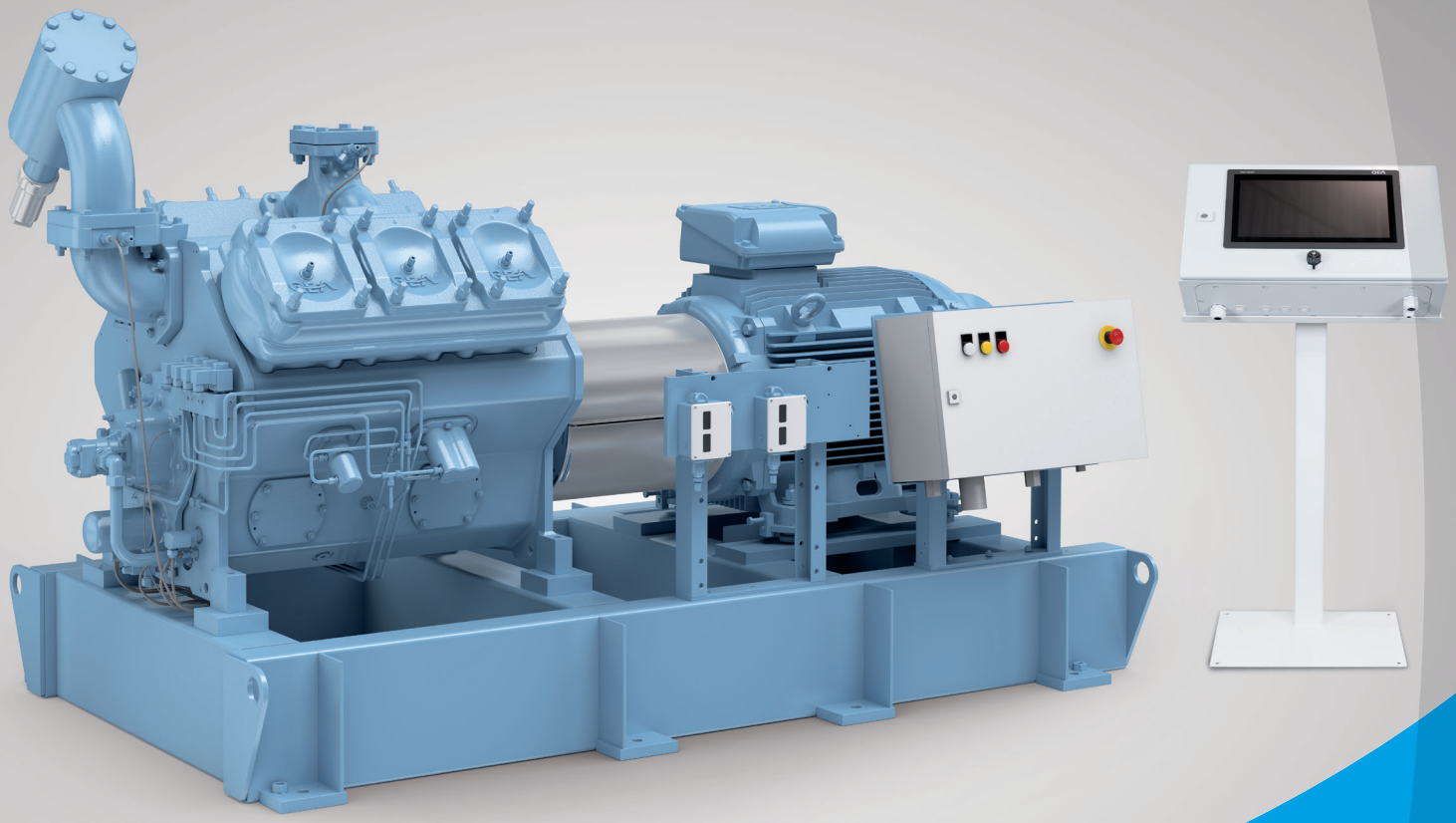


GEA V Series

piston compressor packages
for industrial refrigeration

GEA North America

engineering for
a better world

gea.com

Cooling and freezing evolved from excellence

Leading technology and experience, all in touch with your markets and processes

GEA is one of the leading manufacturers of piston and screw compressors and packages for industrial refrigeration. The extensive range of high-quality, reliable and modern refrigeration compressors can be applied in almost every industrial refrigeration process. Our main markets for industrial refrigeration solutions are:

- Food and beverage processing
- Storage and distribution
- Industrial processes

From the beginning, GEA refrigeration solutions have continuously been extended to cover many different industries. For most industrial cooling and freezing applications our products offer optimal solutions with high reliability and low energy consumption.

