Rotary Screw Compressor Packages

For Industrial Refrigeration

SINGLE SOURCE INDUSTRIAL REFRIGERATION SOLUTIONS

Frick® INDUSTRIAL REFRIGERATION

Johnson Controls

FRICK® Screw Compressors – Reliable, Innovative Technology

FRICK screw compressors help you get the most out of your industrial refrigeration system.

When it comes to industrial refrigeration, FRICK screw compressors offer a blend of efficiency, long-lasting reliability, ease of service, and expertise.

FRICK screw compressors are continually evolving, top-tier technology capable of delivering the industry's lowest lifecycle cost.

FRICK screw compressors deliver the most progressive features needed for your application. That's because FRICK has more than 40 years of experience in screw compressor development and packaging.

In that time, FRICK has produced more than 150,000 screw compressors, and we have designed, engineered and assembled over 50,000 screw compressor packages in our Waynesboro, PA, facility.

All that expertise, plus low maintenance, low noise and vibration levels, and low total cost of ownership make FRICK compressors the preferred technology you're looking for.

RWF II 177
Compressor Package
with Mounted Solid-State Starter

Engineered for Excellence, Performance and Reliability

Proven Firsts

Groundbreaking FRICK innovations, refined over decades of real-world use, have been brought together to create the best in screw compressor package design and optimization. It's everything we've learned to date, and then some.

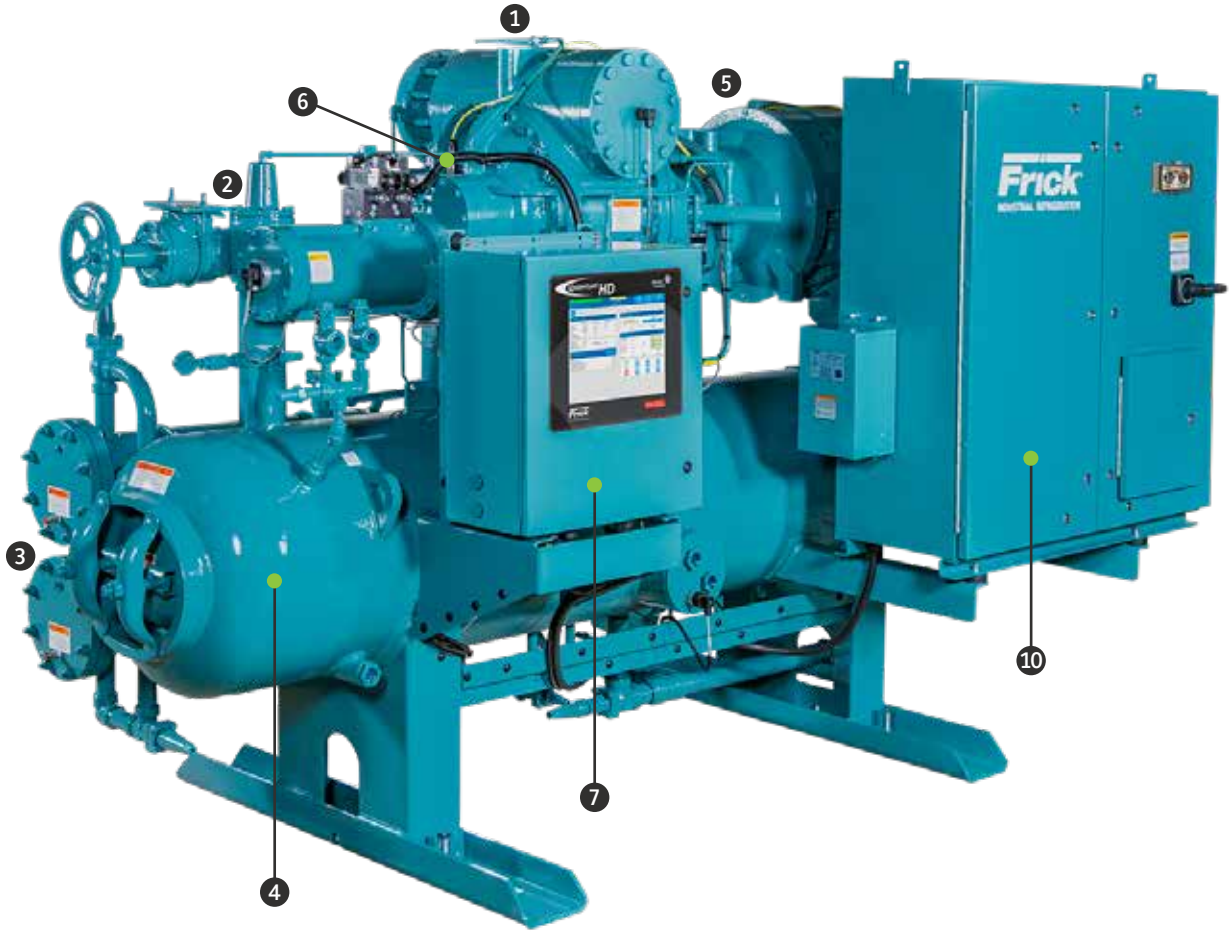
That innovation led to industry first design choices and features like the use of:

