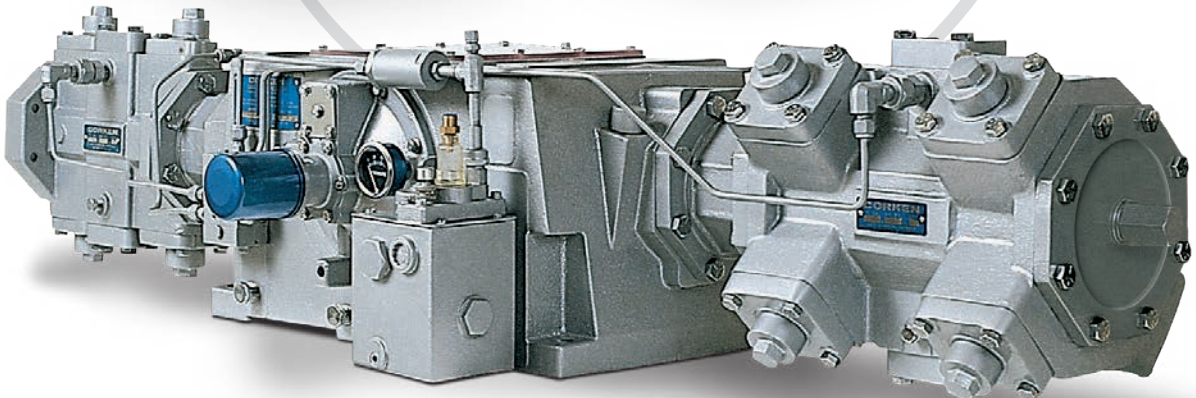
I-Series

Industrial Series Compressors

Model FD491

Model WFD591



Model HG602

CORKEN®

A Unit of IDEX Corporation

A Tradition of Excellence

Corken is a leading manufacturer of industrial compressors, pumps, bypass valves, and accessories designed for liquefied petroleum gas (LPG), anhydrous ammonia, and many other flammable, volatile, and toxic liquids and gases.

Located in Oklahoma City, Oklahoma, USA, Corken was founded in 1924 as a water and boiler feed pump distributor and quickly gained a reputation for excellence in customer service. In the mid-1940s, the company entered the LPG industry which proved to be a turning point. In the years to follow, Corken was recognized for its quality line of compressors, pumps, bypass valves, and accessories.

Many products meet multiple industry standards, including Underwriters Laboratories (UL), Canadian Standards Association (CSA), High Pressure Gas Safety Institute of Japan (KHK), Bureau Veritas of France, European Union Pressure Equipment Directive (PED), ATEX Equipment Directive, European Union Machinery Directive, International Quality Standard (ISO 9001), and Environmental Management Standard (ISO 14001).

Today, Corken is a diversified company serving a worldwide customer base in Far East Asia, Africa, Europe, Middle East, South America, and North America. Each customer is served through an extensive network of distributors sharing the same commitment to customer service demonstrated by Corken for more than 90 years.

This exceptional reputation for customer service and quality products, combined with a strong commitment to technological innovation, has positioned Corken as a global leader in compression and pumping solutions.

CORKEN®

LPG Product Overview

Oil-free compression for a wide range of process gases...

Corken's line of oil-free industrial series (I-Series) compressors are designed to transfer a wide range of process gases such as butadiene, hydrogen, helium, methyl chloride, sulfur dioxide, chlorine, HCFCs, exotic gases for research, corrosive biogases in landfills, and hydrocarbon gases within the oil and gas industry.

Greater control of fugitive emissions...

For toxic, hazardous, and explosive gases, Corken's D-style (single-distance piece with two sets of packing) and T-style (double-distance-piece with three sets of packing) designs provide precise leakage control. When properly equipped, the T-style compressors comply with the EPA's requirements for fugitive emissions control of volatile organic compounds (VOCs).*

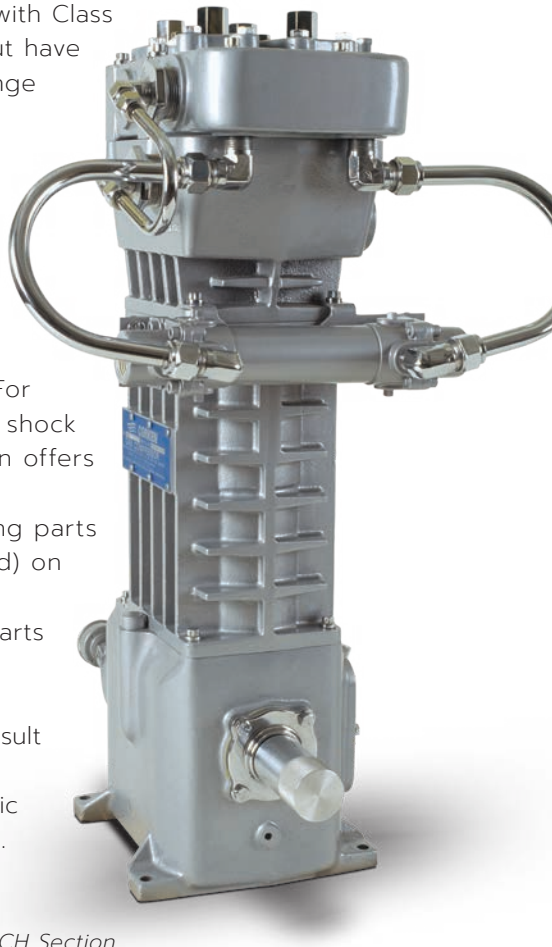
Multiple options to match application requirements...

Corrosion Resistant Coatings: To minimize corrosion and premature wear on critical parts, Corken offers a nickel alloy plating impregnated with fluorocarbons for all gas wetted parts. See page 11 for details.

Multiple Material Options: To increase compatibility with volatile and toxic gases, Corken offers several material options for compressor parts and O-rings.

Class 300 RF Flange Option: All I-Series vertical compressors are available with Class 300 raised face flanges that dramatically improve leakage containment and structural integrity. Most horizontal compressors are not available with Class 300 RF flanges but have a slip-on weld flange option. The only exception is the 2.75" horizontal cylinder which comes standard with Class 300 RF flanges.

DIN Iron Option: For maximum thermal shock endurance, Corken offers DIN spec iron for pressure containing parts (cylinder and head) on several of its compressors. All parts meet German DIN ductile iron specifications. Consult factory for details regarding a specific compressor model.



Model WD391

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*

Compatibility Chart

- Air
- Ammonia
- Argon
- Benzene
- Biogas
- Butadiene
- N-butane
- 1-butene
- Bromotrifluoro-methane
- Carbon dioxide
- Carbon monoxide
- Carbon tetrachloride
- Carbonyl sulfide
- Chlorine
- Chlorodifluoro-methane
- Cyanogen
- Cyclohexane
- Cyclopropane
- Deuterium
- Dimethylamine
- Dimethyl ether
- 2,2-dimethylpropane
- Ethane
- Ethyl chloride
- Ethylene
- Ethylene oxide
- Helium
- Hexafluoroethane
- N-heptane
- N-hexane
- Hydrocarbon gas
- Hydrogen
- Hydrogen chloride
- Isobutane
- Isobutene
- Isobutylene
- Krypton
- Methane
- Methyl acetylene
- Methyl bromide
- Methyl chloride
- Methyl fluoride
- Methyl mercaptan
- Monoethylamine
- Monomethylamine
- Natural gas
- Neon
- Nitric oxide
- Nitrous oxide
- N-octaine
- Ozone
- N-pentane
- Propane
- Propylene
- Refrigerants:
  - CFC-11
  - CFC-12
  - CFC-13
  - CFC-113
  - CFC-114
  - CFC-115
  - CFC500
  - CFC502
  - CFC503
  - HCFC-22
  - HCFC-141B
  - HCFC-142B
  - HFC-14
  - HFC-23
  - HFC-134A
  - HFC-152A
- Sulfur dioxide
- Sulfur hexafluoride
- Tetrafluoroethylene
- Trichloroethane
- Trimethylamine
- Vinyl bromide
- Vinyl fluoride
- Vinyl chloride
- Xenon
- And many more