Refrigeration technology is an inherent and essential part of the food and beverage processing industry. GEA supplies an excellent range of components which can be used throughout the whole value chain, beginning with the production itself and ending with the product ready for market. GEA refrigeration solutions comprise components for cold storage on fishing vessels, cooling and freezing solutions for meat, vegetables, beer and beverages – within the production process or for storage. For storage and distribution of food along the trade chain, cooling and freezing is a must.

Refrigeration from GEA is also responsible for entertainment and well-being in leisure time. Winter sports like skating and skiing in a perfect, cool winter atmosphere – independent of season or geographical region – are the result of the application of GEA components. GEA refrigeration solutions allow our customers to focus 100% on their business.

GEA provides cooling and freezing technology tailored to the requirements and wishes of our customers: cost-efficient, long-life, energy-efficient, sustainable and customized. After all, we know your business and your refrigeration needs from experience of more than 100 years. This is why we offer the best solutions together with top-quality products for greater efficiency and for enhanced climate protection.

Reduce your Total Cost of Ownership

GEA V Series piston compressors —
built to deliver efficiency and reliability

Trendsetter

With the new GEA V Series piston compressors, GEA signaled the start of a complete new era for the industrial refrigeration market. GEA continues to invest in piston technology with a clear vision for the future, and with good reason. The Total Cost of Ownership, where energy is the major component, has become an important issue, which is why the market is now demanding energy-efficient solutions.

Innovation

During the development of the GEA V Series, GEA continually put itself in the position of the customer. Time and again, each component was assessed for the most important elements that contribute to a low Total Cost of Ownership:

- Energy efficiency
- Minimal maintenance costs
- Maximum reliability with minimal downtime

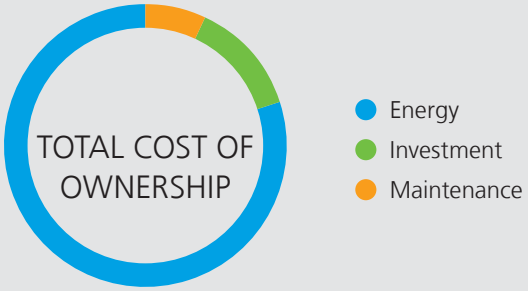
Contractors will benefit from this new development in terms of ease of installation and on-time maintenance.

GEA's worldwide professional product support is a known fact inside the world of industrial refrigeration.

Sustainability

To get the maximum out of the GEA V Series compressor design, we focus on natural refrigerants like NH_3. Our customers can be sure that environmentally friendly NH_3 is not subject to the global warming and ozone layer discussions. And when it comes down to efficiency, ammonia is definitely number one.

More than 100 years of design experience have been combined with state-of-the-art research and technology. The result is a highly efficient and reliable piston compressor with extended and flexible service intervals compared to previous standards. As a consequence of this intensive design the GEA V Series achieves the highest possible reliability. With the V Series, GEA sets a new standard for the future.



Revolutionary design and performance

The choice for well-designed, cost-effective refrigeration

Energy

Piston compressor technology is synonymous with highly efficient operation resulting in lower power consumption. This is the result of minimum internal leakages, automatic head pressure adjustment and increased efficiency at lower speed especially in combination with a frequency inverter. This new design contributes to a further reduction of power consumption under all circumstances.

Minimum maintenance

The selection of the highest quality parts and construction methods enables GEA to reduce the downtime and maintenance frequency for this machine significantly when compared to the traditional compressor maintenance guidelines. Furthermore, we believe that maintenance should only be carried out when it is necessary, this is in contradiction with the fixed maintenance schedules in general use today for refrigeration compressors. That is why each GEA V Series compressor is coupled with a GEA Omni control panel which indicates the right time for maintenance.

Unconditional reliability

GEA believes its customers should be able to focus 100% on their business. That is why we place so much emphasis on reliable and trustworthy systems. With the maintenance carried out in accordance with the maintenance intervals indicated by the GEA Omni control panel, you can be sure of problem-free operation throughout the entire lifespan of the machine so you can concentrate on your business.

Lower investment

The optimized components of this new compressor series as well as the chosen running speed result in a lower price per kW cooling power. Due to the very low oil carry-over of the complete range of the GEA V Series, packaging of these compressors without oil separator is an option.

