OIL-FREE, ROTARY SCREW AIR COMPRESSORS

Two-stage, Air-cooled and Water-cooled
Fixed Speed or VFD

40-500 HP
170-2400 SCFM
40-150 PSIG

KOBELCO®
KNW SERIES
ROGERS MACHINERY CO., Inc.

www.knw-series.com

High Quality, Quiet and Energy Efficient

The Kobelco KNW Series assembly is designed and constructed to exacting quality standards. These standards result in assemblies with long operating life, minimum maintenance and low operating costs.

The Kobelco KNW Series oil-free rotary screw air compressor is designed, manufactured, assembled, and tested in the United States and is delivered ready for operation. The two-stage rotary screw compressor provides completely oil-free air because no oil is allowed in the compression chambers.

Both compression stages employ a new patented Super Rotor design, which is acknowledged to be the most efficient, two-stage, oil-free rotary screw air compressor on the market. This new asymmetric rotor profile provides the lowest power consumption per cubic foot of compressed air.

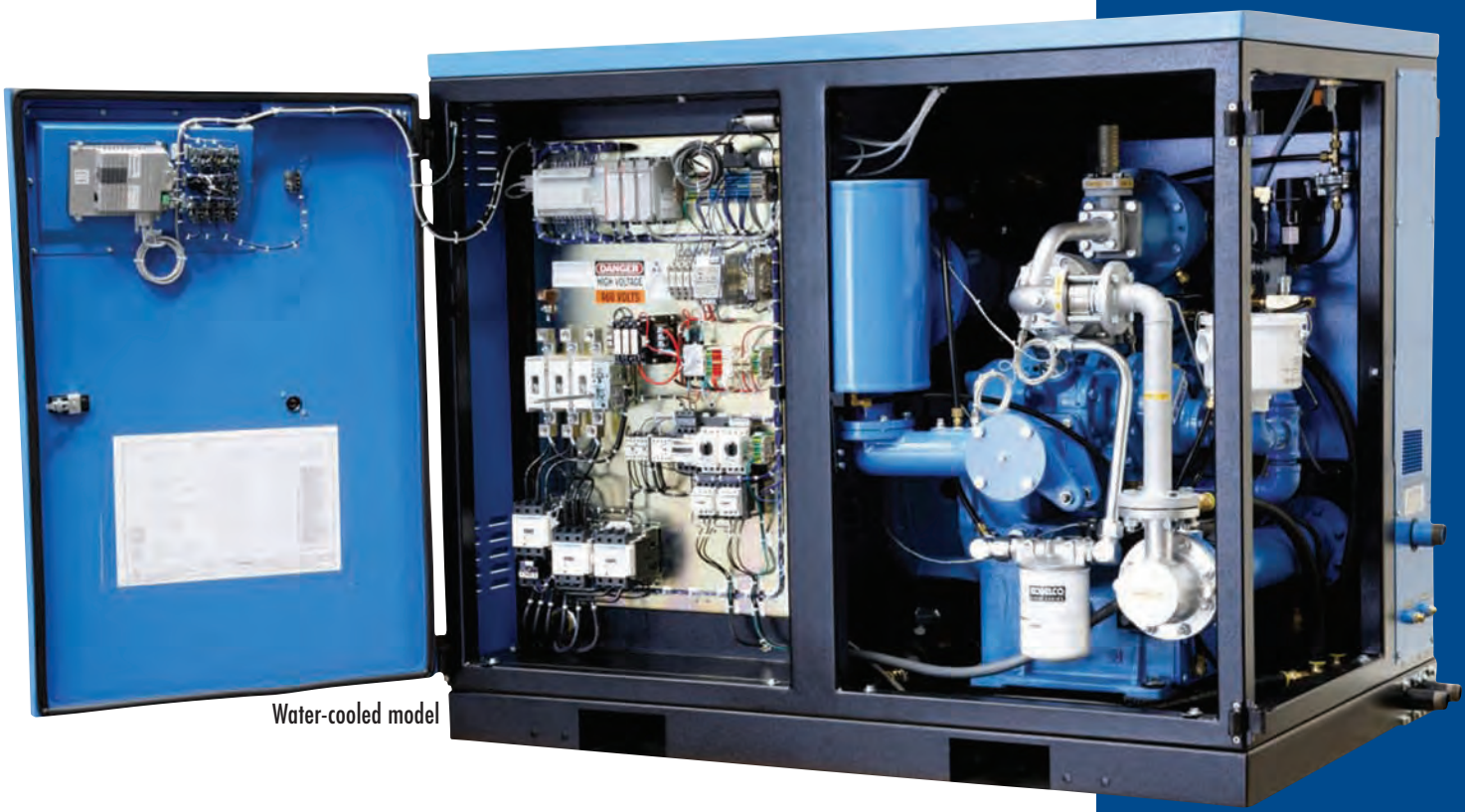
The efficiency is further enhanced by a unique load/unload control system that is simple and trouble free.

