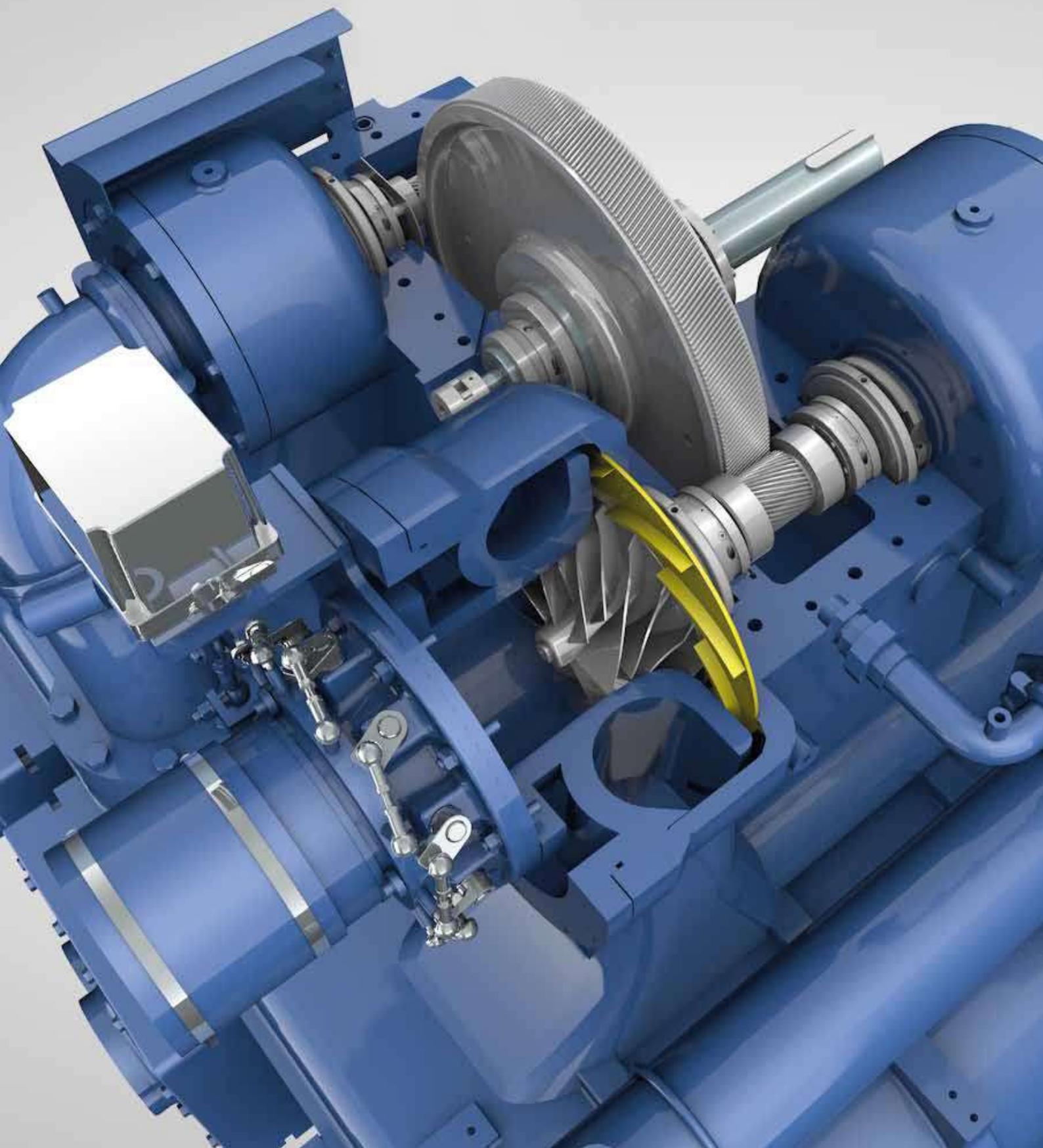


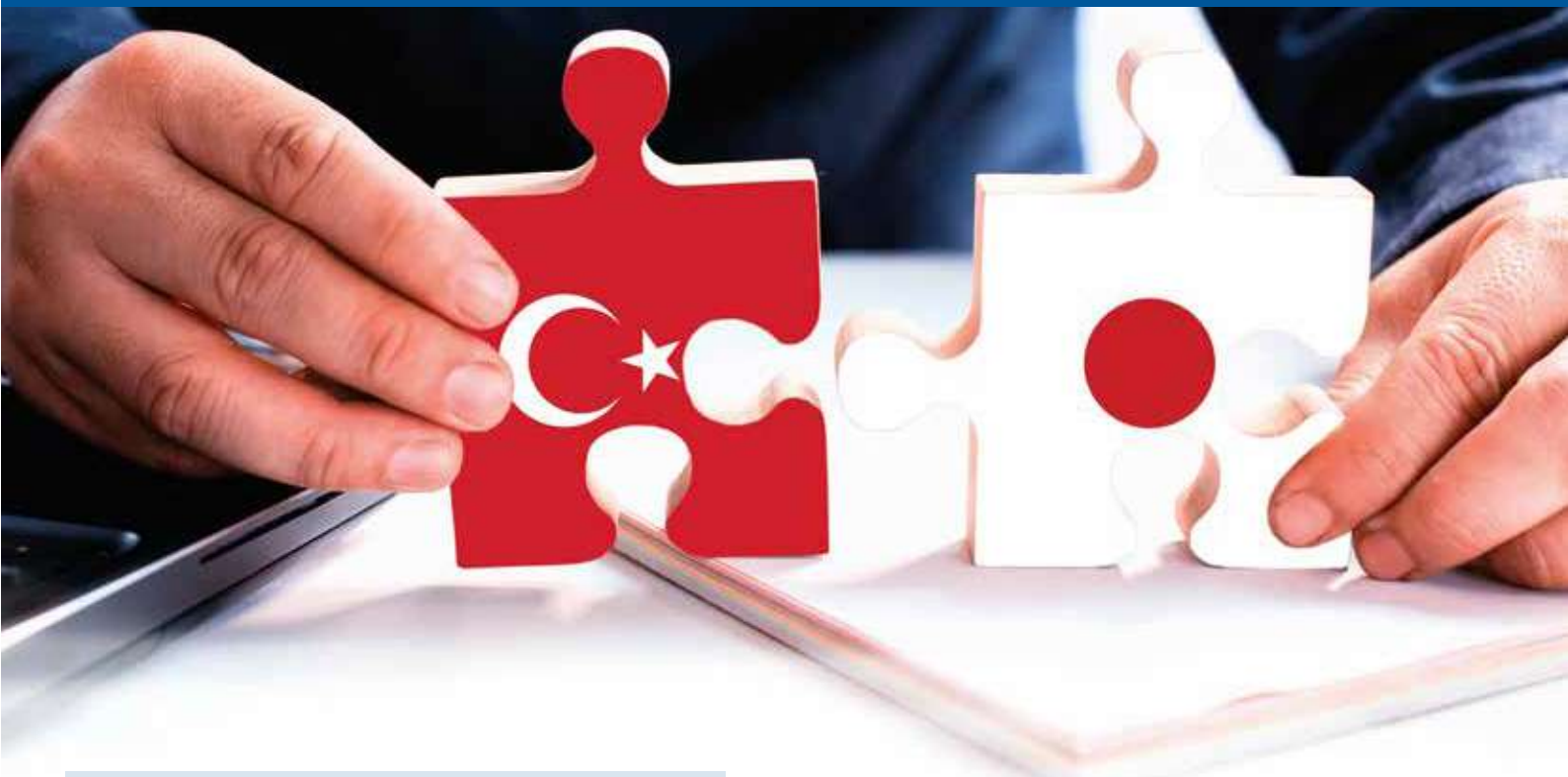


ID TURBO

COMPRESSOR







IHI DALGAKIRAN Machine Industry and Trade Inc. is a Joint Venture invested by Japanese IHI Corporation and Turkish **DALGAKIRAN** Compressor, in order to design, produce, sale and service Centrifugal Turbo Compressors. With the world advanced technology and worldwide marketing network, **IHI DALGAKIRAN** is the first and only Turbo Compressor Manufacturer in Turkey.

IHI Corporation, established in 1853, is one of Japan's leading heavy industries, which has wide operation range in social infrastructure and overseas facilities, bridges and steel structures, industrial systems and general-purpose machinery, in particular aircraft engines, aerospace and defense industries. In Japan, IHI's market share for turbo compressors reaches around %80.

DALGAKIRAN COMPRESSOR, who is one of the leading air compressor producer in the world which has developed an international Compressed Air Sales & Service network worldwide, has been developing and manufacturing air compressors with proven reliability and wear-free durability since 1965. Worldwide, DALGAKIRAN compressors are known via its quality, after sales services, durability and longevity.

IHI DALGAKIRAN produce a variety of tailor made oil-free turbo compressors. The applications for **IHI DALGAKIRAN** oil free compressed air has wide range for such industries;

- Iron & Steel and Foundries
- Textile
- Plastic & Rubber
- Cement
- Automotive & Sub-industry
- Glass Production
- Pharmaceuticals
- Refineries, Petrochemical & Chemical
- Power Generation and Gas Supply
- Construction
- FMCG (Food & Beverages)
- Mining
- Marine
- Oil & Gas
- Aerospace
- Renewables and Energy Recovery
- Electronics Components and Semiconductor Manufacturing



YOUR BEST CHOICE,

IHI DALGAKIRAN's Turbo (Centrifugal) compressors are designed to be simple and reliable to provide easy maintenance, stable operation and maximum lifetime. The gearbox and air coolers are designed in a single, robust and compact body. The inlet guide vane (IGV) modulates the intake air to provides precise capacity control. The IGV control blades increase the efficiency of the compressor by providing pre-swirl flow of suction air.