An unequalled design

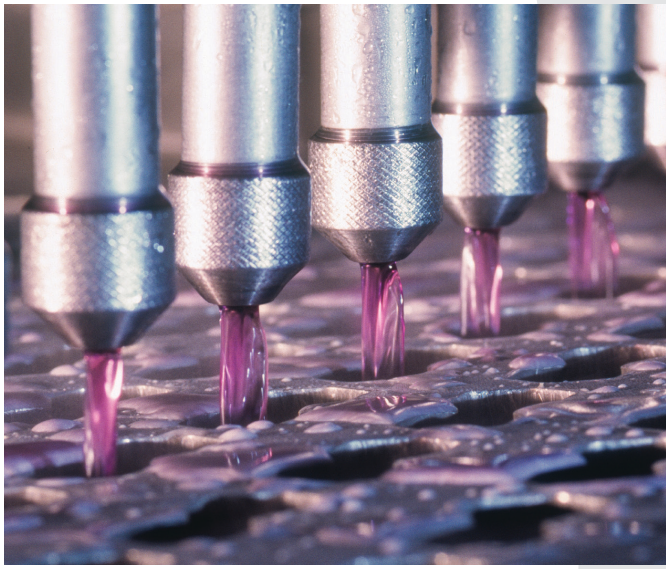
The design of the welded compressor crankcase housing is innovative 'from top to bottom'. This is probably the most striking change in the history of GEA welded compressor construction. By using a revolutionary process of forming the steel sections creating the complete crankcase, the optimum shape and size can be made without compromise and it retains all the advantages of a welded concept.

An unequalled performance

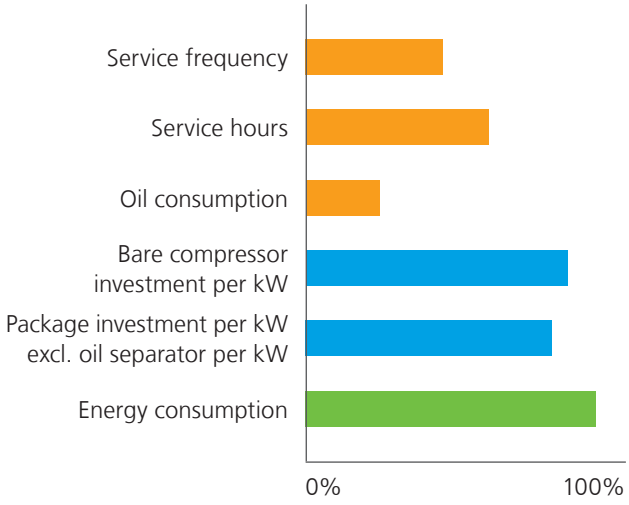
The optimized shape and size of the compressor crankcase made it possible to achieve the highest energy efficiency, minimum maintenance and maximum reliability. Another result is a much lower sound level. The unique combination of a welded crankcase with integrated, generously sized suction chamber and cast iron, externally positioned cylinder heads creates an even better internal temperature separation between the suction side and the discharge side of the compressor, compared with existing models. In practice this results in less internal superheat, more stable oil temperature and, as a consequence, a higher volumetric efficiency. Another effect is that the field of application for part-load running has been extended.

An unequalled reduction of costs

The running cost or TCO (Total Cost of Ownership) is a key factor in designing the total refrigerating system. Since the major costs are located in the engine room area, the impact of a well-designed, cost-effective refrigeration compressor is huge.



REDUCED COSTS COMPARED TO EXISTING MODELS



Total Cost of Ownership savings up to 12%

Key features

The revolutionary design of the steel-welded compressor housing in combination with the temperature-isolated cylinder heads contribute greatly to the thermodynamic advantages of the new GEA V Series. This results in the most efficient industrial piston compressor GEA has ever made.

1. Safety first

- Counter pressure independent overflow valve(s) between suction and discharge chamber to secure a safe operation.

2. Optimized suction gas entry

- Oversized suction gas chamber and optimized filtering and distribution results in low pressure drop and increased resistance against liquid hammer.

3. Optimized temperature separation

- The cold suction chamber is clearly separated from the hot discharge area by means of an isolating gasket and an air gap. In this way we have less internal heating up the suction gas resulting in lower discharge temperatures and more flexibility in part load operation.

4. Oil pump

- Different sizes tuned to compressor model.

5. Oil filter

- Large capacity 'screw-on' oil filter to cover long service intervals. Externally accessible.

6. Maximum lifetime

- Composite material for suction and discharge valves.
- Free-flow discharge valve configuration with gas damping chambers.
- High volume and low gas velocity suction chamber.
- Oil pump size adapted to compressor size.

7. Reliability and ease of maintenance

- Axial roller bearing construction to withstand high crankcase pressures for maximum lifetime at high loads.
- Increased main bearing diameter for stable low-speed inverter drive running.
- Large-capacity, externally mounted oil filter for long service intervals.
- Full oil pump flow over shaft seal for maximum cooling/life time extension.