The compressor air end is a heavy-duty, two-stage design with each stage driven by a common gear.

These components are arranged in a single modular design to form a compact unit which is mounted on vibration isolators to a structural steel base. No special foundation considerations are required.

Standard water-cooled model

Simple and Efficient with High Reliability



Water-cooled model

Kobelco KNW Series precision machined timing gears are mounted on each rotor shaft to maintain accurate clearances between the rotors. The bearings are anti-friction type for long life and smooth operation. The electric motor is directly coupled to the input drive shaft through a flexible coupling.

Axial thrust is reduced by incorporating an air pressure operated thrust balance piston on each stage. This arrangement minimizes thrust loading thus increasing bearing life.

The state-of-the-art programmable microprocessor controller maximizes operating efficiency and versatility.

The sound attenuated enclosure assures quiet operation. Doors are hinged and pinned allowing easy removal for inspection and maintenance.

Advanced Design Features

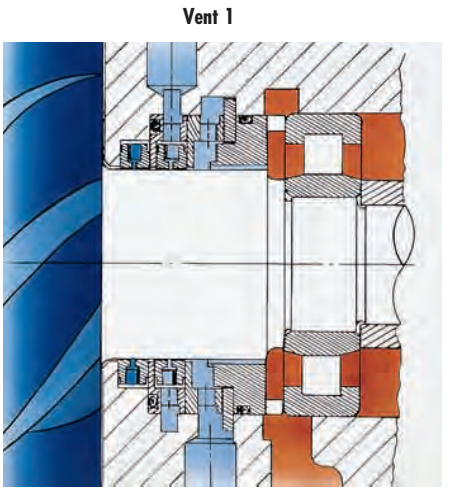
High Efficiency Rotors

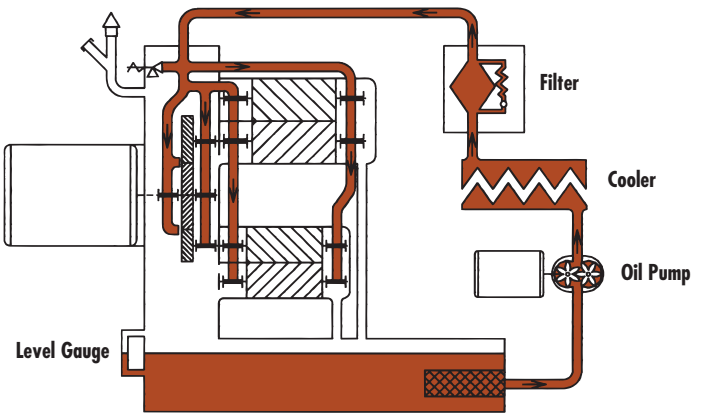
The new patented Super Rotor* profile is the most efficient in the industry. The machined forged steel rotor sets have the most precise tolerances in the industry. FDA approved rotor coating further increases volumetric efficiency for the life of the machine.

Two-stage oil-free compression module.

Dual Vent Seals with Stainless Steel Rings

Each shaft seal consists of floating stainless steel rings and an oil labyrinth inserted between the rotor chamber and the bearings. Each seal is buffered by gas from the compression chamber which is purged to atmosphere ensuring that no lubricating oil or its vapor can enter the compression chamber.





Lubrication of Gears and Bearings

Lubrication prior to start-up, during operation and after shutdown is supplied by an independent motor driven gear pump. Compressor operation is not allowed until oil pressure is established. During the coast down period the oil pump continues to provide full lubrication until the compressor stops. This design increases gear and bearing life and is not standard on competitive units.