Vertical Industrial Gas Compressors

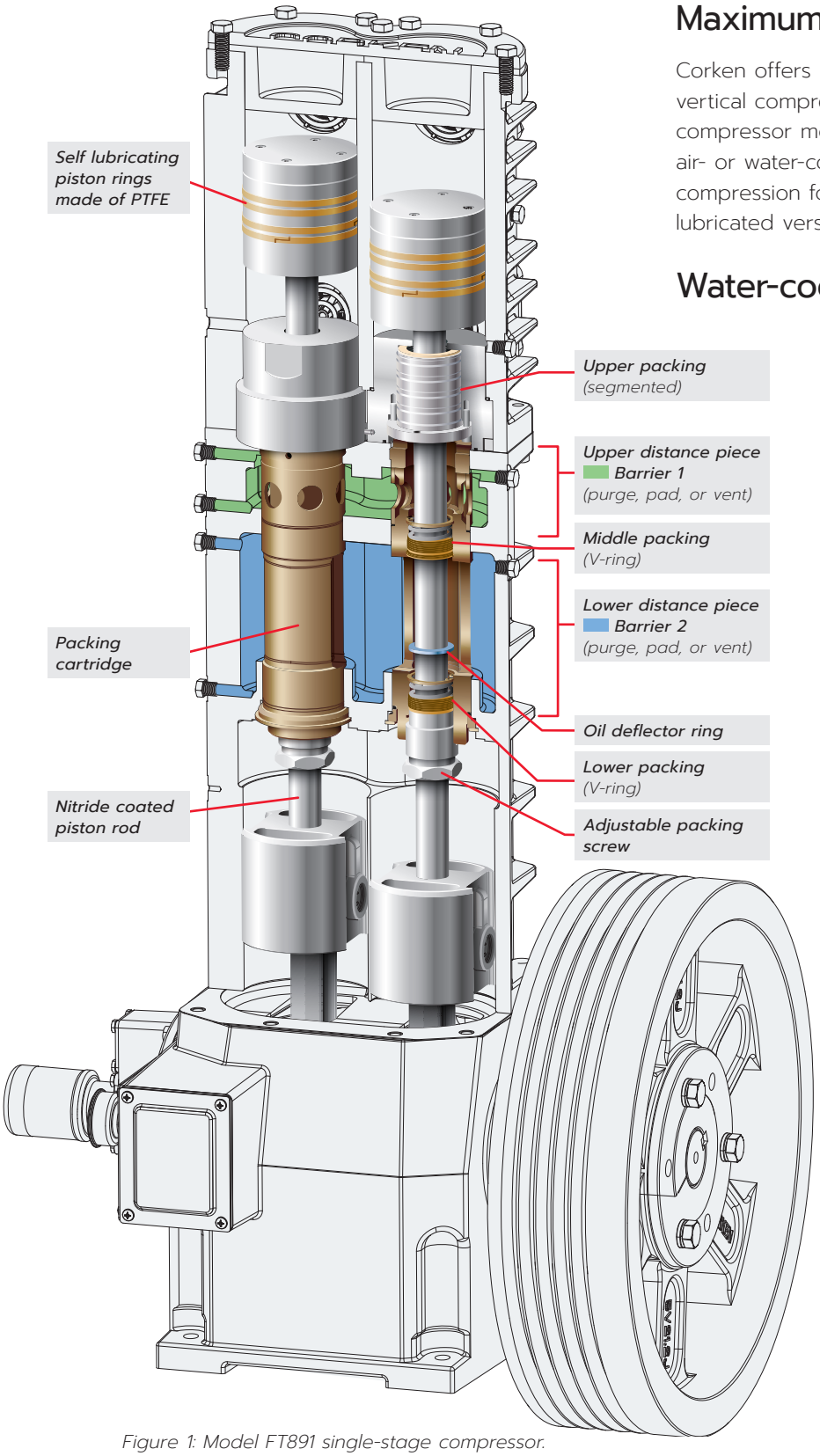


Figure 1: Model FT891 single-stage compressor.

Maximum versatility...

Corken offers one of the most versatile lines of industrial vertical compressors in the world. There are several compressor models with single- or two-stage compression, air- or water-cooled options, and single- or double-acting compression for maximum efficiency. Lubricated and non-lubricated versions are also available.

Water-cooled heads, cylinders, and packing...

To accommodate a wide range of process gases, Corken offers water-cooled heads, cylinders, and packing on several models. The water-cooled features greatly reduce the operating temperature making the compressor ideal for gases with a high K value such as argon, air, helium, hydrogen, and nitrogen.

Oil-free gas compression...

Most all of Corken's vertical industrial compressors offer oil-free gas compression in both double (D-Style) and triple packed (T-Style) designs. The D-style has a single distance piece containing two sets of packing rings per piston rod while the T-Style has a double-distance piece with three sets of packing per piston rod. Since the distance between each packing set is greater than the stroke of the compressor, there's no rod over travel or oil carryover. In the event oil gets past the lower packing set, an oil deflector ring keeps the oil from rising up the piston rod (see figure 1 for details). Additionally, the lower packing set has an adjustable packing screw for maintaining sealing performance. All of these features enable the compressor to supply oil-free gas for boosting or vacuum service. Both single- and two-stage compressors deliver up to 23 in Hg (157 mm Hg) vacuum.

Features and Benefits

Piston rod packing design...

With the exception of models 791 and 891, all of Corken's vertical industrial compressors use a V-ring packing design. Compressor models 791 and 891 use a combination of V-ring and segmented packing. V-ring packing consists of several V-rings, male packing rings, female packing rings, washers, and a spring. In high temperature applications, optional K-ring spacers are used in conjunction with the V-ring packing to improve leakage control and extend the service life of the packing. Segmented packing consists of packing cups, spacers, O-rings, segmented packing, backup rings, and a spring.

Maximum leakage control and containment...

The D-style (single-distance piece) forms one isolated barrier between the crankcase and compression chamber while the T-style (double-distance piece) forms two isolated barriers (see figure 1 for details). Each distance piece has its own line connections and may be pressurized, purged, or vented as required. Purge kits are sold separately. When using the purge kit option, the T-style compressor is virtually leak proof and complies with the EPA requirements for fugitive emissions control of volatile organic compounds (VOC).*

Single-stage oil-free compressors...

Single-stage compressors are typically used in applications where the gas compression ratio is less than 5:1. Generally, applications with relatively low differential pressures are well suited for a single-stage compressor. Transport, rail car, and marine unloading by vapor differential are examples of single stage applications.

Two-stage oil-free compressors...

When the gas compression ratio is greater than 5:1, a two-stage compressor is required. Two-stage compressors divide the compression process into two separate steps. The gas is cooled after the first stage of compression using an intercooler. An aftercooler or water cooled cylinders and heads can also be used if a water source is available at the application site. Two-stage compression is commonly used in booster and vapor recovery applications requiring high differential pressures.

Single- and double-acting designs...

Single-acting vertical compressors have one compression stroke per revolution so the compression takes place on one side (top) of the piston. Double-acting compressors have two compression strokes per revolution so the compression takes place on both sides of the piston.

Corken offers two vertical models in a double-acting design. The model 891 is a single-stage gas compressor capable of supplying between 56.7 and 117.0 CFM (96.3 and 198.8 m^3/hr) while the model 791 is a two-stage compressor with roughly the same capacities but a much higher working pressure.

Custom engineered compressor packages available...

Corken offers standard mountings designed specifically for liquefied gas transfer, vapor recovery, and gas booster applications. If they do not meet the specifications for the application, Corken can supply a custom engineered package. Skid mounted units are supplied with control panels, safety controls, pulsation dampeners, receiver tanks, valves and other special accessories as required. For more details, see the standard compressor mountings and custom engineered packages at the back of this brochure.

