 91,82 (2,600)                     |                                          | 60,3 (45)              | 122,0x49,2x65,0 (3100x1250x1650) | 3218,7 (1460)     |
| KP-3300/75 | 116,54 (3,300)                    |                                          | 73,8 (55)              | 122,0x49,2x65,0 (3100x1250x1650) | 3306,9 (1500)     |

## Maximum working pressure 1160 psig (80 barg). Compression of atmospheric air.

| Model      | Capacity at STP*,<br>cfm (m³/min) | Minimum working pressure,<br>psig (barg) | Drive power<br>HP (kW) | Dimensions, LxWxH<br>in (mm)    | Weight<br>lb (kg) |
|------------|-----------------------------------|------------------------------------------|------------------------|---------------------------------|-------------------|
| KP-1100/80 | 38,85 (1,100)                     | 870,2 (60)                               | 24,8 (18,5)            | 51,2x35,4x37,4 (1300x900x950)   | 1300,7 (590)      |
| KP-2000/80 | 70,63 (2,000)                     |                                          | 40,2 (30)              | 57,5x42,5x42,7 (1460x1080x1085) | 1300,7 (590)      |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## Maximum working pressure 1305 psig (90 barg). Compression of atmospheric air.

| Model      | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)        | Weight lb (kg) |
|------------|--------------------------------|---------------------------------------|---------------------|----------------------------------|----------------|
| KP-140/90  | 4,94 (0,140)                   | 1087,8 (75)                           | 4,0 (3)             | 44,9x32,7x59,6 (1140x830x1515)   | 738,5 (335)    |
| KP-215/90  | 7,59 (0,215)                   |                                       | 5,4 (4)             | 44,9x32,7x59,6 (1140x830x1515)   | 760,6 (345)    |
| KP-650/90  | 22,95 (0,650)                  |                                       | 14,8 (11)           | 81,1x28,748,8 (2060x730x1240)    | 1058,2 (480)   |
| KP-800/90  | 28,25 (0,800)                  |                                       | 20,1 (15)           | 81,1x28,748,8 (2060x730x1240)    | 1080,3 (490)   |
| KP-950/90  | 33,55 (0,950)                  |                                       | 24,8 (18,5)         | 81,1x28,748,8 (2060x730x1240)    | 1124,4 (510)   |
| KP-1600/90 | 56,50 (1,600)                  |                                       | 40,2 (30)           | 120,1x49,2x63,8 (3050x1250x1620) | 3637,6 (1650)  |
| KP-2000/90 | 70,63 (2,000)                  |                                       | 49,6 (37)           | 120,1x49,2x63,8 (3050x1250x1620) | 3792,0 (1720)  |
| KP-2500/90 | 88,29 (2,500)                  |                                       | 60,3 (45)           | 120,1x49,2x63,8 (3050x1250x1620) | 3924,2 (1780)  |
| KP-3300/90 | 116,54 (3,300)                 |                                       | 73,8 (55)           | 120,1x49,2x63,8 (3050x1250x1620) | 3968,3 (1800)  |

## Maximum working pressure 1740 psig (120 barg). Compression of atmospheric air.

| Model       | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)     | Weight lb (kg) |
|-------------|--------------------------------|---------------------------------------|---------------------|-------------------------------|----------------|
| KP-1100/120 | 38,85 (1,100)                  | 1160,3 (80)                           | 29,5 (22)           | 53,5x35,4x37,4 (1360x900x950) | 1300,7 (590)   |

## Maximum working pressure 2176 psig (150 barg). Compression of atmospheric air.

| Model       | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|-------------|--------------------------------|---------------------------------------|---------------------|---------------------------------|----------------|
| KP-270/150  | 9,53 (0,270)                   | 1740,5 (120)                          | 7,4 (5,5)           | 30,3x25,2x24,0 (770x640x610)    | 440,9 (200)    |
| KP-1100/150 | 38,85 (1,100)                  |                                       | 29,5 (22)           | 54,3x41,3x42,7 (1380x1050x1085) | 1300,7 (590)   |

## Maximum working pressure 3626 psig (250 barg). Compression of atmospheric air.

| Model       | Delivery at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|-------------|--------------------------------|---------------------------------------|---------------------|---------------------------------|----------------|
| KP-225/250  | 7,95 (0,225)                   | 2610,7 (180)                          | 7,4 (5,5)           | 30,3x25,2x24,0 (770x640x610)    | 368,2 (167)    |
| KP-300/250  | 10,59 (0,300)                  |                                       | 10,1 (7,5)          | 45,9x28,9x32,5 (1165x735x825)   | 628,3 (285)    |
| KP-455/250  | 16,07 (0,455)                  |                                       | 12,1 (9)            | 45,9x28,9x32,5 (1165x735x825)   | 650,4 (295)    |
| KP-585/250  | 20,66 (0,585)                  |                                       | 20,1 (15)           | 47,4x35,0x36,4 (1205x890x925)   | 970,0 (440)    |
| KP-705/250  | 24,90 (0,705)                  |                                       | 24,8 (18,5)         | 47,4x35,0x36,4 (1205x890x925)   | 1036,2 (470)   |
| KP-1100/250 | 38,85 (1,100)                  |                                       | 40,2 (30)           | 57,5x41,3x42,7 (1460x1050x1085) | 1322,8 (600)   |
| KP-1400/250 | 49,44 (1,400)                  |                                       | 49,6 (37)           | 61,8x41,3x42,7 (1570x1050x1085) | 1521,2 (690)   |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## Maximum working pressure 5076 psig (350 barg). Compression of atmospheric air.

| Model       | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW)               | Dimensions, LxWxH in (mm)         | Weight lb (kg)                    |
|-------------|--------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| KP-85/350   | 3,0 (0,085)                    | 1305,3 (90)                           | 4,0 (3)                           | 40,2x29,1x51,2 (1020x740x1300)    | 551,2 (250)                       |
| KP-125/350  | 4,4 (0,125)                    |                                       | 5,4 (4)                           | 40,2x29,1x51,2 (1020x740x1300)    | 562,2 (255)                       |
| KP-170/350  | 6,0 (0,170)                    |                                       |                                   | 40,2x29,1x51,2 (1020x740x1300)    | 573,2 (260)                       |
| KP-215/350  | 7,59 (0,215)                   |                                       | 7,4 (5,5)                         | 40,2x29,1x51,2 (1020x740x1300)    |                                   |
| KP-225/350  | 7,95 (0,225)                   | 3625,9 (250)                          |                                   | 30,3x25,2x24,0 (770x640x610)      | 368,2 (167)                       |
| KP-290/350  | 10,24 (0,290)                  |                                       | 12,1 (9)                          | 45,9x28,9x32,5 (1165x735x825)     | 628,3 (285)                       |
| KP-300/350  | 10,6 (0,300)                   | 1305,3 (90)                           | 10,1 (7,5)                        | 58,27x32,68x59,84 (1480x830x1520) | 804,7 (365)                       |
| KP-340/350  | 12,0 (0,340)                   |                                       |                                   | 58,27x32,68x59,84 (1480x830x1520) | 970,0 (440)                       |
| KP-420/350  | 14,8 (0,420)                   |                                       |                                   | 58,27x32,68x59,84 (1480x830x1520) | 992,1 (450)                       |
| KP-445/350  | 15,75 (0,445)                  |                                       |                                   | 45,9x28,9x32,5 (1165x735x825)     | 650,4 (295)                       |
| KP-500/350  | 17,66 (0,500)                  | 1305,3 (90)                           | 20,1 (15)                         | 58,27x32,68x59,84 (1480x830x1520) | 992,1 (450)                       |
| KP-575/350  | 20,31 (0,575)                  | 3625,9 (250)                          |                                   | 47,4x35,0x36,4 (1205x890x925)     | 970,0 (440)                       |
| KP-610/350  | 21,54 (0,610)                  | 1305,3 (90)                           |                                   | 58,27x32,68x59,84 (1480x830x1520) | 1036,2 (470)                      |
| KP-650/350  | 22,96 (0,650)                  |                                       |                                   | 84,25x28,35x49,21 (2140x720x1250) | 1080,3 (490)                      |
| KP-700/350  | 24,72 (0,700)                  | 3625,9 (250)                          | 24,8 (18,5)                       | 47,4x35,0x36,4 (1205x890x925)     | 1036,2 (470)                      |
| KP-800/350  | 28,26 (0,800)                  | 1305,3 (90)                           |                                   | 84,25x28,35x49,21 (2140x720x1250) | 1124,4 (510)                      |
| KP-930/350  | 32,85 (0,930)                  |                                       |                                   | 29,5 (22)                         | 84,25x28,35x49,21 (2140x720x1250) |
| KP-1100/350 | 38,85 (1,100)                  | 3625,9 (250)                          |                                   | 40,2 (30)                         | 57,5x41,3x42,7 (1460x1050x1085)   |
| KP-1300/350 | 45,92 (1,300)                  | 1305,3 (90)                           | 88,98x34,06x51,77 (2260x865x1315) |                                   | 2535,3 (1150)                     |
| KP-1400/350 | 49,44 (1,400)                  | 3625,9 (250)                          | 49,6 (37)                         | 61,8x41,3x42,7 (1570x1050x1085)   | 1521,2 (690)                      |
| KP-1500/350 | 52,98 (1,500)                  | 1305,3 (90)                           |                                   | 88,98x34,06x51,77 (2260x865x1315) | 2535,3 (1150)                     |
| KP-1900/350 | 67,1 (1,900)                   |                                       |                                   | 60,3 (45)                         | 126,0x53,1x63,0 (3200x1350x1600)  |
| KP-2200/350 | 77,7 (2,200)                   | 67,1 (50)                             |                                   | 126,0x53,1x63,0 (3200x1350x1600)  | 5070,6 (2300)                     |
| KP-2500/350 | 88,3 (2,500)                   | 73,8 (55)                             | 126,0x53,1x63,0 (3200x1350x1600)  |                                   |                                   |
| KP-3400/350 | 120,09 (3,400)                 | 1305,3 (90)                           | 100,6 (75)                        | 126,0x53,1x63,0 (3200x1350x1600)  | 4299,01 (1950)                    |
| KP-3500/350 | 123,60 (3,500)                 |                                       |                                   | 118,9x51,2x60,0 (3020x1300x1525)  |                                   |
| KP-3660/350 | 129,25 (3,660)                 |                                       | 1207 (90)                         | 118,9x51,2x60,0 (3020x1300x1525)  | 5511,6 (2500)                     |
| KP-4500/350 | 158,92 (4,500)                 |                                       | 147,5 (110)                       | 126,0x70,9x78,7 (3200x1800x2000)  | 8818,5 (4000)                     |
| KP-6800/350 | 240,14 (6,800)                 |                                       | 214,6 (160)                       | 126,0x70,9x78,7 (3200x1800x2000)  | 8818,5 (4000)                     |

## Maximum working pressure 6092 psig (420 barg). Compression of atmospheric air.

| Model      | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)         | Weight lb (kg) |
|------------|--------------------------------|---------------------------------------|---------------------|-----------------------------------|----------------|
| KP-310/420 | 10,95 (0,310)                  | 5076,3 (350)                          | 10,1 (7,5)          | 44,9x32,7x59,6 (1140x830x1515)    | 970,0 (440)    |
| KP-420/420 | 14,83 (0,420)                  |                                       | 14,8 (11)           |                                   | 992,1 (450)    |
| KP-510/420 | 18,01 (0,510)                  |                                       | 20,1 (15)           |                                   | 1036,2 (470)   |
| KP-800/420 | 28,26 (0,800)                  |                                       | 29,5 (22)           | 84,25x28,35x49,21 (2140x720x1250) | 1256,6 (570)   |

## Maximum working pressure 7252 psig (500 barg). Compression of atmospheric air.

| Model       | Capacity at STP*, cfm (m³/min) | Minimum working pressure, psig (barg) | Drive power HP (kW) | Dimensions, LxWxH in (mm)        | Weight lb (kg) |
|-------------|--------------------------------|---------------------------------------|---------------------|----------------------------------|----------------|
| KP-310/500  | 10,95 (0,310)                  | 5076,3 (350)                          | 10,1 (7,5)          | 44,9x32,7x59,6 (1140x830x1515)   | 970,0 (440)    |
| KP-420/500  | 14,83 (0,420)                  |                                       | 14,8 (11)           |                                  | 992,1 (450)    |
| KP-550/500  | 19,42 (0,550)                  |                                       | 20,1 (15)           |                                  | 1058,2 (480)   |
| KP-1900/500 | 67,1 (1,900)                   |                                       | 60,3 (45)           | 126,0x53,1x63,0 (3200x1350x1600) | 4254,9 (1930)  |
| KP-2300/500 | 81,22 (2,300)                  |                                       | 73,8 (55)           |                                  | 4299,0 (1950)  |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## Medium and High Pressure Compressors VShV «Powerman»

### Special Version for Energy Industries



They proved to be a perfect solution for various applications in energy industries:

atomic power plants;  
hydroelectric power plants;  
thermal power plants;  
transforming stations.

Maximum working pressure 580 and 5076 psig (40 and 350 barg).

#### Compression of atmospheric air

- capacity range: 17,66-123,6 cfm (0,5 - 3,5 m<sup>3</sup>/min);
- Motor belt or direct drive;
- air or water cooling system;
- heat recovery;
- 2000 operating hours before routine maintenance;
- no base is required;
- equipped with an automatic control system (micro-processor controller).

Ensure fail-safe operation of such systems as:

- air pulse supply;
- air for control and measuring devices and automatic equipment;
- hydro turbine blowdown;
- hydro turbine control;
- pressure vessels and pipelines pneumatic tests;
- high-voltage circuit-breakers inside power stations and substations distribution box.

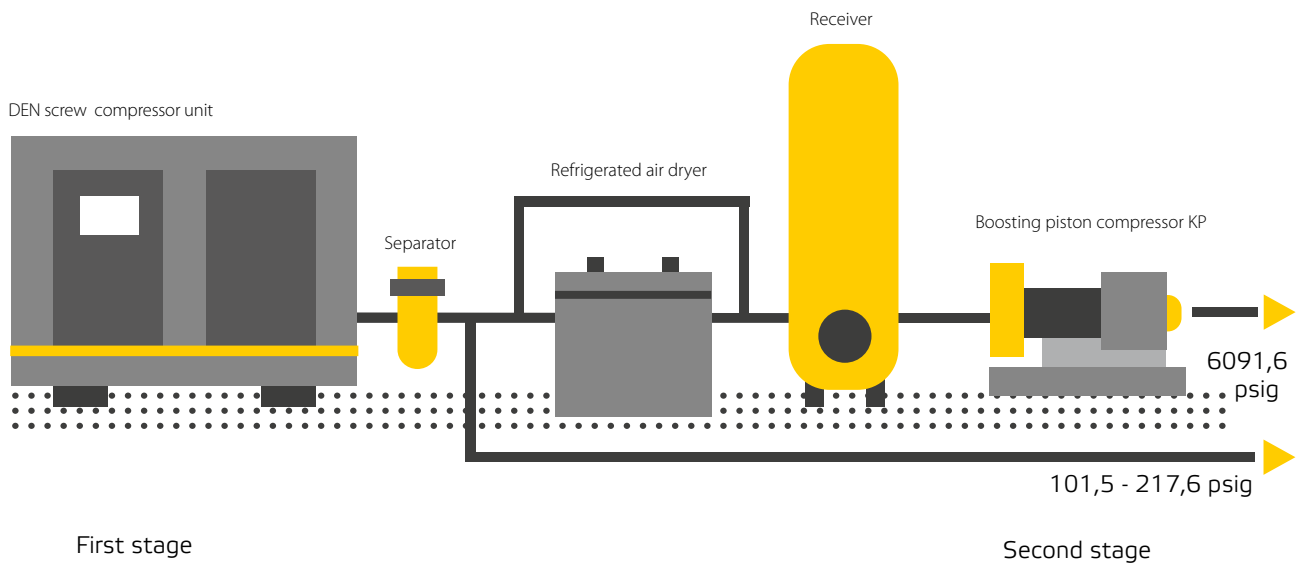
**Working pressure range: 363-580 psig (25-40 barg) + versions for 725, 928, 1160, 1740, 2176, 3626, 5076 psig (50, 64, 80, 120, 150, 250, 350 barg)**

| Model        | Capacity at STP**, cfm (m <sup>3</sup> /min) | Drive power<br>HP (kW) | Weight<br>lb (kg) |
|--------------|----------------------------------------------|------------------------|-------------------|
| VSHV-0,5/40  | 17.66 (0,500)                                | 10,1 (7,5)             | 440.9 (200)       |
| VSHV-1,1/40  |                                              |                        | 903.9 (410)       |
| VSHV-1,1/64  |                                              | 24,8 (18,5)            |                   |
| VSHV-1,1/80  |                                              |                        | 1300.7 (590)      |
| VSHV-1,1/120 | 38.85 (1,100)                                | 29,5 (22)              |                   |
| VSHV-1,1/150 |                                              |                        | 1168.4 (530)      |
| VSHV-1,1/250 |                                              | 40,2 (30)              | 1322.8 (600)      |
| VSHV-1,1/350 |                                              |                        |                   |
| VSHV-2,4/40* | 84.76 (2,400)                                | 49,6 (37)              | 1477.1 (670)      |
| VSHV-2,4/50* |                                              |                        |                   |
| VSHV-3/40    | 106.65 (3,020)                               | 60,3 (45)              | 1521.2 (690)      |

\*-special version for operation in extreme conditions

\*\* - STP standard conditions uses a temperature of 68°F (20°C) and an absolute pressure of 14,7 psi (1 bar)

## KP Medium Pressure Boosting Compressor



Combination of a screw compressor at the first stage and a boosting piston compressor at the second stage is now the most economical solution for air compression to 6091 psig (420 barg).