Designed with the power of a deep-rooted engineering experience and the contribution of CFD technology, the Titanium impellers provide users with top-of-the-range efficiency and a wide range of operations. The kinetic energy generated by the impeller's cyclical movement on the airflow is converted into potential energy as it passes over the diffuser, increasing the system pressure. The kinetic energy generated by the impeller in the rotational motion enhances the system pressure by converting it into potential energy as the flow passes through the diffuser. The air flow passing through the diffuser and impeller is simulated with CFD to obtain a low turbulence minimum loss, maximum efficiency and silent flow profile.

IHI DALGAKIRAN Turbo Compressors advanced structure provides to harness the power of oil-free compressed air high efficiency, reliability and easy maintenance. This is why IHI DALGAKIRAN Turbo Compressors are your **"YOUR BEST CHOICE"**.

User Customization

In the manufacturing facilities, compressed air needs are constantly changing. IHI DALGAKIRAN Turbo Compressors are specially designed based on our customer needs, factory location and climatic conditions to provide the best solution for production operations.

Energy Saving

For the stringent energy-saving requirements, we face today, IHI DALGAKIRAN provides high-level energy savings with turbo compressors using advanced rotary machine technology that provides first-class energy efficiency.

Easy Maintenance

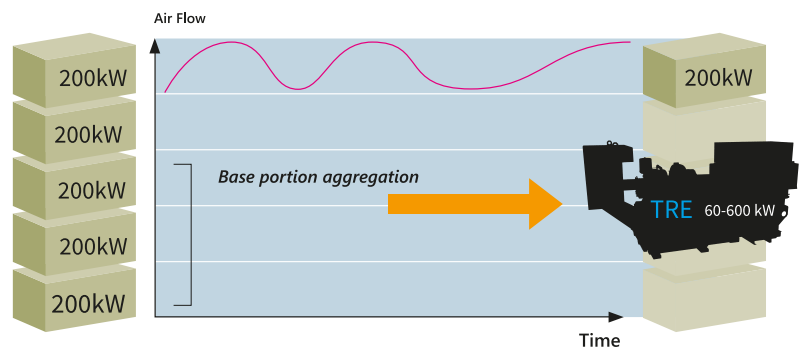
IHI DALGAKIRAN turbo compressors have a simple and robust design, in order to reduce maintenance costs. IHI DALGAKIRAN have worked hard to simplify maintenance procedures so that our products can provide a stable supply of compressed air throughout the year, with minimal maintenance.

ENERGY SAVING



Base Load Machine Setection

Aggregation Case where multiple small and medium sized compressors are used with little airflow fluctuation.



Current Equipment

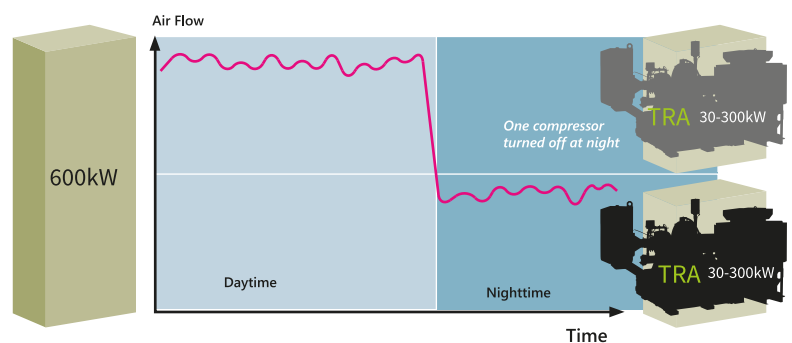
E.g. Three units 200kW screw compressors replaced with one TRE60-600kW compressor.