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*

Reciprocating Gas Compressors Features and Benefits

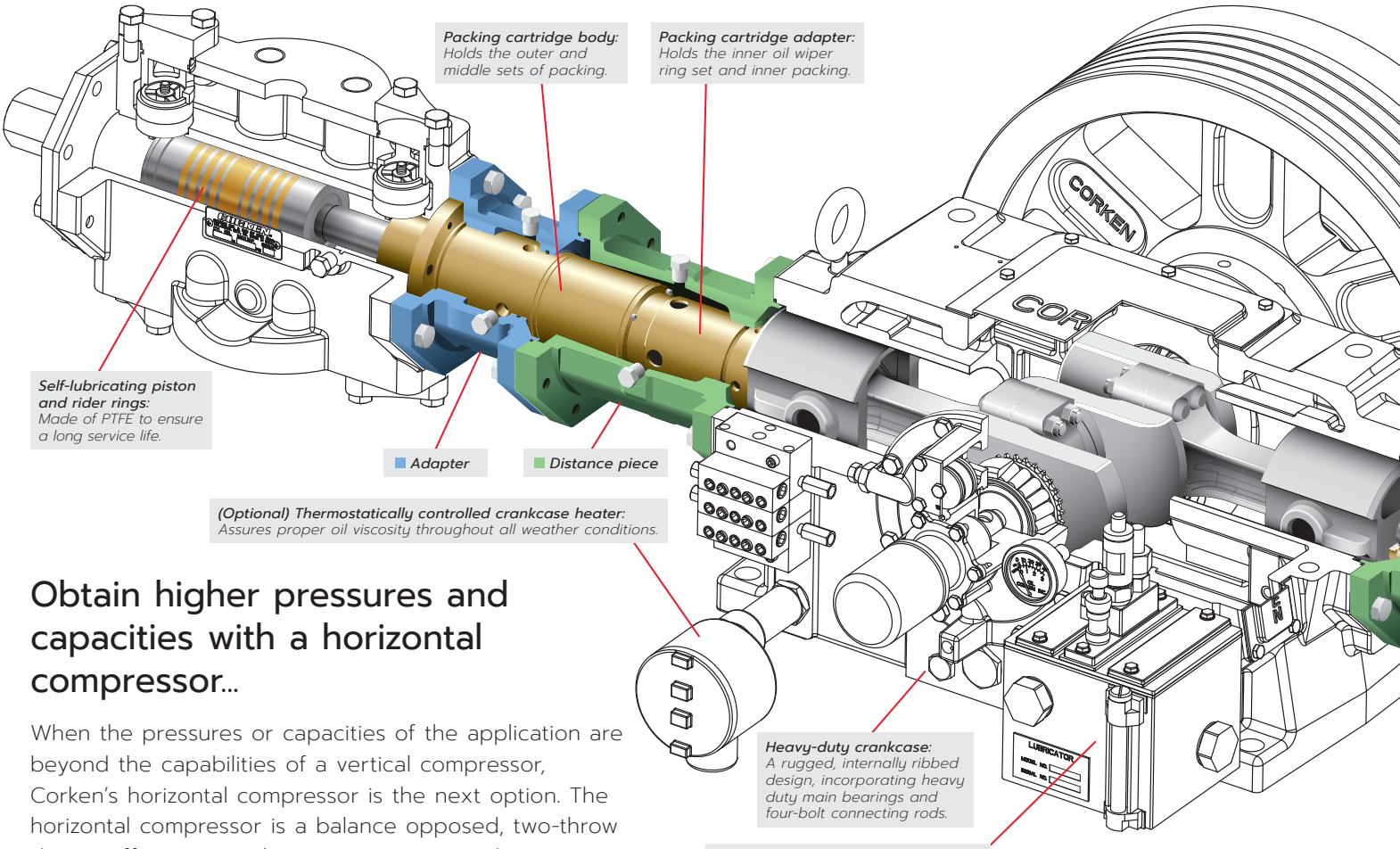


Figure 2: THG602BF (T-style) compressor.

Obtain higher pressures and capacities with a horizontal compressor...

When the pressures or capacities of the application are beyond the capabilities of a vertical compressor, Corken's horizontal compressor is the next option. The horizontal compressor is a balance opposed, two-throw design offering smooth, quiet operation and pressures up to 1,650 psig (113.8 bar g). Piston displacement ranges from 7.6 cfm (12.9 m^3/hr) to 414 cfm (704 m^3/hr). The wide range of cylinder sizes help optimize the compressor for the desired operating condition. Cylinder sizes are 8" (203.2 mm), 6" (152.4 mm), 5" (127.0 mm), 4" (101.4 mm), 3.25" (82.6 mm), and 2.75" (69.9 mm) and can be arranged in various single-stage and two-stage configurations. Lubricated and non-lubricated versions are available.

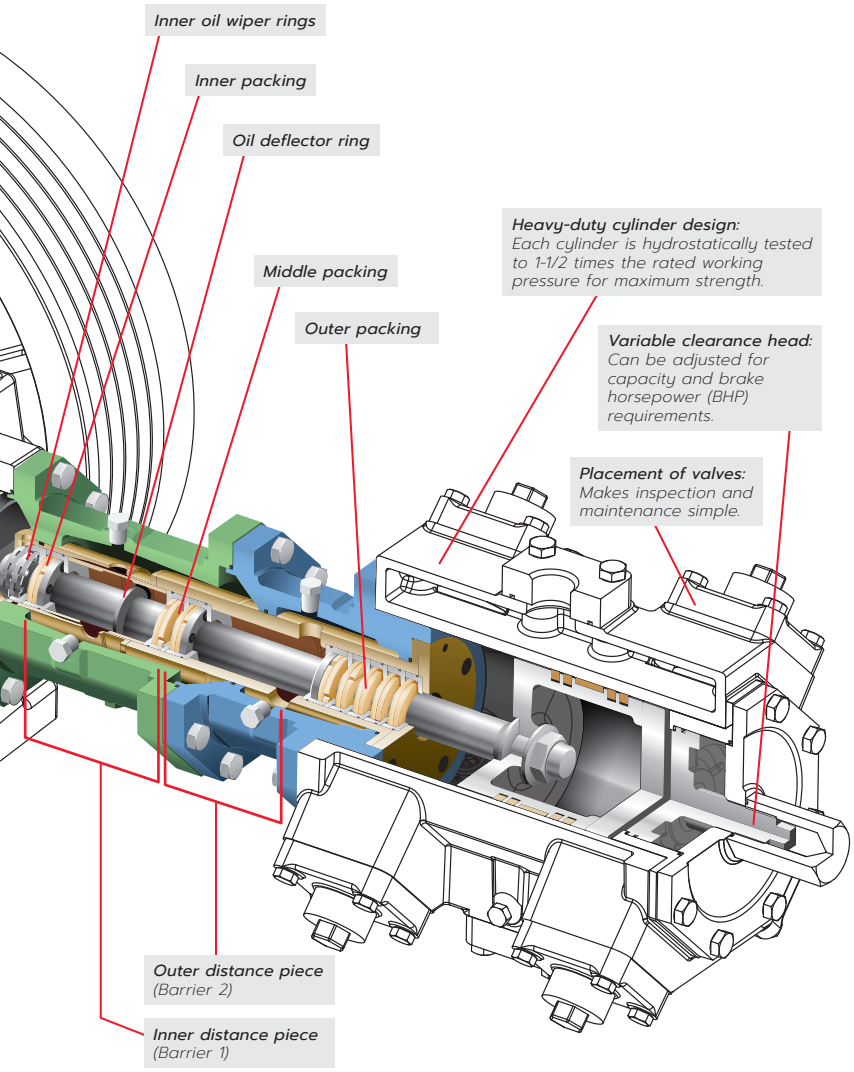
Single-packed design for standard leakage containment...

