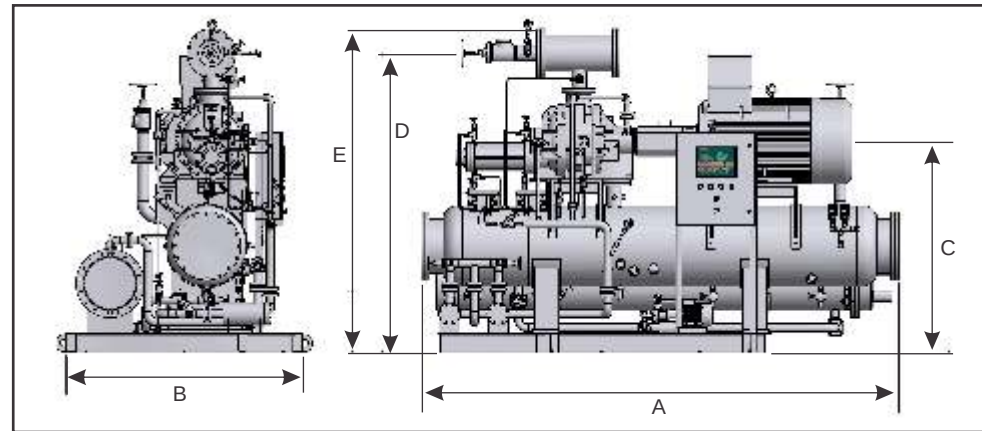


Specifications & Dimensions

FIL/MBM/0617



DIMENSIONS(mm) & Weight (Kgs.)						
MODEL	A	B	C	D	E	WT.
MBM-255	3100	1300	1467	2060	2245	2208
MBM-305	3100	1300	1467	2060	2245	2219
MBM-384	3600	1400	1580	2175	2360	2350
MBM-517	3600	1400	1610	2235	2420	2716
MBM-689	3600	1400	1610	2235	2420	2850
MBM-890	3600	1500	1844	2560	2770	4900
MBM-1120	3600	1500	1844	2560	2770	5100
MBM-1384	4142	1890	1830	2535	2790	6350
MBM-1600	4142	2218	2258	3068	3328	6700
MBM-2000	4142	2218	2258	3068	3328	6890

High Stage (50 Hz.)					High Stage (60 Hz.)					Low Stage (Booster) 50 Hz					Low Stage (Booster) 60 Hz				
@ -5 deg C SST & 40 Deg C SDT					@ -5 deg C SST & 40 Deg C SDT					@ -40 deg C SST & -5 Deg C SDT					@ -40 deg C SST & -5 Deg C SDT				
Models	CMH	Kw	BKw	BkW/TR	Models	CMH	Kw	BKw	BkW/TR	Models	CMH	Kw	BKw	BkW/TR	Models	CMH	Kw	BKw	BkW/TR
MBM 255	433	336.2	87.4	0.91	MBM 255	521	404.5	105.2	0.91	MBM 255B	433	86.0	23.1	0.94	MBM 255B	433	103.5	27.8	0.94
MBM 255E	433	373.2	90.0	0.86	MBM 255E	521	449.1	109.6	0.86										
MBM 305	518	395.5	102.9	0.91	MBM 305	624	475.9	123.8	0.91	MBM 305B	518	101.4	27.2	0.94	MBM 305B	518	122.1	32.7	0.94
MBM 305E	518	439.0	107.1	0.86	MBM 305E	624	528.3	129.0	0.86										
MBM 384	652	497.7	129.5	0.91	MBM 384	785	599.1	155.9	0.91	MBM 384B	652	127.7	34.3	0.94	MBM 384B	652	153.7	41.3	0.94
MBM 384E	652	552.4	134.9	0.86	MBM 384E	785	664.9	162.3	0.86										
MBM 517	878	666.2	165.7	0.87	MBM 517	1057	802.1	199.5	0.87	MBM 517B	878	171.3	43.6	0.89	MBM 517B	878	206.7	52.5	0.89
MBM 517E	878	739.5	172.6	0.82	MBM 517E	1057	889.9	207.7	0.82										
MBM 689	1171	888.7	221.0	0.87	MBM 689	1409	1069.4	266.0	0.87	MBM 689B	1171	228.5	58.1	0.89	MBM 689B	1171	274.8	70.0	0.89
MBM 689E	1171	985.9	228.6	0.82	MBM 689E	1409	1186.6	276.9	0.82										
MBM 890	1512	1200.0	288.8	0.85	MBM 890	1820	1444.3	347.6	0.85	MBM 890B	1512	304.6	75.3	0.87	MBM 890B	1512	366.7	90.7	0.87
MBM 890E	1512	1331.6	300.8	0.79	MBM 890E	1820	1602.7	362.0	0.79										
MBM 1120	1903	1511.0	363.4	0.85	MBM 1120	2290	1818.7	437.8	0.85	MBM 1120B	1903	383.6	94.9	0.87	MBM 1120B	1903	461.9	114.2	0.87
MBM 1120E	1903	1677.0	378.8	0.79	MBM 1120E	2290	2018.3	455.9	0.79										
MBM 1384	2351	1867.6	449.5	0.85	MBM 1384	2830	2247.4	541.0	0.85	MBM 1384B	2351	474.3	117.3	0.87	MBM 1384B	2351	570.8	141.2	0.87
MBM 1384E	2351	2072.5	468.1	0.79	MBM 1384E	2830	2494.1	563.3	0.79										
MBM 1600	2718	2150.6	518.1	0.85	MBM 1600	3271	2588.0	623.4	0.85	MBM 1600B	2718	546.2	135.1	0.87	MBM 1600B	2718	657.4	162.5	0.87
MBM 1600E	2718	2328.3	539.0	0.81	MBM 1600E	3271	2801.8	648.7	0.81										
MBM 2000	3398	2708.2	652.4	0.85	MBM 2000	4089	3258.9	785.1	0.85	MBM 2000B	3398	687.7	170.1	0.87	MBM 2000B	3398	827.6	204.7	0.87
MBM 2000E	3398	2932.0	678.8	0.81	MBM 2000E	4089	3528.4	816.9	0.81										