## Maximum working pressure 580 psig (40 barg). Boosting compressor units.

| Model     | Capacity at STP*, cfm (m³/min) | Pressure             |                         |                         | Drive power HP (kW)  | Dimensions, LxWxH in (mm)       | Weight lb (kg)        |
|-----------|--------------------------------|----------------------|-------------------------|-------------------------|----------------------|---------------------------------|-----------------------|
|           |                                | inlet, psig (barg)   | outlet min, psig (barg) | outlet max, psig (barg) |                      |                                 |                       |
| KP-1/40D  | 63,57-120,07 (1,8-3,4)         | 72,5-145,0 (5-10)    | 290,1 (20)              | 290,1-580,2 (20-40)     | 14,8-20,1 (11-15)    | 48,6x26,4x27,4 (1235x670x695)   | 619,5-650,4 (281-295) |
| KP-1/40D1 | 35,31-88,29 (1,0-2,5)          | 72,5-188,5 (5-13)    |                         |                         |                      |                                 |                       |
| KP-1/40D2 | 134,2-268,39 (3,8-7,6)         | 108,8-188,5 (7,5-13) |                         |                         | 24,8-29,5 (18,5-22)  | 54,3x32,3x35,8 (1380x820x910)   | 848,8-925,9 (385-420) |
| KP-1/40D3 | 204,9-392,1 (5,8-11,1)         | 108,8-188,5 (7,5-13) |                         |                         | 29,5-40,2 (22-30)    | 59,4x36,2x35,8 (1510x920x910)   | 943,6-970,0 (428-440) |
| KP-1/40D4 | 462,62 (13,1)                  | 188,5 (13)           |                         |                         | 60,3 (45)            | 65,0x40,2x35,8 (1650x1020x910)  | 1201,5 (545)          |
| KP-1/40D5 | 459,09-1010,0 (13,0-28,6)      | 58,0-145,0 (4-10)    |                         |                         | 100,6-214,6 (75-160) | 96,9x59,3x70,9 (2460x1505x1800) | 7782,3 (3530)         |

## Maximum working pressure 725 psig (50 barg). Boosting compressor units.

| Model     | Capacity at STP*, cfm (m³/min) | Pressure             |                         |                         | Drive power HP (kW) | Dimensions, LxWxH in (mm)      | Weight lb (kg) |
|-----------|--------------------------------|----------------------|-------------------------|-------------------------|---------------------|--------------------------------|----------------|
|           |                                | inlet, psig (barg)   | outlet min, psig (barg) | outlet max, psig (barg) |                     |                                |                |
| KP-1/50D  | 21,54-63,92 (0,61-1,81)        | 72,5-145,0 (5-10)    | 362,6 (25)              | 362,6-725,2 (25-50)     | 7,4 (5,5)           | 44,9x32,7x59,6 (1140x830x1515) | 804,7 (365)    |
| KP-1/50D1 | 24,72-54,03 (0,7-1,53)         | 108,8-188,5 (7,5-13) |                         |                         |                     |                                | 826,7 (375)    |

## Maximum working pressure 914 psig (63 barg). Boosting compressor units.

| Model    | Capacity at STP*, cfm (m³/min) | Pressure           |                         |                         | Drive power HP (kW) | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|----------|--------------------------------|--------------------|-------------------------|-------------------------|---------------------|---------------------------------|----------------|
|          |                                | inlet, psig (barg) | outlet min, psig (barg) | outlet max, psig (barg) |                     |                                 |                |
| KP-2/63D | 98,88-218,24 (2,800-6,18)      | 58,0-145,0 (4-10)  | 362,6-580,2 (25-40)     | 580,2-913,7 (40-63)     | 49,6 (37)           | 52,8x46,5x82,7 (1340x1180x2100) | 2579,4 (1170)  |

## Maximum working pressure 1088 psig (75 barg). Boosting compressor units.

| Model    | Capacity at STP*, cfm (m³/min) | Pressure           |                         |                         | Drive power HP (kW)  | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|----------|--------------------------------|--------------------|-------------------------|-------------------------|----------------------|---------------------------------|----------------|
|          |                                | inlet, psig (barg) | outlet min, psig (barg) | outlet max, psig (barg) |                      |                                 |                |
| KP-2/75D | 324,89-720,42 (9,2-20,4)       | 58,0-145,0 (4-10)  | 362,6-580,2 (25-40)     | 580,2-1087,8 (40-75)    | 100,6-214,6 (75-160) | 96,9x59,3x70,9 (2460x1505x1800) | 7782 (3530)    |

## Maximum working pressure 1160 psig (80 barg). Boosting compressor units.

| Model    | Capacity at STP*, cfm (m³/min) | Pressure           |                         |                         | Drive power HP (kW) | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|----------|--------------------------------|--------------------|-------------------------|-------------------------|---------------------|---------------------------------|----------------|
|          |                                | inlet, psig (barg) | outlet min, psig (barg) | outlet max, psig (barg) |                     |                                 |                |
| KP-2/80D | 72,75-189,29 (2,06-5,36)       | 58,0-174,0 (4-12)  | 362,6-725,2 (25-50)     | 580,2-1160,3 (40-80)    | 49,6 (37)           | 52,8x46,5x82,7 (1340x1180x2100) | 2579,4 (1170)  |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## Maximum working pressure 1450 psig (100 barg). Boosting compressor units.

| Model      | Capacity at STP*, cfm (m³/min) | Pressure           |                         |                         | Drive power HP (kW)  | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|------------|--------------------------------|--------------------|-------------------------|-------------------------|----------------------|---------------------------------|----------------|
|            |                                | inlet, psig (barg) | outlet min, psig (barg) | outlet max, psig (barg) |                      |                                 |                |
| KP-2/100D  | 329,31-393,41 (9,325-11,14)    | 116,0-145,0 (8-10) | 580,2-725,2 (40-50)     | 1160,3-1450,4 (80-100)  | 120,7 (90)           | 76,8x57,1x55,1 (1950x1450x1400) | 4629,7 (2100)  |
| KP-2/100D1 | 229,55-505,0 (6,5-14,3)        | 58,0-145,0 (4-10)  | 362,6-725,2 (25-50)     | 725,2-1450,4 (50-100)   | 100,6-177,0 (75-132) | 96,9x59,3x70,9 (2460x1505x1800) | 7407,5 (3360)  |

## Maximum working pressure 3176 psig (150 barg). Boosting compressor units.

| Model     | Capacity at STP*, cfm (m³/min) | Pressure           |                         |                         | Drive power HP (kW) | Dimensions, LxWxH in (mm)       | Weight lb (kg) |
|-----------|--------------------------------|--------------------|-------------------------|-------------------------|---------------------|---------------------------------|----------------|
|           |                                | inlet, psig (barg) | outlet min, psig (barg) | outlet max, psig (barg) |                     |                                 |                |
| KP-2/150D | 247,2-278,99 (7,0-7,9)         | 101,5-145,0 (7-10) | 1450,4 (100)            | 2175,6 (150)            | 100,6 (75)          | 88,6x48,8x55,1 (2250x1240x1400) | 4299,0 (1950)  |

## Maximum working pressure 5076 psig (350 barg). Boosting compressor units.

| Model       | Capacity at STP*, cfm (m³/min) | Pressure            |                         |                         | Drive power HP (kW)   | Dimensions, LxWxH in (mm)        | Weight lb (kg) |
|-------------|--------------------------------|---------------------|-------------------------|-------------------------|-----------------------|----------------------------------|----------------|
|             |                                | inlet, psig (barg)  | outlet min, psig (barg) | outlet max, psig (barg) |                       |                                  |                |
| KP-2/350D   | 7,06-16,77 (0,2-0,475)         | 72,5-159,5 (5-11)   |                         |                         | 7,4 (5,5)             |                                  | 804,7 (365)    |
| KP-2/350D1  | 18,01-26,49 (0,51-0,75)        | 101,5-145,0 (7-10)  | 1305,3 (90)             | 5076,3 (350)            | 14,8 (11)             | 44,9x32,7x59,6 (1140x830x1515)   | 992,1 (450)    |
| KP-3/350D   | 15,89-28,25 (0,45-0,8)         | 29,0-58,0 (2-4)     |                         |                         | 20,1 (15)             |                                  | 804,7 (365)    |
| KP-4/350D   | 46,97-86,17 (1,33-2,440)       | 29,0-65,3 (2-4,5)   | 1305,3-2900,8 (90-200)  |                         |                       |                                  | 2535,0 (1150)  |
| KP-4/350D1  | 54,74-109,48 (1,55-3,1)        | 65,3-145,0 (4,5-10) | 1305,3-2900,8 (90-200)  | 2900,8-5076,3 (200-350) | 49,6 (37)             | 52,8x46,5x82,7 (1340x1180x2100)  | 2601,5 (1180)  |
| KP-4/350D2  | 69,6-116,6 (1,97-3,3)          | 116,0-203,05 (8-14) | 2175,6-2900,8 (150-200) |                         |                       |                                  |                |
| KP-3/350D1  | 63,57-158,92 (1,85-4,5)        | 232,1-551,1 (16-38) | 2175,6-2900,8 (150-200) | 3625,9-5076,3 (250-350) |                       |                                  |                |
| KP-4/350D3  | 77,69-185,05 (2,2-5,24)        | 14,5-58,0 (1-4)     | 1305,3-2900,8 (90-200)  | 2900,8-5076,3 (200-350) | 100,6 (75)            |                                  | 3659,7 (1660)  |
| KP-4/350D4  | 88,29-194,23 (2,5-5,5)         | 58,0-145,0 (4,0-10) | 1740,5-3190,8 (120-220) | 4351,1-5076,3 (300-350) |                       | 76,8x57,1x55,1 (1950x1450x1400)  | 3306,9 (1500)  |
| KP-4/350D5  | 87,58-165,98 (2,48-4,7)        | 116,0-232,1 (8-16)  | 2175,6-3625,9 (150-250) | 5076,3 (350)            | 73,8 (55)             |                                  |                |
| KP-4/350D6  | 173,04-331,96 (4,9-9,4)        | 29,0-65,3 (2-4,5)   | 1305,3-2900,8 (90-200)  | 2900,8-5076,3 (200-350) | 100,6-177,0 (75-132)  |                                  |                |
| KP-4/350D7  | 180,1-360,21 (5,1-10,2)        | 65,3-145,0 (4,5-10) | 1305,3-2900,8 (90-200)  | 3625,9-5076,3 (250-350) |                       | 96,9x59,3x70,9 (2460x1505x1800)  | 7385,5 (3350)  |
| KP-4/350D8  | 268,39-437,9 (7,6-12,4)        | 145,0-246,6 (10-17) | 2175,6-3625,9 (150-250) | 5076,3 (350)            | 147,5-177,0 (110-132) |                                  |                |
| KP-4/350D9  | 180,1-413,18 (5,1-11,7)        | 246,6-551,1 (17-38) | 2175,6-3625,9 (150-250) | 3625,9-5076,3 (250-350) | 73,8-147,5 (55-110)   |                                  |                |
| KP-4/350D10 | 346,08-664,02 (9,8-18,8)       | 29,0-65,3 (2-4,5)   | 1305,3-2900,8 (90-200)  | 2900,8-5076,3 (200-350) | 214,6-422,4 (160-315) |                                  | 10582,2 (4800) |
| KP-4/350D11 | 360,21-720,42 (10,2-20,4)      | 65,3-145,0 (4,5-10) | 1305,3-2900,8 (90-200)  | 3625,9-5076,3 (250-350) | 214,6-335,3 (160-250) |                                  |                |
| KP-4/350D12 | 536,78-875,8 (15,2-24,8)       | 145,0-246,6 (10-17) | 2175,6-3625,9 (150-250) | 5076,3 (350)            | 268,2-335,3 (200-250) | 126,0x70,1x77,2 (3200x1780x1960) | 9546,0 (4330)  |
| KP-4/350D13 | 360,21-826,36 (10,2-23,4)      | 246,6-551,1 (17-38) | 2175,6-3625,9 (150-250) |                         | 147,5-268,2 (110-200) |                                  | 9259,4 (4200)  |

## Maximum working pressure 6091 psig (420 barg). Boosting compressor units.

| Model     | Capacity at STP*, cfm (m³/min) | Pressure            |                         |                         | Drive power HP (kW) | Dimensions, LxWxH in (mm)        | Weight lb (kg) |
|-----------|--------------------------------|---------------------|-------------------------|-------------------------|---------------------|----------------------------------|----------------|
|           |                                | inlet, psig (barg)  | outlet min, psig (barg) | outlet max, psig (barg) |                     |                                  |                |
| KP-4/420D | 84,76-100,65 (2,4-2,85)        | 101,5-174,0 (10-12) | 2900,8 (200)            |                         | 49,6 (37)           | 52,8x46,5x82,7 (1340x1180x2100)  | 2601,5 (1180)  |
| KP-/420D1 | 229,58-324,9 (6,5-9,2)         | 87,0-130,5 (6-9)    | 2900,8-3625,9 (200-250) | 6091,6 (420)            | 177,0 (132)         | 96,8x 59,3x70,9 (2460x1505x1800) | 7495,7 (3400)  |



Chapter

07

## Compressor Block-Modular Stations (BKK)



Chelyabinsk Compressor Plant LLC offers more than 135 standard compressor block-modular stations versions and besides that our experts can design compressor stations according to the customers' requirements:

Compressor block-modular stations (BKK, MKS) are complete autonomous compressor stations, manufactured on the basis of customers requirements and in accordance

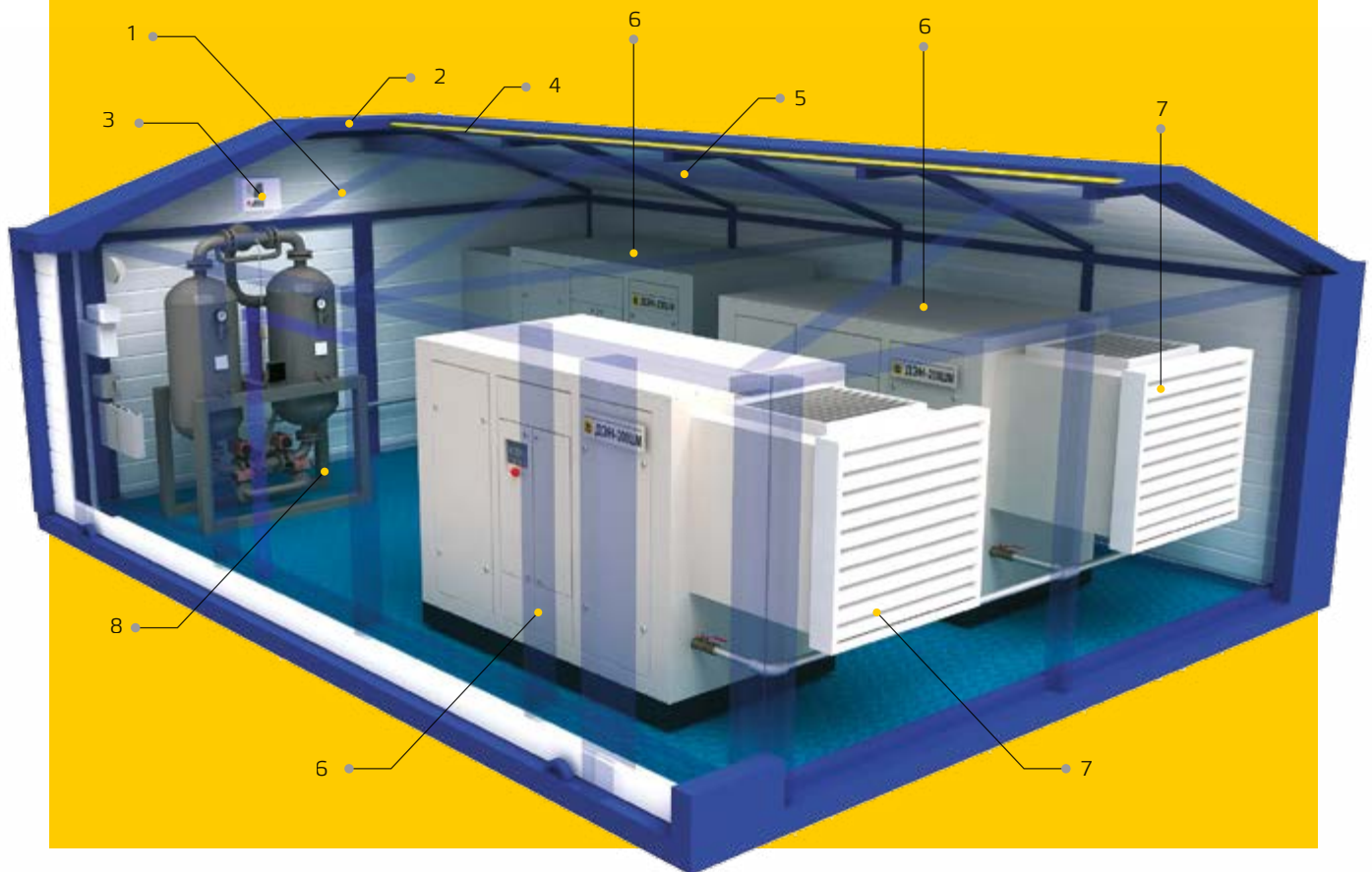
with the technical specifications 3643-364-51470687-2006 (Certificate of Conformity ROSS C-RU MP02.V.00056).

This is an efficient compressed air (nitrogen) supply solution for a technical process with a capacity of 17,66-14125,87 cfm (0,5-400 m<sup>3</sup>/min) and 21,8-7977,1 psig (1,5-550 barg) pressure.



## Standard supply

- |                                |                                            |
|--------------------------------|--------------------------------------------|
| 1 Lamp                         | 5 Monorail for movable hoist               |
| 2 Automatic fire-extinguishers | 6 Compressor units                         |
| 3 Metacentre system            | 7 Air outlet ports with automatic shutters |
| 4 Heat insulation              | 8 Adsorption air dryer                     |



### Compressor block-modular stations (BKK, MKS) performance data

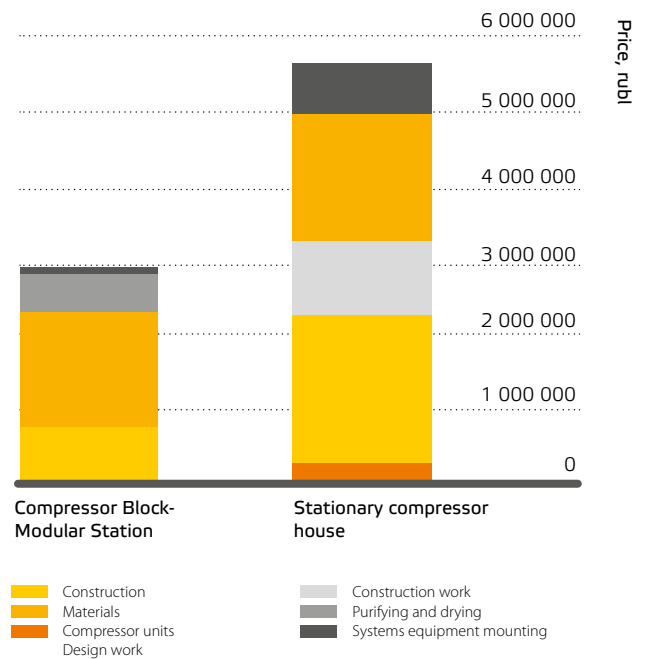
|              |                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Year – round | <p>Heating and venting systems allow operating at the wide temperature range:</p> <ul style="list-style-type: none"> <li>• from -40 °F up to + 104 °F (from -40 °C up to + 40 °C) – standard version</li> <li>• from -76 °F up to + 104 °F (from -60 °C up to +40 °C) - «North» version</li> <li>• from -40 °F up to + 122 °F (from -40 °C up to +50 °C) – «Tropic» version</li> </ul> |
| Autonomy     | <p>The only things, which are required for the compressor block modular station operation, are a horizontal surface and a power supply connection. Each compressor block modular station is equipped with an automatic heating and filter systems.</p>                                                                                                                                 |
| Mobility     | <p>No special basement is required for a compressor block modular station operation and besides a compressor block-modular station can be moved to any convenient for a customer place. Moreover the BKK can be mounted on chassis or rails.</p>                                                                                                                                       |



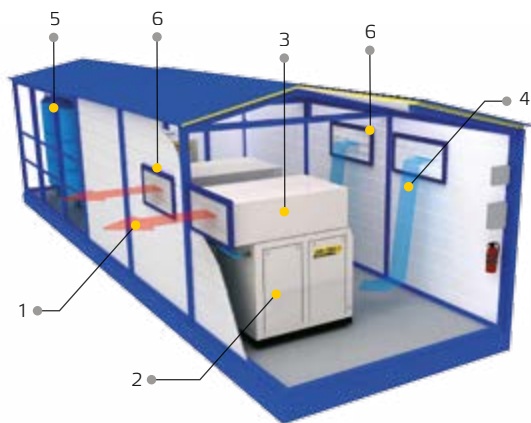
## Compressor Block-Modular Stations (BKK) advantages