The single packed (HG600 series) horizontal compressor has one set of packing per piston rod and does not offer oil free compression. A single packed compressor is typically used in non-corrosive and non-toxic applications where oil-free gas and leakage containment are not critical. Some examples are LPG, oilfield natural gas, and air boosting applications.

Triple-packed (T-Style) design for maximum leakage containment...

The T-style (THG600 series) is a non-lubricated, oil-free design with three sets of packing per piston rod forming two barriers to external leakage (see figure 2 for details). Each distance piece has its own line connections for pressurizing, purging, or venting. This allows the operator to choose the best method of containment for the application. When properly equipped with a purge kit, Corken's double-distance piece (T-style) provides precise leakage control and complies with the EPA's requirements for fugitive emissions control of volatile organic compounds (VOC).* For added convenience, purge kits with all of the accessories needed to purge or pressure each chamber are available. T-styles are typically used in

Tanker and Multiple Railcar Unloading and Recovery



corrosive or toxic applications where leakage containment and non-contamination of the gas stream are critical.

Piston rod packing design...

Unlike Corken's vertical compressor, the horizontal compressor uses segmented purge packing to seal the piston rod. Segmented purge packing consists of purge packing cups, spacers, O-rings, segmented packing, backup rings, and springs.

Oil-free gas compression...

Corken's T-style (double-distance piece) horizontal compressors are oil free so there's no contamination of the process gas stream. The distance between each set of packing is greater than the stroke of the compressor, so there's no rod over travel or oil carryover. In other words, the portion of the piston rod coming into contact with the first set of packing will never reach the second set of packing while the portion of the piston rod coming into contact with the second set of packing will never reach the third set of packing. In the event oil gets past the inner packing set, an oil deflector ring keeps it from reaching the outer distance piece (see figure 2 for details).

Available in single- or double-acting configurations...

The plain and T-style horizontal compressors are available in single- or double-acting configurations. Single-acting configurations are ideal for applications requiring low flow and high pressure while double-acting configurations offer maximum capacity. Single-acting configurations require a blank valve option.

External crankcase oil cooler...

Corken's industrial compressors are equipped with a force-feed-lubrication system and external oil filter. For high horsepower applications, an optional external oil cooler is recommended. This ensures a consistent oil temperature and an optimal service life for the compressor.

Custom engineered compressor packages available...

Corken offers standard mountings designed specifically for liquefied gas transfer, vapor recovery, and gas booster applications. If they do not meet the specifications for the application, Corken can supply a custom engineered package. Skid mounted units are supplied with control panels, safety controls, pulsation dampeners, receiver tanks, valves, and other special accessories as required. For more details, see the standard compressor mountings and custom engineered packages at the back of this brochure.

**U.S. Environmental Protection Agency Regulations 40 CFR CH Section 264.1053.*

Vertical Industrial Gas Compressors

Operating Specifications

Specifications	Single-Stage Compressors							Two-Stage Compressors						
D-style (single-distance piece)	D91	D291	D491	D491-3	D691	D691-4	FD891[a]	FD151	D191	FD351	D391	WFD551	FD591	D791[a]
T-style (double-distance piece)	T91	T291	T491	T491-3	T691	T691-4	FT891[a]	FT151	T191	FT351	T391	WFT551	FT591	T791[a]
Bore of cylinder inches (mm)														
First stage	3.0 (76.2)	3.0 (76.2)	4.0 (101.6)	3.0 (76.2)	4.5 (114.3)	4.0 (101.6)	4.5 (114.3)	2.5 (63.5)	3.0 (76.2)	2.75 (69.9)	4.5 (114.3)	4.0 (101.6)	6.0 (152.4)	6.0 (152.4)
Second stage								1.25 (31.8)	1.75 (44.5)	1.75 (44.5)	2.5 (63.5)	2.5 (63.5)	3.25 (82.5)	3.25 (82.5)
Stroke inches (mm)	2.5 (63.5)	2.5 (63.5)	3.0 (76.2)	3.0 (76.2)	4.0 (101.6)	4.0 (101.6)	4.0 (101.6)	2.5 (63.5)	2.5 (63.5)	3.0 (76.2)	3.0 (76.2)	4 (101.6)	4.0 (101.6)	4.0 (101.6)
Piston displacement CFM (m^3/hr)														
@ 400 rpm	4.1 (7.0)	8.2 (13.9)	17.5 (29.7)	9.8 (16.7)	29.5 (50.1)	23.3 (39.6)	56.7 (96.3)	2.8 (4.76)	4.1 (7.0)	4.1 (7.0)	11.1 (18.9)	11.6 (19.7)	26.2 (44.5)	52.4 (89.0)
@ 825 rpm	8.4 (14.3)	16.9 (28.7)	36.0 (61.2)	20.3 (34.5)	60.8 (103.3)	48.0 (81.6)	117.0 (198.8)	5.9 (10.0)	8.9 (15.2)	8.5 (14.4)	22.8 (38.7)	24.8 (42.1)	54.0 (91.7)	105.8 (179.8)
Maximum working pressure psig (bar g)	335 (23.1)	335 (23.1)	335 (23.1)	600 (41.4)	335 (23.1)	600 (41.4)	450 (31.0)	1,200 (82.8)	600 (41.4)	1,200 (82.8)	600 (41.4)	1,000 (69.0)	600 (41.4)	600 (41.4)
Maximum brake horsepower (kW)	7.5 (5.6)	15 (11)	15 (11)	15 (11)	35 (26.1)	35 (26.1)	45 (34)	15 (11)	15 (11)	15 (11)	15 (11)	35 (26.1)	35 (26.1)	45 (34)
Maximum rod load lbs (kg)	3,600 (1,633)	3,600 (1,633)	4,000 (1,814)	4,000 (1,814)	7,000 (3,175)	7,000 (3,175)	7,000 (3,175)	3,600 (1,633)	3,600 (1,633)	4,000 (1,814)	4,000 (1,814)	7,000 (3,175)	7,000 (3,175)	7,000 (3,175)
Maximum discharge temperature °F (°C)[b]	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)	350 (177)
Bare unit weight with flywheel lbs (kg)	150 (68.0)	210 (95.2)	390 (176.9)	390 (176.9)	745 (337.9)	745 (337.9)	900 (408.2)	215 (97.5)	215 (97.5)	340 (154)	350 (158.8)	815 (369.7)	790 (358.8)	930 (421.9)
ANSI/DIN flange option	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Standard	Yes	Standard	Yes	Standard	Standard	–
Water-cooled option	–	–	–	–	Yes	Yes	–	–	–	Yes	Yes	Standard	Yes	–

[a] *Double-acting compressor*
[b] *350°F discharge temperature requires use of high temperature O-rings, such as PTFE or Viton. Maximum recommended discharge temperature for use with Buna-N or Neoprene O-rings is 250°F.*
Note: Specific application conditions may limit a compressor's operating performance to less than the values shown on this page. Contact a Corken distributor or the factory for verification. Specifications may be changed without liability or advance notice.

Selection Criteria for Vertical and Horizontal Compressors

Corken's industrial vertical compressors offer piston displacement ranging from 2.8 to 117 CFM (4.76–198.8 m^3/hr). Horizontal gas compressors offer piston displacement ranging from 7.6 to 414 CFM (12.9–704 m^3/hr). Sizing and selecting a gas compressor requires many pieces of information. Corken's application engineers have the skills to size and select the best machine for the application.

When sizing a Corken gas compressor, please provide the engineer the following information:

- Gas name (give % composition if a mixture)
- Gas characteristics if not common (material compatibility, toxicity, EPA regulated, etc.)
- Gas suction temperature
- Gas data if not common (critical temperature, critical pressure, specific gravity, and molecular weight)
- Ambient temperatures
- Ambient pressure if above or below sea level
- Gas suction pressure (specify psia or psig, bar a or bar g, and if the compressor will pull a vacuum)
- Gas discharge pressure and any temperature limitations
- Desired flow rate in ACFM, lbs/hr, SCFM, Actual m^3/hr, kg/hr, or Standard m^3/hr
- Description of the application

Corken engineers use this information to size the compressor and select materials and options suitable for the gas. A computer printout with performance data is provided with the quotation.