- Energy saving effect: approx 21 %
- Co₂ reduction: 680 tons / year

- Carbon dioxide emission coefficient : 0.000555tCO₂/kWh

Optimization

Case where a large compressor is used with large airflow fluctuation.



Current Equipment

E.g. 600kW compressor operating at night at 45% load factor to be replaced with two TRA30-300kW compressors

- Nighttime energy saving effect: approx 14 %
- Nighttime CO₂ reduction: 107 tons / year

- Carbon dioxide emission coefficient : 0.000555tCO₂/kWh

Optimal pressure settings

IHI DALGAKIRAN turbo compressors are available in a wide range of variations to match the plant pressurized air needs. Compressors provides best efficiency when operated on design point condition.



IGV Fully Close

Control system selection (IGV energy saving effect)

The compressor's inlet has vanes whose angles can be changed in order to reduce the impeller air intake. This is more effective than using a butterfly valve to add pressur loss in order to reduce airflow, and if the same airflow is discharged, the dynamic power can be kept low.



IGV Half Open

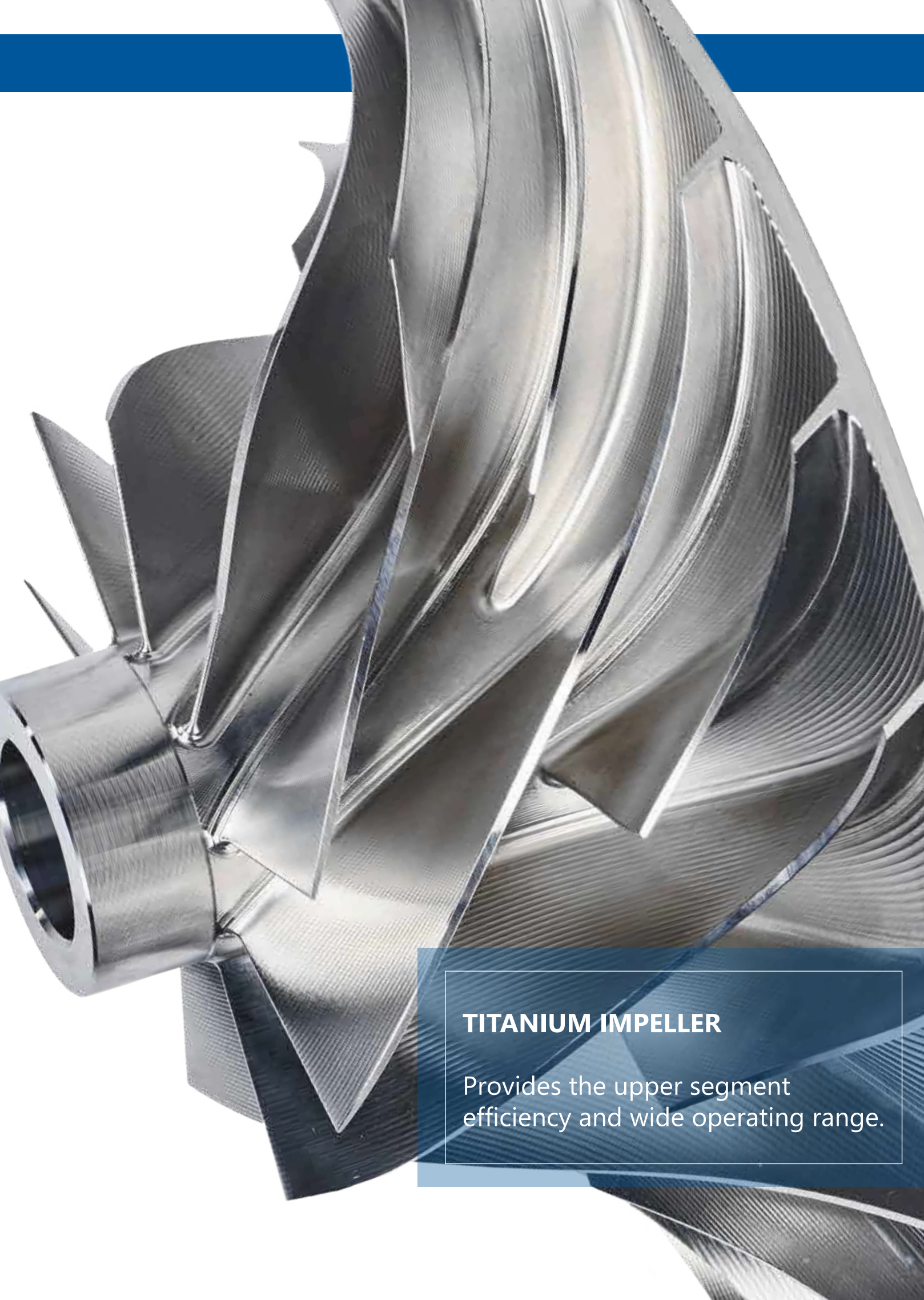
Intake temperature selection

IHI DALGAKIRAN turbo compressors are designed to operate under severe/tough summer conditions of ambient temperature 35°C and relative humidity %80. Lowering the temperture and humidity will improve the drive power ratio accordingly. Therefore, energy saving effect is also obtained by using an "external air intake"; sucking in cool air from outside.

The motor overload prevention function prevents air intake if the discharge airflow exceeds the motor's maximum capacity.



IGV Fully Open



TITANIUM IMPELLER

Provides the upper segment efficiency and wide operating range.

Titanium Impellers

Designed with the power of a deep-rooted engineering experience, impellers provide the upper segment efficiency and wide operating range for users with the support of CFD technology. They are resistant to structural constraints such as corrosion and particulate abrasion, thanks to Titanium structures.



Tilting Pad Journal Bearing

In order for the high speed pinion shafts to be able to bed efficiently, they provide an even distribution of radial loads. They do not need maintenance and replacement under normal operating conditions.