NOTES : a) Allow 18 inch/45 cm on man way end of unit to pull coalescer element. b) Dimension and Performance Data given is for Ammonia Units only, for other refrigerants please contact Frick India Ltd. c) All Specifications are subject to change without notice.



FRICK INDIA LIMITED

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email : fbd@frick.co.in



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ROTARY TWIN SCREW COMPRESSOR PACKAGES

MBM SERIES

Capacity Range :
433 CMH to 4089 CMH

MODELS :
MBM - 255/305/384
MBM - 517/689
MBM - 890/1120/1384
MBM - 1600/2000



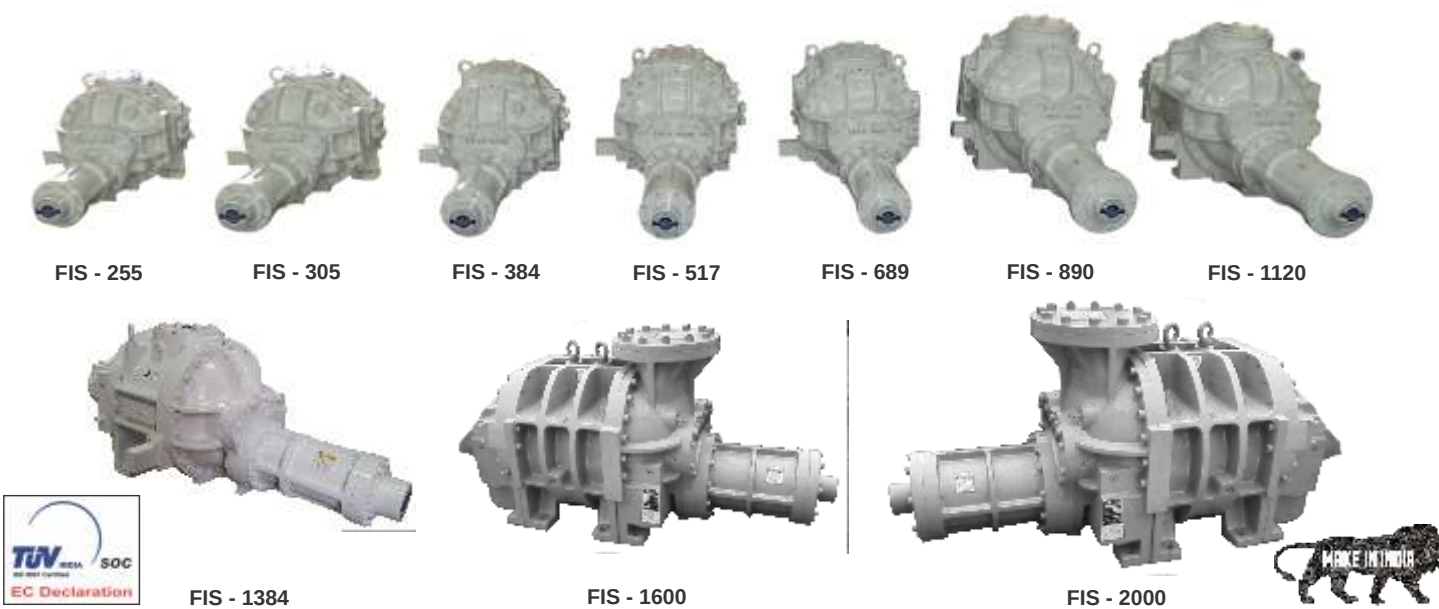
REFRIGERANTS :