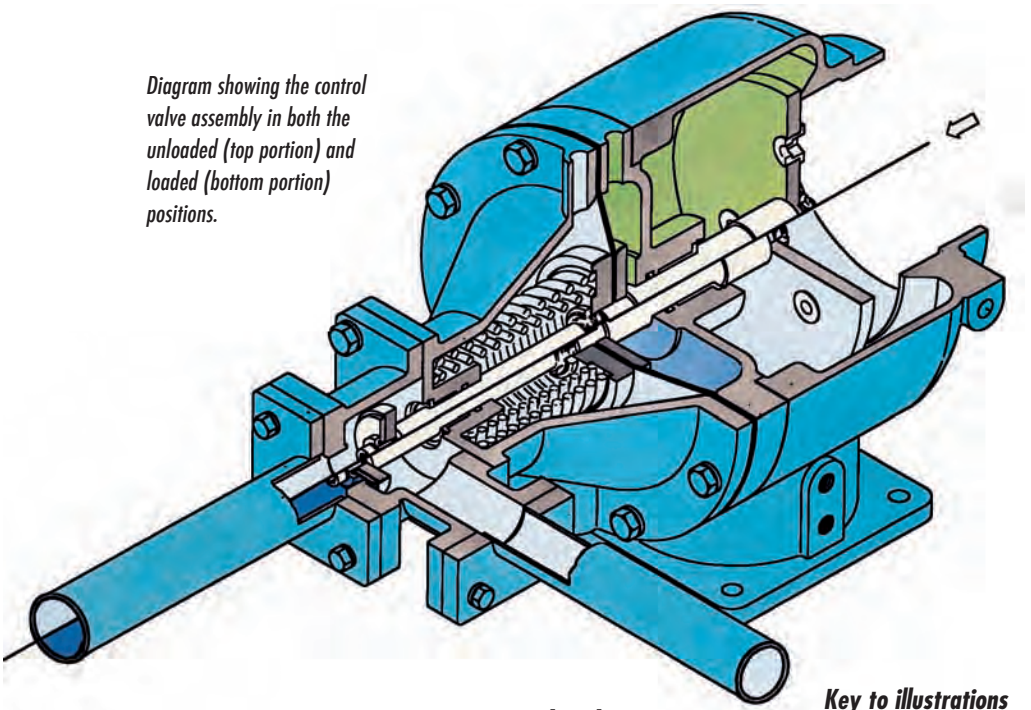
Designed, manufactured and assembled in the USA.

*Patent Numbers 4583927 and 4671749

Capacity Control Valve

The efficient and simple capacity control system is a load/unload type with a direct operating disc valve and no discharge air recirculation. During unloading the bleed-off air is released to atmosphere through a muffler. The control is an electro-pneumatic device using only spring and air pressure. No oil or hydraulic cylinders are used in the operation of this valve.

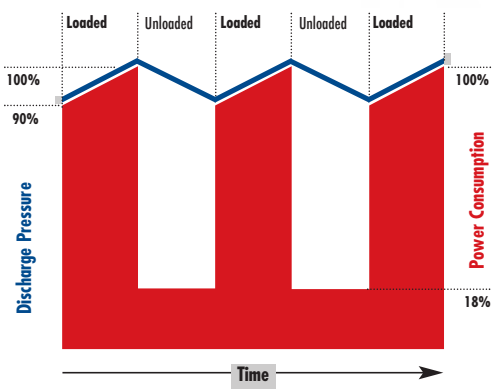
Diagram showing the control valve assembly in both the unloaded (top portion) and loaded (bottom portion) positions.



Capacity Control Valve

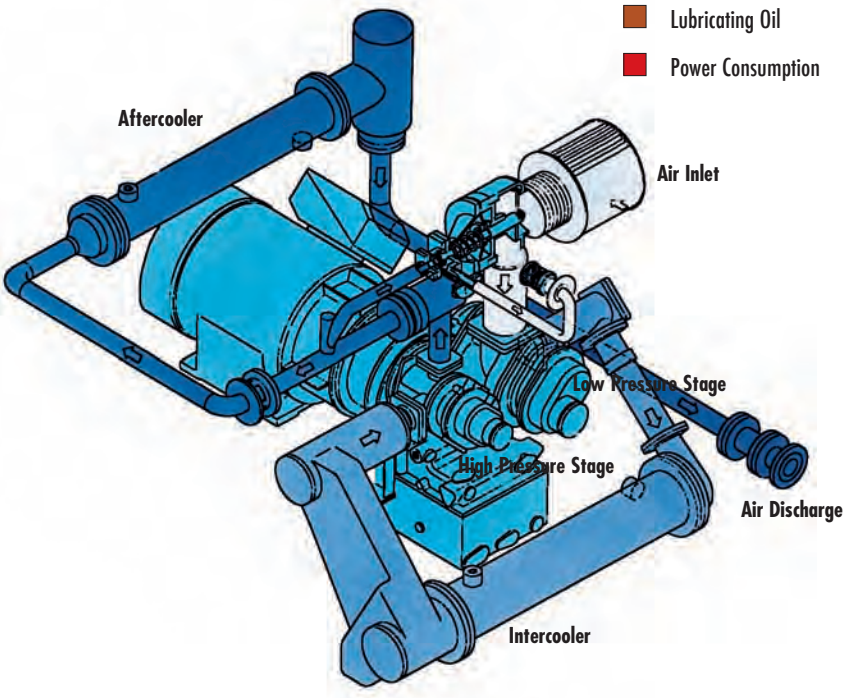
Key to illustrations

- Vacuum
- Atmospheric Pressure
- Interstage Pressure
- Discharge Pressure
- Lubricating Oil
- Power Consumption