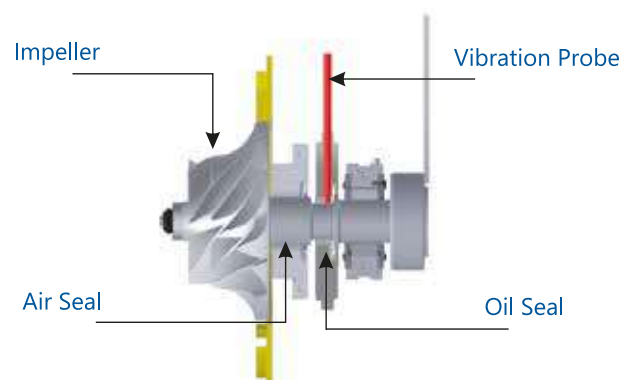
Diffusers

The kinetic energy generated by the impeller in the rotational motion enhances the system pressure by converting it into potential energy as the flow passes through the diffuser. The air flow passing through the diffuser and impeller is simulated in a coupled manner in the CFD environment to obtain a low turbulence flow profile with minimum loss and quiet.



Labyrinth Seal

Labyrinth seals are preferred to ensure sealing between the pressure chamber and the gearbox. The labyrinth seals provide sealing without touching the shaft. Hence it removes the friction losses due to sealing and does not need maintenance.

