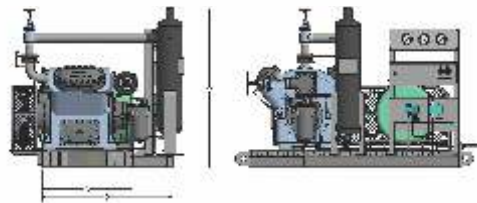


CAPACITIES & DIMENSIONS

Compressor Models	Refrigerant	R-22				NH ₃				R-290(Propane)				R-134a			
		Evaporative Temperature in Deg C	Condensing Temperature		Condensing Temperature		Condensing Temperature		Condensing Temperature		Condensing Temperature		Condensing Temperature				
			35 Deg C	40 Deg C	35 Deg C	40 Deg C	35 Deg C	40 Deg C	35 Deg C	40 Deg C	35 Deg C	40 Deg C	35 Deg C	40 Deg C			
Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW	Qo KW	Pe KW		
452 XL	5	165.61	32.26	153.95	34.94	192.56	29.89	184.41	33.58	--	--	--	--	100.6	21.2	93.6	23.0
	0	136.56	31.36	127.43	33.59	156.70	28.78	151.16	33.22	115.4	29.5	106.6	31.6	79.5	20.2	74.6	21.7
	-5	113.52	29.86	104.25	31.74	126.06	28.87	121.17	31.74	95.7	28.3	87.6	30.1	61.9	19.0	57.7	20.1
	-10	93.17	27.95	84.62	29.40	99.11	27.14	94.40	29.34	78.1	26.8	71.0	28.1	47.1	17.6	44.0	18.2
	-15	74.62	25.80	67.74	26.85	76.43	24.98	71.83	26.54	62.6	24.9	57.0	26.0	35.5	15.9	32.7	16.0
-20	58.25	23.39	52.74	24.03	58.39	22.58	--	--	49.6	22.8	44.7	23.6	27.1	13.9	23.9	13.6	
454 XL	5	331.66	61.67	308.26	66.77	385.64	57.06	370.49	64.22	--	--	--	--	201.2	40.5	187.1	44.1
	0	273.85	59.94	255.38	64.23	313.99	56.91	302.90	63.47	231.1	56.4	213.1	60.5	159.3	38.7	148.8	41.5
	-5	227.63	57.14	208.72	60.63	252.84	55.24	242.95	60.69	191.0	54.2	175.5	57.4	123.4	36.4	115.7	38.5
	-10	186.33	53.41	169.60	56.21	198.80	51.90	189.01	56.05	155.8	51.2	142.4	53.8	94.3	33.6	87.9	34.8
	-15	149.24	49.29	135.84	51.30	153.23	47.72	143.66	50.72	125.2	47.7	113.6	49.6	71.0	30.3	65.4	30.6
-20	116.86	44.67	105.48	45.88	116.86	43.12	--	--	98.8	43.6	89.0	45.0	53.8	26.6	47.8	25.9	
456 XL	5	497.28	90.60	462.21	98.13	578.20	83.91	554.00	94.41	--	--	--	--	301.8	59.5	281.0	64.8
	0	410.41	88.14	382.81	94.44	470.69	83.67	454.10	93.31	46.4	83.0	319.7	88.9	238.8	56.9	223.3	61.1
	-5	341.15	84.00	312.97	89.14	378.90	81.24	364.14	89.22	286.6	79.6	263.1	84.4	185.3	53.5	173.4	56.5
	-10	279.50	78.49	254.22	82.65	297.90	76.30	283.45	82.38	233.9	75.2	213.5	79.0	141.4	49.4	131.9	51.2
	-15	223.86	72.48	203.58	75.39	229.66	70.17	215.49	74.55	187.8	70.0	170.6	72.9	106.6	44.7	97.8	45.0
-20	175.10	65.65	158.22	69.43	175.25	63.35	--	--	148.4	64.1	133.6	66.2	80.9	39.1	72.1	38.0	
458 XL	5	661.44	120.79	614.71	130.86	769.03	111.81	736.90	125.85	--	--	--	--	402.3	79.3	374.6	86.4
	0	546.11	117.46	507.71	125.90	626.16	111.54	604.03	124.41	461.8	110.7	426.6	118.6	318.6	75.8	297.5	81.4
	-5	453.95	111.99	416.14	118.82	504.23	108.28	484.49	118.98	381.9	106.2	350.6	112.6	247.2	71.4	231.4	75.4
	-10	371.58	104.67	338.18	110.20	396.50	101.73	376.98	109.86	311.6	100.3	284.5	105.4	188.2	65.9	175.9	68.2
	-15	297.76	96.64	270.95	100.59	305.73	93.51	286.62	99.40	250.4	93.4	227.2	97.2	141.7	59.6	130.5	60.0
-20	232.99	87.53	210.24	89.93	232.99	84.50	--	--	197.7	85.5	178.0	88.3	108.0	52.2	96.0	50.8	
4512 XL	5	1122.9	167.9	1086.8	184.7	--	--	866.9	176.2	--	--	--	--	--	--	581.7	141.4
	0	914.2	167.4	890.1	183.1	777.2	164.9	731.2	178.5	693.2	165.4	640.4	177.3	500.4	133.6	464.9	137.9
	-5	736.1	162.5	713.7	175.7	650.6	160.3	609.1	171.3	573.6	158.8	527.2	168.4	398.5	125.6	368.2	127.5
	-10	578.7	152.7	557.1	162.8	534.9	152.6	497.6	161.3	468.4	150.1	428.0	157.7	312.6	114.0	287.0	114.1
	-15	446.3	140.4	424.1	147.6	429.4	142.4	396.3	148.9	376.7	139.7	342.2	145.5	239.8	100.5	218.0	99.4
-20	340.4	126.8	319.5	131.7	335.2	130.3	305.6	134.8	297.5	128.1	268.3	132.3	176.2	86.6	157.9	84.9	

NOTES : All specifications are subject to change without notice. For other options on loading/unloading, please contact factory.