- R-717 ■ R-22 ■ R-32 ■ R-134a ■ R-290
- R-404A ■ R-507 ■ R-407c ■ R-600a ■ R-1270

FRICK INDIA LIMITED



High Efficiency Rotary Twin Screw Compressor Blocks



Frick India Limited, established in 1962 and pioneer in the field of Industrial Refrigeration and Air-conditioning equipment brings the third generation Twin Screw Compressor Blocks as well as Rotary Screw Compressor Packages, manufactured at their advanced and updated manufacturing facility at Faridabad.

Our Commitment to produce world class product to meet current and future demands of the Industry and our product development team at our R&D has developed high efficiency screw blocks to conserve energy and low operating costs.

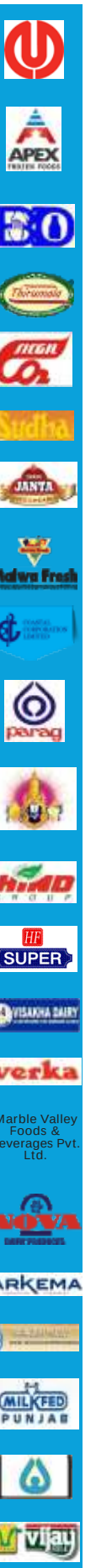


The rotors are from low carbon steel forgings to the exacting tolerance of the latest "N" profile manufactured by renowned company of U.K., M/s Holroyd by using latest technology under the technical know-how from "City University, London". The four lobed male rotors is directly connected to the drivers. The six lobed female rotor is driven by the male rotor on a thin oil film.

These screw blocks can run for almost all gases like R-717, R-22, R-32, R-134a, R-290, R-404A, R-507, R-407c, R-600a, R-1270 etc. For other gas applications custom built packages can be offered.

APPLICATIONS:

- Fruits & Vegetables Industries
- Beverage Industries
- Breweries
- Chemical Industries
- Process Industries
- Sea Food Industries
- Dairy Industries
- Ice Cream Industries
- Cold Storage
- Pharmaceutical Industries
- Air-Conditioning
- Meat & Poultry Industries



Some Installations

Frick India Automation System

High Efficiency Rotary Twin Screw Compressor Packages



Frick India Automation system monitor and control the production and delivery of products and services.

Highly accurate control of the compressor is maintained by Frick India's PLC based Control Panel which constantly monitors the system to maintain design condition and unit energy costs.



Advantages of Frick India Automation System :

- Improve the quality and precision
- Increase in productivity
- Cost reduction
- Reliable performance
- Maintain accurate temperature
- Control your power efficiency
- Read and capture data
- Run system at ideal condition
- Reduce plant breakdown
- More safety to your plant
- Avoid monotonous Work

Frick India Service Network



Our experienced team of highly skilled and specially trained engineers and technicians are available 24x7 on a dedicated support from our Factory to provide all type customer and technical support to our customers pan India.

Training & Skill Development

Apart from our regular after sales service, we regularly train the people through our comprehensive training program in our factory as well as our client's place.

Frick India Genuine Spare Parts

Frick India offers genuine spare parts for lifetime performance of the system.



