

KINNEY[®] VACUUM PUMPS AND BOOSTERS



Piston Pumps

KT Single-Stage Rotary Piston Pump

- Quiet running
- High pumping capacity at high & low pressures
- Triplex piston design: dynamically balanced & practically vibration free
- Durable in dirty applications
- No metal-to-metal contact between pump piston & cylinder - clearances are filled with oil

KT models include an integral, positive pressure lubrication system to insure reliable lubrication at all pressure levels. KT pumps are water-cooled. Optional air-cooling systems are available. Adjustable gas ballast valves are standard for handling water and other vapor loads.

Model	CFM / m ³ /h	HP / kW
KT-150C	150 / 255	7.5 / 6
KT-300D	300 / 510	15 / 11
KT-500D	500 / 850	30 / 22
KT-850D	778 / 1322	40 / 30

Typical Applications

- Vacuum Packaging
- Vacuum Furnaces
- Vacuum Coating



KC and KTC Two-Stage Rotary Piston Pumps

- Recommended for applications where operating pressure is below 0.1 Torr (0.13 mbar)
- Achieve lowest possible pressures from mechanical pumps
- Rugged and reliable
- No metal-to-metal contact between pump piston & cylinder - clearances are filled with oil
- Unequaled durability, even in dirty applications

KC & KTC pumps are air-cooled. KTC-112 is water-cooled with optional air-cooling systems. Adjustable gas ballast valves are standard for handling water and other vapor loads. KTC pumps feature triplex piston design: dynamically balanced & practically vibration free.

Model	CFM / m ³ /h	HP / kW
KC-5	5 / 8.5	0.33 / 0.25
KC-8	8 / 13.6	0.75 / 0.56
KC-15	15 / 25.5	1 / 0.75
KTC-21	21 / 36	1.5 / 1.1
KTC-60	60 / 102	3 / 2.2
KTC-112	107 / 182	7.5 / 5.6

Typical Applications

- Evacuating Refrigeration Systems
- Liquid Gas Storage
- Brake Filling Systems
- Low-Pressure Chemical Vapor Deposition (LPCVD)
- Silicon Crystal Growing
- Leak Detection



KD and KDH Single-Stage Duplex Rotary Piston Pumps

- Absolute pressures down to the low micron range
- Belt-driven, low-speed rotary piston pumps
- No small orifices to plug up
- Rugged and reliable
- No metal-to-metal contact between pump piston & cylinder - clearances are filled with oil
- Adjustable gas ballast permits handling of condensible vapors

KD pumps are air-cooled.

KDH pumps are water-cooled.

Model	CFM / m ³ /h	HP / kW
KD-30	33 / 56	1.5 / 1.11
KD-50	52 / 88	2 / 1.5
KDH-130	165 / 280	5 / 3.7
KDH-150	60 / 102	7.5 / 5.6

Typical Applications

- Drying Chambers
- De-gasifiers
- Filling Machinery
- Evacuation of Process Chambers



Liquid Ring Vacuum Pumps

KLRC Two-Stage

- Ideally suited for pumping wet mixtures - even slugs of liquid
- Can pull down as low as 4 Torr (5.3 mbar a)
- Low-pressure performance is limited by the vapor pressure of the sealing liquid: water, oil or process liquids
- Complete engineered system solutions available: instrumentation, controls, piping & valves
- Self-contained liquid recovery & recirculation are available
- Center-anchored tie rods allow access to either end of the pump without total disassembly
- Double mechanical seals available in models KLRC75 through KLRC525 to meet API Piping Plan Requirements

Available in standard, all iron construction (no yellow metals) and 316 stainless steel. Liquid ring pumps often require water-cooling, but air-cooling systems are available.