Horizontal Industrial Gas Compressors

Operating Specifications

Single-stage Horizontal Compressors

Single Cylinder Models	HG601AX THG601AX	HG601BX THG601BX	HG601CX THG601CX	HG601DX THG601DX	HG601EX THG601EX	HG601FX THG601FX
Size	8"	6"	5"	4"	3.25"	2.75"
Displacement cfm (m^3/hr)						
400 rpm	68.8 (116.9)	38.4 (65.2)	26.4 (44.9)	16.8 (28.5)	10.8 (18.3)	7.6 (12.9)
1200 rpm	207.0 (351.7)	115.0 (195.4)	79.2 (134.4)	49.8 (84.6)	32.2 (54.5)	22.8 (56.0)
Approximate shipping weight lb. (kg.)						
HG model	730 (331.1)	650 (295.0)	640 (290.3)	630 (285.8)	620 (281.2)	620 (281.2)
THG model	780 (353.8)	700 (317.5)	690 (313.0)	680 (308.4)	670 (303.9)	670 (303.9)
Two Cylinder Models	**HG601AA THG601AA**	**HG601BB THG601BB**	**HG601CC THG601CC**	**HG601DD THG601DD**	**HG601EE THG601EE**	**HG601FF THG601FF**
Size	8" x 8"	6" x 6"	5" x 5"	4" x 4"	3.25" x 3.25"	2.75" x 2.75"
Displacement cfm (m^3/hr)						
400 rpm	138 (234.5)	76.8 (130.5)	52.8 (89.7)	33.2 (56.4)	21.2 (36.0)	14.8 (25.1)
1200 rpm	414 (704)	231 (393)	158.4 (268.8)	99.6 (169.2)	64 (108.7)	44.4 (75.6)
Approximate shipping weight lb. (kg.)						
HG model	1,070 (485.4)	910 (412.8)	890 (403.7)	870 (394.6)	845 (383.3)	845 (383.3)
THG model	1,170 (530.7)	1,010 (458.1)	990 (449.1)	970 (440.0)	945 (428.7)	945 (428.7)

Two-stage Horizontal Compressors

Two Cylinder Models	HG602AB THG602AB	HG602AC THG602AC	HG602AD THG602AD	HG602BC THG602BC	HG602BD THG602BD	HG602BF THG602BF
Size	8" x 6"	8" x 5"	8" x 4"	6" x 5"	6" x 4"	6" x 2.75"
Displacement cfm (m^3/hr)						
400 rpm	68.8 (116.9)	68.8 (116.9)	68.8 (116.9)	38.4 (65.2)	38.4 (65.2)	38.4 (65.2)
1200 rpm	207.0 (351.7)	207.0 (351.7)	207.0 (351.7)	115.0 (195.4)	115.0 (195.4)	115.0 (195.4)
Approximate shipping weight lb. (kg.)						
HG model	990 (449.1)	980 (444.5)	970 (440.0)	930 (421.9)	895 (406.0)	880 (399.2)
THG model	1,090 (494.4)	1,080 (489.9)	1,070 (485.4)	1,030 (467.2)	995 (451.3)	980 (444.5)

Two Cylinder Models (continued)	HG602BE THG602BE	HG602CD THG602CD	HG602CF THG602CF	HG602DE THG602DE	HG602DF THG602DF	HG602EF THG602EF
Size	6" x 3.25"	5" x 4"	5" x 2.75"	4" x 3.25"	4" x 2.75"	3.25" x 2.75"
Displacement cfm (m^3/hr)						
400 rpm	38.4 (65.2)	26.4 (44.9)	26.4 (44.9)	16.8 (28.5)	16.8 (28.5)	10.8 (18.3)
1200 rpm	79.2 (134.4)	79.2 (134.4)	79.2 (134.4)	49.8 (84.6)	49.8 (84.6)	32.2 (54.5)
Approximate shipping weight lb. (kg.)						
HG model	880 (399.2)	880 (399.2)	867 (393.3)	860 (390.1)	860 (390.1)	845 (383.3)
THG model	980 (444.5)	980 (444.5)	967 (438.6)	960 (435.5)	960 (435.5)	945 (428.7)

Cylinder Data

Description	Cylinder Code					
	A	B	C	D	E	F
Cylinder bore in. (mm)	8 (203.2)	6 (152.4)	5 (127)	4 (101.6)	3.25 (82.6)	2.75 (69.9)
Maximum working pressure psig (bar g)	300.0 (20.7)	350 (24.1)	750 (51.7)	1,000.0 (69.0)	1,200.0 (82.8)	1,650.0 (113.8)

Frame Data

Stroke inches (mm)	3.0 (76.2)
Maximum gas rod load lb (kg)	7,500 (3,401.9)
Maximum motor size hp (kW)	75 (55.9)
Maximum discharge temp °F (°C)[a]	350.0 (176.7)
Minimum temp °F (°C)	-25 (-31.6)
RPM range	400 - 1,200

[a] 350°F discharge temperature requires use of high temperature O-rings, such as PTFE or Viton. Maximum recommended discharge temperature for use with Buna-N or Neoprene O-rings is 250°F.

Vertical & Horizontal Compressor Options

Multiple options and accessories...

Purge Kit Accessories: Due to new regulations and the growing number of gases posing safety and environmental hazards, leakage containment and control are a high priority. For maximum leakage control, Corken offers purge kits for D- and T-style industrial compressors. Purge kits have all of the accessories needed to purge or pressurize each distance piece. Each distance piece has its own line connections for pressurizing, purging, or venting. This flexibility allows the operator to choose the best method of containment for the application. Figure 3 illustrates how a typical purge kit operates on a T-style (triple packing with double-distance piece) vertical industrial compressor.

Piston Rod Coating Options: To minimize piston rod wear and corrosion, Corken recommends the Nitrotec®1 coating for most applications. Nitrotec®1 is a special heat treated steel with a dark gray finish and a standard option on all industrial compressors. If the Nitrotec®1 coating is not suitable for the application, an optional coating is available.

K-ring Spacers: When used in conjunction with our V-ring packing, K-ring spacers offer improved leakage control and extend the operating life in applications where operating temperatures exceed 250°F (121°C).

Crosshead guide, piston rod, packing barrel, K-ring spacers, and packing set.

Liquid Traps: Corken offers electric (automatic) and mechanical traps. The electric design incorporates one or two liquid level switches depending on specific requirements. Custom traps are available on package units. Traps constructed per ASME code are optional. See figure 4 for details.

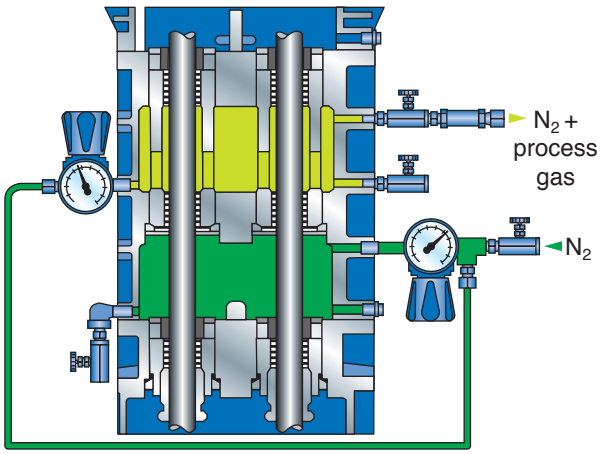


Figure 3: A vertical T-style (double-distance piece) compressor is shown above with the purge kit option. Purge kits are used to pressurize or purge the distance piece.

Safety and Control Switches: Safety and shutdown switches, meeting international and U.S. specifications, can be supplied. Shutdown switches for pressure, temperature, liquid level, and vibration used in conjunction with a control panel can effectively automate the operation of the compressor.