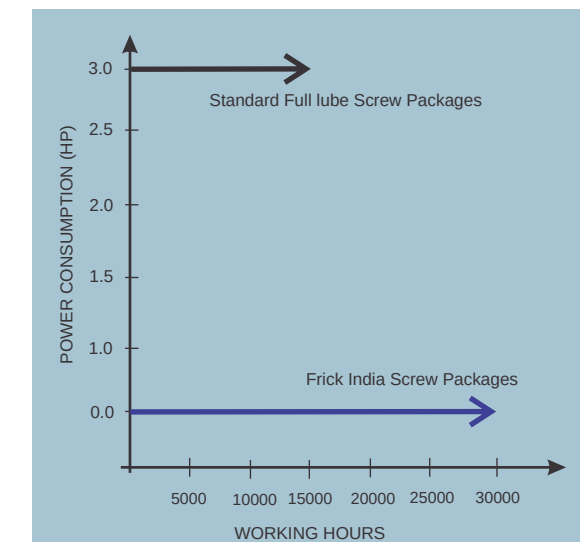
INTRODUCTION :

Frick India Rotary screw compressor units in Ten high efficiency model, range in capacity from 433CMH to 3928 CMH at 2950 RPM as well as 521 CMH to 4089 CMH at 3550 RPM. Standard units are designed for use on Ammonia, Halocarbon and Hydrocarbon refrigerants at pressure ratio upto 26:1.

Energy Saving Features

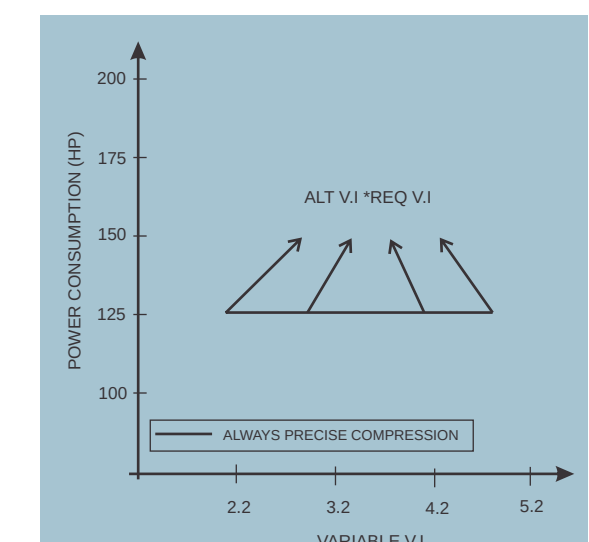
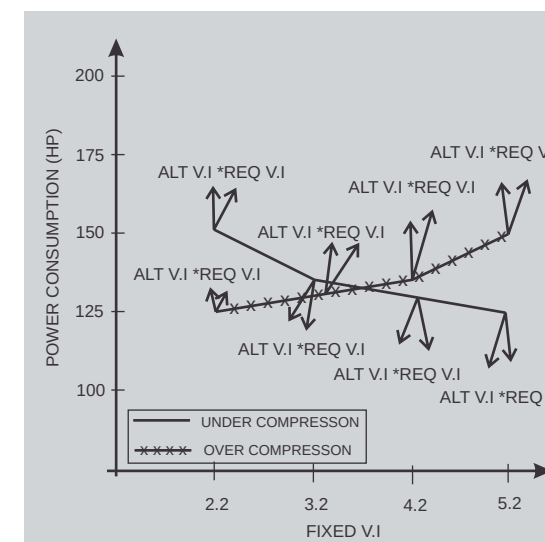
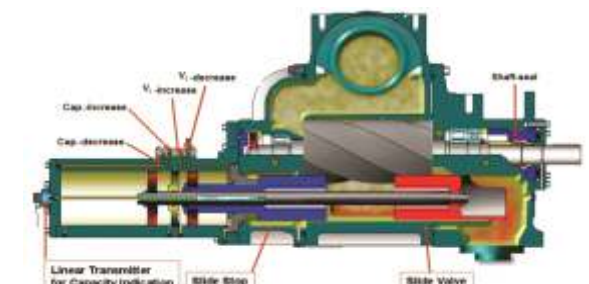
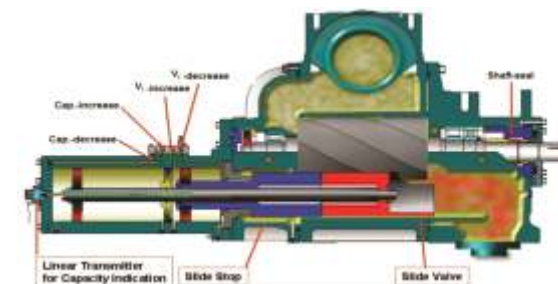
PUMPLESS TECHNOLOGY