Model	CFM / m ³ /h	HP / kW	Typical Applications
KLRC-75	70 / 120	5 / 3.7	• Chemical & Pharmaceutical Processing
KLRC-100	100 / 170	7.5 / 5.5	• Vapor Recovery
KLRC-125	140 / 240	10 / 7.5	• Deaeration
KLRC-200	200 / 340	15 / 11	• Extruders
KLRC-300	300 / 510	25 / 18.5	• Crystallizers
KLRC-525	550 / 935	50 / 37	• Central Vacuum Systems
KLRC-950	950 / 1615	100 / 75	

A Series Single-Stage

- Simplistic in design, rugged in construction
- Built to run in the most severe of industrial conditions
- Unique design allows pump to operate flooded, without damage
- Flat power curve over entire vacuum range prevents motor overload
- No contact between operating components in the casing
- Pull down to 29" Hg - 25 Torr (33 mbar a)
- Increased water handling capability prevents heat build-up, extends life of single mechanical seal
- Reduced stress on motor shaft and bearings
- Compact, close-coupled design eliminates need for interstage manifold or motor alignment

A Series pumps are not as susceptible to cavitation compared to flat plate design because the flow path through the pump is an axial flow. This allows the velocity through the pump to be unchanged and carries the air out effortlessly. It is not unusual for these pumps to run 24/7 operation for years without maintenance.

A Series pumps are vibration-free and environmentally friendly with no oil used for lubrication, and no oil discharged to atmosphere. Complete, self-contained systems including liquid recovery and recirculation are available.



Model	CFM / m ³ /h	HP / kW	Typical Applications
A-5	10 / 17	1 / 0.75	• Filtration
A-10	15 / 26	1.5 / 1.1	• Solvent Distillation/Vapor Recovery
A-15	22 / 37	2 / 1.5	• Sterilization
A-20	35 / 59	3 / 2.2	• Autoclaves
A-75	75 / 128	5 / 3.7	• Degassifiers
A-100	105 / 178	7.5 / 5.5	• Extruders
A-130	140 / 238	10 / 7.5	• Deaeration
A-200	220 / 374	15 / 11	• Evaporators
A-300	300 / 510	20 / 15	

Dry Screw Vacuum Pumps

KDP Screw-Type Dry Vacuum Pump

- Simple, robust design can handle process by-products – liquids, condensate, and even small particles
- No oil or water in contact with process
- No contact between operating components in the casing
- Full pumping speed from atmospheric pressure down to 1 Torr; ultimate pressure 0.1 Torr (.05 Torr on Model KDP-800)
- Quiet operation – less than 85 dB(A)
- Short gas path through the pump for quick discharge
- Extended shaft for either V-belt or direct drive

Casing and rotors are made of ductile iron, PFA coated.



60 Hz, Direct Drive

Model	CFM / m ³ /h	HP / kW
KDP-150	88 / 180	7.5 / 5.5
KDP-330	194 / 330	15 / 11
KDP-400	235 / 400	20 / 15
KDP-800	459 / 780	30 / 22

50 Hz, Direct Drive

Model	CFM / m ³ /h	HP / kW
KDP-150	71 / 120	7.5 / 5.5
KDP-330	159 / 270	15 / 11
KDP-400	194 / 330	20 / 15
KDP-800	388 / 660	30 / 22

Typical Applications

- Solvent Recovery
- Vapor Recovery
- Vacuum Packaging
- Freeze Drying

SDV Variable Pitch, Screw-Type Dry Vacuum Pump

- Patented variable pitch rotor design increases efficiency and lowers temperatures
- No oil or water in contact with process gases
- Can handle both condensable vapors and some solids without leaving residue
- Capable of full pumping speed from atmospheric pressure to 1 Torr (1.3 mbar a)
- Can achieve ultimate vacuum as low as 0.01 Torr (0.013 mbar a)
- No metal-to-metal contact between operating parts
- Quiet operation

The SDV's space saving C-face motor design eliminates the need for motor coupling and guard. It features a short gas path through the pump for quick discharge.