Dimension & Weight of Frick India Reciprocating Compressors

MODEL	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	WEIGHT
452 XL	785	1135	1123	1343	2070	1950 Kg
454 XL	785	1135	1123	1378	2070	2600 Kg
456 XL	785	1135	1173	1378	2450	3100 Kg
458 XL	785	1135	1175	1448	2450	3400 Kg
4512 XL	1241	1828	1145	2020	2880	4500 Kg.



HIGH SPEED RECIPROCATING COMPRESSORS



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fil compressors

450 XL Series High Speed Reciprocating Compressors

DESCRIPTIONS

fil compressors offers complete range of high speed reciprocating compressors ranging from 2 cylinder machine to the high end of 12 cylinder model. In between, there are 4, 6 & 8-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 hydrocarbon refrigerants. It works in extreme applications ranging from 2.07 bar to 17.2 bar pressure differential. It can run at high compression ratios and these compressors are extremely cost-efficient. F I L compressors have a cylinder displacement of 84.5 m³/h while running at 1200 RPM. COP is as high as compared to other compression systems.

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



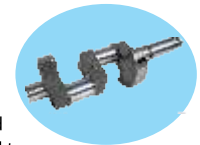
Spring Loaded Safety Heads

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.



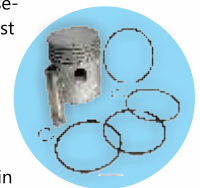
Ductile Iron Crankshaft

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.



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 tinned to prevent scuffing during break-in period.



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.

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.



Oil Separator

Standard Type / Scrubber Type / Cyclone type or Coleascer Type oil separator are used.

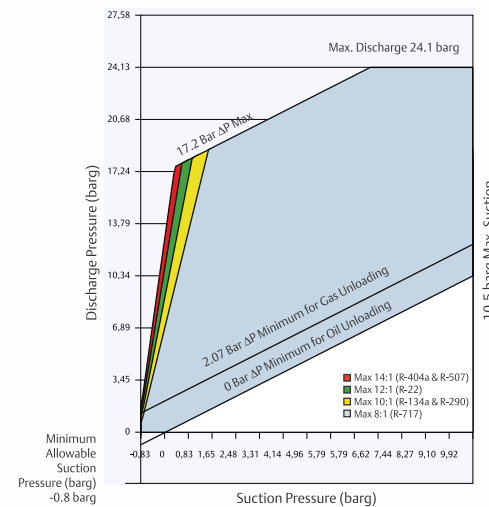
Cast Iron Body

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

FEATURES

- High COP
- Energy Efficiency Performance
- Superior Part Load Performance
- Double Bellow Shaft Seal
- Inherent Variable Volume Ratio
- Liquid resistant Safety Head Protection
- Double Tapered Roller Bearing
- Tri Micro Oil Filtration
- Smooth 100 % Unloading system
- Low Vibration & Noise
- Low Power Consumption
- Less Maintenance
- Environment Friendly
- User Friendly

OPERATIONAL LIMITS



SPECIFICATIONS

DESCRIPTION / MODELS		452XL	454XL	456XL	458XL	4512XL
Number of Cylinders		2	4	6	8	12
Maximum RPM		1200	1200	1200	1200	1200
Bore & Stroke	Inch	4 1/2 x 4 1/2	4 1/2 x 4 1/2	4 1/2 x 4 1/2	4 1/2 x 4 1/2	4 1/2 x 4 1/2
	mm	114 x 114	114 x 114	114 x 114	114 x 114	114 x 114
Swept Volume@ Maximum RPM	CFM (CMH)	99.4 (169)	199 (338)	298 (507)	398 (676)	596 (1013)
Suction Connection -	in. (mm)	2 1/2 (65)	3 (80)	4 (100)	4 (100)	6 (150)
Discharge Connection -	in. (mm)	2 (50)	2 1/2 (65)	3 (80)	3 (80)	3 (80x2)
Unit weight Less Motor -	Lbs. (kg)	1900 (862)	2700 (1225)	3100 (1406)	3400 (1542)	5580 (2565)
Oil Charge -	Ga (Lts)	5 (19)	7 (27)	7 (27)	7 (27)	15 (54)
Standard Steps of Unloading	(%)	0	50/100	33/66/100	25/50/75/100	33/66/100

Genuine Spare Parts



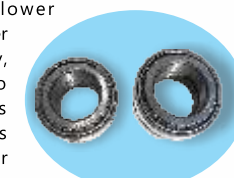
Tri-Micro Oil Filter

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.



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.