- A standard Full lube Screw Compressor package requires full cycle pump which not only increase power consumption but may also require frequent repairs and replacements which may result compressor lubrication failure causing premature overhaul within 15,000 working hours.
- All high stage Frick Screw Compressor don't require oil pump due to choke start technology (by using multi functional compressor valve) and auto unload technology. This feature not only saves power but also reduces risk of frequent pump repair and ensures uninterrupted lubrication of compressor, giving life of at least 30,000 hours.



FULLY AUTOMATIC VARIABLE VOLUME RATIO CONTROL

- All Frick Screw Packages work under wide range of operating conditions with maximum power saving delivered by using Frick India variable Vi technology, which matched external and internal pressure ratios automatically infinitely controlled saving test recorded power (5-25 HP) i.e. (5-15%) of overall power consumption of package w.r.t. standard fixed Vi Screw packages.



Manufacturing Excellence

FOUNDRY

Frick India is committed to manufacturing third generation highest quality compressors. The process starts with casting in our latest State-of-the-Art foundry in our Factory. All screw compressor casting are designed and tested to meet the requirements of ASHRAE 15-78 safety codes for 350 psig maximum discharge pressure. Castings are close grain, ASTM A 278 class 40 cast iron to ensure structural integrity.



Quality Checking of Machined Equipment by Spectro (NABL Accredited) & Trimos Machine for accuracy

MACHINING

We use state of the art CNC machining system to meet the highest possible accuracy in order to produce high efficiency compressors. We use state of the art horizontal machining centres to produce casing in order to achieve accuracy.



Each Housing is inspected on CMM for ensuring consistency in machining

COMPRESSOR ASSEMBLY

Assembly of High efficiency Screw Blocks has been performed by technical engineers at advanced and upgraded manufacturing facility at our factory. After assembly, Frick India offers complete capacity and efficiency testing for all models of Screw Blocks are conducted in-house itself with our test Rigs, installed as per ISO 917 standard.



IN HOUSE TEST RIGS : State-of-the-art Routine testing RIG, confirming to IS 10431 and performance test Rig confirm to ISO 917.

SCREW PACKAGES

Assembly of screw compressor is done by our skilled engineers at Factory. The oil separator is a horizontal, three-stage separation design with integral sump. Two 1000 watt heaters maintain oil temperature at 19.4 deg C minimum during compressor shutdown and are replaceable without shutting the compressor down. Coalescer filter elements are provided for final gas/oil separation of particles down to less than 1 micron.



The compact, vibration free Frick India rotary screw compressor packages are designed for all Industrial refrigeration and air-conditioning requirements.

Specifications

DESCRIPTION / MODELS		452XL	454XL	456XL	458XL	456-42XL	458-62XL
Number of Cylinders		2	4	6	8	4 LS/2HS	6 LS/2HS
Maximum RPM		1200	1200	1200	1200	1200	1200
Bore & Stroke	Inch mm	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114	4 ¹ / ₂ x 4 ¹ / ₂ 114 x 114
CFM @ Maximum RPM (m ³ /hr)		99.4 (169)	199 (338)	298 (507)	398 (676)	298 (507)	398 (676)
Tons (kW) Refrigeration @ 35°C Condensing	R-717 (-10°C) R-134a (-6.6°C)	30.4 (106.7) 31 (108.8)	60.8 (213.4) 62 (217.6)	91.2 (320.1) 93 (326.4)	121.6 (426.8) 124 (435.2)	32(112.3) [#] -	47.5(166.7) [#] -
Tons (kW) Refrigeration @ 40°C Condensing	R-717 (-15°C) R-717 (-5°C)	24.3 (85.3) 37 (129.8)	48.6 (170.5) 74 (259.7)	72.9 (255.8) 111 (389.6)	97.2 (341.1) 148 (519.9)	20(65.8) [#] -	24.8(87.04) [#] -
Tons (kW ³) Refrigeration @ 40°C Condensing	R-134a (4.4°C)	44.5 (156.2)	89 (312.3)	133.5 (468.5)	178 (624.7)	-	-
Suction Connection - in. (mm)		2 ¹ / ₂ (64)	3 (76)	4 (102)	4 (102)	4(102) ⁵ /2 ¹ / ₂ (64) ⁺	4(102) ⁵ /2 ¹ / ₂ (64) ⁺
Discharge Connection - in. (mm)		2 (51)	2 ¹ / ₂ (64)	3 (76)	3 (76)	2 ¹ / ₂ (64) ⁵ /2 (51) ⁺	3 (76) ⁵ /2 (51) ⁺
Unit weight Less Motor - Lbs. (kg)		1900 (862)	2700 (1225)	3100(1406)	3400(1542)	3264 (1481)	3564 (1617)
Oil Charge - Gallons (Liters)		5(19)	7 (27)	7 (27)	7 (27)	7(27)	7(27)
Standard Steps of Unloading (%)		0	50	33/66	25/50/75	50	33/66

