

Centrifugal Compressors



P-DNR202305-08 Specifications are subject to change without prior notice.
Never use compressed air as breathing air without prior purification in accordance with local legislation and standards.



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Centrifugal Compressor

Core Technology



01 Impeller



Model processing



Grid division

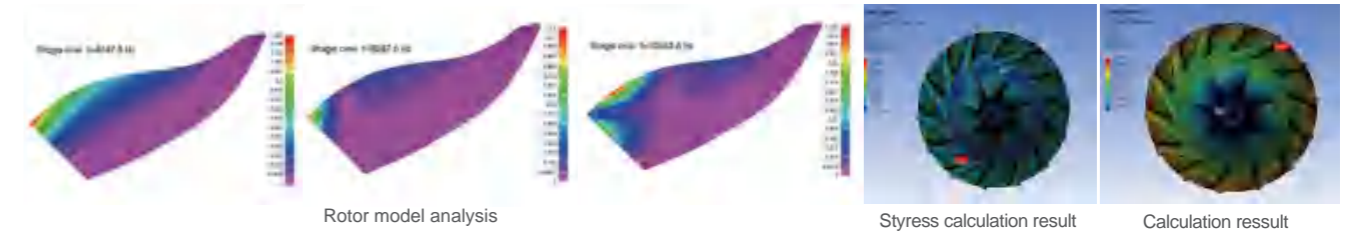


Boundary condition

02 Pneumatic Design Section

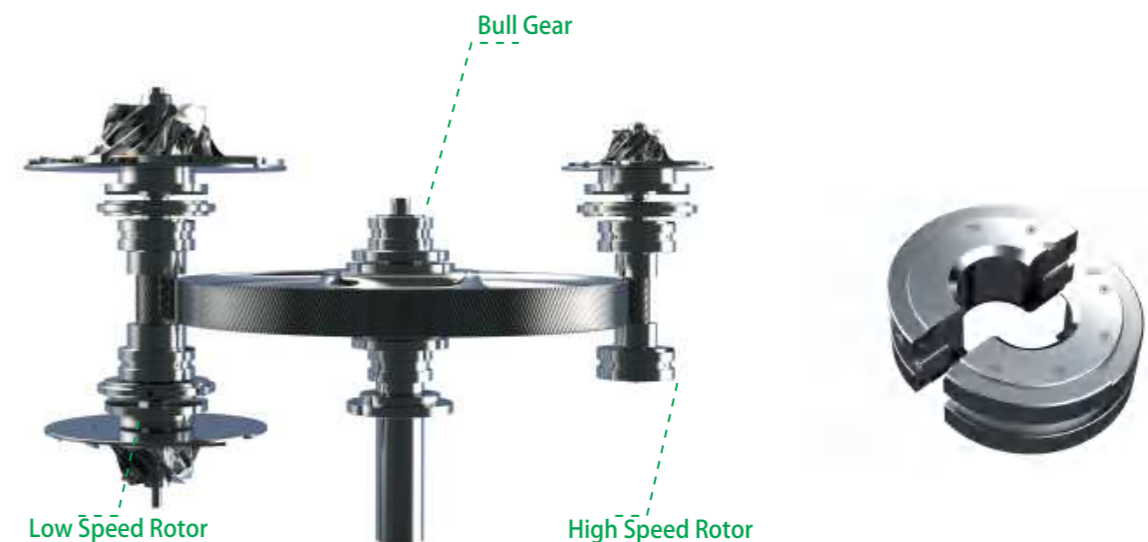
The aerodynamic design of Denair centrifugal compressors applies advanced aerodynamic principles, combined with self-developed high-efficiency modeling software, CFD simulation and other means, to ensure optimal inter-stage compression ratio distribution and stable reliability; The long-term product verification design experience, rich impeller database and design software of Denair team ensure the superiority of aerodynamic design.

03 Impeller Strength Analysis



The finite element analysis software is used to simulate the stress and deformation of the impeller under the design conditions. The results of stress analysis provide a scientific basis for checking the strength of the impeller, prevent accidents due to local stress concentration and insufficient strength of the impeller during the actual operation of the unit. The calculated axial and radial deformations are the values of the gap between the impeller and the inlet cylinder. It provides a reference to prevent the impeller and the intake cylinder from scraping each other when the unit is running, resulting in impeller damage and other major failures.

04 Rotor Dynamics Design



Professionally designed rotors and bearings ensure that they can operate under reasonable oil film temperature, pressure and thickness, effectively reducing bearing power consumption. Through extracting the stiffness and damping data from a large number of bearings, DENAIR conduct rotor dynamics analysis to ensure reasonable vibration value of the rotor as well as ensuring the rated speed setting is far away from the critical speed and enhancing the stability of the whole machine.