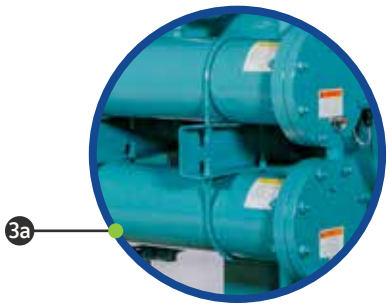
- Anti-friction bearings
- Infinite volume ratio control
- Cold-start valve
- Infinite capacity reduction
- Powermizer for ideal Vi control with the use of ecomizer
- Flanged motor mounting
- Superior and efficient oil cleaning and management
- Efficient, quiet and reliable motor design
- Quantum™ HD control panel
- Streamlined package for peak safety, longevity, and reliability
- Package mounting of starters and variable speed drives
- EZ-CAL™ High Pressure Cut-out

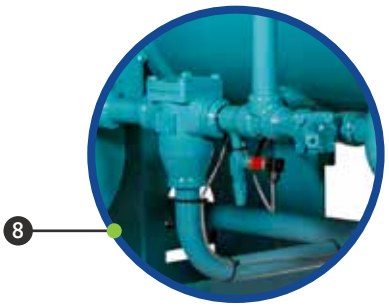
Advanced FRICK Screw Compressor Package Design:

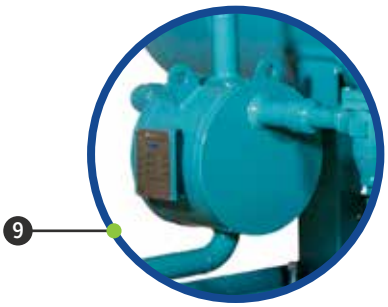
- Engineered and manufactured to meet industrial refrigeration requirements
- Designed to assure reliability, accessibility and ease of service
- Rotor designs that provide the strongest, most efficient operation for their applications
- Compact package allows reduced engine room size and lower construction costs
- High stage and booster applications for all common refrigerants

The World's Best Industrial Refrigeration Compressor Package









1 Compressor

Anti-Friction Bearings
- High reliability; reduced horsepower and predictive maintenance
- Allows 5:1 turndown ratio (720 rpm min.)

Variable Volume Ratio Control
- Maximum efficiency at all application conditions

Infinite Capacity Control
- Precisely matched load requirements

2 Cold-Start™ Valve
- Provides a quick start at any condition, and oil pressure without the need for a pump

3 SuperFilter™ II
- Efficient oil cleaning down to 5 microns – longer bearing life

3a Dual Oil Filters (Option)
- Ensure continuous operation during service of the primary filter
- Isolation valves included

4 Super Coalescer
- Significantly reduces condensing pressures for maximum energy efficiency

5 Flange-Mounted Motors
- No need for coupling alignment

Smart Series™ Motors
- NEMA premium efficient, low noise motors, with corrosion protection features, RTDs standard, for efficient, quiet, and reliable operation. VSD motors rated and constructed for 5:1 turndown ratio (720 rpm min.)

6 PhD Vibration Protection
- PhD vibration monitoring helps stop interruptions before they start

7 Quantum HD Controller
- User-friendly, worry-free operation

8 Smart, Leak-Free Packaging
- Internal oil passages and pre-bent pipe results in fittings and welds with less leak potential

9 External Oil Cooling
- Capacity and power penalties eliminated thanks to the latest technology in plate design
- Constructed according to ASME Section VIII Division I

10 Mounted Starters (Option)
- Factory mounted, superior motor overload protection
- Less mounting space, and reduced installation costs

Reliability with Confidence
- Proven in thousands of installations

Easy to Service
- All critical components are easliy accessible

Variable Speed Drive (Option)
- Changes capacity by varying motor speed
- Package-mounted version available

Lower Total Cost of Ownership

While evaluating productivity improvements, it's important to take a close look at overall life cycle cost.

Innovative Design

Here's where reliable, advanced, energy-saving FRICK technologies such as anti-friction bearings reduce operating costs significantly.

These bearings offer higher efficiency, demand less maintenance and, unlike conventional bearings, do not require an oil pump on the package. Further, they are so dependable in extreme conditions, they are used in commercial jet engines.

Industrial Strength

Lower maintenance, operation and repair costs mean FRICK screw compressors provide increased productivity and efficiency, resulting in lower total ownership cost – giving you peace of mind while saving time, energy and money.