Sufficient savings on construction

Short construction terms



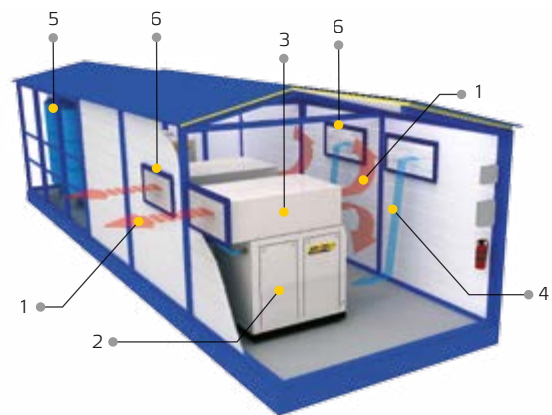
BKK operation in summer period



1 warm air  
2 screw compressor unit  
3 airpipe

4 cold air  
5 air vessels  
6 automatic shutters

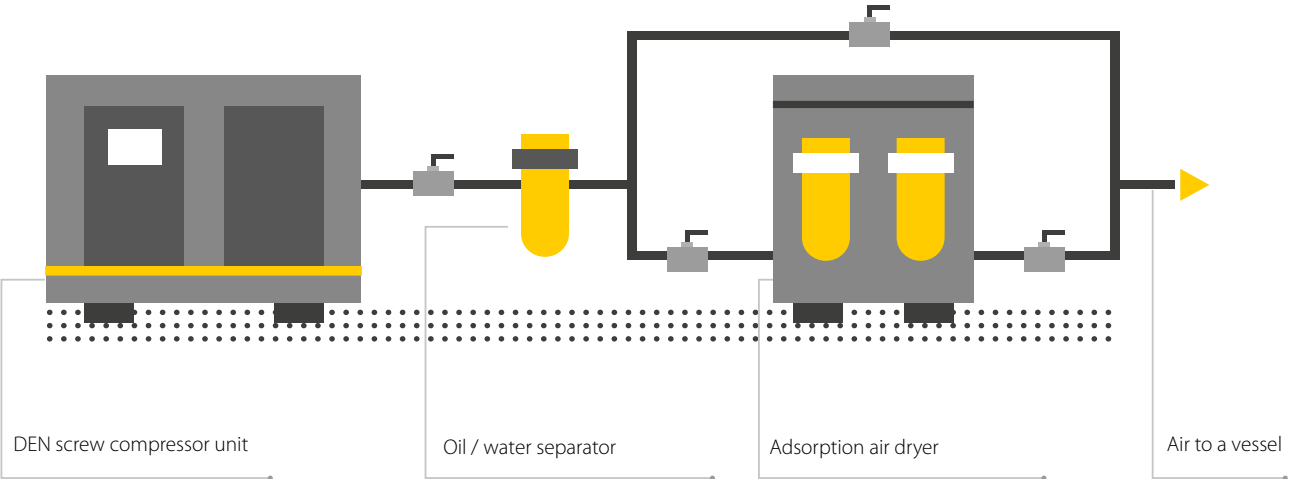
BKK operation in winter period



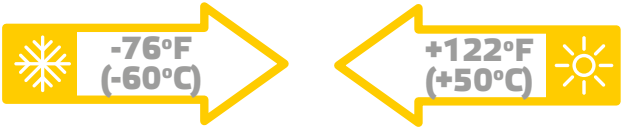
Energy saving

Stable pressure and low compressed air losses

High quality of compressed air



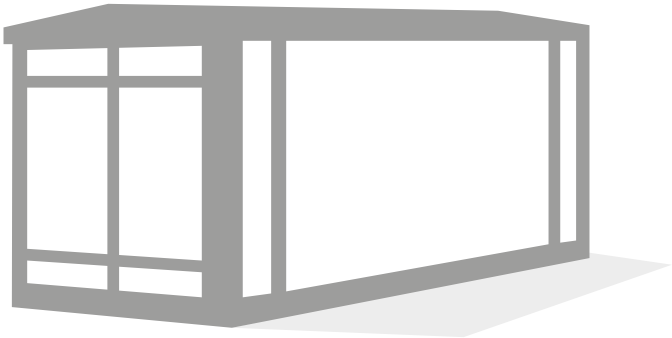
Fully-autonomous stations



All-season operation

Mobile construction

Automation and remote  
Metacentre control

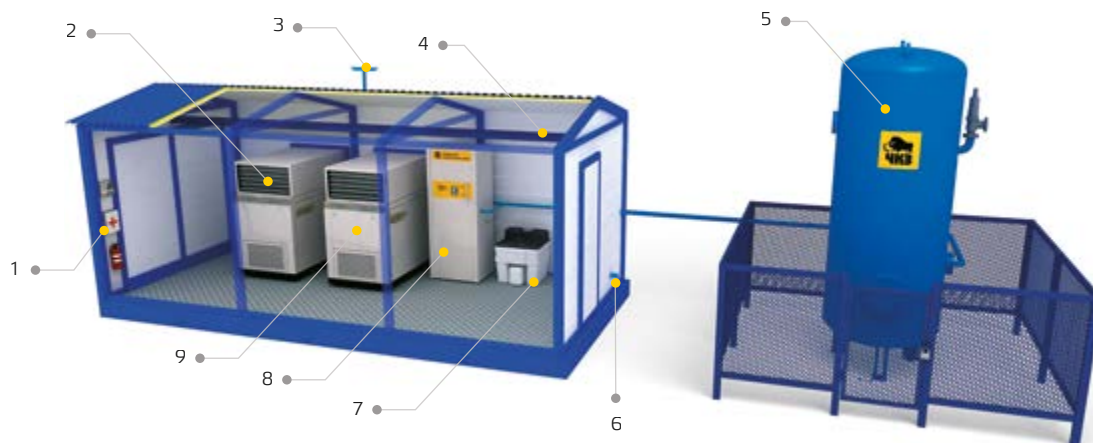


Wide range of working temperature



## BKK is a Comprehensive Technical Solution for Railways

Screw compressor block-modular stations for switches blow-off system



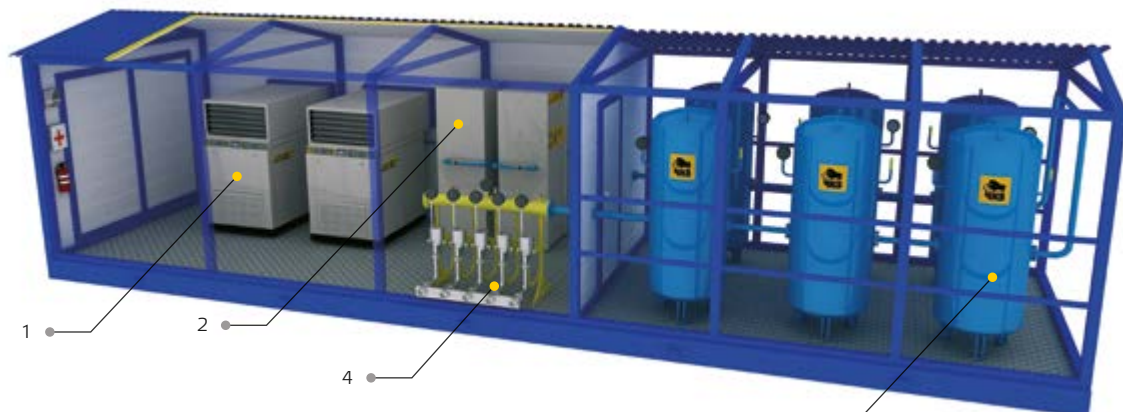
- |                                            |                              |
|--------------------------------------------|------------------------------|
| 1 Remote control system Metacentre         | 6 Purified condensate outlet |
| 2 Airpipe with automatic shutters          | 7 Oil / water separator      |
| 3 Compressed air discharge by safety-valve | 8 Adsorption air dryer       |
| 4 Monorail for movable hoist               | 9 DEN screw compressor unit  |
| 5 Air vessel                               |                              |

Compressor block-modular stations for compressed air supply to gravity yards



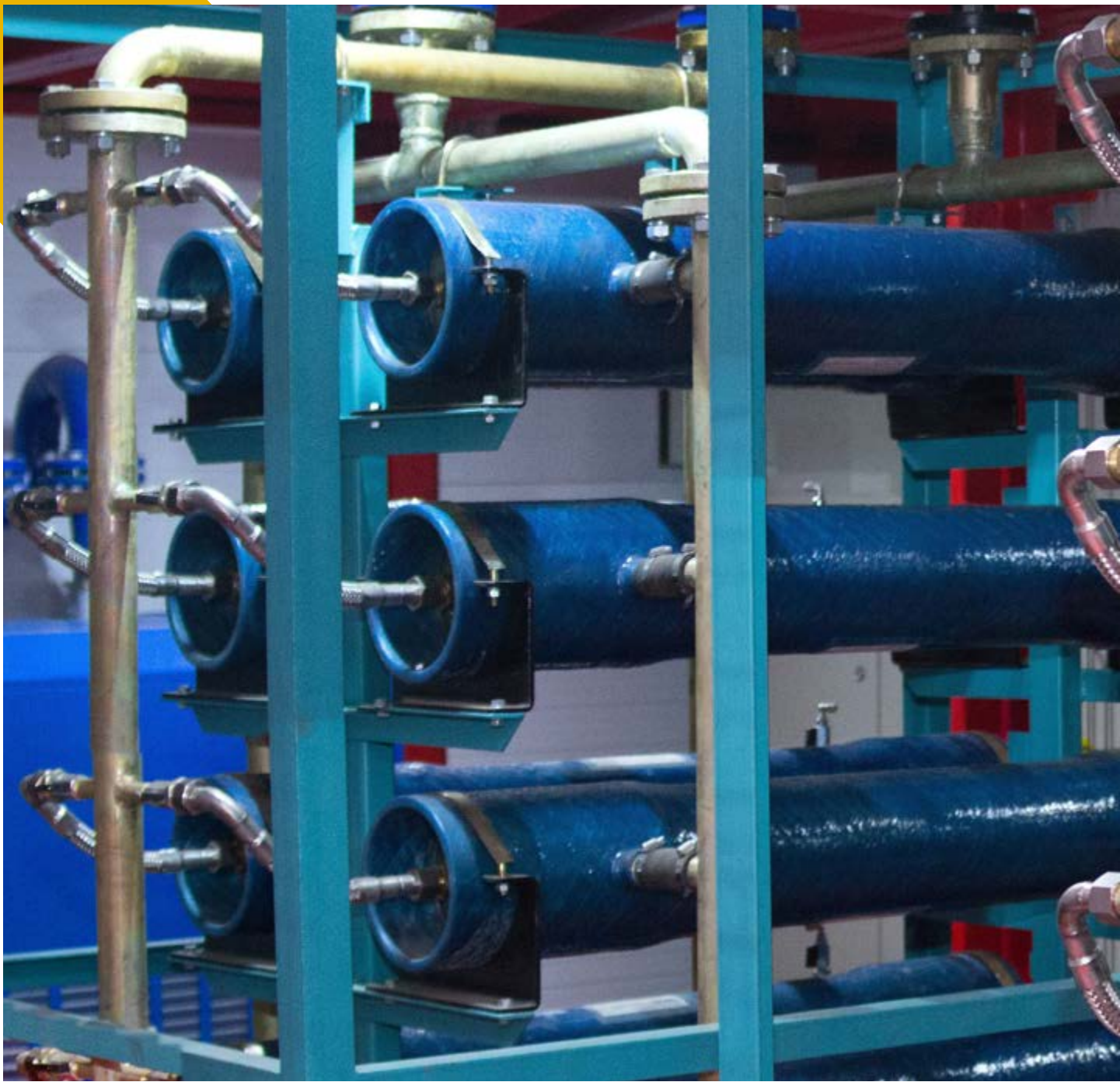
- |                                     |                                    |
|-------------------------------------|------------------------------------|
| 1 Air filter                        | 5 Oil filter                       |
| 2 Adsorption air dryer              | 6 Remote control system Metacentre |
| 3 Heat-exchange unit                | 7 Power control box                |
| 4 Screw compressor unit DEN-132 ShM | 8 Oil / water separator            |

Compressor block-modular stations with a charging and testing brake device (UZOT –Radio) for railway rolling stock



- |                                    |                                                   |
|------------------------------------|---------------------------------------------------|
| 1 Screw compressor units DEN-55 Sh | 3 Charging and testing brake device (UZOT –Radio) |
| 2 Adsorption air dryer             | 4 Air vessels                                     |





Chapter

08

## Nitrogen Membrane Units (AMU) and Stations (BKK (AMU))



## NITROGEN

Inert, diatomic, colourless, odour-free, tasteless gas. It does not sustain combustions, protects from oxidation and rotting. combustions, protects from oxidation and rotting.

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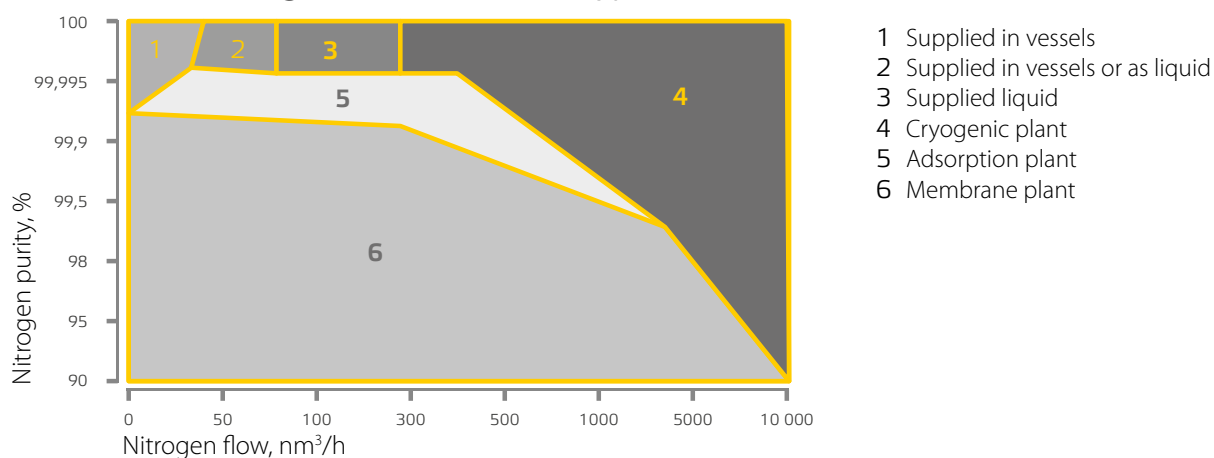


## Membrane technology for nitrogen production

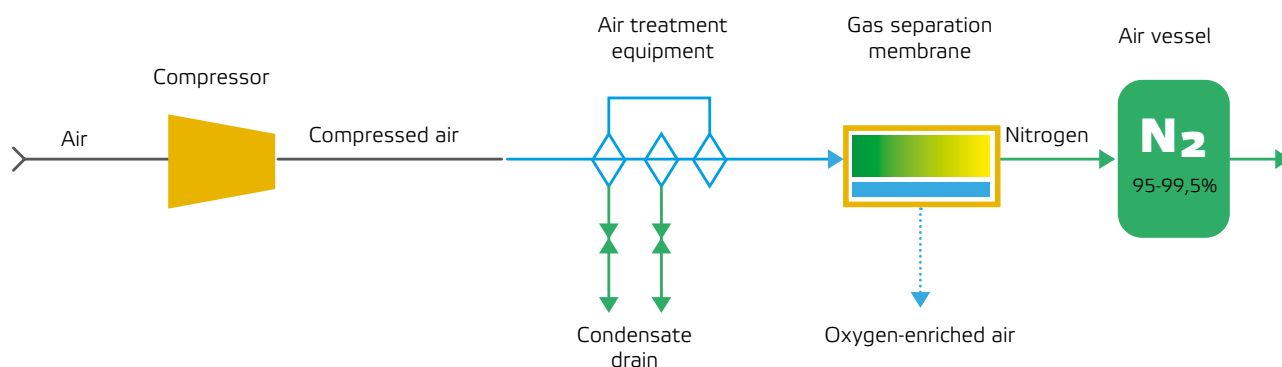
There are several technologies for nitrogen production:

- **Membrane**
- **Adsorption**
- **Cryogenic**

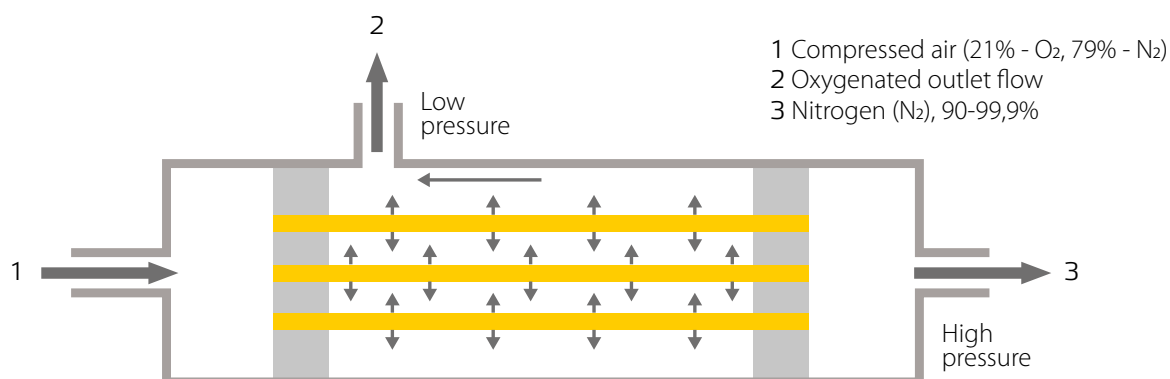
Selection of a usage of certain unit type



## Scheme of a nitrogen membrane generator



## Scheme of a nitrogen membrane unit



Compressed in the compressor and heated to the required temperature air is supplied to the gas-separation membrane modules. Oxygen and water vapor in the air, quickly penetrate through the polymer

membrane and discharge from the membrane module through one of the outlet pipes to the network or to the atmosphere. Nitrogen, as opposed to oxygen and water vapor, slowly permeates through the membrane,

and is delivered to the consumer without pressure loss through another outlet of the membrane gas separation unit.

Chelyabinsk Compressor Plant offers the packaged technical solutions with nitrogen membrane stations (AMU) with the following characteristics range:

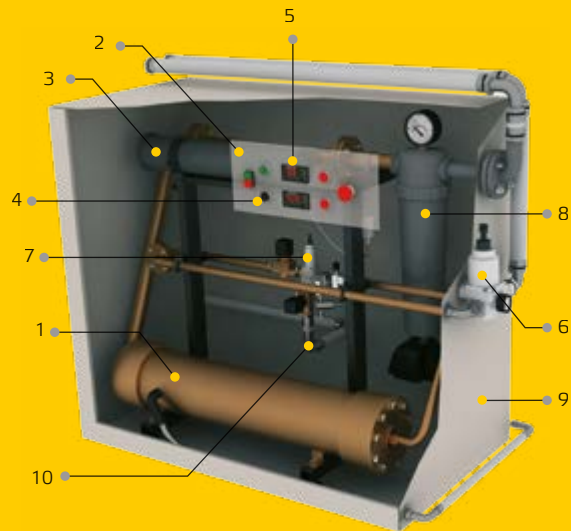
| N <sub>2</sub> purity, % | Capacity at STP**, m <sup>3</sup> /hour | Pressure, barg | Dew point, °F (°C)    | Ambient temperature, °F (°C)    |
|--------------------------|-----------------------------------------|----------------|-----------------------|---------------------------------|
| 90 - 99,9                | 0,1-7000*                               | 1 - 500        | up to -94 (up to -70) | from 37,4 up to +122 (+3 - +50) |

\* - higher capacity – subject to agreement;

\*\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## CHKZ nitrogen membrane stations series AMU «Standard»

- 1 Membrane module
- 2 AMU controller
- 3 Compressed air heating unit
- 4 Gas analyzer display
- 5 Temperature sensor display
- 6 Reducer
- 7 Pneumatic valve fittings
- 8 Pre-filter (filter unit)
- 9 Noise insulation hood
- 10 Sound-proof housing



«Standard» gas separation station is the best solution for general industrial application.

The detailed structure of nitrogen membrane station is on the picture above. Filters unit ensures the purity of the air, which goes to gas separation module (air purification of required class according to Russian Standards; solid particles size less than 0,003 mg/m<sup>3</sup>).

Automatic control system ensures the produced nitrogen quality. AMU can be produced in a sound-proof housing or without it; the air electric heater is preinstalled.

### CHKZ nitrogen membrane stations AMU «Standard» advantages:

No special requirements to ambient air quality (filters unit is integrated into the system).

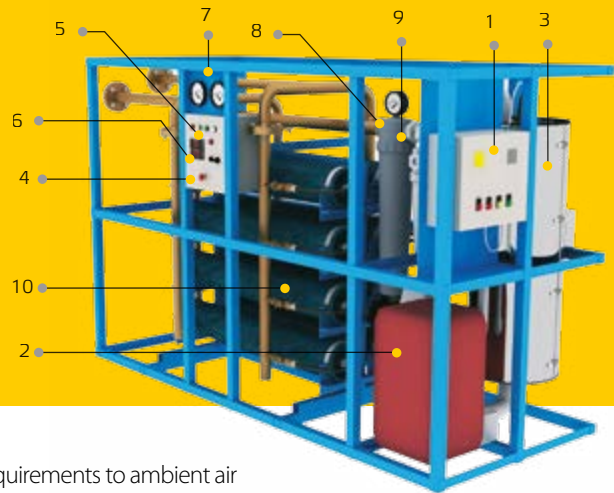
Low operating cost, easy maintenance.

Easy

Flexible nitrogen purity and capacity adjustment .