8. O-ring sealing for maximum tightness

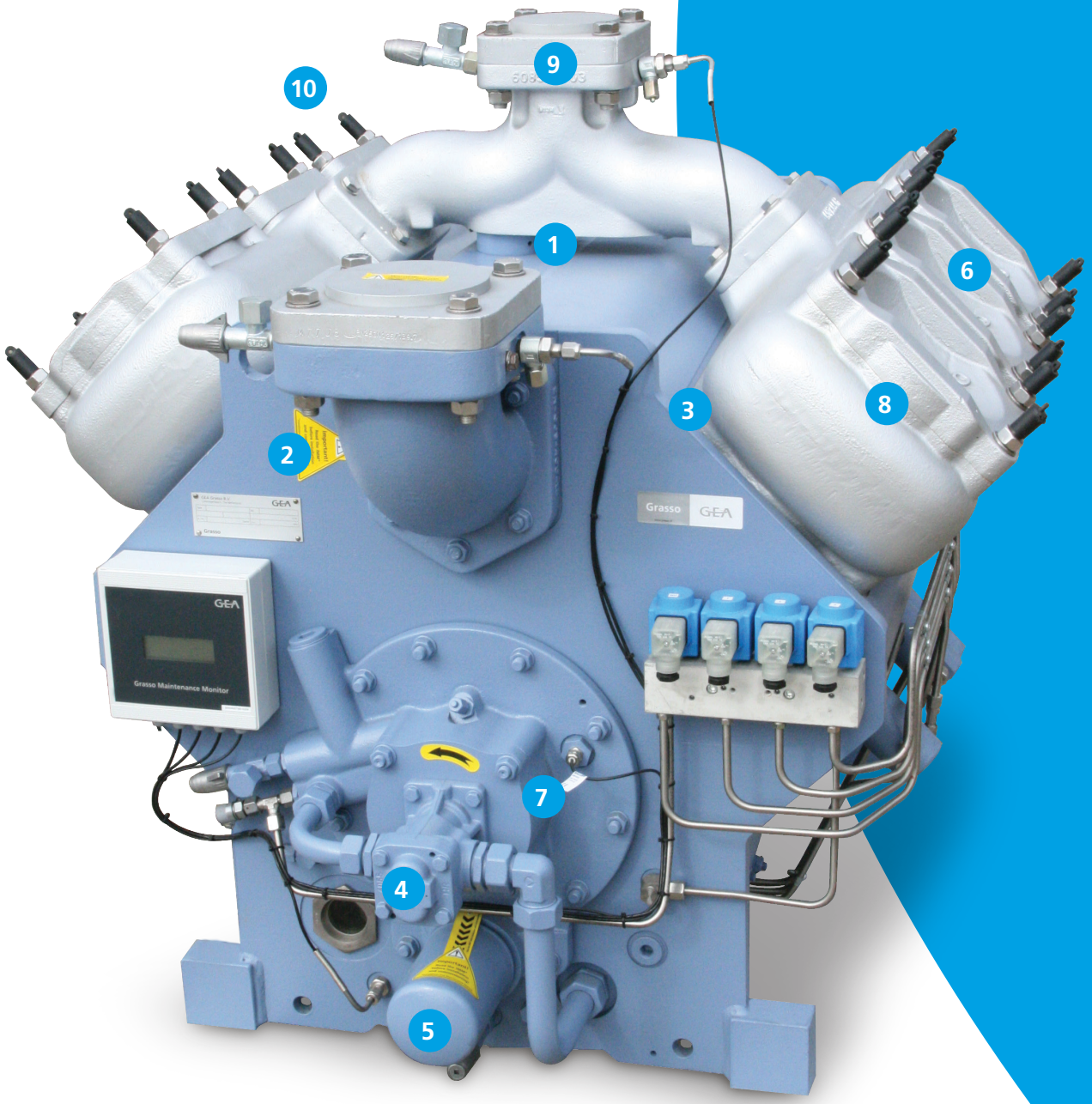
- Easy disassembly and assembly.
- Over 60% fewer fixing bolts contribute to reduced service times.

9. Minimized oil carry-over to refrigeration system

- The oversized common suction chamber, the position of the cylinder liners, as well as the increased distance between oil sump and crankshaft (and lower internal temperatures) result in an extremely low oil carry-over. The necessity of using an oil separator is subject to application and, in some cases, can be omitted.

10. Low noise level

- Modular setup of the steel-welded housing in combination with the rigid cast iron cylinder heads guarantees the lowest possible noise emission.


10
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GEA
GEA
Grasso Maintenance Monitor
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A complete product range

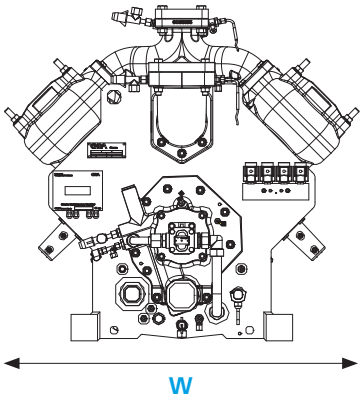
Find the right compressor for each application in the well-balanced GEA V Series family. For this, the capacity steps between models have been set as narrow as possible, increasing in steps of two cylinders. Two different bore and stroke ratios are integrated into the basic design to cover the required swept volume range without capacity overlap.