FRICK TECHNOLOGY DELIVERS TOTAL COST SAVINGS

- Anti-Friction Bearings
- SuperCoalescer
- Cold-Start Valve
- Variable Volume Ratio Control
- External Oil Cooling
- Premium Efficient Motors

Just One Savings Example

Frictional losses are greater in sleeve bearings than in roller bearings. Using roller bearings will, on average, consume 3% less horsepower.

Example: Screw compressor with a 300 hp motor

300 hp x 3% = 9 hp

Anti-friction roller bearings save 9 hp over sleeve bearings.

At 10¢ per kW, a 9 hp efficiency could provide a **cost savings of approximately $6,000 per year!**

Eligible for FRICK Extended Warranty Program

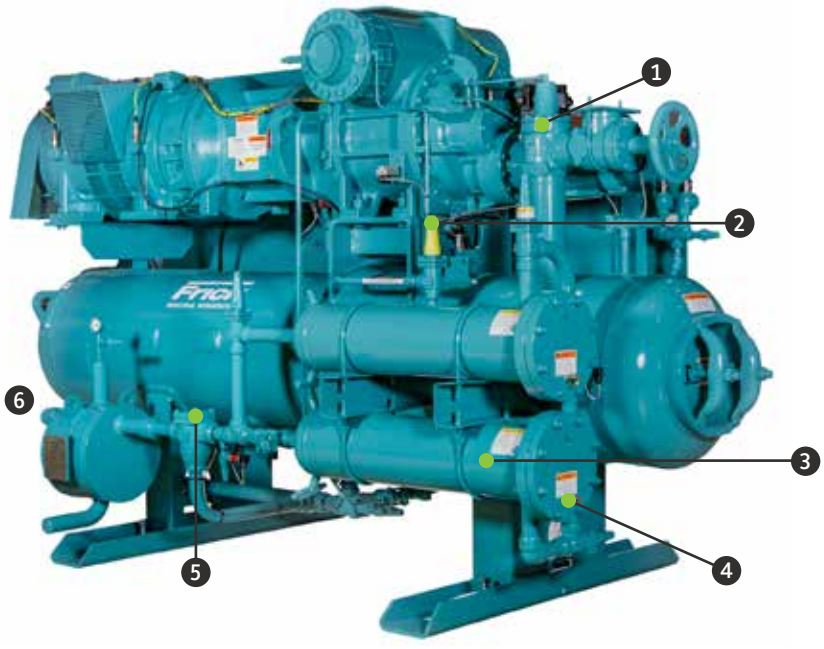
Plus 3 Plus 4 Plus 5

Based on number of items purchased.

FRICK Screw Compressor Package Component Layout

FRICK screw compressor packages are designed and fabricated from the best components and materials. Special care is taken to arrange the components for maximum reliability and ease of service.

1. Discharge stop valve
2. Slide control valves
3. Compressor
4. Motor
5. Starter
6. Sight glasses
7. Quantum HD microprocessor
8. Manway
9. Relief valves & manifold



1. Cold start valve
2. Oil injection valve
3. Oil filter
4. Oil filter sample valve
5. Oil temperature control valve
6. Oil cooling heat exchange

The Screw Compressor Packages – Models and Specifications

RWF II (591–6,402 CFM)

RWF II 316
Compressor Package

RWF II Specifications[1]					
High Stage		R-717		R-507	
Model	CFM	TR	BHP	TR	BHP
100	591	212	238	203	267
119 SS[2]	691	249	280	235	315
134	788	283	317	274	359
159 SS[2]	921	333	375	318	425
177	1,040	380	414	355	463
209 SS[2]	1,216	443	484	406	543
222	1,310	480	522	459	588
264 SS[2]	1,531	559	611	530	692
270	1,618	593	644	562	721
316	1,864	681	742	639	833
375 SS[2]	2,179	782	870	720	976
399	2,347	857	936	806	1,059
472 SS[2]	2,744	984	1,098	908	1,243
480	2,824	1,027	1,124	950	1,262
546	3,209	1,167	1,278	1,059	1,438
496	2,920	1,053	1,180	973	1,343
676	3,981	1,422	1,610	1,256	1,846
856	5,068	1,807	2,054	1,582	2,503
1080[3]	6,402	618	678	745	963

1. Based on 20°F suction, 95°F condensing, 10°F liquid subcooling with 10°F superheat
2. SS – SuperSpeed models nominal @ 4,150 rpm. All other models nominal @ 3,550 rpm
3. Booster only @ -40°F suction, 10°F intermediate, no superheat

RXF (72–596 CFM)