60 Hz, Direct Drive

Model	CFM / m ³ /h	HP / kW
SDV-120	71 / 120	5 / 3.7
SDV-200	106 / 180	5 / 3.7
SDV-320	188 / 320	10 / 7.5
SDV-430	253 / 430	15 / 11
SDV-800	441 / 750	20 / 15

50 Hz, Direct Drive

Model	CFM / m ³ /h	HP / kW
SDV-120	59 / 100	5 / 3.7
SDV-200	88 / 150	5 / 3.7
SDV-320	157 / 267	10 / 7.5
SDV-430	211 / 358	15 / 11
SDV-800	368 / 625	20 / 15

Typical Applications

- Chemical & Pharmaceutical Processing
- Solvent Recovery
- Crystallization
- Vapor Recovery

Engineered Solutions

Booster/Rotary Piston Vacuum Pumping Systems

- Pump high volumes at very low pressure
- High-capacity dry rotary lobe vacuum booster is matched to a smaller rotary piston vacuum pump
- For continuous operation below 1 Torr (1.3 mbar a), the vacuum booster can increase pumping speed by a factor of 10 or more
- For operation at higher pressure and for faster evacuations, the booster may be approximately twice the capacity of the piston pump
- Performance ranges 200-12,000 CFM (340-20,388 m³/h) with ultimate vacuum levels as low as 0.2 microns
- Conventional systems with direct driven or V-belt driven boosters
- Low-profile systems with close-coupled boosters are available
- Creates a higher capacity system with economy of scale

Tuthill application engineers can help you make the best selection for your specific needs.

Typical Applications

- Transformer Oil Drying
- Vacuum Furnaces
- Vapor Coating
- Vacuum Packaging

Booster/Liquid Ring Vacuum Pumping Systems

- Ideal for pumping wet gas mixtures at low pressures
- Oil-filled systems avoid problems with corrosive contaminants and sealant liquid vapor pressures at higher temperatures
- Process liquid-filled systems prevent contamination of process gases with either water or oil

A variety of two and three-stage systems are available, complete with instrumentation, condensers, partial or complete sealant liquid recovery and recirculation, piping, and valves.

Typical Applications

- Vapor Recovery
- Chemical Processing
- Dryers & Evaporators

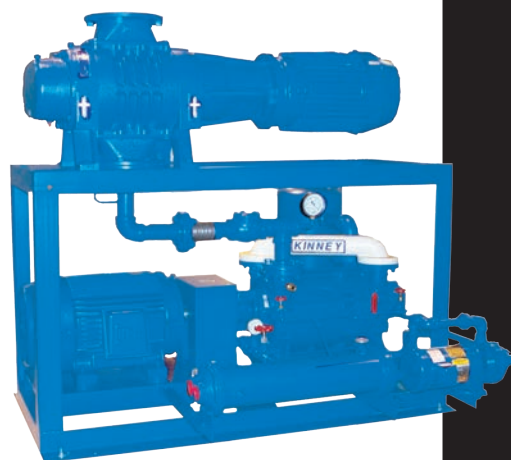
Booster/Dry Screw Vacuum Pumping Systems

- Combine high pumping speed with deep vacuum levels and operate free of oil, water or other sealing liquids
- Flows range to 4,500 CFM (7646 m³/h) with vacuum levels to 10 microns and below

Complete engineered solutions are available and may include any combination of dry screw vacuum pumps, vacuum boosters, electric motors, direct or V-belt drive, coolant recirculation systems, instrumentation, controls, skid piping and valves.

Custom Engineered Solutions

Tuthill application engineers are ready to help you select the best system and combinations of components for your specific needs. Custom engineered system solutions to 12,000 CFM are available with a combination of vacuum boosters/air ejectors and roughing pumps for any vacuum application. Contact your Tuthill rep or call 800-825-6937 for assistance.