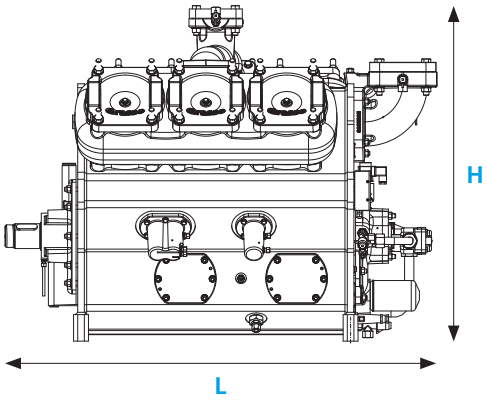
Single stage

The single-stage series, having seven models, starts with a four-cylinder, small bore x stroke for accurate capacity control and ends with a 10-cylinder big bore x stroke to cover a swept volume of 938 CFM. The modular construction and the intermediate plate for the larger compressors guarantee a smooth vibration-free running and low noise emission.

Two stage

Two-stage-or 'compound' models benefit from the same characteristics as the single-stage models. Internally they have separate suction chambers for low and intermediate pressure and, on the outside, two connections are added for the intermediate side. The range also comprises seven models, each with only one LP/HP cylinder ratio in order to simplify the selection procedure. For the two-stage compressors, several highly efficient and patented intermediate cooling systems are available.





SINGLE-STAGE MODELS

Models	Swept Volume		Number of cylinders	Bore		Stroke		Max Speed (rpm)	Dimensions (inch)*			Dimensions (mm)*			Weight	
	(cfm)	(m^3h)		(inch)	(mm)	(inch)	(mm)		L	W	H	L	W	H	(lbs)	(kg)
40VMX	171	290	4	4.31	110	3.31	85	1,500	34.75	36.75	36.31	882	933	922	1,268	575
60VMX	256	435	6	4.31	110	3.31	85	1,500	42.38	36.75	36.31	1,076	933	922	1,656	751
80VMX	342	580	8	4.31	110	3.31	85	1,500	53.69	36.75	36.31	1,363	933	922	2,298	1,042
100VMX	375	637	4	6.25	160	4.31	110	1,200	40.75	42.38	39.94	1,035	1,076	1,013	1,751	794
150VMX	562	955	6	6.25	160	4.31	110	1,200	50.38	42.38	39.94	1,279	1,076	1,013	2,324	1,054
200VMX	750	1,274	8	6.25	160	4.31	110	1,200	64.56	42.38	40.44	1,639	1,076	1,027	3,296	1,495
250VMX	938	1,592	10	6.25	160	4.31	110	1,200	73.38	42.38	40.44	1,863	1,076	1,027	3,803	1,725

TWO-STAGE MODELS

Models	Swept Volume		Number of cylinders (LP+HP)	Bore		Stroke		Max Speed (rpm)	Dimensions (inch)*			Dimensions (mm)*			Weight	
	(cfm)	(m^3h)		(inch)	(mm)	(inch)	(mm)		L	W	H	L	W	H	(lbs)	(kg)
40VMXT	128	217	3 + 1	4.31	110	3.31	85	1,500	36.19	36.75	36.31	918	933	922	1,372	622
60VMXT	171	290	4 + 2	4.31	110	3.31	85	1,500	43.81	36.75	36.31	1,112	933	922	1,775	805
80VMXT	256	435	6 + 2	4.31	110	3.31	85	1,500	55.06	36.75	36.31	1,399	933	922	2,414	1,095
100VMXT	282	478	3 + 1	6.25	160	4.31	110	1,200	42.31	42.38	39.94	1,075	1,076	1,013	1,846	837
150VMXT	375	637	4 + 2	6.25	160	4.31	110	1,200	51.94	42.38	39.94	1,319	1,076	1,013	2,428	1,101
200VMXT	562	955	6 + 2	6.25	160	4.31	110	1,200	65.44	42.38	40.44	1,661	1,076	1,027	3,380	1,533
250VMXT	750	1,114	7 + 3	6.25	160	4.31	110	1,200	75	42.38	40.44	1,905	1,076	1,027	3,898	1,768