# CHKZ nitrogen membrane stations AMU «Optim»

- 1 Eco Tec Converter controller
- 2 Eco Tec Converter heat exchanger
- 3 Catalyst-module with a heater
- 4 AMU controller
- 5 Gas analyzer display
- 6 Temperature sensor display
- 7 Solenoid valves unit
- 8 Nitrogen sampling and analyzing unit
- 9 Filter unit
- 10 Membrane module



## CHKZ nitrogen membrane stations AMU «Optim» advantages:

- Long operational life of the station – membrane module operational life is twice longer.
- High quality of produced nitrogen, no particles and oil.
- No special requirements to ambient air quality.
- Flexible nitrogen purity and capacity adjustment.
- Easy operation, high reliability.

Gas separation station AMU «Optim» is the best solution for processes procedures.

The detailed structure of a nitrogen membrane station is on the picture above. Filter unit and innovative purifying system Eco Tec Converter ensures the purity of the air, which goes to gas separation module (solid particles size less than 0,001 mkm; hydrocarbons concentration less than 0,0025 mg/m<sup>3</sup>, what is significantly less than it is prescribed for 1 contamination class according to Russian Standards).

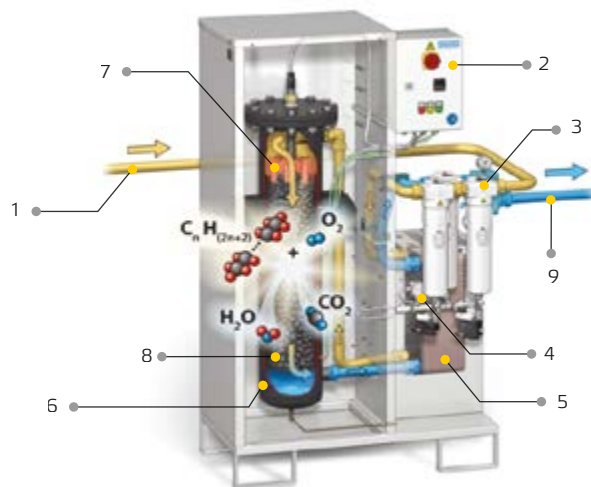
Automatic control system ensures the produced nitrogen quality. AMU can be produced with a sound-proof housing or without it.

## Eco Tec Converter system

Eco Tec Converter (ETC) operation principle is to transform the oil and other hydrocarbons during physical and chemical process into water and carbon dioxide by means of special catalyst.

This is a revolutionary process for removal oil from the compressed air, which states new standards for reliability, price, condensate cleaning and environmental protection.

## Flow chart



- 1 Compressed air
- 2 Controller
- 3 Additional speed change unit
- 4 Minimum pressure valve
- 5 Heat exchanger
- 6 Converter chamber
- 7 Heating element
- 8 Catalyst
- 9 Outlet into compressed air system

## Eco Tec Converter advantages:

- guaranteed oil-free compressed air, oil / carbohydrates concentration less than 0,001 mg/m<sup>3</sup> (compressed air);
- condensate generated in Eco Tec Converter compressed air network elements requires no further purification, consequently there is no need to install an oil separator for condensate;
- low power consumption (~ 5 W/m<sup>3</sup>);
- long operation period (20 000 hours) before cartridge-catalyst replacement;
- 100% efficiency during whole life time, because Eco Tec Converter productivity does not depend on inlet oil concentration (wide range), air humidity, inlet air temperature.

# Nitrogen Compressor Station

Nitrogen compressor station designed for reliable operation of oil products underground storage Podzemneftegaz OJSC is a bright example of high-quality design and production of gas separation station based on BKK.

This compressor block-modular station is mobile. To make the transportation easier it consists of four sections which can be disassembled and conserved after the testing at the plant, and the station can be transported by auto or railway transport.

The station is designed to meet the customers requirements. Podzemneftegaz OJSC storage is remote from main power supply, it results in lack of energy. Chelyabinsk Compressor Plant proposed the following solution: first stage new compressors DEN «Volt» are designed for 6kV voltage, and the other equipment (such as Eco Tec Converter, boosting compressor stations), which consume less energy, is designed for 0,4kV.

To ensure required compressed air purity (hydrocarbons residual concentration – less than 0,0025 mg/m³) two hydrocarbons catalytic decomposition system Eco Tec Converter are integrated into the station.

The Central element of the specially designed for Podzemneftegaz OJSC compressor block-modular station is the gas separation membrane system.



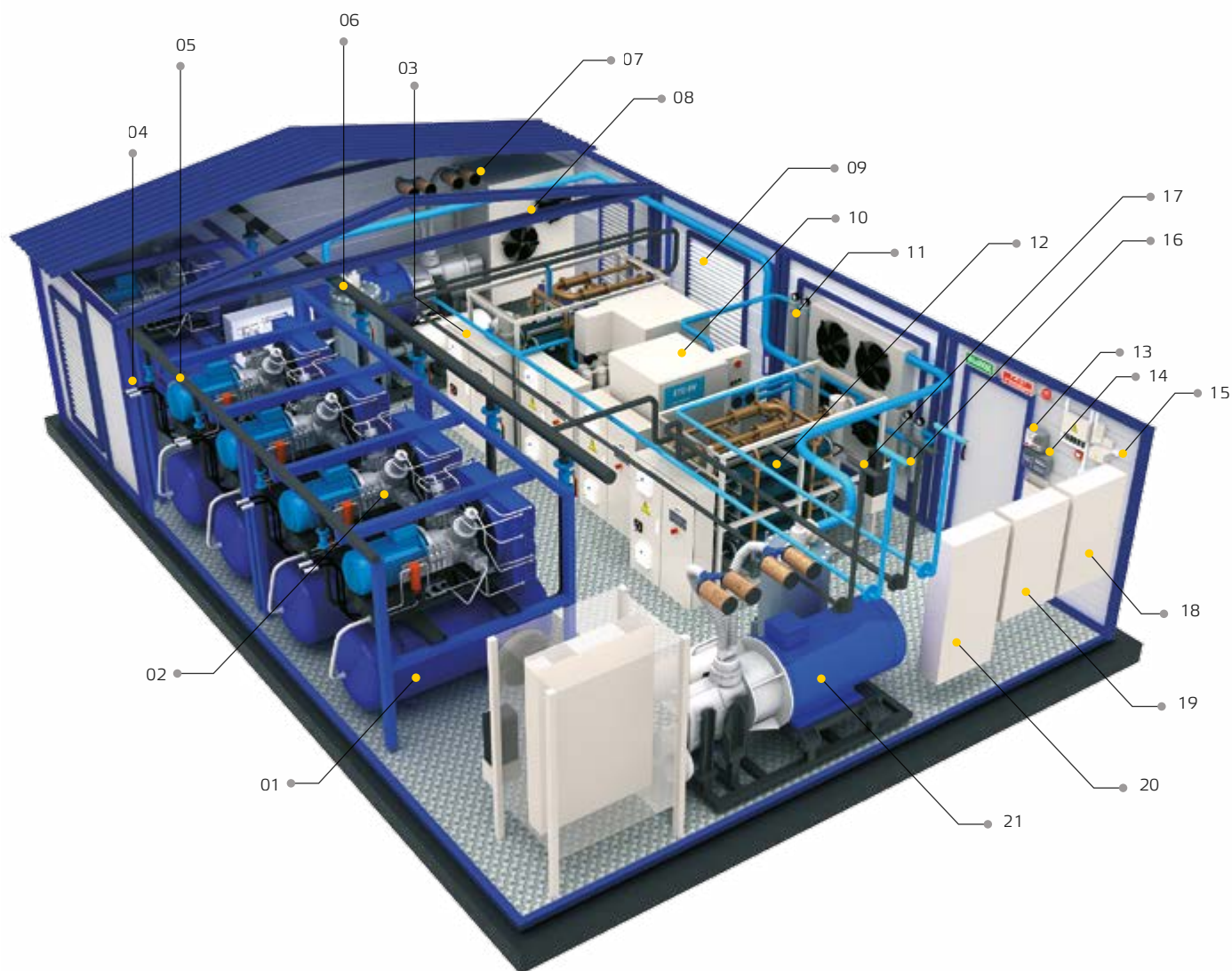
## Technical characteristics

| Model       | Nitrogen capacity at STP*,<br>m³/hour | Pressure, barg | Nitrogen purity, % |
|-------------|---------------------------------------|----------------|--------------------|
| BKK-67/13-2 | 2400                                  | 150            | 90                 |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)



## 3D-model BKK-67/13-2 Podzemneftegaz OJSC



- |                                                                                  |                                                                           |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>1</b> Surge tank                                                              | <b>12</b> Nitrogen membrane station AMU-1200/90 «Optim»                   |
| <b>2</b> High pressure compressor unit KP-2/15D                                  | <b>13</b> Low pressure compressors group control system Metacentre DCO3   |
| <b>3</b> High pressure compressor units control cabinet                          | <b>14</b> High pressure compressors group control system Metacentre SX    |
| <b>4</b> High pressure compressor unit relief system silencer                    | <b>15</b> Fire alarm system                                               |
| <b>5</b> High pressure nitrogen pipeline                                         | <b>16</b> Permeate withdrawal                                             |
| <b>6</b> Low pressure nitrogen pipeline                                          | <b>17</b> Off-nitrogen                                                    |
| <b>7</b> Air pre-filter                                                          | <b>18</b> Nitrogen compressor station life support system auxiliary board |
| <b>8</b> Fan blade rotation frequency – regulated compressor unit heat exchanger | <b>19</b> High pressure compressor power supply cabinet                   |
| <b>9</b> Nitrogen compressor station ventilation system shutter                  | <b>20</b> Low pressure compressor power supply cabinet                    |
| <b>10</b> Hydrocarbons catalytic decomposition system                            | <b>21</b> Compressor unit DEN-315ShM «Volt»                               |
| <b>11</b> Flow filtration system                                                 |                                                                           |



# Adsorption Nitrogen Units

Adsorption gas separation technology is applied when it is necessary to produce nitrogen with purity more than 99,95%. Adsorption technology

is based on the absorption of certain substances with molecular sieves, which guarantees separation of air mixture. The operation principle is

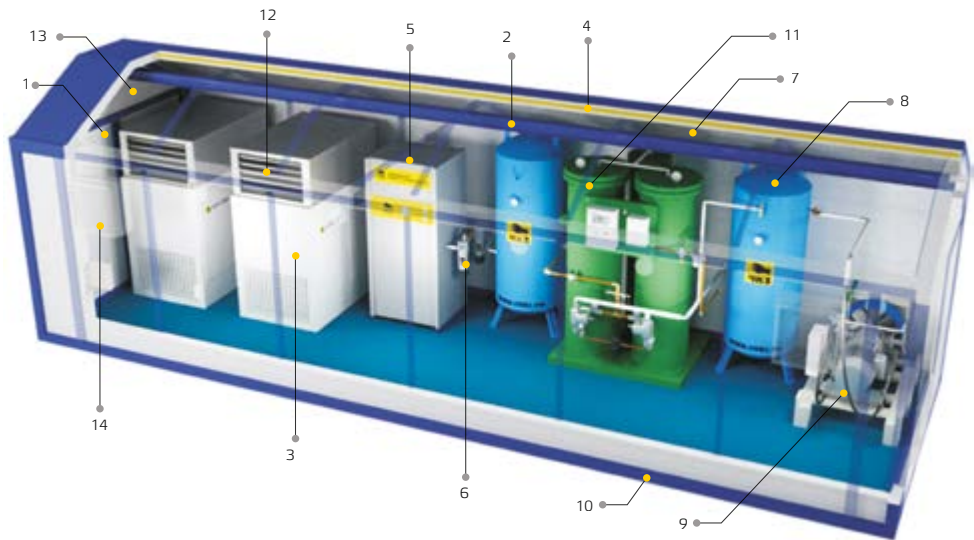
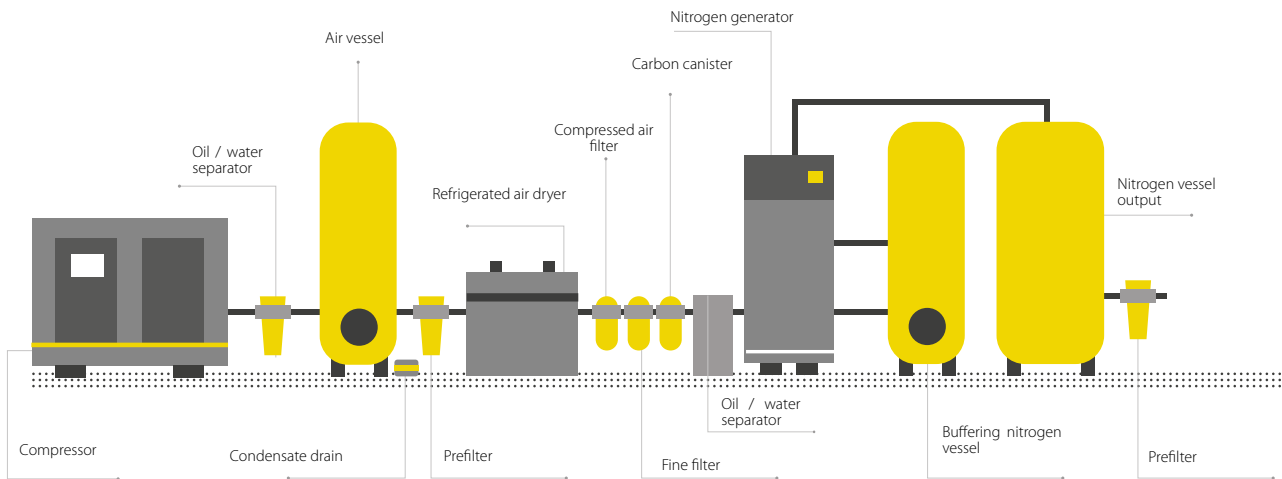
based on a different adsorption rate of certain gas mixture components depending on pressure and temperature.

| Nitrogen purity, % | Capacity at STP**, m <sup>3</sup> /hour | Pressure, barg | Dew point, °F (°C) | Ambient temperature, °F (°C)  |
|--------------------|-----------------------------------------|----------------|--------------------|-------------------------------|
| 95 - 99,999        | 1-550*                                  | 1-500          | up to -94 (-70)    | fom 37,4 up to 122 (+3 - +50) |

\* - higher capacity – subject to agreement;

\*\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

## Scheme of nitrogen adsorption station



- |                              |                       |                                |
|------------------------------|-----------------------|--------------------------------|
| 1 Lighter                    | 6 Filter              | 11 Gas separation unit         |
| 2 Monorail for movable hoist | 7 Heating system      | 12 Airpipe with shutters       |
| 3 Compressor unit            | 8 Receiver            | 13 Automatic fire-extinguisher |
| 4 Heat insulation            | 9 Boosting compressor | 14 Remote control              |
| 5 Adsorption air dryer       | 10 Shipping eye       |                                |

**A comprehensive technical solution is represented on the picture:**

mobile gas separation station based on BKK, especially designed for Antipinsky Oil Refinery CJSC. Compressed air supply system (for control and instrumentation equipment) and 99,9% purity nitrogen supply system (for oil connected technological processes oil products) are combined together in one modular.



Chapter

09

## Gas Screw Compressor Units and Stations



## CHELYABINSK COMPRESSOR PLANT UP-TO-DATE DEVELOPMENTS

are presented by gas screw compressor units with slide-valve capacity control for natural gas compression and the stations on basis of them.

They are produced in explosion-proof version, equipped with gaseous extinguishing system and in-built nitrogen ramp station. The control is performed via Allen Bradley controller, the world of industrial automation systems leader. These gas compressor units are designed for both high inlet pressure and minimum inlet excessive pressure (vacuum).

**Chelyabinsk Compressor Plant produces vacuum and boosting compressor units with the power of 1 megawatt and the capacity up to 14714,58 cfm (25000 m<sup>3</sup>/hour) at STP (*STP - stands for 68°F (20°C) and absolute pressure 14,7 psi (1 bar)*).**

**Outlet pressure of boosting screw compressors - up to 50 kg/cm<sup>2</sup>.**

supplied to NGK Slavneft, JSC eight explosion-proof compressor stations BKK- 13,5/7-1 Ex for oil-dissolved gas with capacity of 13,5 m<sup>3</sup>/min. BKK-13,5/7-1 Ex is a compressor block-modular divided into two parts by ventilated space on a common frame.

The first part is a compressor (production) compartment. It houses a gas compressor unit, process pipeline, and field facilities of instrumentation and control. All equipment is in explosion-proof.

The second part of the container is a control compartment (power compartment). It houses control cabinets BKK-13,5/7-1 Ex with operational parameters indicated on a color display. BKK-13,5/7-1 Ex can be controlled by touch screen display and buttons, as well as remotely controlled from the operator's room. The whole system is 100% backed up with a reserve BKK-13,5/7-1 Ex.

In 2013 Chelyabinsk Compressor Plant produced and



The block-modular is supplied with complete heat and sound insulation, ventilation system, fire-alarm, air contamination controller, lighting and heating systems and automatic gaseous fire-extinguishing system. There are passages and space for routine maintenance and service of the equipment, canopy and outdoor lighting above the entrance door.

There is lifting equipment inside the container for repairing purposes.

Fire-extinguishing system, compressor module control cabinet, power cabinet and in-house power cabinet are located in the power compartment.

One of the distinctive features of BKK-13,5/7-1 Ex is a screw compressor GEA Grasso with antifriction bearings, optimized rotors profile providing high efficiency. Convex rotor drive allows eliminating overload and guarantees

long lifetime of the bearings and low noise and vibrations levels. Zero profile wear provides sustainable operational parameters during service lifetime.

The compressor is equipped with a slide-valve regulator forming the compression zone the way the compressor takes in only the required gas volume from the suction line to meet the feed demand. Gas volume is regulated within 10

ensure the required delivery. The slide-valve is applied instead of drive frequency regulation system to improve energy efficiency of the entire unit.

BKK-13,5/7-1 Ex has a high energy efficiency. Power consumption of the unit does not exceed (and is significantly below) the Energy Efficiency Index fixed by the Russian Government Regulation.



## Technical characteristics of the vacuum gas compressor stations for NGK Slavneft, JSC

| Model             | Capacity at STP*, m <sup>3</sup> /hour | Inlet absolute pressure, kgf/cm <sup>2</sup> | Outlet absolute pressure, kgf/cm <sup>2</sup> |
|-------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------|
| «BKK-13,5/7-1 Ex» | 810                                    | 0,5 ÷ 2,0                                    | 6,0 ÷ 8,0                                     |

\* - STP stands for temperature of 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

In 2014 Chelyabinsk Compressor Plant proceeded cooperation with NGK Slavneft, JSC and other oil and gas companies. The landmark order was a supply of 16 gas boosting vacuum compressor stations to the petroleum company Rosneft for operation at eight oil deposits.

The cooperation began in 2013 when Chelyabinsk Compressor Plant and TNK-Uvat (current RN-Uvatneftegas, subsidiary company of NK Rosneft) came to the agreement to update six SAGE Canadian compressor units, previously purchased by the petroleum corporation, so as to meet the requirements of the Russian Regulations and GOST. The Canadian compressors were produced in conformity with international standards API, which have differences with GOST requirements and regulations in force on the territory of the Russian Federation, thus they could not be accepted by the Federal Supervision Agency Rostekhnadzor and could not be commissioned.

Because of the intensification of the Canadian manufacturer to minimize the compressor dimensions the operation and maintenance of the compressor gave rise to some difficulties. Upon elaborated design drafting and its trilateral confirmation with the manufacturer and the customer our specialists performed modernization of the compressor units providing easy access to the assemblies and components of the compressor during operation, maintenance and service.

To make the compressor equipment operate outdoor under severe weather conditions on the customer's site Chelyabinsk Compressor Plant protected the compressor units with all-weather block-modular cover. Modular construction allows easy transportation of the units. The block-modular construction allows maintaining the operational temperature from -58 to +104 °F (from -60 to +40 °C).

After acceptance of the equipment by the customer on Chelyabinsk Compressor Plant site our specialists installed the equipment including arrangement of inter-block connections between the containers on the RN-Uvatneftegas site.

Commissioning works were performed in cooperation with the Canadian partners - SAGE company responsible for checking operational characteristics of its equipment and Spartan Controls company responsible for checking automation system of operational process control.