Intercoolers and Aftercoolers: Corken offers water-cooled and air-cooled intercoolers and aftercoolers in a variety of materials. Custom designed heat exchangers are available for applications requiring extra cooling or special material considerations.

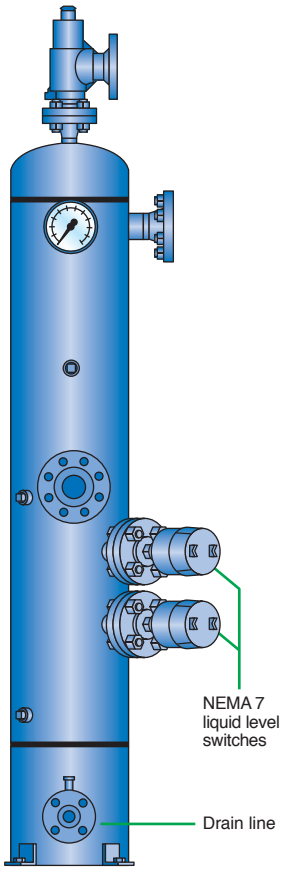


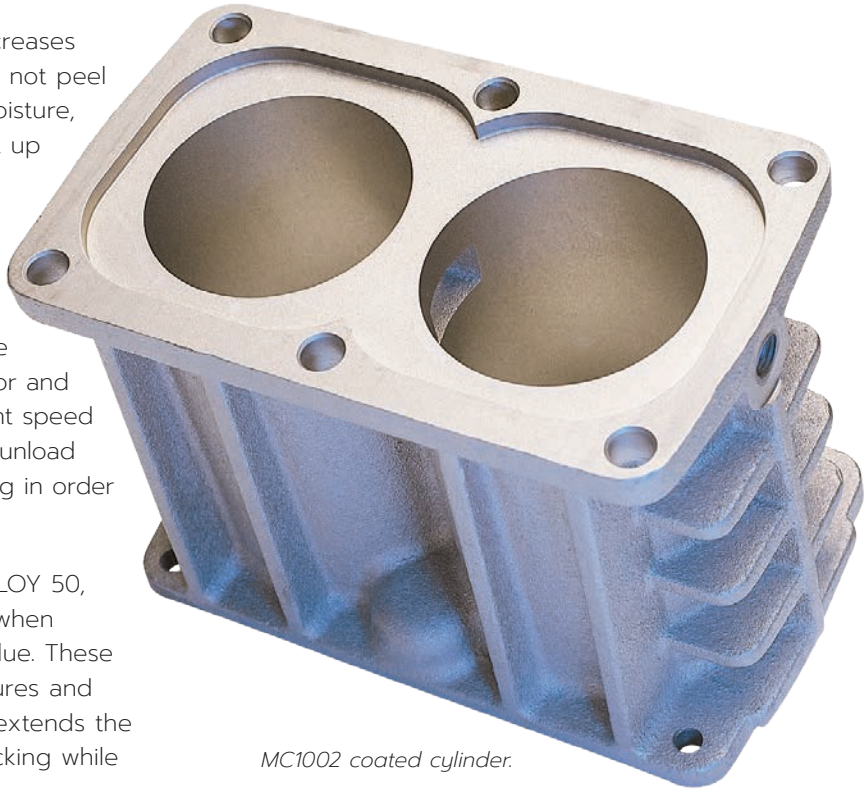
Figure 4: Flanged, ASME code liquid trap with liquid-level switches, manual drain, and stainless steel demister pad.

Vertical & Horizontal Compressor Options

MC1002 Coating: This coating significantly increases component life in corrosive gas service. It will not peel or chip and offers resistance to corrosion, moisture, abrasion. Lab tests show piston rings can last up to three times longer when used with an MC1002 coated cylinder.

Suction Valve Unloaders: Unloaders provide loadless starting and constant speed unloading. When the initial differential pressure is high, it can strain or damage the compressor and motor so loadless starting is required. Constant speed unloading allows the compressor to load and unload while running rather than stopping and starting in order to control the capacity.

ALLOY 50 Piston Rings and Rod Packing: ALLOY 50, a proprietary composition, is recommended when compressing a very dry gas with a high K value. These gases tend to have high operating temperatures and offer minimal lubricating qualities. ALLOY 50 extends the operating life of the piston rings and rod packing while minimizing leakage.



MC1002 coated cylinder.

ALLOY 50 piston rings and V-ring piston rod packing.

Material Options: Multiple material options are available for a variety of compressor parts. Piston rings are available in ALLOY 50, PEEK, and other filled PTFE blends. PEEK is standard for most valve plates while stainless steel is available on select models only. Optional materials for piston rods are also available. O-rings are offered in PTFE, Viton®[2], Buna-N, or Neoprene®[2]. Consult the factory for optional materials not specified.

Multiple options for process gases...

The table on the following page lists some of the more common gases and some of the hazards associated with them. Certain gases or gas mixtures can be corrosive, flammable, explosive, or toxic. Many of these factors affect the selection of compressor and material options. Some of the more common options are matched up with the assorted gases listed on the following page; however, this not a comprehensive list of required options. Corken's application engineers will gladly recommend the most suitable materials of construction and select the appropriate options for the application and gas product.

[1] *Registered trademark of TTI Group, Ltd.*
[2] *Registered trademark of the DuPont Company.*

Matching Options with Process Gases

Type of Gas	Formula	Gas Properties				Compressor Requirements				Comments
		Explosive	Flammable	Corrosive	Toxic	T-style Double Distance Piece	MC 1002 Corrosion Resistant Coating	Alloy 50 Piston Rings & Rod Packing	Optional Materials	
Amines									●	Copper, aluminum and zinc prohibited. PTFE O-rings and iron/lead trim recommended.
Ammonia	NH_3			●	●				●	Copper and copper alloys prohibited.
Argon	AR					●		●		Leak tightness important. Compression ratios are limited due to high specific heat ratio.
Biogas		●	●	●	●		●		●	Highly corrosive when wet. Recommendations will vary depending on nature of mixture.
Butadiene	C_4H_6	●	●		●	●			●	Copper and copper alloys prohibited. Leak tightness is important.
Butane, butene	C_4H_{10} / C_4H_8	●	●							Easily liquefied.
CFC, HFC, HCFC						●		●	●	Leak tightness important.
Carbon dioxide	CO_2			●			●			Acidic when wet, compression ratios are limited due to high specific heat ratios.
Carbon monoxide	CO	●			●					No high nickel alloys or pure nickel. Compression ratios are limited due to high specific heat ratio.
Chlorine	Cl_2			●	●	●	●		●	Highly corrosive when wet, chrome oxide piston rod coating and PTFE O-rings required.
Dimethylamine	$(CH_3)_2NH$	●	●		●	●			●	Copper, tin, zinc prohibited. PTFE O-rings required.
Dimethyl ether	$(CH_3)_2O$	●	●						●	Optional O-ring material available.
Ethane	C_2H_6	●	●							
Ethylene	C_2H_4	●	●							Iron/lead trim and PTFE O-rings recommended.
Ethylene oxide	C_2H_4O	●	●		●	●	●		●	Copper, silver, magnesium prohibited. PTFE O-rings required.
Helium	He					●		●	●	Leak tightness important. Compression ratios are limited due to high specific heat ratio.
Hydrocarbon gases	HC	●	●							Unusual compressibility factors, chance of liquefaction.
Hydrogen	H_2	●	●			●		●	●	Leak tightness very important. Compression ratios are limited due to high specific heat ratio.
Hydrogen chloride	HCl			●	●	●	●		●	Chrome oxide piston rod coating recommended. Iron/lead trim and PTFE O-rings required. Compression ratios are limited due to high specific heat ratio.
Isobutane	$CH(CH_3)_3$	●	●							
Isobutylene	$(CH_3)_2C:CH_2$	●	●						●	Iron/lead trim and PTFE O-rings required.
Methane	CH_4	●	●							
Methyl chloride	CH_3Cl	●	●	●	●	●	●		●	Zinc, aluminum, magnesium, and their alloys prohibited. Chrome oxide piston rod coating recommended. PTFE O-rings recommended.
Methyl mercaptan	CH_3SH	●	●		●	●	●		●	Copper, lead, zinc prohibited. PTFE O-rings required.
Natural gas		●	●							Review composition of mixture.
Nitrogen	N_2							●		Usually very dry with no lubricating qualities. Compression ratios are limited due to high specific heat ratio.
Nitrous oxide	N_2O			●			●		●	Avoid any hydrocarbons.
Propylene	C_3H_6	●	●			●			●	Leak tightness important. Iron/lead trim and PTFE O-rings recommended.
Sulfur Dioxide	SO_2			●	●	●	●		●	Corrosive when wet. Leak tightness important.
Vinyl chloride	CH_2CHCl	●	●			●	●		●	Chrome oxide piston rod coating recommended. Iron/lead trim and PTFE recommended.