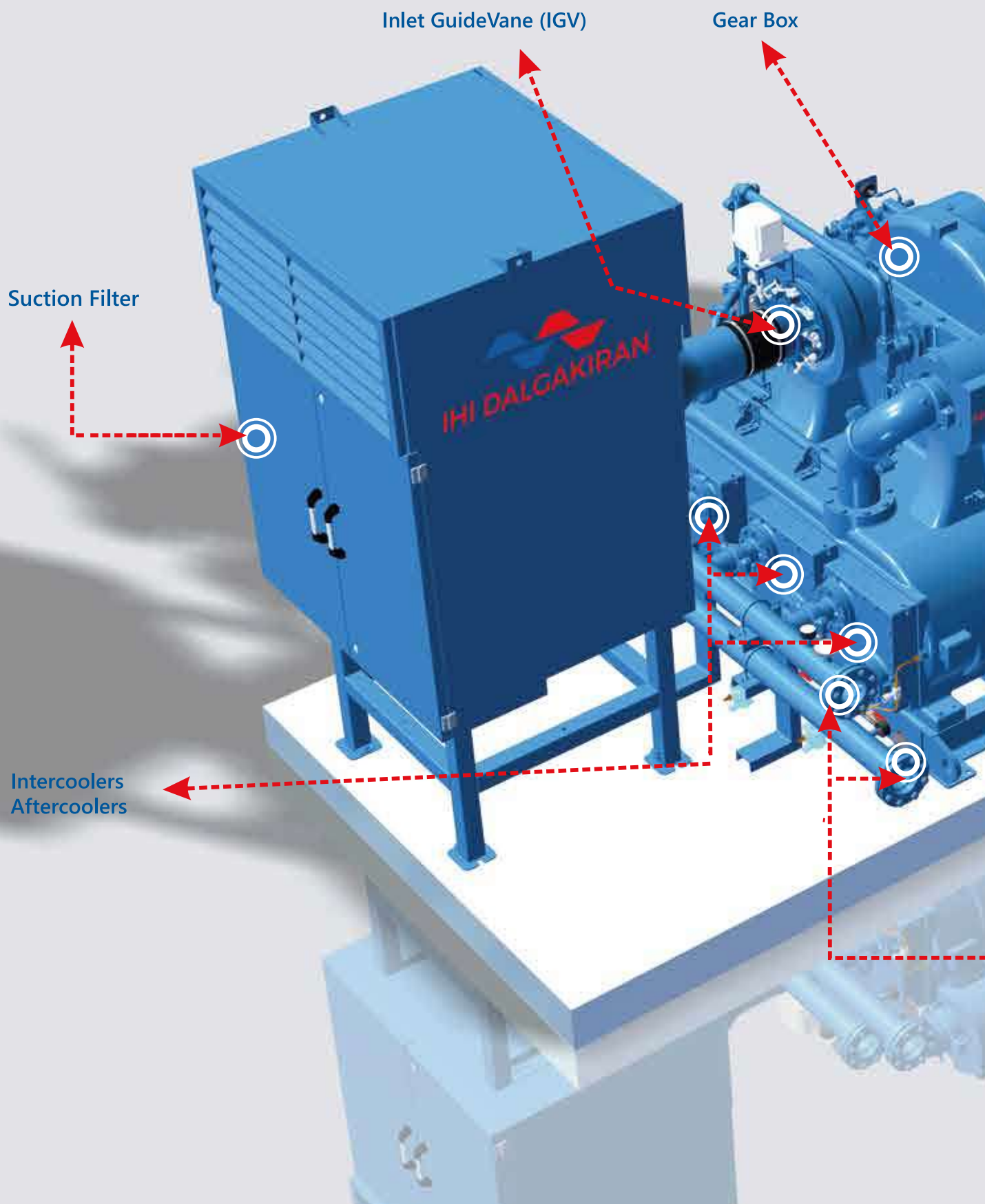


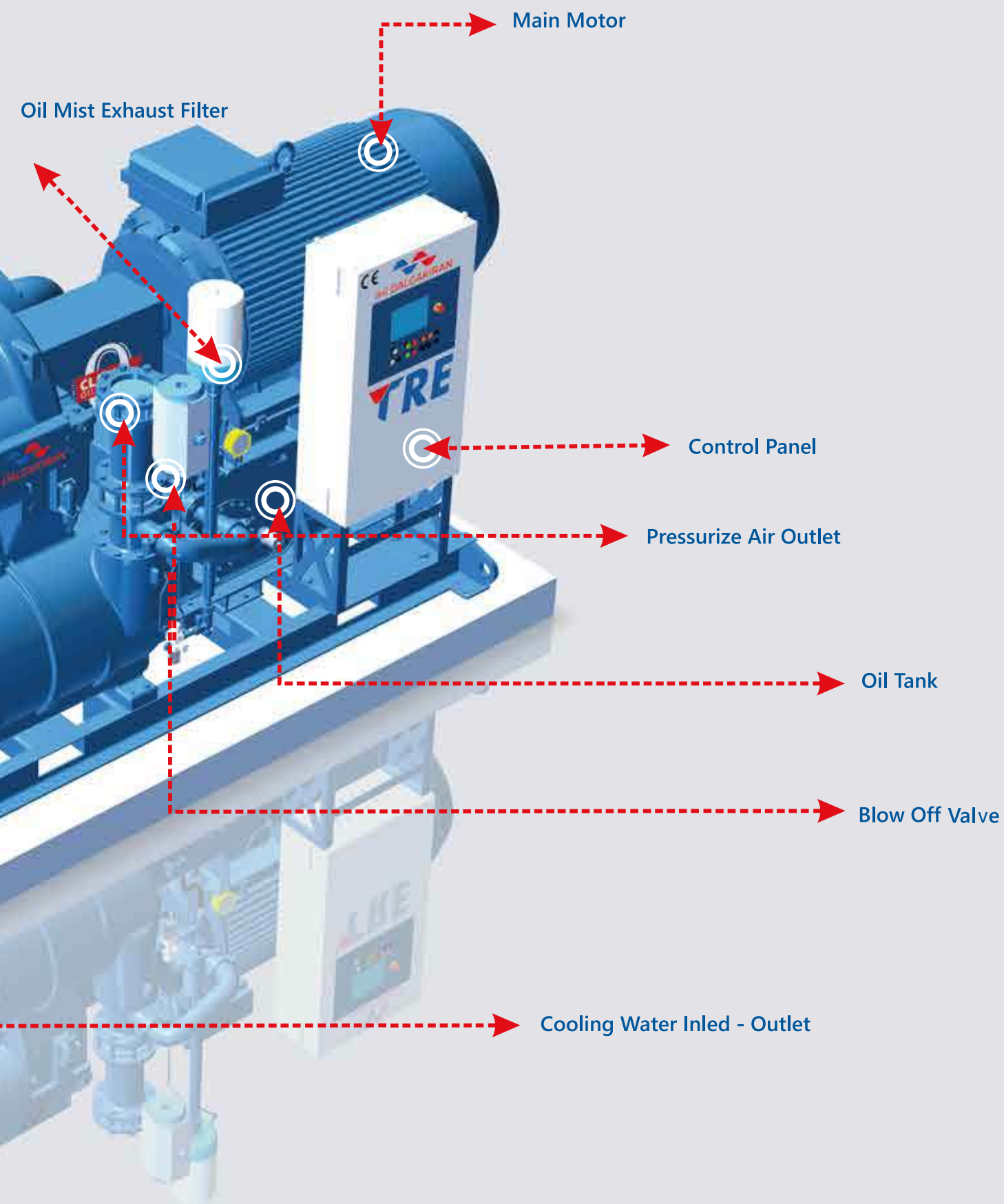
IGV INLET GUIDE VANE

The compressor's inlet has vanes whose angles can be changed in order to reduce the impeller air intake. This is more effective than using a butterfly valve to add pressure loss in order to reduce airflow, and if the same airflow is discharged, the dynamic power can be kept low.



Turbo Compressor Outline





IHI DALGAKIRAN Features

Suction Filter

The suction filter uses a combined type element, making it very easy to maintain. IHI DALGAKIRAN original design, high performance, combined filter element has pre and main filter in one element.



Compressor Frame (one-piece gear case and air coolers)

The gear case and air coolers are cast together in a single, construction. The robust and compact compressor unit and air paths are surrounded by a thick, seamless wall that is also highly effective in reducing noise level and internal pressure losses.



Heat exchanger Line

IHI DALGAKIRAN Turbo Compressors use special copper in their coolers to increase energy efficiency. To provide maximum heat transfer, Heat Exchangers are produced from copper fins and copper tubes with a IHI patented special press machine.



Product Group Turbo Compressor



T2A Series 2 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)	Dimensions (mm)			Weight (kg)
						Length	Width	Height	
T2A	132 250	4 9	59 130	1,394 2,700	1,250 2,400	3,043	2,066	2,506	4,500



TRA Series 2- 3 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)	Dimensions (mm)			Weight (kg)
						Length	Width	Height	
TRA	200 600	2 11	30 160	2,400 6,600	2,150 5,900	3,700 4,940	2,000 2,100	2,000 2,400	7,100 9,500

Product Group Turbo Compressor



TRE Series 2-3-4 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)	Dimensions (mm)			Weight (kg)
						Length	Width	Height	
TRE	355	2	30	3,600	3,200	4,100	2,100	2,000	8,300
	1,060	16	232	11,400	10,200	5,429	4,100	3,000	13,500



T3A Series 2-3 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)	Dimensions (mm)			Weight (kg)
						Length	Width	Height	
T3A	400	2	30	8,200	7,400	4,600	2,250	2,000	10,000
	1,400	11	188	15,000	13,400	6,700	2,500	3,500	16,000

Product Group Turbo Compressor



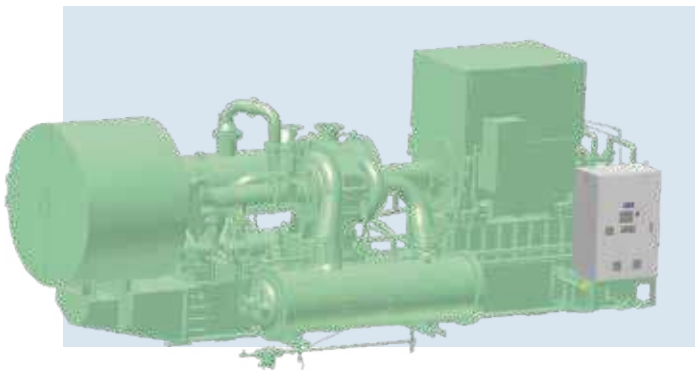
TRX Series 2-3 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)	Dimensions (mm)			Weight (kg)
						Length	Width	Height	
TRX	710 2,000	2 10	30 145	8,200 22,000	7,300 19,500	4,850 7,260	2,400 3,900	2,150 3,400	13,500 20,000

F Series 2-3-4-5-6 Stages

Model	Motor (kW)	Pressure Range Bar(g)	Pressure Range Psi(g)	Flow Rate (m³/h)	Flow Rate (N³/h)
F	1,000 15,000	1 55	15 800	10,000 220,000	8,300 182,000

Up to 20 MV



Control Panel

IHI DALGAKIRAN offers advance control panel for T2A, TRA, T3A, TRE and TRX compressors with high speed and high reliability

Control panel specifications are stated as below;

- High quality touch screen with special functions
- Flexible and high resolution Analog/Digital Inputs, Outputs
- Profinet communication protocol standard, Profibus and Modbus are optional
- Adjustable capacity control methods for machine type
- Easily integrated with DCS or Scada System of the customer.

Constant Pressure + Load/Unload Control

Discharge pressure is monitored on the control panel. If discharge pressure increases more than set value, compressor automatically unloads. If discharge pressure decreases below the set value, compressor automatically reloads again.