Load and Unload Control or VFD

Both controls provide energy efficient operation while eliminating adjustments and minimizing maintenance. When the compressor unloads the brake horsepower drops to approximately 18% of full load, significantly reducing overall energy cost. The compressor will shut down after operating unloaded for a period of time and will automatically restart on pressure demand.



Component Arrangement Showing Typical Air Flow (Water-cooled)

Touchscreen Operator Interface

Installation and Start-up Supervision

A factory trained field representative will supervise installation and start-up. This same representative will also train your maintenance personnel in the operation and maintenance of the assembly. Our commitment is to provide a trouble free, reliable installation of which we can both be proud.

Touchscreen Display with Graphics

Complete status indication is displayed continuously during operation, while in stand-by or after emergency shutdown. Discrete push buttons with lights for quick indication of operating status. Ethernet card with email capability also available (optional).

Allen Bradley Programmable Logic Controller

The microprocessor initiates and sequences the proper events during start-up, operation and shutdown. It monitors system functions, safety devices and instrumentation. The microprocessor incorporates an erasable programmable read only memory chip (EPROM) for permanent program storage. Programs can be changed to meet various plant requirements. In addition, interfacing with other equipment and plant monitoring systems is easily accomplished.

Standard Allen-Bradley PLC
Built in sequencing capability–up to four compressors. Interfacing with plant monitoring systems easily accomplished (optional)
(Allen Bradley Ethernet module shown)

Standard Equipment and Safety Devices

Controls and Instrumentation

Service Indicators

- Air inlet filter condition indicator
- Oil filter condition indicator
- Oil level gauge
- Routine maintenance
- Lube oil
- Aftercooler temperature

Pressure Indicators

- First stage air discharge
- Second stage air discharge
- Oil pressure
- First stage suction

Temperature Indicators

- First stage air discharge
- Second stage air inlet
- Second stage air discharge
- First stage suction

Additional Indicators

- Stand-by mode light
- Oil pump run light
- Fan run light
- Compressor run light
- Compressor load light
- Alarm light
- Hour meter – running time
- Hour meter – loaded time
- Manual unload light and switch

Safety Devices

All safety shutdowns are indicated by message on display and alarm light.

- Compressor motor overload shutdown and light
- Oil pump motor overload shutdown and light
- Fan motor overload shutdown and light
- High first stage air discharge temperature shutdown and light
- High second stage suction temperature shutdown and light
- High second stage air discharge temperature shutdown and light
- High oil temperature shutdown and light
- Low oil pressure shutdown and light
- High cabinet temperature shutdown and light
- Aftercooler temperature shutdown and light
- Starter failure light
- Temperature pre-shutdown alarm
- Relief valve

Additional Devices

- Start/stop push buttons
- Lamp test
- Audible alarm
- Acknowledge switch
- Reset switch
- Common alarm contacts for remote indication
- Event alarm log
- SAE oil circuit fittings
- Petes plugs for pressure transmitter locations
- Emergency stop button

Integrated Variable Speed Drive

Designed specifically for use with Kobelco KNW Series Oil Free compressors

Standard air-cooled assembly with Allen-Bradley VFD

Variable Speed Drive Potential Energy Savings

- Lower system pressure reduces kW and leak load
- No current spikes at start up
- Frequent stops and starts allowed
- Excellent as trim compressor
- Option of having VFD shipped loose
- Large speed range, depending on model
- Lower unloaded kW
- Shorter unloaded run time

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KNOW PRESSURE COMPRESSED AIR CHALLENGE®

NFPA® MEMBER

ASHE American Society for Healthcare Engineering of the American Hospital Association MEMBER

ISPE® MEMBER

Specifications Subject To Change Without Notice

Compressed air discharged from this compressor should not be used for breathing air unless properly purified. Kobelco and Rogers Machinery Company, Inc. assume no responsibility or liability for the purchaser's breathing air equipment.

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