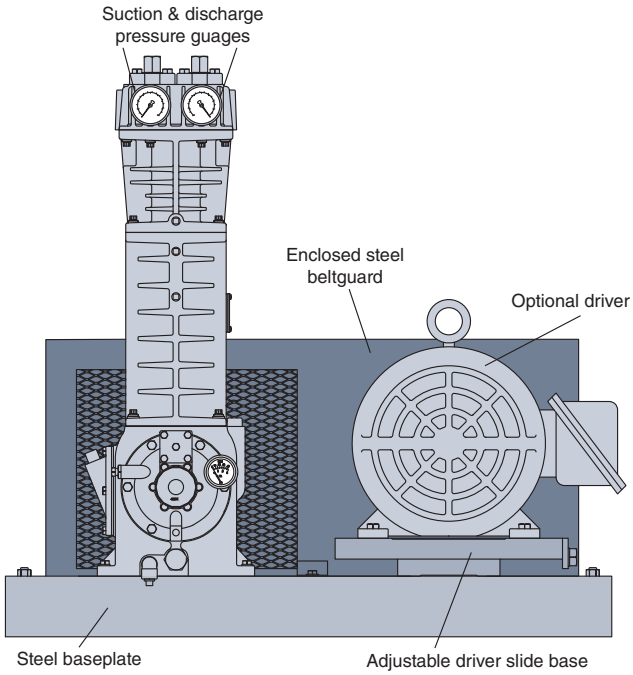
Note: Consult factory for details.

Standard Compressor Packages

Corken offers three standard mountings for industrial compressors. The 103 mounting is a basic mounting and allows for maximum flexibility for on-site installation. The 107 mounting comes with a 4-way valve and liquid trap and is designed for both Liquefied Gas Transfer and Vapor Recovery (LTVR) applications. The 109 mounting does not include a 4-way valve but has a liquid trap but. The 109 is best suited for either a liquefied gas transfer or vapor recovery application but not both in the same application.

The various 107 and 109 mountings are available with three different liquid trap configurations. The first liquid trap, used on the 107 and 109, is a mechanical liquid trap with a floating ball to block the suction and cut off flow before liquid can enter the compressor causing damage. The 107A and 109A have an automatic liquid trap that utilizes a single NEMA 7 liquid level switch for shut down control. The 107B and 109B use a larger ASME code liquid trap containing two NEMA 7 liquid level switches. One sounds an alarm and the other shuts down the compressor. Alternatively, the switches can be configured to operate a dump system.

All of the mounting configurations mentioned above are available with an optional heavy-duty mounting and flywheel. With slow running applications, this option helps balance out the rotational forces caused by the crankshaft and flywheel.



–103 mounting shown above.

I-Series compressors are used in many applications...

- Air boosting
- Gas blanketing
- Instrumentation
- Landfill gas recovery
- Liquid transfer
- Pressure boosting
- PSA gas generation
- Refrigerant reclaiming
- Selective catalytic reduction
- Tank car unloading
- Vapor recovery

Industries served...

Process

- Chemical and petrochemical processing

Energy

- Oil and natural gas production
- Alternative fuel
- Liquefied gases
- Electric power generation

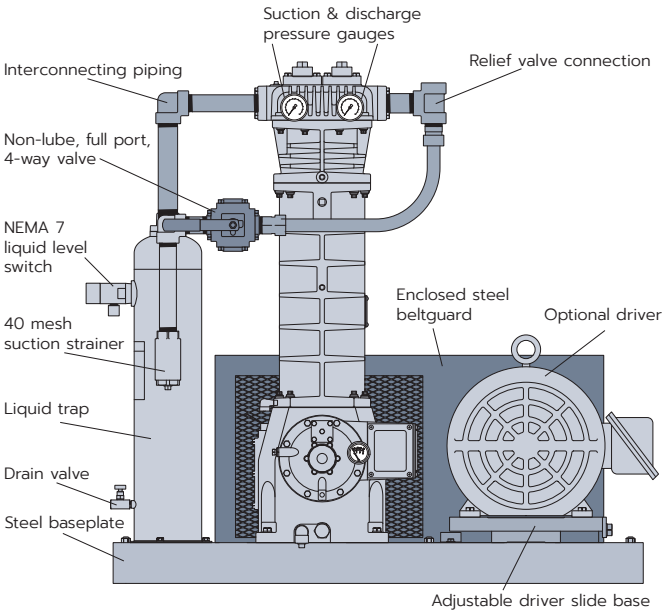
Transportation

- Truck and transport
- Liquid and liquefied gas terminals
- Marine

103 Mounting

- Steel baseplate
- V-belt drive
- Adjustable driver slide base
- Enclosed steel beltguard
- Suction and discharge pressure gauges

Standard Compressor Mountings



–107A mounting shown above.

Standard 107 Items

- Steel baseplate
- V-belt drive
- Adjustable driver side base
- Enclosed steel guard
- Suction and discharge pressure gauges
- 40 Micron strainer
- Non-lube 4-way valve
- Interconnecting piping
- Liquid trap as specified below

107 Mounting

- Mechanical liquid trap with ball float

107A Mounting

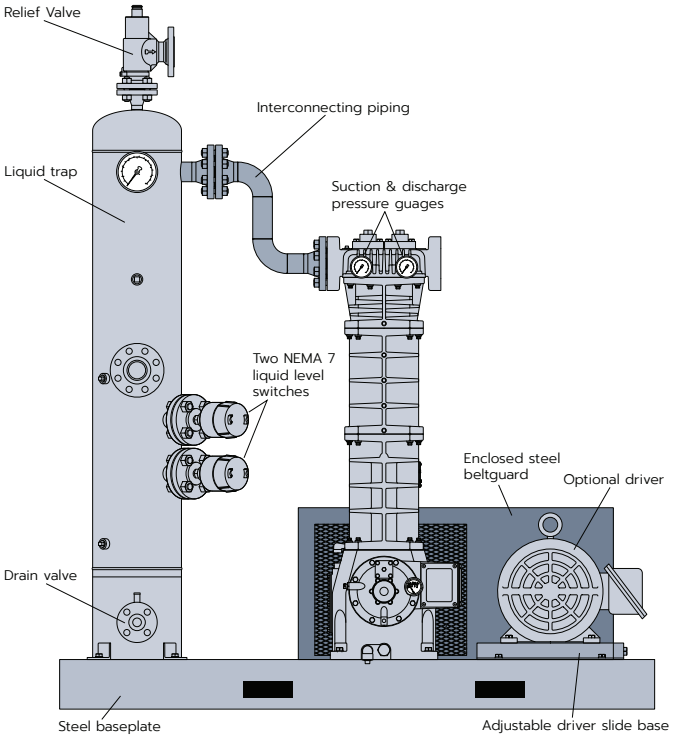
- Automatic liquid trap with one NEMA 7 liquid level switch

107B Mounting

- Automatic liquid trap with two NEMA 7 liquid level switches

107F Mounting

- 107A or 107B with Class 300 RF flanged components and connections



–109F mounting shown above.