Typical Applications

- Chemical & Pharmaceutical Processing
- Semiconductor Processing
- Solvent Recovery
- Crystallization
- Dry Etching
- Vapor Recovery

Rotary Vane Vacuum Pumps

KVA Single Stage

- Ideally suited for clean or moderately contaminated applications when suction filters are fitted to the pump
- Oil-flooded, multi-vane vacuum pumps are single stage, air cooled and direct driven
- Compact design for easy installation
- Carbon composite vane material for long life
- TEFC high efficiency tri-voltage motor (208-230/460V 50/60)
- Models KVA 25-630C include spin-on oil filter and exhaust pressure gauge

This simple design ensures the reliability and the durability that is required in the vacuum industry. The design features oil level sight glass and vibration isolators.



Model	CFM / m ³ /h	HP / kW	Model	CFM / m ³ /h	HP / kW	Typical Applications
KVA-12	7 / 12	.75 / 0.55	KVA-100	70 / 119	5.0 / 3.7	• Vacuum Packaging
KVA-21	15 / 26	1.0 / 0.75	KVA-160C	117 / 199	7.5 / 5.5	• Meat Packing
KVA-25	21 / 36	1.5 / 1.1	KVA-250D	180 / 306	10 / 7.5	• Vacuum Chucking & Holding
KVA-40	31 / 53	2.0 / 1.5	KVA-400C	330 / 561	15 / 11	• Central Vacuum Systems
KVA-63	45 / 76	3.0 / 2.2	KVA-630C	460 / 782	25 / 18.5	• Plastic Thermoforming
						• Food Processing

Vacuum Boosters

Vacuum boosters are used to supercharge vacuum pumps to extend pump performance. This creates much faster pumping speeds and deeper vacuum levels.

- High-capacity gas volumes at high vacuum (50 Torr to micron range)
- May be used in conjunction with all types of vacuum pumps
- Designed to operate at 82 dB(A) or less at blank-off (open field; motor and background noise excluded)
- Supplied with a heavy-duty drive shaft for either direct coupled or belt-driven applications
- Standard construction materials: cast iron housing, end plates and port fitting with ductile iron rotors and shafts
- Special materials offered: stainless steel, carbon steel, ductile iron
- Special testing available: Hydrostatic testing to 150 PSIG (10.35 bar g), Seal leakage testing, Noise testing



Model	DISPL. CFM / m ³ /h	Model	DISPL. CFM / m ³ /h	Typical Applications
KMBD 200/400	400 / 680	KMBD 2900	3000 / 5100	• Supercharging
KMBD 540	540 / 918	KMBD 3600	3600 / 6117	• Vacuum Systems
KMBD 720	720 / 1223	KMBD 4500	4600 / 7816	• Vacuum Drying
KMBD 850	800 / 1359	KMBD 5400	5500 / 9400	• Dehydration
KMBD 1200	1200 / 2039	KMBD 7300	7300 / 12400	• Packaging
KMBD 1600	1600 / 2720	KMBD 8000	9400 / 16000	• Vacuum Furnace
KMBD 2000	2000 / 3400	KMBD 10000	12700 / 21600	• Silicon Crystal Growing
KMBD 2700	2700 / 4590			• Distillation
				• Chemical Vapor Deposition

Vacuum Pump Selector Guide

Step 1

Vertical Scale: Locate the desired vacuum level in inches of mercury (Torr or mbar*).

Step 2

Horizontal Scale: Calculate and locate the required capacity in cubic feet per minute or cubic meters per hour based on system volume, pump down time, gas load, and leakage.

Step 3

Intersection of Scales: The box where the two lines intersect contains the possible pumps for selected pressure and capacity.