05 High Reliability Bearing

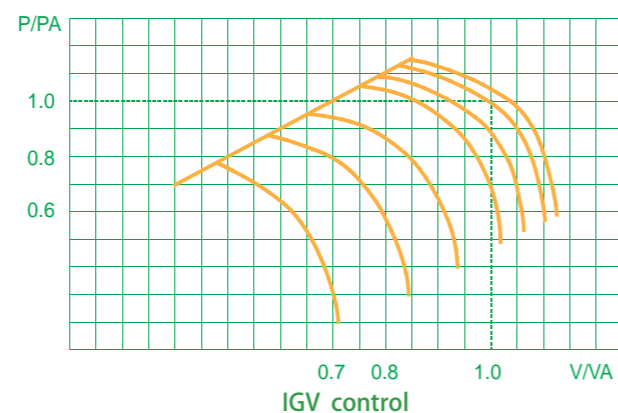
Through the professional design of rotor dynamics, the tilting pad bearing with high load capacity and low vibration is adopted. The bearing bush can be automatically adjusted according to the load and temperature changes, so as to ensure the stable operation of the unit under various harsh working conditions.

06 Integral Casting Gearbox-Modular Integrated Assembly



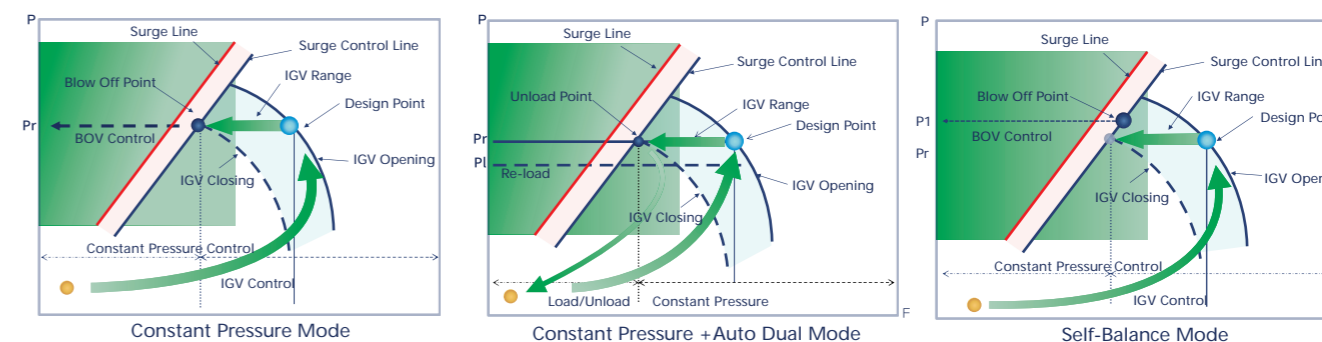
Adopting modular design, the horizontally split gearbox is integrally cast with volutes at all stages while the cooler box is integrally cast design. Compared with the splitted and welded gearbox, compression unit of horizontal one is with higher strength mechanism, fewer processing surfaces, more reliable operation and there is no assembly error, no deformation, low noise and low vibration between the volute and the gear box at all stages. Compared with integral casting, processing, assembly, transportation, on-site installation and maintenance for our coolers are simpler. When compression unit needs to be returned to the factory for overhaul, the integral casting requires larger lifting equipment and destroys the installation foundation, resulting in secondary installation but ours, which is modular design, perfectly solve this problem.

07 High Performance IGV



The electric actuator drives the airfoil stainless steel blades, precisely controls the opening of the inlet guide vanes, changes the pre-swirl value of the intake air, and improves the operating efficiency of the centrifugal compressor. When the compressed air demand is reduced, the IGV can save up to about 9% energy consumption, making the centrifugal compressor run efficiently and energy-saving.

08 Intelligent Control System



Denair DAC series centrifugal compressor control system can realize three operating modes: full constant pressure mode, automatic dual mode and self-balancing mode. It can intelligently adjust according to the actual operation conditions and gas demand of customers to ensure that the equipment is always in a state of high efficiency, energy saving and stable operation.

09 Control Cabinet



The highly integrated control cabinet adopts Siemens PLC with touch display screen, which is concise and clear and easy-to-operate. Our controller supports multi-languages switching and all parameters read and displayed in real time, especially key information like running curves and numbers. Meanwhile, automatic alarm, chain shutdown protection, anti-surge and surge prediction functions are available to ensure the safety and reliability of equipment operation.

10 Quality Control



Denair implements the product concept of "design and development, precision manufacturing, professional assembly, test verification, operation optimization, marketing, efficient service, sustainable development" to realize all-round testing and verification of key design results, such as product aerodynamic design, structural strength, vibration, transmission efficiency, heat exchange, pressure loss and overall machine efficiency, so as to ensure that each product developed has the advanced level of similar products in the world in terms of structure, performance, reliability and ease of use.

Centrifugal Compressor Structural Composition



11 Product Application Field

Denair centrifugal compressors are 100% oil-free and could be custom-made, widely favored in metallurgy, chemical industry, textile, chemical fiber, medicine, automobile manufacturing, aerospace and other industries.