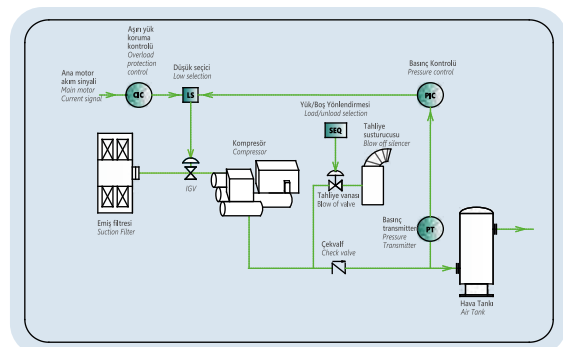
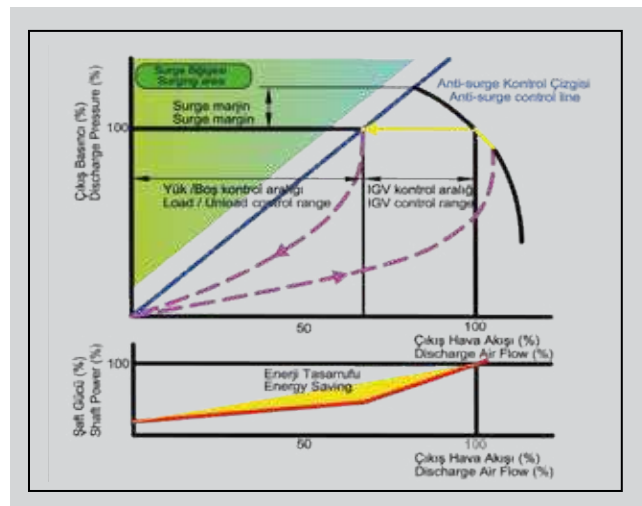
If this control method is used, blow-off valve is ON/OFF digital controlled valve.

This method automatically modulates the inlet guide vane between full load and minimum stable flow to adjust system pressure demand.

Capacity Control Methods

There are two capacity control methods to control T2A, TRA, T3A, TRE and TRX turbo compressors, shown as below:

- 1) Constant Pressure + Load / Unload Control Method
- 2) Constant Pressure + Anti Surge Control Method (Except T2A)

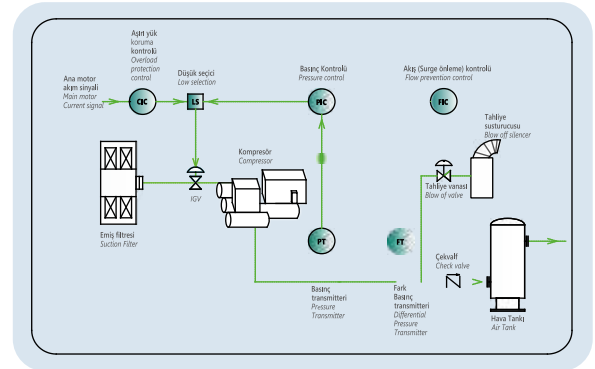
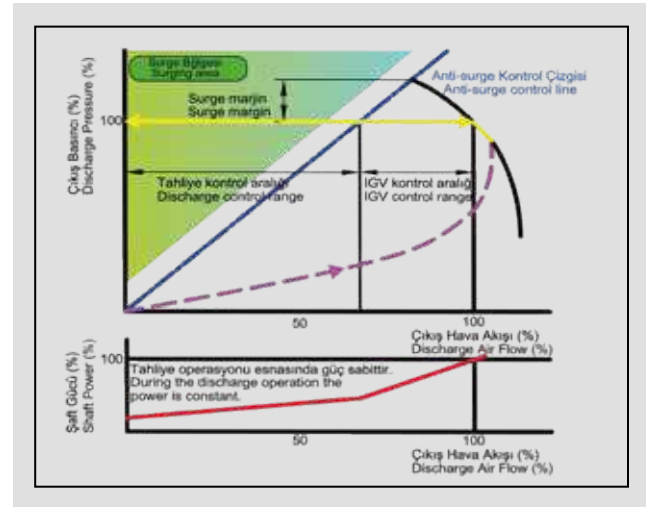


Constant Pressure + Anti/Surge Control

Discharge pressure is monitored on the control panel. If discharge pressure reaches the maximum set value; blow off control valve opens slightly and in controlled manner; air evacuation is done. In this way, discharge pressure is held stable.

If this control method is used, blow off valve must be proportional analog controlled valve.

This method automatically modulates the inlet guide vane and blow off valve; stable discharge pressure is obtained at this point. The most important difference is that, compressor doesn't work at unloading state and discharge pressure is more stable than load/unload method.



IHI DALGAKIRAN PLC Panel

Operating Conditions

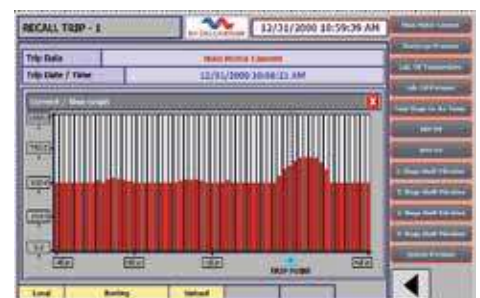
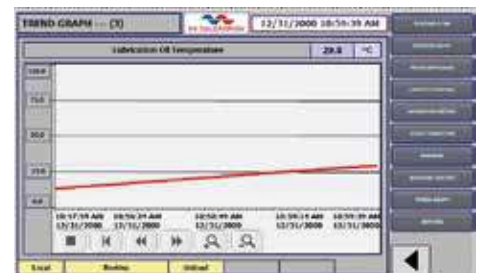
For ease of daily monitoring, key measurements, data and operating conditions can be checked via the control panel's easy-to-read graphics and datas.

Trend Graph

The on-machine control panel provides a graphical interface for operators to monitor optimum working conditions and view trends to aid maintenance planning.

Recall Data

All sensor data and parameters related to alarms that may occur while the compressor is running are saved by the PLC. The data records for the last 3 trips are stored in memory together with the alarm time. This function helps to find the source of the error by graphically checking the error.



Causes & Countermeasure

While the compressor running in the event of a failure, causes and possible countermeasures can be checked onscreen, providing operators with clear guidance.

Data Communication

Easy and fast connection can be done by using PROFINET. PROFINET is standard communication protocol for IHI Dalgakiran Turbo Compressors.

PROFIBUS and MODBUS is another options for connection.



Various Options

Various options such as motor starter panel and group control panel can also be provided by IHI Dalgakiran upon request.