RXF 24
Compressor Package

RXF Specifications[1]					
		R-717		R-507	
Model	CFM	TR	BHP	TR	BHP
12	71.5	25.3	30.3	20	35
15	89.2	31.6	37.9	27	44
19	110.5	39.1	46.9	35	54
24	144.1	51	61.1	43	71
30	179.8	63.7	76.3	57	88
39	222.6	78.9	94.5	72	110
50	292.3	103.6	124	94	144
58	341	120.9	143.3	113	166
68	403	142.7	169.3	134	193
85	499	176.8	209.6	169	240
101	596	211.4	250.7	201	292

1. Based on 20°F suction, 95°F condensing, 10°F liquid subcooling with 10°F superheat

SuperSpeed Packages – Increased Capacity

The six FRICK RWF II SuperSpeed (SS) Packages are specifically designed for use at 4,200 rpm with a variable speed drive (VSD). When a VSD is required in a cold storage application, these models increase the capacity per base model size. All components on the compressor package are designed for higher speeds.

High Pressure Screw (HPS) Compressors

The FRICK HPS rotary twin screw compressor series is designed to operate at higher pressures (1,100psi – 273mm, 725psi – 157mm), which makes them a perfect fit for special applications, including CO_2 refrigeration, and ammonia heat pumps.

HPS 42
Compressor Package

HPS High Pressure Screw – Specifications					
Package Model	Screw Model & Size (mm)	Driver Speed - rpm	Displacement - Ft^3/Min (M^3/hr)	R-744 CO_2 [1]	
				Capacity - TR[3]	Power - BHP[3]
36	1510 (157)	3550	208 (354)	187	223
42	1510 (157)	4150	243 (413)	221	260
166	2709 (273)	3550	974 (1,655)	918	844
221	2712 (273)	3550	1,298 (2,206)	1,225	1,125

1. Based on -30°F suction, +20°F condensing, with 10°F superheat
2. Natural gas ratings based on 350 psig, 60°F suction and 700 psig discharge
3. SG=specific gravity, k=ratio of specific heats (Cp/Cv), TR=tons refrigeration, BHP=brake horsepower

Quantum™ HD Unity Compressor Controller

Simply the easiest-to-use, yet most powerful controller available today. Access any control, calibration or configuration value using on-screen touch control. With a large, high-definition display, navigation and reading of the operating values and control settings is easy.

Features and Benefits

- High-definition, 15" easy-to-read display
- Logical/intuitive navigation – No control set point is more than three touches away; most are within two
- 3-level pin user management access control
- On-screen calibrations and built-in diagnostic functions
- Heavy-duty industrial processor provides peace-of-mind performance
- Real-time and historical trending
- Ethernet-based for high-speed communications
- Industry standard serial communication protocols: FRICK ASCII; Allen-Bradley® DF1 Serial; Modbus ASCII; Modbus RTU
- Ethernet: Modbus TCP and Allen-Bradley Ethernet IP (web accessible)
- Up to 8 proportional/integral control loops
- Service reminders

Unity Control Access

View any equipment that has a Unity controller from any other Unity controller on the same network. From a compressor panel, you can now view your condenser, vessel, evaporator, engine room or even another compressor (offers redundancy).

Smart Connectivity

Getting connected to your Quantum HD is easy. The patented web-based remote access feature of the Quantum HD can provide access from any commonly networked computer in your facility.

Compressor Package Specific Features

- Four user-defined capacity control modes for a wide application range
- Sequence up to 3 temperature levels with up to 8 compressors per level
- Capacity load profiling
- Smart compressor package safeties for trouble-free operation
- Optional compressor vibration monitoring
- Motor temperature monitoring (stator and bearings)
- Retransmitting analog outputs
- Reciprocating compressor control

FRICK – Committed to Cold for Over 135 Years

We deliver innovative products that help the world run smoothly, smartly, simply and safely.

FRICK is the leader in industrial refrigeration.

Through our unrivaled expertise, developed and honed over nearly a century and a half, we provide world-class refrigeration technology that is reliably cold.

We relentlessly pursue and achieve superior-quality products so you can confidently focus on your core businesses.

We offer a full line of equipment for food and beverage applications including low charge systems, rotary screw compressor packages, condensers, evaporators, heat exchangers, hygienic air handlers, controls, vessels and replacement parts for these products.

And we work with an elite set of sales and installation partners – our FRICK Factors – whose dedication to your absolute satisfaction contributes to our successful products, processes and services.

Specify FRICK solutions. Find the FRICK Factors nearest you at www.frickcold.com.

We promise to go further.

SINGLE SOURCE INDUSTRIAL REFRIGERATION SOLUTIONS

World-Class Solutions
FRICK creates confident customer experiences with our best-in-class solutions.

Reliably Cold
FRICK is synonymous with refrigeration – we have generations of experience building refrigeration solutions.

Unrivaled Expertise
FRICK offers quality that is unrivaled in the industry.

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INDUSTRIAL REFRIGERATION

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