Standard 109 Items

- Steel baseplate
- V-belt drive
- Adjustable driver side base
- Enclosed steel guard
- Suction and discharge pressure gauges
- 40 Micron strainer
- Interconnecting piping
- Liquid trap as specified below

109 Mounting

- Mechanical liquid trap with ball float

109A Mounting

- Automatic liquid trap with one NEMA 7 liquid level switch

109B Mounting

- Automatic liquid trap with two NEMA 7 liquid level switches

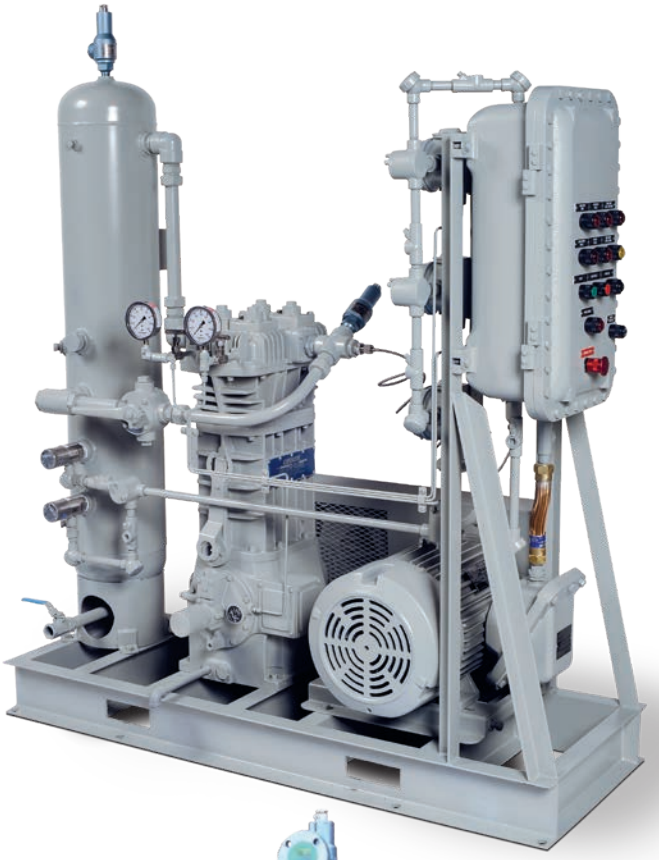
109F Mounting

- 109A or 109B with Class 300 RF flanged components and connections

Custom Engineered Compressor Packages

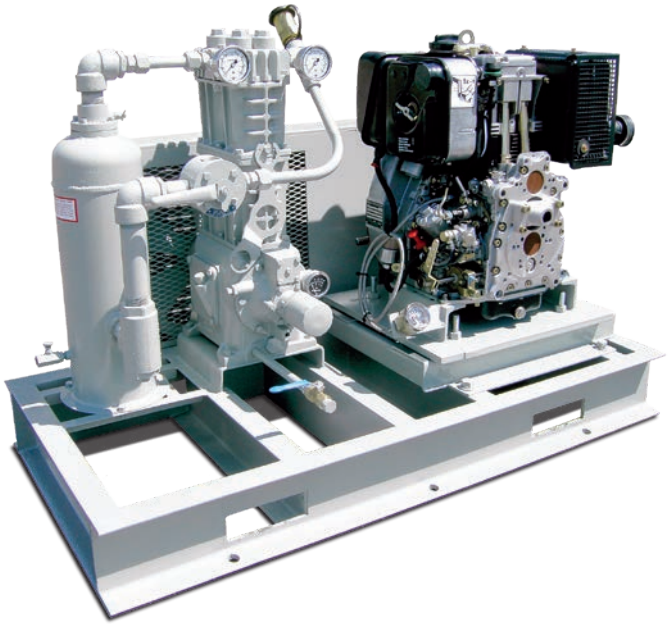
Custom engineered packages...

When a standard mounting does not fit the application, Corken can build a custom compressor package. Most custom packages are a modification of a standard mounting. If this is not suitable for the application, Corken will build a mounting or skid from the floor up. Just send the specifications to Corken and an application engineer will design a compressor package to match the requirements.



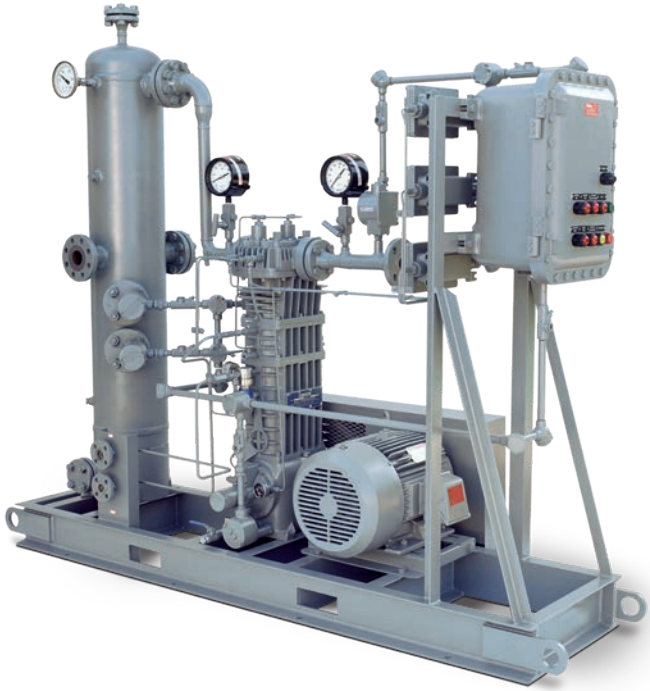
Right: Customized 691-107B single-stage LPG compressor package designed for liquefied gas transfer and vapor recovery applications.

Below: Customized HG602CE-109C two-stage compressor package designed for LPG sphere evacuation. This package can operate in single-stage and two-stage mode for deep evacuation. This package can also be used for propylene and other products.

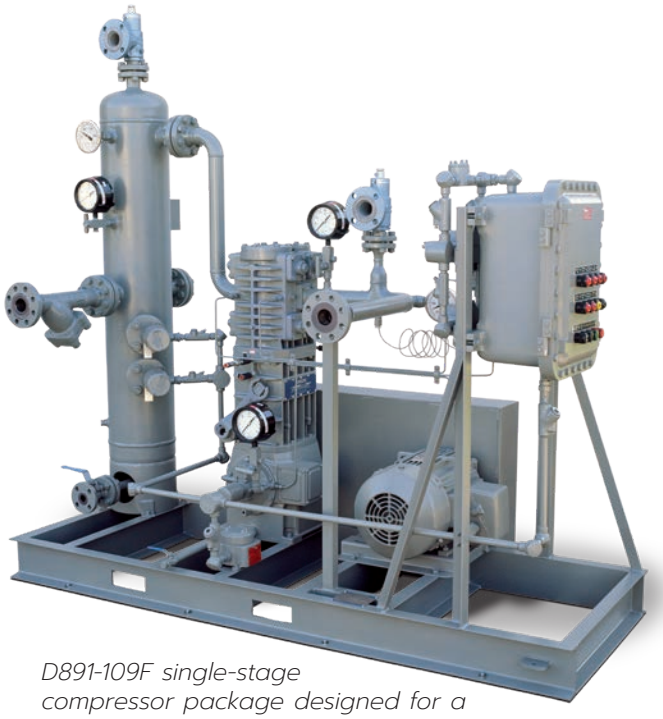


291-107 single-stage compressor package designed for tank maintenance evacuation and emergency evacuation situations like an over turned tank car or transport truck.

Customized D891-109F single-stage compressor package designed for a liquefied gas transfer application.



FT491-109F single-stage, flanged compressor package designed for liquefied gas transfer applications using vinyl chloride, butadiene and methyl chloride.



D891-109F single-stage compressor package designed for a liquefied gas transfer application using propylene.

Solutions beyond products...

CORKEN®

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