Motor Starter Panel

Starter panels can be provided according to type of motor (low voltage type or middle voltage type) on compressor by IHI Dalgakiran according to requests.

Group Control Panel

IHI Dalgakiran offers the group control option when multiple compressors are requested to be controlled automatically.



Acoustic Canopy

For reducing the sound levels of our compressor, we provide option of acoustic canopy in all compressor series.

Starter Panel

Generally, soft starter method is used to start low voltage or middle voltage motors. Main advantages :

- Inrush current is lower than direct start or star-delta start method.
- Electrical stress is less than on motor and on main electrical line.
- Torque control function is available
- Wear and tear on mechanical equipments is less than other starting methods.
- MODBUS RTU protocol can be used for communication to the other devices.
- IHI Dalgakiran can provide another starting methods for main motor start as below according to request for low voltage and medium voltage:
 - Direct Starter Panel
 - Star-Delta Starter Panel
 - Reactor Starter Panel
 - Inverter Starter Panel

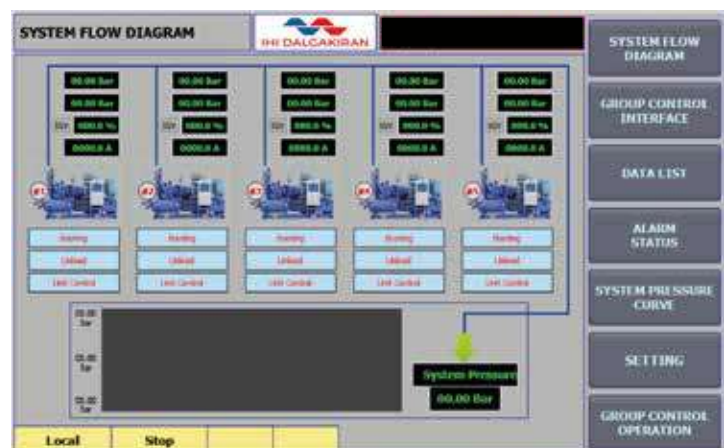


Group Control Panel

IHI Dalgakiran offers the group control option when multiple compressors are requested to be controlled automatically. One group control panel can control up to 24 machines.

Advantages of group control is shown as below:

- Saving time to operate lot of compressors
- Operating various compressors
- Operating compressors according to air consumption
- Saving energy consumption
- Co-aging function for all compressor in process



ID Turbo IIoT System

With the ID Turbo remote monitoring system, the operating data of your compressor can be monitored remotely. Thanks to Ethernet or 4G connection, the compressor is accessed via internet. It is possible to monitor the compressors with a computer or phone wherever there is internet access.



Real Time Data Monitoring

All instantaneous operating values of the compressor, operating status of auxiliary equipment, valves, analog and digital signals can be tracked on the remote monitoring system.



Fault Prevention and Maintenance Notification

Thanks to the notifications received before reaching the alarm and trip values of the compressor, faults are prevented. There is a maintenance warning notification system with the analysis of the collected data. This feature helps to reduce operating costs and increase operational efficiency.

Historical Data

The remote monitoring system allows storage of operation data. It enables studies to increase compressor performance by analyzing the logged data.

TURBO COMPRESSOR TEST CENTER

Turbo Compressor Test Center

In the compressor test center we can test low voltage up to 1 MW; in the medium voltage up to 4 MW.

IHI DALGAKIRAN's precisely calibrated test room apply and simulate the exact conditions for the site condition of the customers plant. All performance characteristics of the IHI DALGAKIRAN Turbo compressor conditions can be perform and measure in each turbo compressor test, customer design point capacity, pressure and shaft power reported.



TURBO COMPRESSOR RESEARCH & DEVELOPMENT CENTER

Turbo Compressor Research & Development Center

IHI DALGAKIRAN, in its Research & Development Center which was approved by Industrial an Technological Minister of Turkey design and develop turbo-compressors with expert staff consists of Turkish and Japanese engineers.



Incoming Quality Control

To be sure of product is manufactured with the right materials (correct shape and dimensions, proper technical specifications with regard to technical requirement) is essential to IHI DALGAKIRAN quality system, whether it is produced in our facility or done by a contractor. We reject defective products from the production process and assembly lines for further examination of the nonconformity. We reject defective products during incoming quality control and don't release to assembly line or stock.

Dimensional Check

Automatic dimensional control traceability can be performed with CMM Machines and latest technology measuring devices.

Quality Process Control

During the production each step is followed and controlled by quality supervisors. We ensure the production process quality with corrective actions and risk management systems.

Measurement, Analysis and Improvement

The calibration follow-up of the measuring instruments is carried out with certain periods. To analyze the product and system quality we consider the Nonconformity reports and incoming quality control results for continuous improvements.

Product Quality

For the standardization of product quality, we ensure the traceability of all products and total process by inspections of each product, assembling process and final machine (which will be used by end user).

IHI DALGAKIRAN Integrated Quality Management System includes the areas of Environment, and Health and Safety and is applied to all IHI DALGAKIRAN factory, production process, suppliers and employees.

IHI DALGAKIRAN fulfill the requirements of the ISO standards:

- ISO 9001:2015 (Quality Management System)
- ISO 14001:2015 (Environment Management)
- ISO 45001:2018 (Health and Safety Management System)

IHI DALGAKIRAN briefly promises to provide high quality, professional products and services in line with above customer expectations, legislation and technical requirements and order. This commitment is the basis of our continuous growth and success.

IHI DALGAKIRAN Total quality management includes following principles;

Accuracy of the measurements

To ensure the reliability in each stage of the production process we measure the each component. In IHI DALGAKIRAN we apply the latest technology in our devices for quality assurance.

Supplier Control

We highly believe to grow with the business partners. For the outsourced parts and devices, we make audit and also support for improvement our vendors to reach exact quality.

After Sales Service



**24/7
Service Support
+90 850 515 0 112**

After Sales Service



Our Structure and Cornerstones

IHI DALGAKIRAN's after-sales department continues to be a notification away from the customer after the installation and commissioning process of the compressor with its team of expert engineers and technicians. It continues to be a solution and business partner with strong technical support and experience in failures, periodical maintenance, measurement and energy analyzes that the customer may need.

We follow your compressors periodic maintenance with our expert technical team. Maintenance performed with original spare parts increase life time of your machine while avoiding unexpected failures and costs. We carry out stock work for the machines of our existing customers and always keep stock for possible requirements.