All the equipment successfully passed 72-hour tests on a rare gas, and then on a real gas.

The unique cooperative project of Chelyabinsk Compressor Plant, LLC and the Canadian company SAGE was successfully completed.



### Technical characteristics of the gas compressor stations for RN-Uvatneftegas, LLC

| Capacity of one unit at STP*, cfm<br>hour) | (m <sup>3</sup> / | Inlet excess pressure,<br>kgf/cm <sup>2</sup> | Outlet excess pressure,<br>kgf/cm <sup>2</sup> |
|--------------------------------------------|-------------------|-----------------------------------------------|------------------------------------------------|
| 2472,03 (4200)                             |                   | 1,0 ÷ 3,0                                     | 22,0                                           |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psi (1 bar)

In 2015 Chelyabinsk Compressor Plant produced and supplied to OAO Tomskneft VNK block-modular compressor station under the program for utilization of the associated gas. The station is applied for compression of free oil associated gas which arrives from preliminary water discharge unit – 7 at Lomovoe oil field from the field separation stage and for its delivery to existing pipeline for joint transportation

of the liquid-gas mixture to the oil treatment unit.

The block-modular station consists of 2 separate compressor units (BK-1 – main, BK-2 – backup), auxiliary equipment and one controller.

All the operational parameters of the station are transferred to control unit and to the operator's room to the automated workstation.

The station is fully autonomous which is the customer's crucial requirement as the station is operated in tough climatic conditions and is located in a long distance from human settlement.

### Technical characteristics of the boosting gas compressor stations on preliminary water discharge unit – 7 for Tomskneft, JSC objects.

| Capacity at STP*, cfm (m <sup>3</sup> /hour) | Inlet excess pressure,<br>kgf/cm <sup>2</sup> | Outlet excess pressure,<br>kgf/cm <sup>2</sup> |
|----------------------------------------------|-----------------------------------------------|------------------------------------------------|
| up to 1471,45 (2500)                         | up to 2,0                                     | up to 12,0                                     |





Chapter

10

## Autonomous Diesel-Generator Units



Autonomous diesel-generator units can be also used as backup (emergency) power sources in those industries where constant no-break power supply independent of voltage drops in the central electrical supply network is required..

Now the ADGU range of covers power from 10kW till 500kW power, which are the most demanded on the market. Upon a special request there can be

higher-powered units produced.

The main ADGU advantages are autonomy and mobility. The autonomous diesel-generator units which do not require capital construction are used when central power network are not available. The delivery and supply with a required diesel fuel volume the, connect ion to the local power network and the start of diesel-generator is only required

for commissioning of such a unit. The units could be equally efficiently applied for permanent and backup operation, out of the country and in cities and for various facilities such as construction, trade, living or industrial area.

# Main elements of an autonomous diesel-generator unit

- 1 Control panel
- 2 Silencer
- 3 Air filter

- 4 Radiator
- 5 Diesel engine
- 6 Fuel filters

- 7 Vessel
- 8 Frame



## Manufacturers of the components for ADGU

Autonomous diesel-generator units are produced from the components made by the largest European manufacturers which have gained excellent reputation for the long-term period of application in Russia. Applied state-of-the-art diesel engines guarantee reduced fuel consumption

and low level of exhaust emission. Generator models installed on the stations produced by CHKZ have increased resistance to various operational conditions of ADGU and do not require any odd maintenance costs.

## Suppliers list:

### Generators:



Stamford (UK)



ACG (Germany)



MeccAlte (Italy)



Leroy Sommer (UK)



Linz (Germany)

## Engines:



Perkins (UK)



Hatz (Germany)



Volvo Penta (Germany)



Cummins (UK)



MTU (Germany)



YaMZ – Yaroslavl Motor (Russia)



Yanmar (Japan)



MMZ – Minsk motor plant (Belorussia)



Deutz (Germany)

## Control panel:



AGGRETECH

ACG (Germany)



ComAp (Czech)



DeepSea Electronics  
(Germany)

## Integrated solutions with ADGU

Example of an integrated solution: ADGU with a compressor DEN



- 1 Autonomous diesel-generator unit
- 2 Local distribution panel
- 3 DEN electric screw compressor



## Open Autonomous Diesel-Generator Units



Open autonomous diesel-generator units (ADGU) are used only in the facilities, where all the peripheral systems, venting, heating, exhaust gases outlet, electrical equipment control and protection, additional fuel, fire alarm and firefighting, are mounted on site.

This version is used for back operation of autonomous diesel-generator unit as well as for regular operation and is considered to be the most convenient.

## Autonomous Diesel-Generator Units in a Sound-Proof Housing



Sound-proof housing for generator units ensures working units noise level reduction. Moreover, units in housings could be placed outside, because the housings protects the unit from atmospheric influence such as rain, low temperature etc.

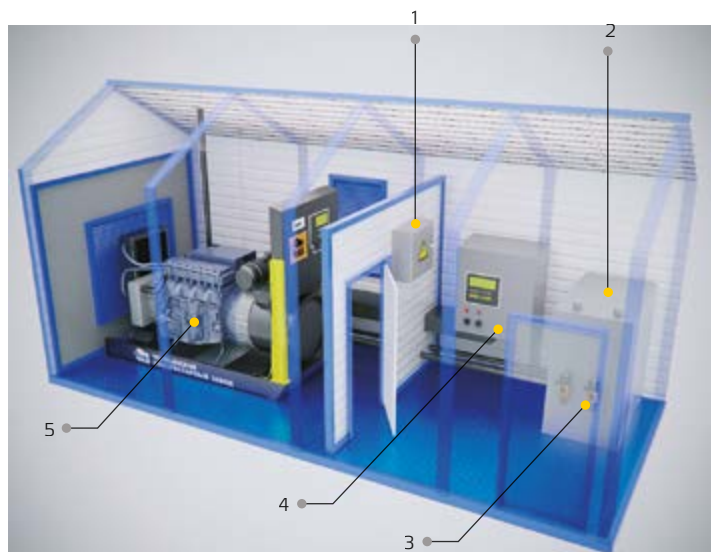
Housing is a solid metal framework, the inner side of which is glued over with a special sound-proof material. For an ADGU maintenance there are access doors from both side of a housing. There are also special openings for proper venting of an ADGU and a silencer for exhaust gases outlet.

Housing allows using the unit outside as well as inside of a building, because sound-proof housings reduce noise for 30dB, which sufficiently lowers the noise level from the one of 100-110dB of operating unit.

It is to supply When an ADGU is placed outside a building and in the housing a cooling liquid heater and an accumulator battery charging device are recommended for the scope of supply.

| Model     | Prime power, HP<br>(kW) | Maximum power,<br>HP (kW) | Phases | Engine                         | Voltage, V | Frequency, Hz |
|-----------|-------------------------|---------------------------|--------|--------------------------------|------------|---------------|
| ADGU 10Y  | 13,7 (10,2)             | 14,8 (11,0)               | 3      | Yanmar / Weichai / MMZ / YaMZ  | 480        | 50            |
| ADGU 15Y  | 20,4 (15,2)             | 21,6 (16,1)               | 3      | Yanmar / Weichai / MMZ / YaMZ  | 480        | 50            |
| ADGU 23Y  | 31,6 (23,6)             | 32,2 (24,0)               | 3      | Yanmar / Weichai / MMZ / YaMZ  | 480        | 50            |
| ADGU 35Y  | 47,2 (35,2)             | 48,3 (36,0)               | 3      | Yanmar / Weichai / MMZ / YaMZ  | 480        | 50            |
| ADGU 48P  | 65,2 (48,6)             | 71,3 (53,2)               | 3      | Perkins / Weichai / MMZ / YaMZ | 480        | 50            |
| ADGU 59P  | 79,7 (59,4)             | 83,4 (62,2)               | 3      | Perkins / Weichai / YaMZ       | 480        | 50            |
| ADGU 82P  | 110,1 (82,1)            | 121,2 (90,4)              | 3      | Perkins / Weichai / YaMZ       | 480        | 50            |
| ADGU 103V | 138,1 (103,0)           | 152,9 (114,0)             | 3      | Volvo / Weichai / YaMZ         | 480        | 50            |
| ADGU 125V | 167,6 (125,0)           | 175,7 (131,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 162V | 217,2 (162,0)           | 236,0 (176,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 199V | 266,9 (199,0)           | 295,0 (220,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 252V | 337,9 (252,0)           | 354,0 (264,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 305V | 409,0 (305,0)           | 447,9 (334,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 332V | 445,2 (332,0)           | 482,8 (360,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 364V | 488,1 (364,0)           | 543,1 (405,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 404V | 541,8 (404,0)           | 586,0 (437,0)             | 3      | Volvo / Shendong / YaMZ        | 480        | 50            |
| ADGU 457V | 612,8 (457,0)           | 677,2 (505,0)             | 3      | Volvo / Shendong               | 480        | 50            |
| ADGU 507V | 679,9 (507,0)           | 756,3 (564,0)             | 3      | Volvo / Shendong               | 480        | 50            |

## Block-Modular Energy Station (BKE)



Block-modular energy station is a heat-insulated container with a diesel-generator unit supplied with all the systems necessary for normal ADGU operation in aggressive ambient conditions inside.

The BKE is designed to fulfill the largest Russian diesel-generators consumers needs in accordance with all the necessary operating requirements.

- 1 Local distribution panel
- 2 Auxiliary fuel tank
- 3 Fuel purification separator
- 4 Power- transfer relay
- 5 Autonomous diesel-generator unit

| Name                                                                                                           | Characteristics, description, brand                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Block-modular station with arched roof design (climatic version: -76 °F... + 104°F (-60 °C... +40°C)</b> | <p>Metal cage with bordering made of 3-layer panels without framework according to Technical Specification TS 5284-183-01217836-2005 with 110-120 kg/m³ density polyurethane foam heat insulation 60mm width.</p> <p>Room category according to Fire Code SP 12/13130-2009-V3.</p> <p>Fire resistance degree according to the Russian Federal Law №123-FZ and SP 2.13130-2009-III.</p> |
| 1.1. Automatic firefighting system                                                                             | Gas or powder fire extinguishing module.                                                                                                                                                                                                                                                                                                                                               |
| 1.2. Lightening system (inside)                                                                                | LED lamp SPP-30 (32 W, 230 V).                                                                                                                                                                                                                                                                                                                                                         |
| 1.3. Lightening system (outside)                                                                               | LED lamp SPP-30 (32 W, 230 V).                                                                                                                                                                                                                                                                                                                                                         |
| 1.4. Emergency lighting system                                                                                 | Emergency lighting BS-943 (2x18 W, 230 V).                                                                                                                                                                                                                                                                                                                                             |
| 1.5. Combined extract-and-input system                                                                         | Inlet and outlet windows' electric controlled jalousie (electric drive – Dämmerung LK230-10 with return spring).                                                                                                                                                                                                                                                                       |
| 1.6. Heating system                                                                                            | Heater KEV-6C40 (6 kW, 380), electric convector (2 kW, 230 V).                                                                                                                                                                                                                                                                                                                         |
| <b>2. Diesel-generator</b>                                                                                     | ADGU                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>3. Reserve input device</b>                                                                                 | Automatic starter for backup power supply (in the case of industrial main power network disconnection).                                                                                                                                                                                                                                                                                |
| <b>4. Auxiliary power management control system of own needs</b>                                               | Auxiliaries board, cable input from external source, wiring layout through the block-modular station.                                                                                                                                                                                                                                                                                  |
| <b>5. Fuel system</b>                                                                                          | Additional fuel tank with priming pump.                                                                                                                                                                                                                                                                                                                                                |



Chapter

11

## Air Vessels (Tanks)





Chelyabinsk Compressor Plant LLC manufactures a wide range of air vessels (volume tanks) with a capacity from 0,2 m<sup>3</sup> up to 80 m<sup>3</sup>.

An air vessel is a vertical or horizontal welded cylindrical tank with elliptical heads.

It is supplied with a pressure gauge, a safety valve and a counter flange.

The operating temperature range is from -70°C up to +45°C.

The working environment temperature range is from -70°C up to +200°C.

Operation life is 40 years.

In accordance with the customers' technical requirements also nonstandard vessels working under pressure can be developed and production.





CHKZ vessels are produced with the world leading manufacturers equipment:

- Laser cutting machine "BYSTRONIK" ensures high cutting accuracy and minimal metal deformation.
- Roll-bending machine "SAHINLER" ensures shell diameter for one-joint welding is up to 196,85 in (5 meter).
- Welding machine "LINCOLN" ensures welding joint thickness is up to 0,98 in (25 mm).



All the vessel are certified and have the appliance permission required for technical equipment used at dangerous industrial objects.

CHELYABINSK COMPRESSOR PLANT LLC OFFERS A COLD ZINC COATING INSIDE (AT A CAPACITY OF MORE THAN 1M<sup>3</sup>) AS WELL AS OUTSIDE (AT A VOLUME FROM 0,5 UP TO 50M<sup>3</sup>) A VESSEL FOLLOWING THE CUSTOMERS NEEDS).

## Technical characteristics

| Model               | Volume, m <sup>3</sup> | Pressure, psig (barg)       | Dimensions, LxWxH in (mm)           | Weight lb (kg)* |
|---------------------|------------------------|-----------------------------|-------------------------------------|-----------------|
| Tanks               |                        |                             |                                     |                 |
| RV-110-10           | 0,11                   | 145,0 (10)                  | 18,1x19,1x42,1 (460x485x1070)       | 132,3 (60)      |
| RV-250-10           | 0,25                   | 145,0 (10)                  | 24,4x22,8x51,2 (620x580x1300)       | 220,5 (100)     |
| RV-500-10           | 0,5                    | 188,5 (13)                  | 33,1x29,5x77,6 (840x750x1970)       | 440,9 (200)     |
| RV-900-10           | 0,9                    | 145,0 (10)                  | 35,4x37,0x89,4 (900x940x2270)       | 683,4 (310)     |
| Air Tanks           |                        |                             |                                     |                 |
| VV-0,9-0,8/1,0/1,6  | 0,9                    | 116,0/145,0/232,1 (8/10/16) | 41,1x37,4x85,0 (1045x950x2160)      | 683,4 (310)     |
| VV-1-0,8/1,0/1,6    | 1,0                    | 116,0/145,0/232,1 (8/10/16) | 41,1x37,4x94,3 (1045x950x2395)      | 848,8 (385)     |
| VV-1,6-0,8/1,0/1,6  | 1,6                    | 116,0/145,0/232,1 (8/10/16) | 51,6x51,6x92,7 (1310x1310x2355)     | 1477,1 (670)    |
| VV-2,0-0,8/1,0/1,6  | 2,0                    | 116,0/145,0/232,1 (8/10/16) | 51,6x51,6x116,9 (1310x1310x2970)    | 1719,6 (780)    |
| VV-2,7-0,8/1,0/1,6  | 2,7                    | 116,0/145,0/232,1 (8/10/16) | 51,6x51,6x146,5 (1310x1310x3720)    | 2050,3 (930)    |
| VV-3,2-0,8/1,0/1,6  | 3,2                    | 116,0/145,0/232,1 (8/10/16) | 61,8x60,0x127,8 (1570x1525x3245)    | 2689,6 (1220)   |
| VV-4,0-0,8/1,0/1,6  | 4,0                    | 116,0/145,0/232,1 (8/10/16) | 61,8x60,0x153,7 (1570x1525x3905)    | 3130,6 (1420)   |
| VV-5,0-0,8/1,0/1,6  | 5,0                    | 116,0/145,0/232,1 (8/10/16) | 69,6x68,3x146,5 (1768x1735x3720)    | 3461,3 (1570)   |
| VV-6,3-0,8/1,0/1,6  | 6,3                    | 116,0/145,0/232,1 (8/10/16) | 69,5x68,3x182,3 (1765x1735x4630)    | 4069,7 (1846)   |
| VV-8,0-0,8/1,0/1,6  | 8,0                    | 116,0/145,0/232,1 (8/10/16) | 77,4x76,0x176,8 (1965x1930x4490)    | 4629,7 (2100)   |
| VV-10,0-0,8/1,0/1,6 | 10,0                   | 116,0/145,0/232,1 (8/10/16) | 77,4x76,0x216,1 (1965x1930x5490)    | 5467,5 (2480)   |
| VV-12,5-0,8/1,0/1,6 | 12,5                   | 116,0/145,0/232,1 (8/10/16) | 92,5x91,7x180,3 (2350x2330x4580)    | 6966,6 (3160)   |
| VV-16,0-0,8/1,0/1,6 | 16,0                   | 116,0/145,0/232,1 (8/10/16) | 92,5x91,7x219,5 (2350x2330x5575)    | 8267,3 (3750)   |
| VV-20,0-0,8/1,0/1,6 | 20,0                   | 116,0/145,0/232,1 (8/10/16) | 92,5x91,7x236,2 (2350x2330x6000)    | 9832,6 (4460)   |
| VV-25,0-0,8/1,0/1,6 | 25,0                   | 116,0/145,0/232,1 (8/10/16) | 92,5x91,7x279,1 (2350x2330x7090)    | 11089,3 (5030)  |
| VV-32,0-0,8/1,0/1,6 | 32,0                   | 116,0/145,0/232,1 (8/10/16) | 110,6x114,2x298,8 (2810x2900x7590)  | 16314,2 (7400)  |
| VV-40,0-0,8/1,0/1,6 | 40,0                   | 116,0/145,0/232,1 (8/10/16) | 110,6x114,2x384,8 (2810x2900x9775)  | 22046,2 (10000) |
| VV-50,0-0,8/1,0/1,6 | 50,0                   | 116,0/145,0/232,1 (8/10/16) | 110,6x114,2x461,4 (2810x2900x11720) | 29255,3 (13270) |
| VV-80,0-0,8/1,0/1,6 | 80,0                   | 116,0/145,0/232,1 (8/10/16) | 139,8x128,0x503,9 (3550x3250x12800) | 56217,9 (25500) |

\* Weight is indicated for the an vessels with 145,0 psig (10 barg) pressure.

U2 and UHL1 versions of air vessels can be manufactured upon the request. Horizontal version available (RG and VG types).

### Description:

U2 – operation at the temperature up to -40°F (-40°C), steel 09Г2С category 6, 12;  
 UHL1 - operation at the temperature up to -94°F (-70°C), steel 09Г2С category 8, 15;  
 RV – vertical air vessel;  
 RG – horizontal air vessel;  
 VV – air tank vertical;  
 VG – air tank horizontal.

# Tanks and Pressure Vessels





Chelyabinsk Compressor Plant, LLC offers a wide range of tanks and pressure vessels: vertical and horizontal pressure vessels with elliptical heads and matrix; horizontal pressure vessels with taper unbeaded heads, underground drain vessels, cylindrical vessels for liquid and gas non-aggressive mediums, air reservoirs, receivers etc.

Pressure vessels are applied in oil-refining, petrochemical and other hazardous industries. Pressure vessels are designed for receiving, storage, heating, separation, mixing and other operational procedures with liquid and gas substances with temperature range  $-94^{\circ}\text{F}$  -  $+392^{\circ}\text{F}$  ( $-70^{\circ}\text{C}$  -  $+200^{\circ}\text{C}$ ) (depending on construction).







**NEW!**

Watch 3D-tour at [www.chkz.ru](http://www.chkz.ru) on the page "Pumping stations"!

Chapter

**13**

## Multifunctional Pumping Stations TsNP



Chelyabinsk Compressor Plant LLC offers pumping stations for five application fields. Our specialists can develop a special technical solution in accordance with customer requirements. TsNP is a ready-to-operate pumping station

which is manufactured in compliance with Russian Standards TU 3631-399-51470687-2015 (Declaration CU TR No.TC RU T-RU.AF27.00074, scheme 5Д)

## Applications



Water supply



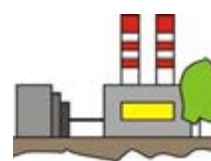
Circulating water supply



Fire-fighting system



Reservoir pressure maintenance



Oil pumping



# Available scopes of supply

## 1 Control system

- without operator's presence
- with occasional operator's presence
- manual control

## 2 Pump

- Console
- With two side input (D type)
- Multistaged (horizontal/vertical)

## 3 Drive

- electric
- diesel

## 4 Pipeline

- carbon steel (Cr20)
- cold-resistant low-alloyed steel (09Г2С)
- stainless steel (12Х18Н10Т)

## 5 Valves

- manual stop valves
- electric stop valves
- electric multipurpose valves

## 6 Suction type

- standard (minus 6 meter)
- injection (minus 20 meter)



## Operating features

### All-season

Electric heating and ventilation system ensures operation in a wide temperature range:

- -40 °C - +40 °C – standard version
- -60 °C - +40 °C – “North” version
- -40 °C - +50 °C – “Tropic” version

### Autonomy

A foundation and power supply is all you need for TsNP operation.