* *A single-stage compressor is depicted at left.*

GEA V Series compressor packages

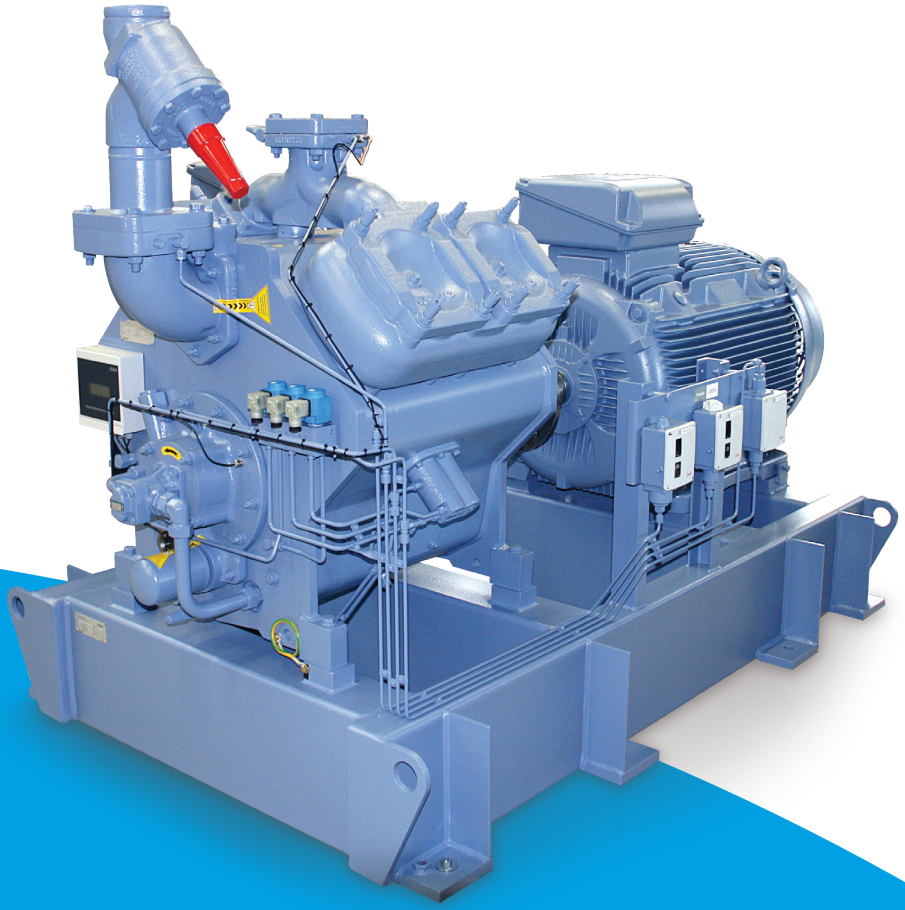
All GEA V Series compressor packages for the North America market are assembled in York, PA. Standard packages consist of a mounted 1,200 rpm, direct-drive motor complete with a torsional rigid steel coupling and a coupling guard.

The choice of components to fit on and around the compressors is huge, and the fact that all required components are factory-fitted gives the contractor the advantage to concentrate 100 % on the erection of the refrigeration plant.

A direct-drive arrangement is featured on all compressors. The introduction of frequency inverters in combination with maintenance-free couplings gives the customer the opportunity to positively influence energy and maintenance costs.

The extremely low oil carry-over, related to the design of the compressor particularly on cooling applications, is even less than 10 ppm and gives the customer the opportunity to execute a compressor package with or without an oil separator, depending on the system demands. The use of GEA's high-efficiency oil separator will further reduce the carry-over to an absolute minimum, and oil contamination through to the installation.

Each V Series package features the GEA Omni control panel, capable of controlling up to ten compressor packages.