Our Goal and Strategy

As IHI DALGAKIRAN, it is our priority to create value for our customers in After Sales Services and to respond to their expectations with a quality and solution oriented approach. It's a reflex of our entire team.

In our After Sales Service, main target is 100% customer satisfaction. Our strategy is determined also by consideration of environmental awareness. IHI DALGAKIRAN will provide the confidence and pride of having After Sales Services with it's professional technical team.

We work with a service goal that makes a difference in warranty, extended warranty, maintenance, maintenance agreement, stock availability, training with customer and solution oriented approaches. We give importance to continuous improvement.

Operator Training

Operators are able to operate the compressor immediately, to carry out daily maintenance and control, and to solve basic problems.

IHI DALGAKIRAN Original Components

The high reliability of the original components ensures a long service life of IHI DALGAKIRAN turbo compressors.

Technical Advisors for Installation and Commissioning

Having in-house expertise; it will help to maximize efficiency in the installation and commissioning of compressors and to minimize the risks.

Periodic Maintenance Services

To maintain the maximum efficiency and reliability of our compressors, our authorized service centers provide planned maintenance, spare parts and technical service.

Highlights of the maintenance agreement:

- Replacement of all necessary maintenance parts and materials
- Cooler checks and detailed cleaning
- Detailed cleaning of inlet scrolls
- Lubrication system checks
- Motor check
- Vibration and temperature check
- Motor alignment and spare parts penetration tests if necessary
- Detailed maintenance report
- Compressor air connections leakage checks
- Compressor cleaning
- Maintenance planning due to customer's facility production stop.

Warranty Options

IHI DALGAKIRAN provide you best warranty extension options. With the ESW (Extended Service Warranty) options, we offer different options to ensure optimum support in all circumstances:

- Warranty extension during initial sales
- Warranty extension before standard warranty expires
- Warranty extension after standard warranty

Flow Measurement and Electrical Energy Analysis

We are able to make flow measurement and electrical energy analysis for which you have. We measure your energy efficiency with the latest technology devices and tools and report to you.

Continuous development with our technical training and development center

All our technical departments have the opportunity of continuous development with our Technical Training and Development Center, which we opened for service as of 2020. We continue to work intensively in our center in order to improve our products and give you with higher quality after-sales service.



IHI DALGAKIRAN Original Spare Parts

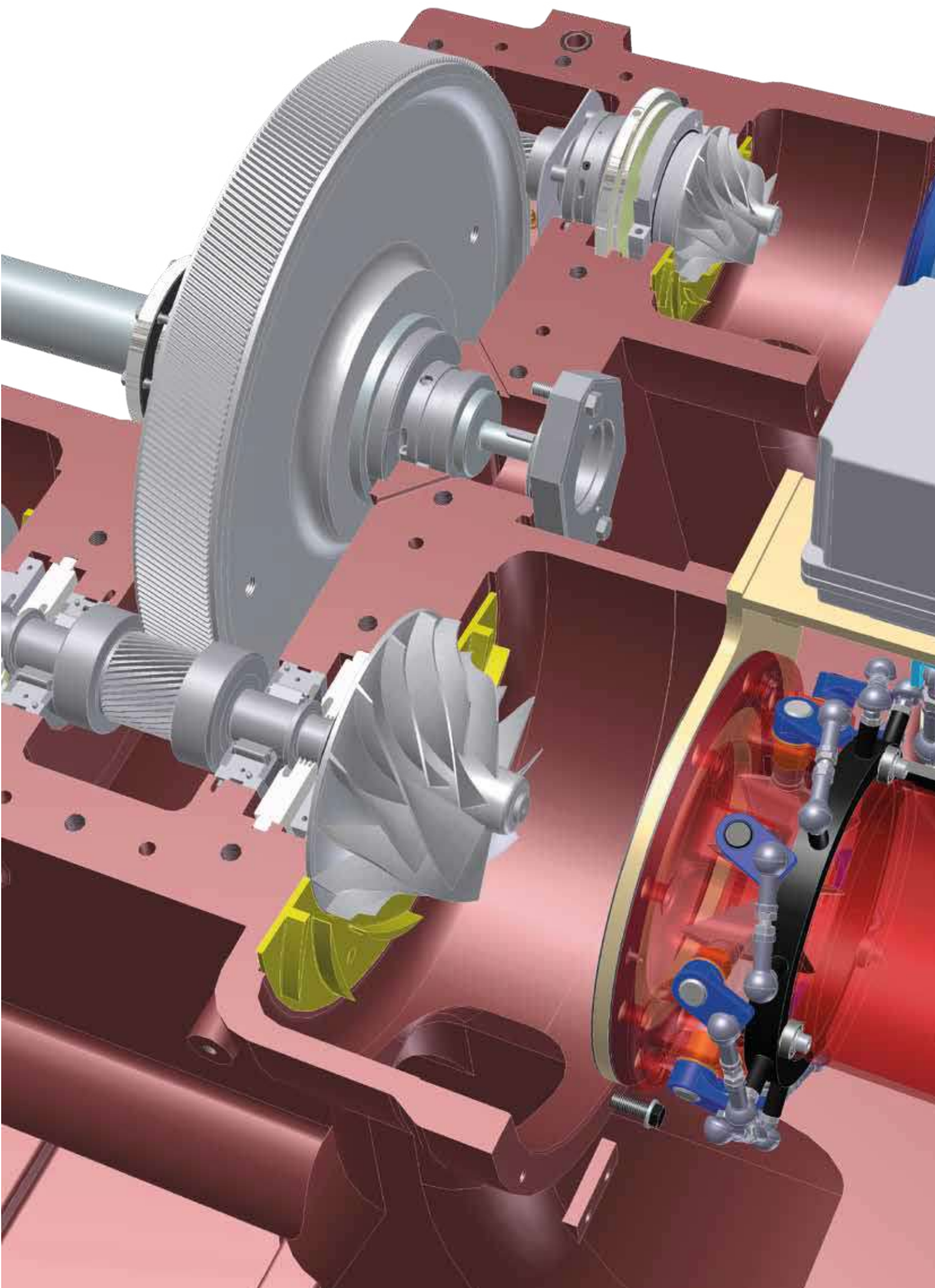
IHI DALGAKIRAN original spare parts are the same as those used in the manufacture of your compressor.

It directly contributes to the performance you expect.

Measurably ahead in strength.
It contributes to the life of your machine.
Contributes to continuous operation; prevents unexpected failures.
Reduces your total operating cost.

24/7 Support

For all questions and comments about after-sales, please contact us at **+90 850 555 0 112** or service@ihidalgakiran.com







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