CHEMICAL INDUSTRY

- A. Compressed air acts as an oxidation reaction gas
- B. Compressed air acts as a power source
- C. Refining and production of hydrogen peroxide



AUTOMOTIVE/MANUFACTURING INDUSTRY

- A. Pneumatic, instrument, stamping, electroplating, painting, heat treatment and other production lines
- B. Pneumatic wrench, pneumatic grinder, dust blowing gun, and other end tools
- C. Protection gas, cooling, dust removal, cleaning



AEROSPACE INDUSTRY

- A. Engine Simulation Wind Tunnel
- B. High-altitude platform test system
- C. Pneumatic component test system



METAL SMELTING INDUSTRY

- A. Air separation to produce nitrogen, oxygen, etc.
- B. Used as process instrument gas for iron making, sintering, steel rolling, etc.
- C. As instrument gas for alumina, electrolytic aluminum, lead and zinc smelting, etc.



TEXTILE AND CHEMICAL FIBER INDUSTRY

- A. Used for weft insertion in air-jet textiles
- B. Pressurize the roll
- C. As splicing and instrumentation gas

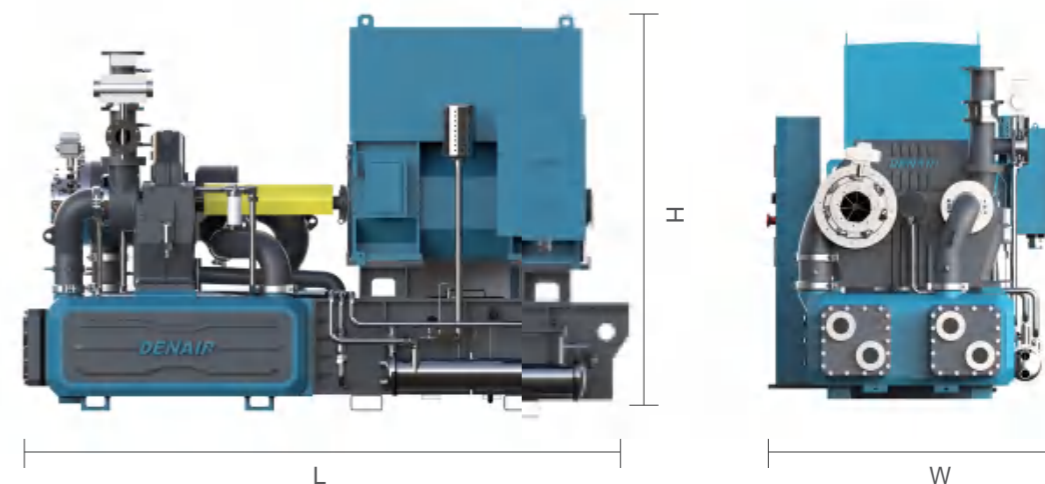


PHARMACEUTICAL INDUSTRY

- A. For biological fermentation
- B. For chemical raw material production and preparation

Parameter Selection

According to customers' demand, the models with matching flow and pressure can be customized.



DAC50-DAC450

Model	Pressure range(barg)	Flow range (m³/min)	Motor power		Dimensions(mm)			Weight kg
			kW	hp	L	W	H	
DAC50	0.6-8.0	25-48	132-263	175-350	2650	1650	1850	3860
DAC80	0.6-10	40-85	225-450	300-600	3350	1860	2150	6500
DAC120	0.6-13	75-123	400-630	535-850	3850	2100	2250	8250
DAC200	0.6-13	115-208	618-1120	830-1500	4250	2150	2350	11500
DAC250	0.6-20	175-260	925-1375	1250-1850	4500	2250	2380	16000
DAC300	0.6-25	228-310	1225-1600	1650-2200	4650	2250	2450	17500
DAC350	0.6-25	283-360	1500-1850	2000-2500	4850	2250	2500	18500
DAC450	0.6-25	350-460	1800-2350	2400-3150	5250	2300	2950	21500

Note: For detailed parameters, please consult with Denair team.

DAC550-DAC3000

Model	Pressure range(barg)	Flow range (m³/min)	Motor power		Dimensions(mm)			Weight kg
			kW	hp	L	W	H	
DAC550	0.6-25	430-586	2250-3150	3000-4200	6250	4550	3550	41500
DAC1000	0.6-25	550-1015	2850-5000	3800-6750	8350	4800	3850	45500
DAC1500	0.6-25	920-1650	4500-7850	6000-10500	12500	5150	4550	62500
DAC3000	0.6-25	1680-3000	7980-14500	10800-20000	14500	5850	5350	78500

Note: For detailed parameters, please consult with Denair team.

Turbocharger series

Model	Inlet pressure range (barg)	Flow range (m³/min)	Outlet pressure range (barg)	Motor power		Dimensions(mm)			Weight kg
				kW	hp	L	W	H	
DAC550-HB	0.3-1.0	436-586	16-50	1214-1758	1628-2358	5250	3250	2850	25000
DAC1000-HB	0.3-1.0	550-1020	16-50	1925-3570	2581-2446	5850	3550	3150	32500
DAC1500-HB	0.3-1.0	920-1650	16-50	3220-5775	4318-7744	6500	4350	3550	42500
DAC3000-HB	0.3-1.0	1680-3000	16-50	5880-10500	7885-14080	7500	5350	4250	58500

Note: For detailed parameters, please consult with Denair team.