NOTES : ⁺At -25°C Evaporative and 35°C Condensing [#]At -40°C Evaporative and 35°C Condensing
⁵Low side ⁺High Side All specifications are subject to change without notice. For other options on loading/unloading, please contact factory.

Some of our Customers



FRICK INDIA LIMITED



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Secunderabad	: 608, VI Floor, Swapnalok, 92/93, S.D. Road, Secunderabad -500 003.	27813044, 27813897	27813897	hyd@frick.co.in
Vizag	: D No 3/18, 3 rd Floor, Eswar Homes, 1 st Lane, Dwaraka Nagar, Vizag- 530016.	2553232		vizag@frickmail.com

FRICK INDIA HIGH SPEED RECIPROCATING COMPRESSORS



www.frickweb.com

FRICK INDIA LTD.

Frick India 450 XL Series High Speed Reciprocating Compressors



HIGH EFFICIENCY
PERFORMANCE



HIGH COP

Advanced
FILTERS
removes 95%
Contamination



Smooth Unloading System

double bellow
shaft seal

Low **POWER**
Consumption



Spring Loaded Safety Heads

Spring loaded safety heads are provided on all 450 XL models for protection against liquid slugs. In case of slugging, the springs can compress, and the safety heads rise to provide additional volume, thereby avoiding transmission of a heavy shock load and subsequent damage to compressor parts. Extra space provided by this arrangement allows liquid to be forced out of the cylinder more easily. The 450 XL suction and discharge valve porting was designed to improve the compressor's efficiency and its capacity.



Piston, Ring & Ring Assembly

A new, unique shrink-fit wrist pin is used on the 450 XL to increase the piston's load-carrying capabilities. Piston pins are of case hardened steel, ground and polished to size. Piston rings are made of special, close-grained, heat-treated cast iron. Ring set includes 3 compression rings and 1 oil ring. Entire aluminium piston is tin-plated to prevent scuffing during break-in period.



Double Bellow Shaft Seal

The 450XL shaft seal is manufactured from materials strictly used for industrial refrigeration applications. Seal unit assembly consists of two opposed seals - one sealing from the atmosphere and the other from the crankcase. Mating seal surfaces are lubricated and cooled by circulated oil.

Tri-Micro Oil Filter

Removes 95% of contaminants as small as 3 microns in size. Allows full flow of oil at all times, resulting in reduced wear on compressor components. Combines extreme filtering capacity with the convenience of a throw-away recharge element. Filter is enclosed in a seamless drawn carbon steel shell with cast iron cover, and is equipped with a means for determining pressure drop across the filter.



Taper roller ball bearing

Taper roller ball bearings are specially designed to manage heavy radial loads. Bearings are fitted at both the ends of the crankshaft for better efficiency of crankshaft rotation. Less power losses, higher speed, lower maintenance, better overall efficiency, better equipped to deal with liquid slugs are main advantages of taper roller bearings over welded bush type bearings.



Ductile Iron Crankshaft

The 450XL crankpin diameter was designed for greater shaft strength and to provide greater projected bearing area. Bearing surfaces are carefully ground and polished to close tolerance. Shafts are balanced both statically and dynamically to minimize vibration, and are specially drilled to ensure hydrodynamic lubrication of the bearings throughout the compression cycle. For the 6, 8 cylinder models, the shafts are shot-peened for even greater strength.