### Mobility

One-modular TsNP can be mounted on the chassis or sleigh upon Customer request.

# Design solutions

## 1 Construction

- rigid base (pipe 160x160)
- light arched constructions (pipe 60x80)

## 2 Heat insulation

- walls – sandwich panel (foamed polyurethane / silicate cotton)
- roof - sandwich panel (foamed polyurethane / silicate cotton)
- floor - silicate cotton

## 3 Heating

- electric (convector/fan heater)
- liquid

## 4 Ventilation

- natural
- axial fans (single-stage air exchange)
- ventilation unit (multi-stage air exchange)

## 5 Safety

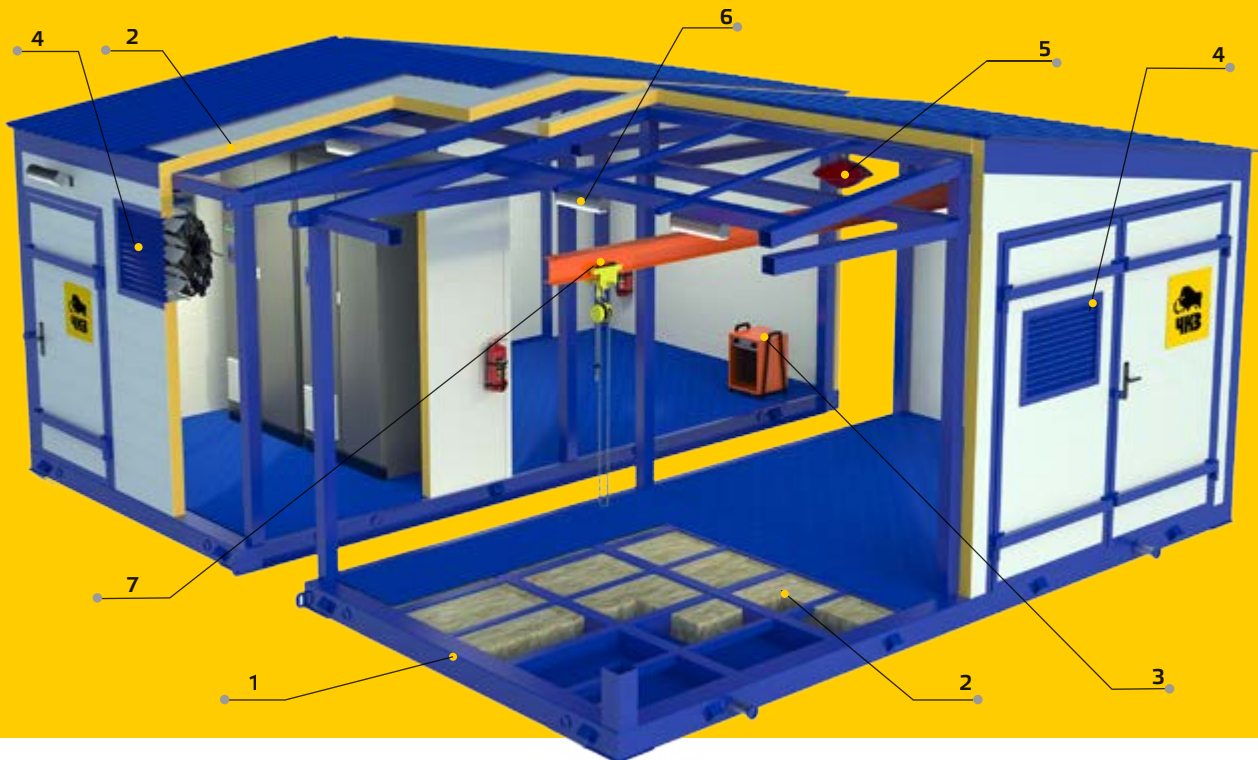
- alarm (burglar/fire)
- automatic fire-extinguishing (powder/gas)

## 6 Lightening

- main LED
- alarm LED
- outside LED

## 7 Lifting devices

- manual chain hoist 3 tons
- trolley 5 tons (rail/wheel)



## Options



Conditioning system



Anti-slip floor



Removable roof



Corporate mnemonics



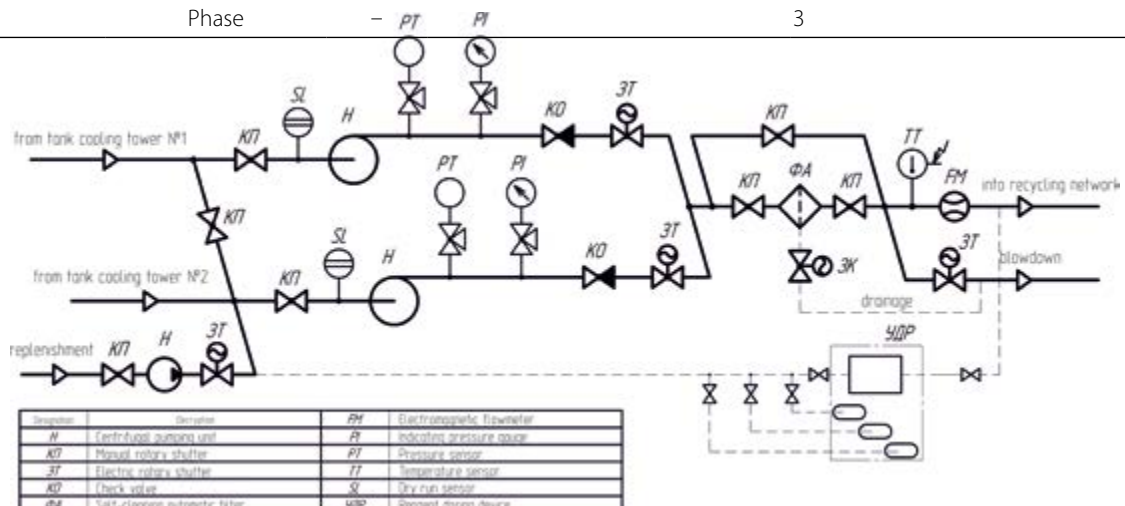


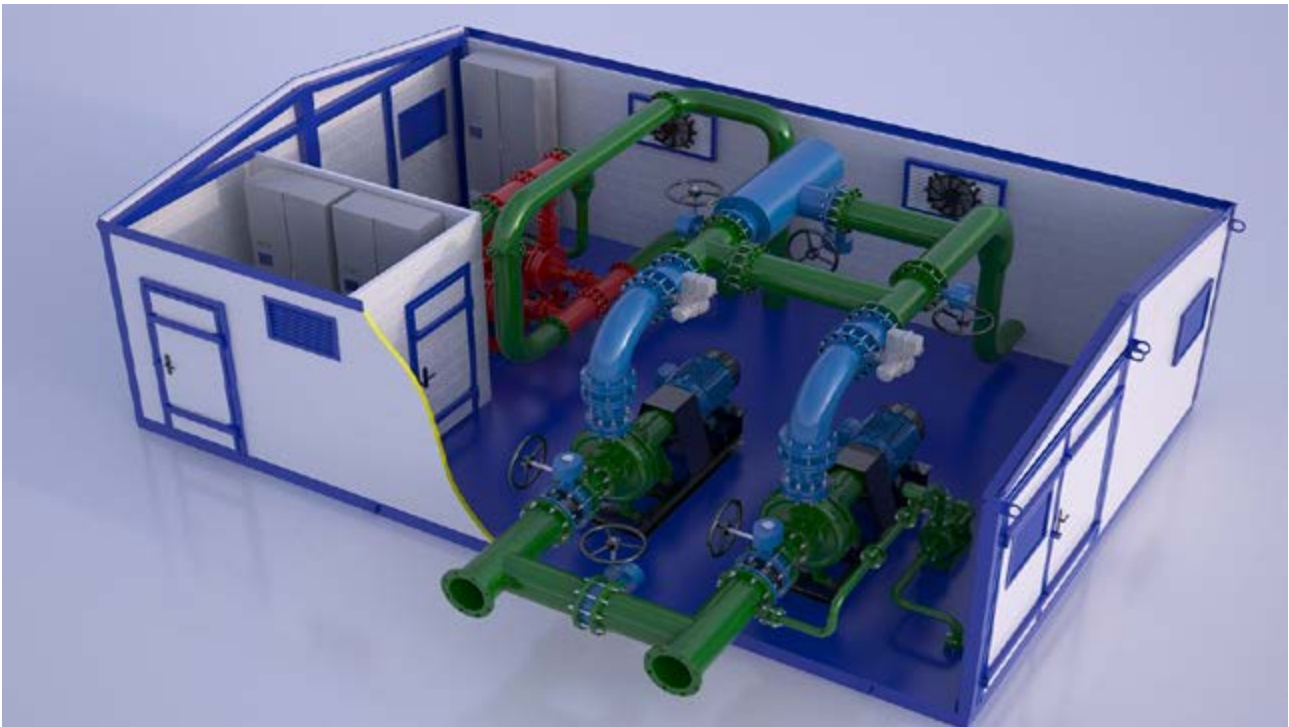
## TsNP project

Circulating water supply pumping station TsNP-2B.60.400.120AC11.4 for Metafrax PJSC formalin production workshop in Gubaha Perm Region was developed and manufactured in 2015. High requirements to its autonomy and reliability imposed.

The automation system controls the whole cooling unit (water cooling tower+pumping station), continuously controls the temperature, pressure and flow parameters and regulates the water tower heat take-off. Industrial control dispatching is arranged via ModBus RTU.

| Parameter             | Unit                 | Value                    |               |
|-----------------------|----------------------|--------------------------|---------------|
|                       |                      | Circulating water supply | Fire-fighting |
| Pumped medium         | –                    | water                    |               |
| Nominal capacity      | m <sup>3</sup> /hour | 550,0                    | 400,0         |
| Nominal pressure exc. | MPa                  | 0,45                     | 0,60          |
| Nominal power, max    | kW                   | 220                      |               |
| Pumping units         | Total                | 2                        | 2             |
|                       | Main                 | 1                        | 1             |
|                       | Backup               | 1                        | 1             |
|                       | Type                 | centrifugal, console     |               |
| Injection pump data   | Nominal capacity     | m <sup>3</sup> /hour     | 20,0          |
|                       | Nominal power        | kW                       | 1,5           |
| Power supply          | Voltage              | V                        | 380           |
|                       | Frequency            | Hz                       | 50            |
|                       | Phase                | –                        | 3             |





Loose fire-fighting unit was mounted inside the station upon the customer request. The unit has its own control cabinet and is switched on via external dry contact signal.

Pumping station consists of 3 standard modules and makes up united machinery hall with isolated electrical room.

| Parameter                                                       | Value                                  |
|-----------------------------------------------------------------|----------------------------------------|
| Heating                                                         | Electric fan heater                    |
| Ventilation                                                     | Automatic forced                       |
| Lightening                                                      | LED inside / outside                   |
| Control system                                                  | Automatic. Controller - Siemens S7 120 |
| Climatic version and station placement category (GOST 15150-64) | UHL1                                   |
| Station operation temperature, °C                               | -53...+40                              |
| Standard module dimensions (LxWxH), mm                          | 6000x2900x3100                         |
| Station dimension (LxWxH), mm                                   | 6000x8700x3100                         |
| Station weight, kg                                              | 15000                                  |







Chapter

14

## Compressed Air Treatment Equipment



## Clean air guarantees your product quality

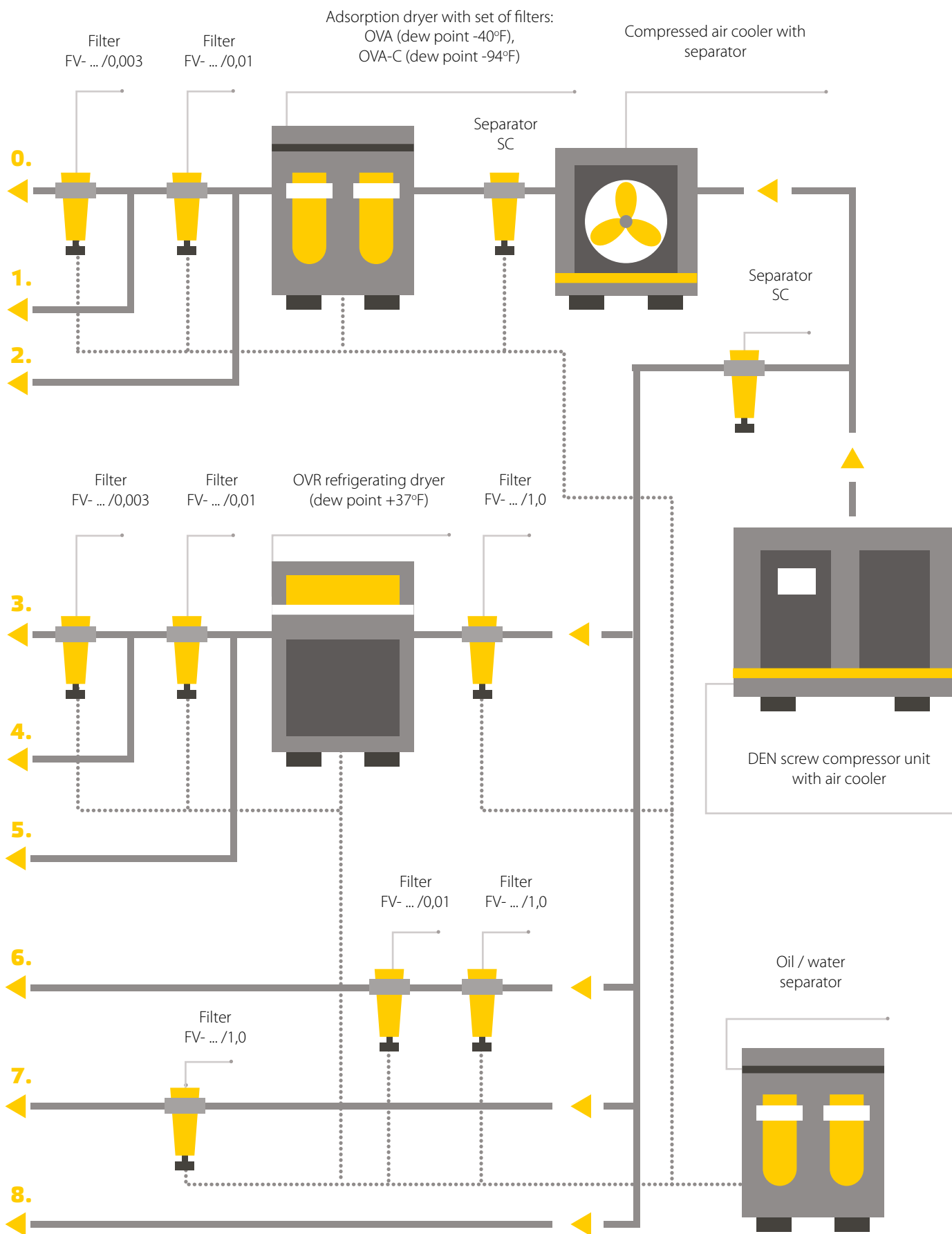
### Moisture in a compressed air line may lead-to:

- corrosion of pneumatic line inner surfaces which may result in higher pressure losses, compressed air leakages and eventually in energy consumption increase;
- deoiling of pneumatic instruments inner surfaces in higher abrasive wear, loss in performance, shorter service life and breakdown.

All these factors have adverse effect on the product quality, lead to increase of defects and as a result to client's dissatisfaction.

Specialists of Chelyabinsk Compressor Plant are ready to analyse of a compressed air system, to give certain recommendations on compressed air quality, energy efficiency, cost saving. Our specialists will select the necessary air treatment equipment to meet the customer requirements.





## Air treatment process schemes

### 0.

food industry (odor-free); minimum water vapor content (0,0033 g/m<sup>3</sup>, dew point -70 °C) (0,117 g/m<sup>3</sup>, dew point -40 °C), the finest filtration of oil (max. 0,003 mg/m<sup>3</sup>) and particles (max. 0,01 μm).

*Class higher than 1.1.1(2).  
(Russian Standards)*

### 1.

chemical plants, high-quality painting, electronic engineering, pharmaceutical industry, instrumentation equipment etc.; minimum water vapor content (0,0033 g/m<sup>3</sup>, dew point -70 °C) (0,117 g/m<sup>3</sup>, dew point -40 °C), filtration of oil (max. 0,01 mg/m<sup>3</sup>) and particles (max. 0,01 μm).

*Class 1.1.1(2).  
(Russian Standards)*

### 2.

oil and gas industry (condensate-free at working temperature up to -70°C), light industry, powder coating; minimum water vapor content (0,0033 g/m<sup>3</sup>, dew point -70 °C) (0,117 g/m<sup>3</sup>, dew point -40 °C), filtration of oil (max. 0,03 mg/m<sup>3</sup>) and particles (max. 0,01 μm).

*Class 2.1.1(2).  
(Russian Standards)*

### 3.

construction materials manufacturing, painting etc.; lower compressed air dew point (water vapor content 5,95 g/m<sup>3</sup>, dew point +3 °C), the finest filtration of oil (max. 0,003 mg/m<sup>3</sup>) and particles (max. 0,01 μm).

*Class 1.1.4.  
(Russian Standards)*

### 4.

packing, technological processes control, pneumatic instrument drive;

### 5.

sandblasting, bead-blasting in construction;

### 6.

sandblasting, bead-blasting with no specific requirements to the compressed air quality; residual oil content 0,01 mg/m<sup>3</sup>, dust particles up to 0,01 μm, 100%-humidity, oil water condensate.

*Class 1.-.1  
(Russian Standards)*

### 7.

drill-blast, air blow through, chisel hammer works;

### 8.

no requirements to the compressed air quality; residual oil content 3,5 — 5 mg/m<sup>3</sup>, dust particles up to 5 μm, 100% — humidity, oil-water condensate.

*Class 4.3.-.  
(Russian Standards)*

## Compressed Air Treatment Equipment

### Advantages of EcoTec Converter



EcoTec Converter system is designed to remove the oil from the compressed air. The EcoTec concept uses a special catalyst to convert the oil and other hydrocarbons in water and further harmless air components in a physical-chemical process. Compressed air treated with is technically oil-free (max. residual hydrocarbon vapors 0,003 mg/m). The quality of the air substantially exceeds requirements of contamination grade 1 according to GOST R ISO 8573-1-2005 (Russian Standards)) with maximum allowed oil content 0,01 mg/m<sup>3</sup>.