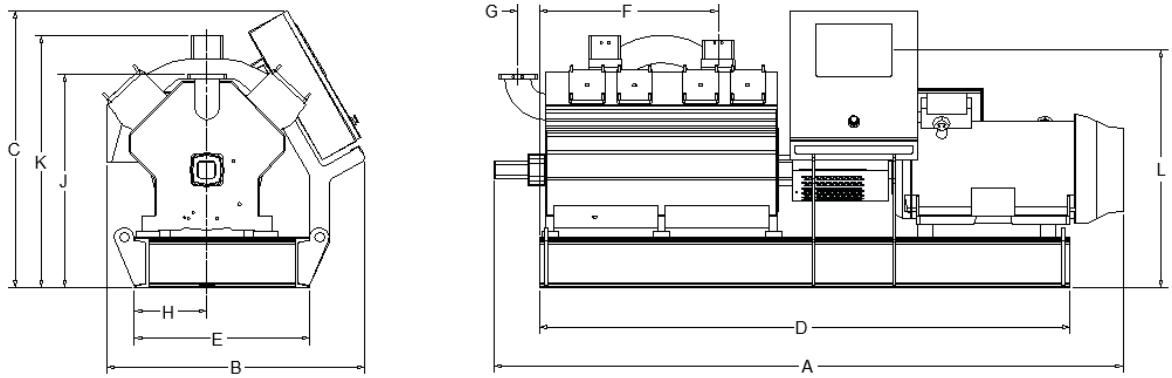


GEA V Series compressor package models and specifications

Models	Capacity		Power		Speed (rpm)	Discharge		Package Weight		Suction Connection		Discharge Connection	
	(tons)	(kW)	(BHP)	(kW)		(cfm)	(m^3/h)	(lbs)	(kg)	(inch)	(DN)	(inch)	(DN)
40VMXB	10.9	38.3	13.1	9.8	1,160	39.9	67.8	2,351	1,066	2.5	65	2	50
40VMX	30.4	107	42	31.3	1,160	28.8	49	2,823	1,280	2.5	65	2	50
60VMXB	16.4	57.6	18.7	13.9	1,160	59.9	101.9	2,952	1,339	3	80	2.5	65
60VMX	45.7	160.9	62	46.2	1,160	43.3	73.6	3,484	1,580	3	80	2.5	65
80VMXB	21.9	76.9	24.2	18.1	1,160	81.1	342.1	3,818	1,732	4	100	3	80
80VMX	61	214.6	82	61.1	1,160	58	98.5	4,624	2,097	4	100	3	80
100VLXB	30.9	108.8	31.6	23.5	1,160	108.7	184.6	3,495	1,585	4	100	3	80
100VLX	90	316.5	115.3	86	1,160	83.6	142	4,342	1,969	4	100	3	80
150VLXB	46.8	164.6	46	34.3	1,160	164.1	278.8	4,558	2,067	5	125	4	100
150VLX	136	478.4	172.1	128.3	1,160	126	214.1	5,768	2,616	5	125	4	100
200VLXB	62.3	219.2	60.5	45.1	1,160	217.5	369.5	6,371	2,890	6	150	4	100
200VLX	181.2	637.3	228.8	170.6	1,160	167.5	284.7	7,112	3,226	6	150	4	100
250VLXB	78.1	274.7	74.5	55.6	1,160	274.7	466.8	7,204	3,268	6	150	5	125
250VLX	226.8	797.8	284.5	21.2	1,160	210.6	357.7	7,912	3,589	6	150	5	125

High-stage ratings are at 10˚F evaporative temperature and 95˚F condensing temperature.
Booster ratings are at -40˚F evaporative temperature and 10˚F condensing temperature.

All values are for R-717.



Models	Motor Frame Size	Approximate Dimensions (inches/millimeters)										
		A	B	C	D	E	F	G	H	J	K	L
40VMX	286T, 324T, 326T, 364/5T	75/1,905	49/1,245	46/1,168	60/1,524	33/838	11/280	3/76	15/381	34/864	41/1,041	38/965
	404/5T	80/2,032	49/1,245	46/1,245	64/1,625	33/838	11/280	3/76	15/381	34/864	41/1,041	38/965
60VMX	326T	79/2,007	49/1,245	46/1,168	66/1,676	33/838	15/381	3/76	15/381	34/864	41/1,041	38/965
	364/5T, 404/5T	88/2,235	49/1,245	46/1,168	71/1,803	33/838	15/381	3/76	15/381	34/864	41/1,041	38/965
	444/5T	93/2,362	50/1,270	46/1,168	76/1,930	33/838	15/381	3/76	15/381	34/864	41/1,041	38/965
80VMX	364/5T, 404/5T	99/2,515	49/1,245	46/1,168	83/2,108	33/838	30/762	3/76	15/381	34/864	41/1,041	38/965
	444/5T	105/2,667	50/1,270	46/1,168	87/2,210	33/838	30/762	3/76	15/381	34/864	41/1,041	38/965
100VLX	404/5T	88/2,235	49/1,245	46/1,168	69/1,753	33/838	13/330	4/102	15/381	39/991	45/1,143	38/965
	444/5T	94/2,388	50/1,270	46/1,168	74/1,880	33/838	13/330	4/102	15/381	39/991	45/1,143	38/965
	447/9T	105/2,667	51/1,295	46/1,168	83/2,108	33/838	13/330	4/102	15/381	39/991	45/1,143	38/965
150VLX	404/5T, 444/5T	103/2,617	50/1,270	50/1,270	84/2,134	33/838	18/457	4/102	15/381	42/1,067	48/1,220	42/1,067
	447/9T	115/2,921	52/1,321	50/1,270	92/2,337	33/838	18/457	4/102	15/381	42/1,067	48/1,220	42/1,067
200VLX	444/5T	117/2,972	50/1,270	52/1,321	97/2,464	33/838	36/914	4/102	15/381	42/1,067	49/1,245	42/1,067
	447/9T	128/3,252	52/1,321	52/1,321	106/2,692	33/838	36/914	4/102	15/381	42/1,067	49/1,245	42/1,067
250VLX	444/5T	127/3,226	50/1,270	52/1,321	107/2,718	33/838	46/1,168	4/102	15/381	42/1,067	49/1,245	42/1,067
	447/9T	138/3,505	52/1,321	52/1,321	115/2,921	33/838	46/1,168	4/102	15/381	42/1,067	49/1,245	42/1,067
	586/7T	144/3,658	54/1,372	54/1,372	121/3,073	33/838	46/1,168	4/102	15/381	42/1,067	49/1,245	42/1,067