Capacity Control System

A piston-operated unloading mechanism that is actuated by suction pressure raises the suction valve to unload individual cylinders and/or pairs of cylinders for easy starting and capacity control. High pressure gas or oil is metered into the operating chamber of the unloader piston through a small port, thereby depressing the piston to lower the suction valve plate, and thus loading the compressor. This system's unique design allows for removal of the unloader piston and seal assembly for servicing without dismantling the entire compressor.



Fully Automatic

Easy to Install and Operate Frick India PLC Control Panel have manual as well as automatic function for Compressor Loading & Unloading. Energy saving through auto operation. USB port to connect USB drive for data logging.

Oil Separator

Cyclone type oil separator is having auto oil draining system without any controls

Cast Iron Body

Suitable for refrigeration applications being thermally insensitive to expansions / contraction during operations. better thermal insulation leading to low noise / sound.

Capacity Control System

A piston-operated unloading mechanism that is actuated by suction pressure raises the suction valve to unload individual cylinders and/or pairs of cylinders for easy starting and capacity control. High pressure gas or oil is metered into the operating chamber of the unloader piston through a small port, thereby depressing the piston to lower the suction valve plate, and thus loading the compressor. This system's unique design allows for removal of the unloader piston and seal assembly for servicing without dismantling the entire compressor



DESCRIPTIONS

Frick India offers Six models of High Speed reciprocating compressors ranging from a nominal 2 cylinder machine all the way to the high end of scale-a nominal 8 cylinder model. In between are the 4 & 6-cylinder mid size units. All High Speed reciprocating compressors run at a maximum of 1200 RPM, and all are provided with built-in capacity reduction steps for economical operation at reduced loads. V-belt and direct connected motor operation are also available throughout the entire range of High Speed reciprocating models.

The 450XL can operate with ammonia, halocarbon and even some hydrocarbon refrigerants. It works in extreme applications with up to a 17.2 bar pressure differential. It can be belt-driven up to 224 kW or direct driven all the way up to 285 kW. And it can run at high compression ratios all the way up to 12:1 with certain halocarbon refrigerants. these compressors are extremely cost-efficient.

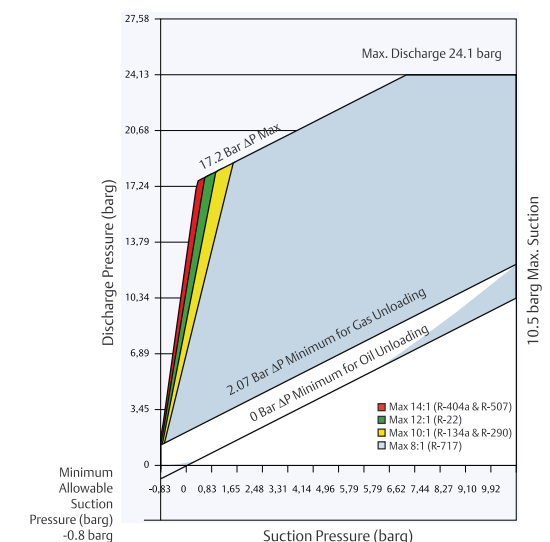
Frick India High Speed Compressors has a whopping cylinder displacement of 84.5 m³/h while running at 1200 RPM. and the high efficiency of the 450XL means its COP is high as compared to other compression systems.

The 450XL can be installed almost anywhere, even on an upper floor if necessary, since vibration is kept to a minimum. Noise level is low too, due to the use of quick acting, precise ring plate suction and discharge valves.

Applications

The 450XL is so versatile it can handle almost any refrigeration system conditions. Up to 24.1 bar maximum discharge, and upto 10.3 bar maximum suction with a maximum 17.2 bar pressure differential. At different compression ratios, too, from 8:1 for ammonia to 14:1 for R404A.

In V-belt configurations all the way up to 224 kW, or, direct drive setups up to 285 kW. And it's usable for both 50Hz and 60Hz applications up to 1200 RPM.



452 XL



454 XL



456 XL



458 XL

Frick India Genuine Spare Parts

When you need parts for your 450XL compressor – whether for repair work or scheduled maintenance – make sure you specify Genuine Spare Parts. Cheap parts can become an expensive mistake. Make sure you insist on using only Genuine Spare Parts, readily available in our Factory and our Branch offices pan India.

You can also buy the Genuine spare parts online. Visit www.efrickindia.com