### Technical characteristics of EcoTec Converter

| Model                                     | Flow capacity at 101,5 psig, cfm (m <sup>3</sup> /min) | Maximum pressure, psig (barg) | Dimensions, LxWxH, in (mm)      | Weight, lb (kg) |
|-------------------------------------------|--------------------------------------------------------|-------------------------------|---------------------------------|-----------------|
| ETC-SV04                                  | 14,13 (0,4)                                            | 232,1 (16)                    | 27,5x13,3x55,0 (699x339x1397)   | 132,3 (60)      |
| ETC-SV1                                   | 35,31 (1)                                              | 232,1 (16)                    | 33,9x17,9x55,8 (860x455x1418)   | 308,6 (140)     |
| ETC-SV2                                   | 70,63 (2)                                              | 232,1 (16)                    | 33,9x17,9x63,7 (860x455x1618)   | 352,7 (160)     |
| ETC-SV5                                   | 176,57 (5)                                             | 232,1 (16)                    | 46,3x24,3x74,3 (1175x617x1887)  | 793,7 (360)     |
| ETC-SV7                                   | 247,20 (7)                                             | 232,1 (16)                    | 46,3x24,3x74,3 (1175x617x1887)  | 903,9 (410)     |
| ETC-SV10                                  | 353,15 (10)                                            | 232,1 (16)                    | 64,2x30,7x82,6 (1630x779x2098)  | 1300,7 (590)    |
| ETC-SV15                                  | 529,72 (15)                                            | 232,1 (16)                    | 64,2x30,7x82,6 (1630x779x2098)  | 1697,6 (770)    |
| ETC-SV20                                  | 706,29 (20)                                            | 232,1 (16)                    | 74,6x44,8x84,6 (1895x1138x2148) | 1984,2 (900)    |
| ETC-SV30                                  | 1059,44 (30)                                           | 232,1 (16)                    | 74,6x44,8x84,6 (1895x1138x2148) | 2425,1 (1100)   |
| ETC-S40                                   | 1412,59 (40)                                           | 232,1 (16)                    | 87,4x35,4x88,2 (2220x900x2240)  | 3306,9 (1500)   |
| ETC-S50                                   | 1765,73 (50)                                           | 232,1 (16)                    | 87,4x35,4x88,2 (2220x900x2240)  | 3747,9 (1700)   |
| <b>EcoTec Converter for high pressure</b> |                                                        |                               |                                 |                 |
| ETC-MS6                                   | 204,83 (5,8)                                           | 652,7 (45)                    | 37,9x18,4x59,8 (963x467x1518)   | 485,0 (220)     |
| ETC-MS12                                  | 406,12 (11,5)                                          | 652,7 (45)                    | 37,9x18,4x59,8 (963x467x1518)   | 595,2 (270)     |

*Absolutely oil-free air – pure water condensate.*

Extremely robust performance characteristics of oil-injected screw compressor together with outstanding qualities of EcoTec Converter help to achieve the following parameters:

- guaranteed oil-free compressed air; oil/carbonate content max. 0,001 mg/m<sup>3</sup>;
- condensate separated in pneumatic system elements after EcoTec Converter, requires no further purification, as a result oil separators for condensate not necessary;
- low energy consumption (~ 5 W/m<sup>3</sup>);
- long working period (20 000 hours) before a catalyst agent cartridge replacement;
- absolute operating reliability because the degree of efficiency of the EcoTec Converter is independent of:
  - oil inlet concentration;
  - air humidity;
  - inlet temperature;
- full automation, as a result no continuous attendance is required and corresponding costs are eliminated;
- bacterial destruction in EcoTec Converter heated air (over +320°F (+160°C)).

Chelyabinsk Compressor Plant supplies any compressor DEN with EcoTec Converter equipment.

## SC Main Cyclone Separators



### Features:

- Patented design for effective water separation – more than 99%.
- Automatic drain, safe drain, safety valve and observation hole.
- Anodized aluminum alloy housing covered with epoxy inside and with dry powder coating – more than 10 years warranty.
- No filter – no need to replace filter.

### Main characteristics:

- Max. working pressure: 232,1 psig (16 barg)
- Max. working temperature: 150,8°F (66°C)
- Pressure drop: 0,15 psig (0,01 barg)

## Technical characteristics of SC separators

| Model     | Flow capacity at STP*,<br>cfm (m <sup>3</sup> /min) | Dimensions, DxH, in (mm) | Pressure drop, psig<br>(barg) | Weight, lb<br>(kg) |
|-----------|-----------------------------------------------------|--------------------------|-------------------------------|--------------------|
| SC-140R   | 52,97...88,29 (1,5...2,5)                           | 3,54x8,07 (90x205)       |                               | 2,2 (1,0)          |
| SC-220R   | 81,22...134,20 (2,3...3,8)                          | 3,54x9,06 (90x230)       |                               | 2,4 (1,1)          |
| SC-270R   | 102,41...194,23 (2,9...5,5)                         | 3,54x10,04 (90x255)      |                               | 2,4 (1,1)          |
| SC-540R   | 187,17...441,43 (5,3...12,5)                        | 4,72x12,13 (120x308)     |                               | 6,0 (2,7)          |
| SC-1260R  | 409,65...971,15 (11,6...27,5)                       | 6,30x21,26 (160x540)     |                               | 13,0 (5,9)         |
| SC-2500R  | 858,15...1571,50 (24,3...44,5)                      | 7,87x 23,62 (200x600)    |                               | 28,4 (12,9)        |
| SC-2500F  | 858,15...1571,50 (24,3...44,5)                      | 15,75x42,52 (400x1080)   | 0,15 (0,01)                   | 28,4 (12,9)        |
| SC-2900R  | 1101,82...1801,05 (31,2...51,0)                     | 7,87x 23,62 (200x600)    |                               | 48,3 (21,9)        |
| SC-2900F  | 1101,82...1801,05 (31,2...51,0)                     | 18,90x42,13 (480x1070)   |                               | 68,3 (31)          |
| SC-3600F  | 1377,27...2436,71 (39,0...69,0)                     | 18,90x45,28 (480x1150)   |                               | 202,8 (92)         |
| SC-6500F  | 2295,45...4061,19 (65,0...115,0)                    | 25,20x 48,43 (640x1230)  |                               | 352,7 (160)        |
| SC-10800F | 4131,82...6709,79 (117,0...190,0)                   | 29,53x36,22 (750x920)    |                               | 767,2 (348)        |
| SC-17300F | 6356,64...10770,97 (180,0...305,0)                  | 29,13x39,76 (740x1010)   |                               | 1124,4 (510)       |
| SC-26000F | 9888,11...16174,12 (280,0...458,0)                  | 39,37x 38,98 (1000x990)  |                               | 1459,5 (662)       |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

**R** – thread connection, **F** – flange connection, **SC** – cyclone separator

Example of explanation:

**SC – 140R**

└─ thread connection  
└─ air flow capacity, m<sup>3</sup>/h

**SC – 2900F**

└─ flange connection  
└─ air flow capacity, m<sup>3</sup>/h

## Correction factors of SC separators

| Pressure, psig<br>(barg) | 14,5 (1) | 43,5 (3) | 72,5 (5) | 101,5 (7) | 130,5 (9) | 159,5 (11) | 188,5 (13) | 217,6 (15) | 246,6 (17) | 290,7 (20) |
|--------------------------|----------|----------|----------|-----------|-----------|------------|------------|------------|------------|------------|
| Factor                   | 0,5      | 0,71     | 0,87     | 1,0       | 1,12      | 1,22       | 1,32       | 1,41       | 1,50       | 1,62       |



## FV Main Air Filters

Compressed air is usually polluted with solid abrasive particles: dust, dirt, generated in pipelines rust, as well as compressor oil, water and acid condensate, vapor, carbohydrates.

If these contaminants are not removed, the costs for pneumatic equipment and tools technical maintenance increases and products quality decreases.



### Features:

- Internal surface of the filter housing has high-quality anticorrosion protection and fully conform with standards for high pressure vessels. In normal operation conditions 15-year life time is guaranteed. Filter housing is adapted to a great variety of original filters.
- In filter elements of 035 - 800 size the aerodynamic technologies are applied. Inlet nozzle with modified 90-gradus elbow eliminates turbulence and minimizes local resistance.
- A cone type diffuser at the filter element base is used – flow diffusion expands the filter area.
- An adjusting pin simplifies filter element replacement.
- Filter elements are produced from high-performance filter material.

### Main characteristics:

Nominal working pressure .....87 psig ~ 116 psig (6 barg ~ 8 barg)  
 Permissible intake temperature.....≤ 140°F (60°C)  
 Ambient temperature.....: .....≤ 104°F (40°C)

Pressure drop:  
 dry air.....≤ 1 psig (0,07 barg)  
 wet air.....≤ 2 psig (0,14 barg)

### 5 filters types are presented available:

| Air filter | Type  | Purpose                 | Residual content        |                       |
|------------|-------|-------------------------|-------------------------|-----------------------|
|            |       |                         | Maximum concentration   | Maximum particle size |
| FV         | 3,0   | Dust filter             | 5 mg/m <sup>3</sup>     | 3 µm                  |
| FV         | 1,0   | Particle filter         | 1 mg/m <sup>3</sup>     | 1 µm                  |
| FV         | 0,01  | Oil filter              | 0,01 mg/m <sup>3</sup>  | 0,01 µm               |
| FV         | 0,001 | Super oil filter        | 0,001 mg/m <sup>3</sup> | 0,01 µm               |
| FV         | 0,003 | Activated carbon filter | 0,003 mg/m <sup>3</sup> | 0,01 µm               |

### Main technical parametres:

Explanation:

FV – air filter

1. FV – xxxx / 3,0 ..... dust filter 3µm

2. FV – xxxx / 1,0 ..... dust filter 1µm

3. FV – xxxx / 0,01 ..... oil filter 0,01 mg/m<sup>3</sup>

4. FV – xxxx / 0,001 ..... super oil filter 0,001 mg/m<sup>3</sup>

5. FV – xxxx / 0,003 ..... activated carbon filter 0,003 mg/m<sup>3</sup>

Example of explanation:

**FV – 0100/3,0**

└─ Filter element type  
 └─ Air flow capacity, m<sup>3</sup>/h

## FV filters technical characteristics

| Model     | Flow capacity at STP*, cfm<br>(m³/min) | Dimensions, DxH, in<br>(mm) | Filter element |          | Weight, lb (kg) |
|-----------|----------------------------------------|-----------------------------|----------------|----------|-----------------|
|           |                                        |                             | Model          | Quantity |                 |
| FV-0100R  | 56,50 (1,6)                            | 10,24x3,54 (260x90)         | 35E            | 1        | 4,0 (1,8)       |
| FV-0160R  | 91,82 (2,6)                            | 13,0x3,54 (330x90)          | 70E            | 1        | 4,6 (2,1)       |
| FV-0230R  | 134,20 (3,8)                           | 14,57x4,72 (370x120)        | 100E           | 1        | 7,1 (3,2)       |
| FV-0300R  | 176,57 (5,0)                           | 21,26x4,72 (540x120)        | 150E           | 1        | 9,3 (4,2)       |
| FV-0420R  | 247,20 (7,0)                           | 21,26x4,72 (540x120)        | 200E           | 1        | 10,6 (4,8)      |
| FV-0510R  | 300,17 (8,5)                           | 25,79x4,72 (655x120)        | 300E           | 1        | 11,7 (5,3)      |
| FV-0690R  | 406,12 (11,5)                          | 25,79x4,72 (655x120)        | 350E           | 1        | 13,7 (6,2)      |
| FV-0810R  | 476,75 (13,5)                          | 25,79x4,72 (655x120)        | 400E           | 1        | 20,3 (9,2)      |
| FV-1020F  | 600,35 (17,0)                          | 43,70x12,60 (1110x320)      | 600E           | 1        | 116,8 (53)      |
| FV-1380F  | 812,24 (23,0)                          | 48,43x12,60 (1230x320)      | 800E           | 1        | 127,9 (58)      |
| FV-1620F  | 953,50 (27,0)                          | 45,28x16,93 (1150x430)      | 400E           | 2        | 174,2 (79)      |
| FV-2040F  | 1200,70 (34,0)                         | 47,24x16,93 (1200x430)      | 600E           | 2        | 187,4 (85)      |
| FV-2700F  | 1589,16 (45,0)                         | 51,38x16,93 (1305x430)      | 800E           | 2        | 253,5 (115)     |
| FV-3300F  | 1942,31 (55,0)                         | 47,24x21,26 (1200x540)      | 600E           | 3        | 282,2 (128)     |
| FV-3900F  | 2295,45 (65,0)                         | 53,54x21,26 (1360x540)      | 800E           | 3        | 297,6 (135)     |
| FV-5220F  | 3072,38 (87,0)                         | 57,28x23,62 (1430x600)      | 800E           | 4        | 341,7 (155)     |
| FV-6600F  | 3884,61 (110,0)                        | 57,28x23,62 (1455x600)      | 800E           | 5        | 348,3 (158)     |
| FV-7800F  | 4590,91 (130,0)                        | 57,28x23,62 (1455x600)      | 800E           | 6        | 374,8 (170)     |
| FV-9600F  | 5650,35 (160,0)                        | 58,46x29,13 (1485x740)      | 800E           | 8        | 540,1 (245)     |
| FV-12600F | 7416,08 (210,0)                        | 64,02x29,13 (1626x740)      | 800E           | 10       | 595,2 (270)     |
| FV-15600F | 9181,81 (260,0)                        | 69,69x35,43 (1700x900)      | 1600E          | 6        | 705,5 (320)     |
| FV-18600F | 10947,55 (310,0)                       | 69,69x36,61 (1770x930)      | 800E           | 14       | 992,1 (450)     |
| FV-24600F | 14479,01 (410,0)                       | 59,06x36,61 (1500x930)      | 800E           | 19       | 959,0 (435)     |
| FV-30600F | 18010,48 (510,0)                       | 65,75x38,74 (1670x984)      | 800E           | 23       | 959,0 (435)     |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

R – thread connection, F – flange connection

## FV filters correction factors

| Pressure (barg) | 2,0  | 3,0  | 4,0  | 5,0  | 6,0  | 7,0  | 8,0  | 9,0  | 10,0 | 11,0 | 12,0 | 13,0 | 14,0 | 15,0 | 16,0 |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Factor          | 0,29 | 0,43 | 0,57 | 0,71 | 0,86 | 1,00 | 1,14 | 1,29 | 1,43 | 1,57 | 1,71 | 1,86 | 2,0  | 2,1  | 2,3  |

## OVR Refrigerated Dryers



### Main working characteristics:

|                            |                                                                |
|----------------------------|----------------------------------------------------------------|
| Inlet air temperature..... | +41°F (+5°C) < t ≤ +113°F (+45°C) (≤ +176°F (+80°C) for OVR-D) |
| Ambient temperature.....   | +41°F (+5°C) < t ≤ +104°F (+40°C)                              |
| Working pressure.....      | 29-145 psig (2-10 barg)                                        |
| Dew point.....             | 35,6-50°F (2-10°C)                                             |
| Cooling agent.....         | R134A, R407                                                    |

### Options:

- Various power supply voltage
- Thread connection NPT
- Dew point indicator
- Prefilter and after filter
- High ambient temperature
- PLC controller

### Features:

- Stable dew point
- Low pressure losses
- Operational stability for a prolonged period
- External condensate drain - easy servicing

### Dew point

In atmospheric air there's always some water vapor content which depends on air humidity and temperature. Air maximum saturation value can be reached by the temperature of atmospheric air lowering. If air temperature is decreased below this value vapor will not be able to sustain

its content in the air and will condense. This temperature value is called dew point. The notion "dew point temperature" of compressed means defines the temperature value at which water vapor contained in compressed air at the specified pressure condense. Up 80% of condensate can be removed using after

coolers, separators and drainage devices. Retained moisture can be removed by a dryer.

### Technical characteristics of the refrigerated dryers with air inlet temperature up to +113°F (+45°C)

| Model     | Flow capacity at STP* |         | Power Supply |      | Air Outlet, in. | Element Model  | Dimensions |           |            | Weight, kg |
|-----------|-----------------------|---------|--------------|------|-----------------|----------------|------------|-----------|------------|------------|
|           | m³/min                | m³/hour | V, ph, Hz    | Kw   |                 |                | Length, mm | Width, mm | Height, mm |            |
| OVR-0020  | 0,38                  | 23      | 230/1/50     | 0,32 | 1/2"            | GKO50 MX+MY    | 420        | 370       | 560        | 32         |
| OVR-0040  | 0,63                  | 38      | 230/1/50     | 0,32 | 1/2"            | GKO50 MX+MY    | 420        | 370       | 560        | 32         |
| OVR-0050  | 0,88                  | 53      | 230/1/50     | 0,37 | 1/2"            | GKO50 MX+MY    | 420        | 370       | 560        | 32         |
| OVR-0100  | 1,67                  | 100     | 230/1/50     | 0,37 | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 51         |
| OVR-0160  | 2,58                  | 155     | 230/1/50     | 0,6  | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 53         |
| OVR-0190  | 3,17                  | 190     | 230/1/50     | 0,68 | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 55         |
| OVR-0210  | 3,50                  | 210     | 230/1/50     | 0,82 | 3/4"            | GKO500 MX+MY   | 560        | 510       | 880        | 78         |
| OVR-0300  | 5,08                  | 305     | 230/1/50     | 1,08 | 1 1/2"          | GKO500 MX+MY   | 560        | 510       | 880        | 83         |
| OVR-0375  | 6,25                  | 375     | 230/1/50     | 1,27 | 1 1/2"          | GKO500 MX+MY   | 560        | 510       | 880        | 86         |
| OVR-0500  | 8,25                  | 495     | 230/1/50     | 1,07 | 2"              | GKO851 MX+MY   | 680        | 650       | 1160       | 160        |
| OVR-0630  | 10,38                 | 623     | 230/1/50     | 1,18 | 2"              | GKO1210 MX+MY  | 680        | 650       | 1160       | 165        |
| OVR-0930  | 15,50                 | 930     | 230/1/50     | 1,43 | 2"              | GKO1210 MX+MY  | 950        | 730       | 1370       | 220        |
| OVR-1200  | 20,00                 | 1200    | 230/1/50     | 1,81 | 2"              | GKO1210 MX+MY  | 950        | 730       | 1370       | 230        |
| OVR-1400  | 23,13                 | 1388    | 400/3/50     | 2,77 | 3"              | GKO1820 MX+MY  | 950        | 800       | 1460       | 270        |
| OVR-1800  | 30,00                 | 1800    | 400/3/50     | 3,14 | 3"              | GKO1820 MX+MY  | 950        | 800       | 1460       | 285        |
| OVR-2500  | 41,67                 | 2500    | 400/3/50     | 4,03 | 3"              | GKO2700 MX+MY  | 1170       | 780       | 1730       | 392        |
| OVR-2775  | 46,25                 | 2775    | 400/3/50     | 4,62 | 3"              | GKO2700 MX+MY  | 1170       | 780       | 1730       | 410        |
| OVR-3300  | 55,50                 | 3330    | 400/3/50     | 5,51 | DN100           | not in the set | 1400       | 850       | 1770       | 492        |
| OVR-3900  | 65,25                 | 3915    | 400/3/50     | 6,16 | DN100           | not in the set | 1400       | 850       | 1770       | 520        |
| OVR-5100  | 84,75                 | 5085    | 400/3/50     | 7,76 | DN100           | not in the set | 1470       | 1100      | 1930       | 696        |
| OVR-5850  | 97,50                 | 5850    | 400/3/50     | 9,92 | DN100           | not in the set | 1470       | 1100      | 1930       | 718        |
| OVR-7000  | 116,25                | 6975    | 400/3/50     | 11,1 | DN150           | not in the set | 2190       | 1070      | 1930       | 900        |
| OVR-7900  | 131,25                | 7875    | 400/3/50     | 11,9 | DN150           | not in the set | 2190       | 1070      | 1930       | 1000       |
| OVR-9000  | 150,00                | 9000    | 400/3/50     | 15   | DN150           | not in the set | 2700       | 900       | 1980       | 1400       |
| OVR-10500 | 175,00                | 10500   | 400/3/50     | 15   | DN200           | not in the set | 2700       | 900       | 1980       | 1400       |
| OVR-12500 | 208,33                | 12500   | 400/3/50     | 18,4 | DN200           | not in the set | 2550       | 1550      | 2100       | 1600       |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