Graphic and dimensions above are for reference only. Use only certified drawings for erection.
All dimensions are based on a fixed-speed, 1,200 rpm motor.
Dimension A, B & D are based on largest motor frame size in the corresponding row.

GEA Service — for your continued success

Reduce the life cycle cost of your plan and equipment

We team with refrigeration contractors in North America to support customers throughout the full life cycle of their plant and equipment.

Getting you started

As a supportive and committed partner for life, we plan and build around individual needs, sharing process knowledge, training employees and supporting operators to get our customers up and running and ensure smooth, seamless on-going operation.

Keeping it running

To ensure our customers benefit from continuous production processes for minimal downtime, we provide fast support, efficient maintenance and top-quality spare parts, whenever and wherever needed.

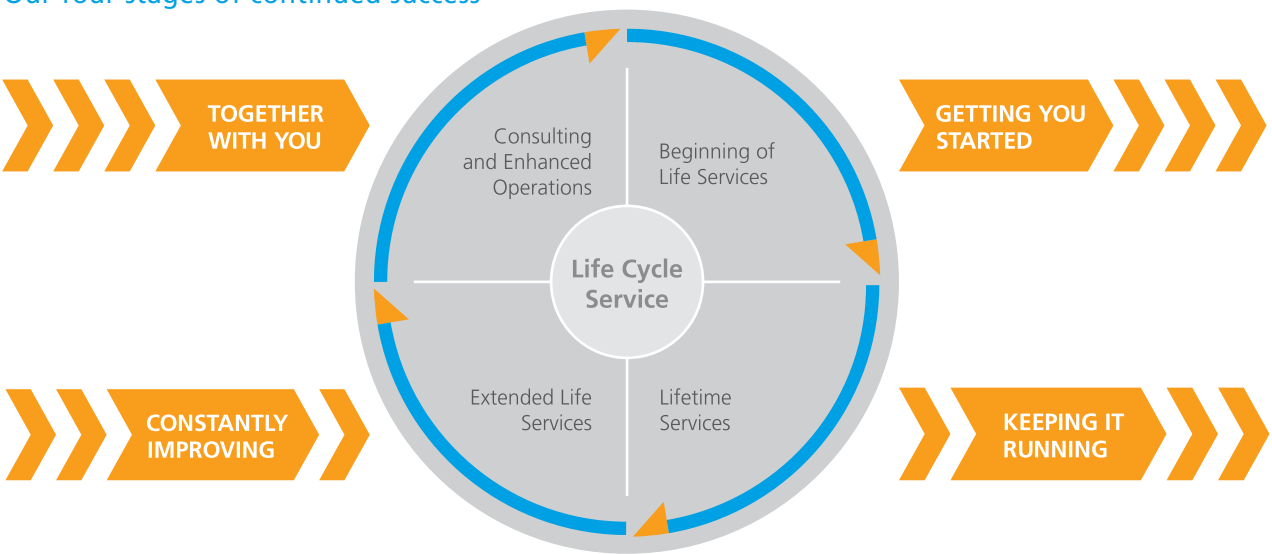
Constantly improving

We safeguard our customers' investments by constantly looking ahead through modernizing or upgrading of equipment and optimizing of processes to meet changing needs and new market demands. We are always working to increase production efficiency and ensure peak performance.

Together with you

Commitment to our customers means investing in their objectives, their risks and their success. We work in ever-closer collaboration, providing on-going system audits and on-site support through innovative new service models in order to generate improved performance.

Our four stages of continued success



Keeping it cool, with GEA Service

engineering for
a better world

We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is one of the largest technology suppliers for food processing and a wide range of other industries. The global group focuses on technologies, components and sustainable solutions for sophisticated production processes in diverse end-user markets. The company is listed on the German MDAX (G1A, WKN 660 200), the STOXX® Europe 600 Index and selected MSCI Global Sustainability Indexes.

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