## Technical characteristics of the refrigerated dryers with air inlet temperature up to +176°F (+80°C)

| Model       | Flow capacity at STP* |         | Power Supply |      | Air Outlet, in. | Element Model  | Dimensions |           |            | Weight, kg |
|-------------|-----------------------|---------|--------------|------|-----------------|----------------|------------|-----------|------------|------------|
|             | m³/min                | m³/hour | V, ph, Hz    | Kw   |                 |                | Length, mm | Width, mm | Height, mm |            |
| OBP-M-0050  | 0,7                   | 42      | 230/1/50     | 0,37 | 1/2"            | GKO50 MX+MY    | 420        | 370       | 560        | 32         |
| OBP-M-0070  | 1,1                   | 66      | 230/1/50     | 0,37 | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 51         |
| OBP-M-0100  | 1,6                   | 96      | 230/1/50     | 0,6  | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 53         |
| OBP-M-0130  | 2,17                  | 130     | 230/1/50     | 0,68 | 3/4"            | GKO150 MX+MY   | 480        | 460       | 840        | 55         |
| OBP-M-0170  | 2,8                   | 168     | 230/1/50     | 0,82 | 3/4"            | GKO150 MX+MY   | 560        | 510       | 880        | 78         |
| OBP-M-0240  | 4                     | 240     | 230/1/50     | 1,08 | 1 1/2"          | GKO500 MX+MY   | 560        | 510       | 880        | 83         |
| OBP-M-0300  | 5                     | 300     | 230/1/50     | 1,27 | 1 1/2"          | GKO500 MX+MY   | 560        | 510       | 880        | 86         |
| OBP-M-0400  | 6,6                   | 396     | 230/1/50     | 1,07 | 1 1/2"          | GKO851 MX+MY   | 680        | 650       | 1160       | 160        |
| OBP-M-0500  | 8,3                   | 498     | 230/1/50     | 1,18 | 2"              | GKO1210 MX+MY  | 680        | 650       | 1160       | 165        |
| OBP-M-0660  | 11                    | 660     | 230/1/50     | 1,43 | 2"              | GKO1210 MX+MY  | 950        | 730       | 1370       | 220        |
| OBP-M-0870  | 14,5                  | 870     | 230/1/50     | 1,81 | 2"              | GKO1210 MX+MY  | 950        | 730       | 1370       | 230        |
| OBP-M-1110  | 18,5                  | 1110    | 400/3/50     | 2,77 | 3"              | GKO1820 MX+MY  | 950        | 800       | 1460       | 270        |
| OBP-M-1380  | 23                    | 1380    | 400/3/50     | 3,14 | 3"              | GKO1820 MX+MY  | 950        | 800       | 1460       | 285        |
| OBP-M-1710  | 28,5                  | 1710    | 400/3/50     | 4,03 | 3"              | GKO2700 MX+MY  | 1170       | 780       | 1730       | 392        |
| OBP-M-2220  | 37                    | 2220    | 400/3/50     | 4,62 | 3"              | GKO2700 MX+MY  | 1170       | 780       | 1730       | 410        |
| OBP-M-2670  | 44,4                  | 2664    | 400/3/50     | 5,51 | DN100           | not in the set | 1400       | 850       | 1770       | 492        |
| OBP-M-3140  | 52,2                  | 3132    | 400/3/50     | 6,16 | DN100           | not in the set | 1400       | 850       | 1770       | 520        |
| OBP-M-4070  | 67,8                  | 4068    | 400/3/50     | 7,76 | DN100           | not in the set | 1850       | 1150      | 1600       | 696        |
| OBP-M-4680  | 78                    | 4680    | 400/3/50     | 9,92 | DN100           | not in the set | 1470       | 1080      | 1930       | 718        |
| OBP-M-5580  | 93                    | 5580    | 400/3/50     | 11,1 | DN150           | not in the set | 2190       | 1070      | 1930       | 900        |
| OBP-M-6300  | 105                   | 6300    | 400/3/50     | 11,9 | DN150           | not in the set | 2190       | 1070      | 1930       | 1000       |
| OBP-M-7200  | 120                   | 7200    | 400/3/50     | 15   | DN150           | not in the set | 2700       | 900       | 1980       | 1400       |
| OBP-M-8400  | 140                   | 8400    | 400/3/50     | 15   | DN200           | not in the set | 2700       | 900       | 1980       | 1400       |
| OBP-M-10000 | 166,67                | 10000   | 400/3/50     | 18,4 | DN200           | not in the set | 2550       | 1550      | 2100       | 1600       |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

Example:



In case your working parameters diverge from standard parameters (pressure: 101,5 psig (7 barg), temperature: 95°F (35°C)), use the correction indexes listed below for calculating flow capacity of the refrigerated dryer

Formula: Capacity = Output / (f1xf2xf3)

### Correction factors of refrigerated dryers

| Correction factor – inlet air pressure |          |          |          |          |           |           |           |            |            |            |            |
|----------------------------------------|----------|----------|----------|----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Pressure, psig (barg)                  | 43,5 (3) | 58,0 (4) | 72,5 (5) | 87,0 (6) | 101,5 (7) | 116,0 (8) | 130,5 (9) | 145,0 (10) | 159,5 (11) | 174,0 (12) | 188,5 (13) |
| Factor f1                              | 0,74     | 0,83     | 0,90     | 0,96     | 1,00      | 1,03      | 1,06      | 1,08       | 1,10       | 1,12       | 1,13       |

| Correction factor – inlet air temperature |         |         |          |          |          |          |          |
|-------------------------------------------|---------|---------|----------|----------|----------|----------|----------|
| Temperature, °F (°C)                      | 86 (30) | 95 (35) | 104 (40) | 113 (45) | 122 (50) | 131 (55) | 140 (60) |
| Factor f2                                 | 1,21    | 1,00    | 0,84     | 0,70     | 0,59     | 0,49     | 0,41     |

| Correction factor – ambient temperature |         |         |         |          |          |          |
|-----------------------------------------|---------|---------|---------|----------|----------|----------|
| Ambient temperature, °F (°C)            | 77 (25) | 86 (30) | 95 (35) | 104 (40) | 113 (45) | 122 (50) |
| Factor f3                               | 1,00    | 0,94    | 0,88    | 0,82     | 0,76     | 0,70     |



## OVA Heatless Adsorption Dryers



### Main characteristics:

|                                                 |                                               |
|-------------------------------------------------|-----------------------------------------------|
| Working pressure.....                           | 72,5-145,0 psig (5 -10 barg)                  |
| Inlet temperature.....                          | +35,6°F (+2°C) ≤ t ≤ +113°F (+45°C)           |
| Ambient temperature.....                        | +37,4°F (+3°C) ≤ t ≤ +113°F (+45°C)           |
| Pressure dew point.....                         | ≤ -40°F (-40°C)<br>(-94°F (-70 °C) for OVA-C) |
| Regeneration losses.....                        | 14,5 %                                        |
| Cycle.....                                      | 5-10 min.                                     |
| Pressure losses.....                            | ≤ 3 psi (0,21 bar)                            |
| Adsorbent.....                                  | activated alumina                             |
| Inlet oil content.....                          | ≤ 0,1 mg/m <sup>3</sup>                       |
| Power supply.....                               | 220V / 1ph / 50Hz                             |
| Pre-installed air filters                       |                                               |
| Adsorbent – molecular sieve for dew point ..... | -94°F (-70 °C)                                |

OVA dryers are adsorption dryers with alternating phases of adsorption and regeneration.

While one absorber is used for drying the medium, the other one is used for regeneration. Following regeneration the vessels are being switched and regeneration starts in the other one. This method secures continuity of the process.

The medium to be dried passes through a prefilter at the dryer inlet. Inlet micro filter eliminates condensate, air-oil mist and dirt particles.

At the absorber outlet the dried medium is led to a after filter, where the smallest dust particles and drying agent particles are caught by a dust filter. Then the dried and purified medium is directed to the working net.

### Additional options:

- Specific power supply voltages 110V / 1ph / 60Hz
- Higher protection level IP65
- Dew point gauge
- Stainless steel pipelines and components

In case your working parameters diverge from standard parameters (pressure: 101,5 psig (7 barg), temperature: 95°F (35°C)), use the correction indexes listed below for calculating flow capacity of the refrigerated dryer.

### Correction factors for heatless adsorption dryer (dew point -40°F (-40°C))

| Temperature, °F<br>(°C) | Working pressure, barg |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                         | 4,0                    | 5,0  | 6,0  | 7,0  | 8,0  | 9,0  | 10,0 | 11,0 | 12,0 | 13,0 | 14,0 | 15,0 | 16,0 |
| 77 (25)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 86 (30)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 95 (35)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 104 (40)                | 0,61                   | 0,73 | 0,85 | 0,97 | 1,10 | 1,21 | 1,34 | 1,46 | 1,58 | 1,70 | 1,82 | 1,94 | 2,07 |
| 113 (45)                | 0,55                   | 0,65 | 0,77 | 0,87 | 0,98 | 1,09 | 1,20 | 1,31 | 1,42 | 1,52 | 1,64 | 1,74 | 1,85 |

## Correction factors for heatless adsorption dryer (dew point -94°F (-70°C))

| Temperature, °F (°C) | Working pressure, barg |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                      | 4,0                    | 5,0  | 6,0  | 7,0  | 8,0  | 9,0  | 10,0 | 11,0 | 12,0 | 13,0 | 14,0 | 15,0 | 16,0 |
| 77 (25)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 86 (30)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 95 (35)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 104 (40)             | 0,61                   | 0,73 | 0,85 | 0,97 | 1,10 | 1,21 | 1,34 | 1,46 | 1,58 | 1,70 | 1,82 | 1,94 | 2,07 |
| 113 (45)             | 0,55                   | 0,65 | 0,77 | 0,87 | 0,98 | 1,09 | 1,20 | 1,31 | 1,42 | 1,52 | 1,64 | 1,74 | 1,85 |
| 122 (50)             | 0,50                   | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 | 1,70 |
| 131 (55)             | 0,40                   | 0,48 | 0,56 | 0,64 | 0,72 | 0,80 | 0,88 | 0,96 | 1,04 | 1,12 | 1,20 | 1,28 | 1,36 |

## Heatless adsorption dryers technical characteristics

| Model OVA<br>cold regeneration<br>(dew point) |                  | Flow capacity at STP* |      | Dimensions**    |                |                 | Weight**, lb (kg) |
|-----------------------------------------------|------------------|-----------------------|------|-----------------|----------------|-----------------|-------------------|
| -40°F<br>(-40°C)                              | -94°F<br>(-70°C) | m³/min                | CFM  | Length, in (mm) | Width, in (mm) | Height, in (mm) |                   |
| 0230                                          | 0230C            | 3.8                   | 134  | 28,74 (730)     | 15,75 (400)    | 67,32 (1710)    | 529,10 (240)      |
| 0300                                          | 0300C            | 5.0                   | 176  | 35,43 (900)     | 20,47 (520)    | 69,29 (1760)    | 564,38 (256)      |
| 0360                                          | 0360C            | 6.0                   | 211  | 35,43 (900)     | 20,47 (520)    | 69,29 (1760)    | 621,70 (282)      |
| 0420                                          | 0420C            | 7.0                   | 247  | 35,43 (900)     | 20,47 (520)    | 71,46 (1815)    | 683,43 (310)      |
| 0480                                          | 0480C            | 8.0                   | 283  | 35,43 (900)     | 20,47 (520)    | 79,13 (2010)    | 753,97 (342)      |
| 0600                                          | 0600C            | 10.0                  | 354  | 39,37 (1000)    | 22,44 (570)    | 75,39 (1915)    | 881,84 (400)      |
| 0720                                          | 0720C            | 12.0                  | 425  | 39,37 (1000)    | 22,44 (570)    | 83,66 (2125)    | 1141,98 (518)     |
| 0860                                          | 0860C            | 14.0                  | 507  | 48,03 (1220)    | 24,21 (615)    | 77,76 (1975)    | 1313,94 (596)     |
| 0960                                          | 0960C            | 16.0                  | 566  | 50,00 (1270)    | 25,39 (645)    | 85,63 (2175)    | 1620,38 (735)     |
| 1200                                          | 1200C            | 20.0                  | 708  | 57,48 (1460)    | 30,12 (765)    | 82,87 (2105)    | 1973,12 (895)     |
| 1500                                          | 1500C            | 25.0                  | 885  | 61,81 (1570)    | 29,13 (740)    | 87,20 (2215)    | 2195,78 (996)     |
| 1800                                          | 1800C            | 30.0                  | 1062 | 62,99 (1600)    | 34,45 (875)    | 75,59 (1920)    | 2303,81 (1045)    |
| 2100                                          | 2100C            | 35.0                  | 1239 | 71,26 (1810)    | 34,45 (875)    | 93,11 (2365)    | 2524,27 (1145)    |
| 2580                                          | 2580C            | 43.0                  | 1522 | 71,26 (1810)    | 34,45 (875)    | 102,36 (2600)   | 3075,42 (1395)    |
| 3300                                          | 3300C            | 55.0                  | 1947 | 84,65 (2150)    | 41,73 (1060)   | 100,39 (2550)   | 3637,59 (1650)    |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

\*\*Dimensions and weight are indicated excluding filters

Example:

Adsorption air dryer
**OVA – 0050 C**
Dew point -94°F (-70°C)

Air flow capacity, m³/h

## OVA-T Heated Adsorption Dryers



### Main characteristics:

|                          |                                                |
|--------------------------|------------------------------------------------|
| Working pressure.....    | 72,5-145,0 psig (5 -10 barg)                   |
| Inlet temperature.....   | +35,6°F (+2°C) ≤ t ≤ +113°F (+45°C)            |
| Ambient temperature..... | +37,4°F (+3°C) ≤ t ≤ +113°F (+45°C)            |
| Pressure dew point.....  | ≤ -40°F (-40°C)<br>(-94°F (-70 °C) for OVA-TC) |
| Regeneration losses..... | 6 %                                            |
| Cycle.....               | 120 minutes                                    |
| Pressure losses.....     | ≤ 3 psi (0,21 bar)                             |
| Adsorbent.....           | activated alumina                              |
| Inlet oil content.....   | ≤ 0,1 mg/m <sup>3</sup>                        |
| Power supply.....        | 380V / 3ph / 50Hz                              |

### Features:

- Adsorption is supported by excess pressure, regeneration process occurs with application of heat.
- Prolonged switching cycle.
- Regeneration by high temperature of the electric heater. Regeneration cycle: heating + purge cooling.
- Heated dry air is used as gas for regeneration and cooling, air consumption is minimal.
- Simple process, low failure rate, low investment value.
- User-friendly.
- Automatic operation, no permanent staff attendance.
- Pre-filters.
- Adsorbent is a molecular sieve for dew point -94°F (-70°C).



### Options:

- Specific power supply voltages 110V / 1ph / 60Hz
- Higher protection level IP65
- Dew point sensor
- Stainless steel pipelines and components

In case your working parameters diverge from default parameters (pressure: 101,5 psig (7 barg), temperature: 95°F (35°C)), the correction indexes listed below for calculating flow capacity of the refrigerated dryer use.

## Correction factors for heated adsorption dryers (dew point -40°F (-40°C))

| Temperature, °F<br>(°C) | Working pressure, barg |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                         | 4,0                    | 5,0  | 6,0  | 7,0  | 8,0  | 9,0  | 10,0 | 11,0 | 12,0 | 13,0 | 14,0 | 15,0 | 16,0 |
| 77 (25)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 86 (30)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 95 (35)                 | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 104 (40)                | 0,61                   | 0,73 | 0,85 | 0,97 | 1,10 | 1,21 | 1,34 | 1,46 | 1,58 | 1,70 | 1,82 | 1,94 | 2,07 |
| 113 (45)                | 0,55                   | 0,65 | 0,77 | 0,87 | 0,98 | 1,09 | 1,20 | 1,31 | 1,42 | 1,52 | 1,64 | 1,74 | 1,85 |

## Correction factors for heated adsorption dryers (dew point -94°F (-70°C))

| Temperature, °F (°C) | Working pressure, barg |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                      | 4,0                    | 5,0  | 6,0  | 7,0  | 8,0  | 9,0  | 10,0 | 11,0 | 12,0 | 13,0 | 14,0 | 15,0 | 16,0 |
| 77 (25)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 86 (30)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 95 (35)              | 0,63                   | 0,75 | 0,88 | 1,0  | 1,13 | 1,25 | 1,38 | 1,5  | 1,63 | 1,75 | 1,88 | 2,0  | 2,13 |
| 104 (40)             | 0,61                   | 0,73 | 0,85 | 0,97 | 1,10 | 1,21 | 1,34 | 1,46 | 1,58 | 1,70 | 1,82 | 1,94 | 2,07 |
| 113 (45)             | 0,55                   | 0,65 | 0,77 | 0,87 | 0,98 | 1,09 | 1,20 | 1,31 | 1,42 | 1,52 | 1,64 | 1,74 | 1,85 |
| 122 (50)             | 0,50                   | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 | 1,10 | 1,20 | 1,30 | 1,40 | 1,50 | 1,60 | 1,70 |
| 131 (55)             | 0,40                   | 0,48 | 0,56 | 0,64 | 0,72 | 0,80 | 0,88 | 0,96 | 1,04 | 1,12 | 1,20 | 1,28 | 1,36 |

## Heated adsorption dryers technical characteristics

| Model OVA<br>heat regeneration<br>(dew point) |                  | Flow capacity at<br>STP* |      | Heater, kW | Dimensions**    |                |                 | Weight**, lb<br>(kg) |
|-----------------------------------------------|------------------|--------------------------|------|------------|-----------------|----------------|-----------------|----------------------|
| -40°F<br>(-40°C)                              | -94°F<br>(-70°C) | m³/min                   | CFM  |            | Length, in (mm) | Width, in (mm) | Height, in (mm) |                      |
| 0230T                                         | 0230TC           | 3.8                      | 134  | 1.5        | 40,16 (1020)    | 18,70 (475)    | 69,09 (1755)    | 555,56 (252)         |
| 0300T                                         | 0300TC           | 5.0                      | 176  | 1.8        | 40,16 (1020)    | 18,70 (475)    | 69,09 (1755)    | 593,04 (269)         |
| 0360T                                         | 0360TC           | 6.0                      | 211  | 2.1        | 40,16 (1020)    | 18,70 (475)    | 76,97 (1955)    | 652,56 (296)         |
| 0420T                                         | 0420TC           | 7.0                      | 247  | 2.4        | 40,16 (1020)    | 18,70 (475)    | 86,02 (2185)    | 718,70 (326)         |
| 0480T                                         | 0480TC           | 8.0                      | 283  | 2.4        | 41,34 (1050)    | 20,47 (520)    | 78,74 (2000)    | 791,45 (359)         |
| 0600T                                         | 0600TC           | 10.0                     | 354  | 4.5        | 48,43 (1230)    | 23,82 (605)    | 76,77 (1950)    | 925,93 (420)         |
| 0720T                                         | 0720TC           | 12.0                     | 425  | 4.5        | 48,43 (1230)    | 23,82 (605)    | 83,86 (2130)    | 1199,30 (544)        |
| 0860T                                         | 0860TC           | 14.0                     | 507  | 5.4        | 61,81 (1570)    | 28,35 (720)    | 76,77 (1950)    | 1380,08 (626)        |
| 0960T                                         | 0960TC           | 16.0                     | 566  | 7.5        | 61,81 (1570)    | 28,35 (720)    | 77,95 (1980)    | 1701,95 (772)        |
| 1200T                                         | 1200TC           | 20.0                     | 708  | 9          | 61,81 (1570)    | 28,35 (720)    | 84,25 (2140)    | 2072,32 (940)        |
| 1500T                                         | 1500TC           | 25.0                     | 885  | 10.8       | 66,93 (1700)    | 32,68 (830)    | 83,86 (2130)    | 2303,81 (1045)       |
| 1800T                                         | 1800TC           | 30.0                     | 1062 | 15         | 66,93 (1700)    | 32,68 (830)    | 93,70 (2380)    | 2418,45 (1097)       |
| 2100T                                         | 2100TC           | 35.0                     | 1239 | 18         | 66,93 (1700)    | 32,68 (830)    | 103,54 (2630)   | 2649,93 (1202)       |
| 2580T                                         | 2580TC           | 43.0                     | 1522 | 22.5       | 84,65 (2150)    | 41,73 (1060)   | 98,43 (2500)    | 3229,74 (1465)       |
| 3300T                                         | 3300TC           | 55.0                     | 1947 | 28.8       | 79,92 (2030)    | 39,76 (1010)   | 104,33 (2650)   | 3820,57 (1733)       |

\* - STP stands for temperature 68°F (20°C) and absolute pressure 14,7 psig (1 barg)

\*\*Dimensions and weight are indicated excluding filters

Example:

Adsorption air dryer ———— **OVA-0050 T C** ———— Dew point -94°F (-70°C)  
Air flow capacity, m³/h ———— In regeneration process heat energy is used





## CHELYABINSK COMPRESSOR PLANT



### GEOGRAPHY

● Dealers and service centers

● Dealers

## CONTACTS

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«CHKZ» LLC is entitled to change technical characteristics of its equipment without a preliminary notice.

Please check current characteristics on our web site [www.chkz.ru](http://www.chkz.ru) or by phone **+7 (351) 216-50-50**.

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