Example

*1 Torr = 1mm mercury absolute pressure

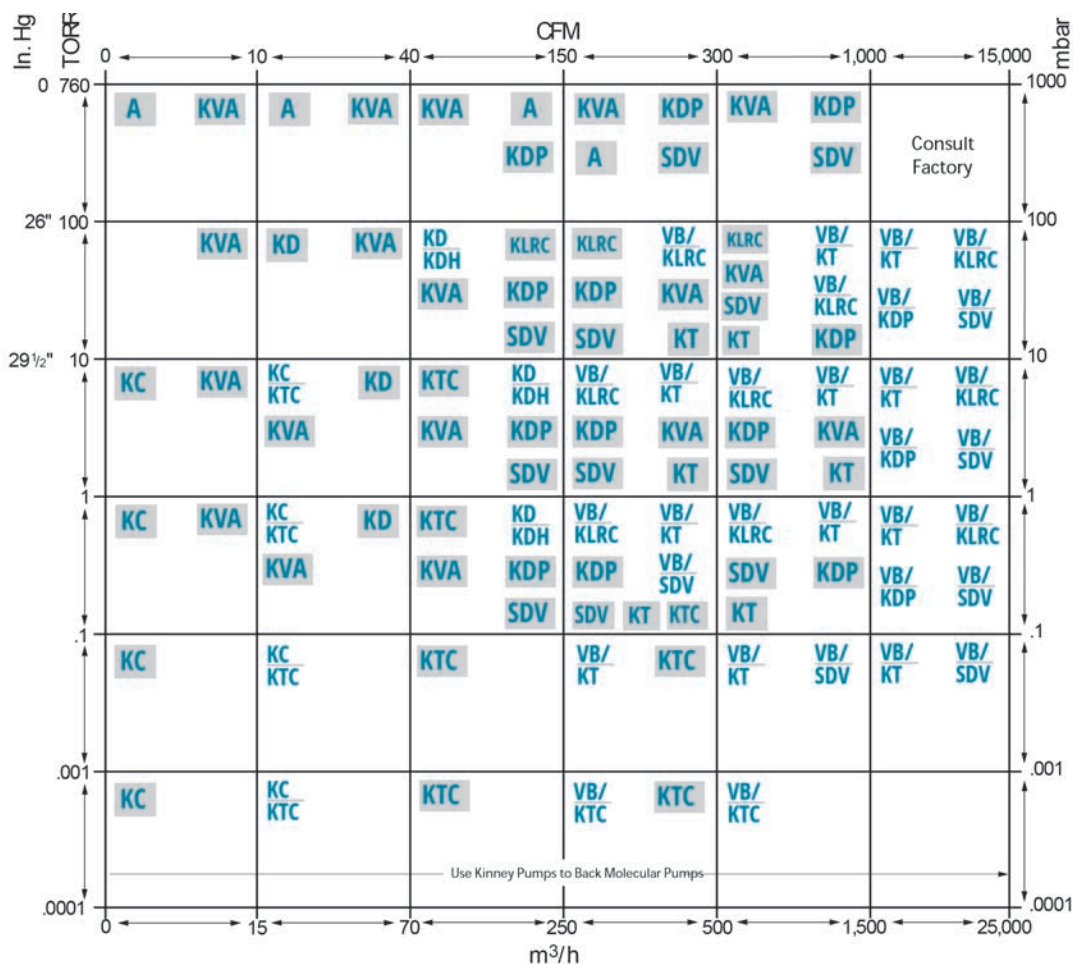
To convert inches of mercury vacuum to Torr:

$\text{Torr} = (30 - \text{inches of vacuum}) \times 25.4$ at sea level e.g.,

20 inches Hg = $(30-20) \times 25.4 = 254$ Torr

Please consult your Tuthill sales

representative for assistance in making your final product selection.



Example: For 50 CFM and 80 Torr, the selector guide indicates that KD, KDH, KVA, KLRC, KDP, and SDV pumps should be considered.

VBXpert Vacuum & Blower Sizing Tool

Gain access to the most useful tool available for blower sizing and selection! This easy-to-use software prompts you to plug in technical specifications for your application and "VB" quickly calculates the best vacuum pump or blower for you.

VBXpert is available for download at tuthillvacuumblower.com



Excellence at work. Excellence in life.

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Repair & Service Centers

Tuthill's Repair & Service Centers are fully staffed to perform prompt service on your vacuum pumps or blowers, using genuine OEM repair parts, and factory-trained personnel to ensure that your equipment performs to factory specifications.

Tuthill Vacuum & Blower Systems, manufacturer of Kinney® vacuum pumps and M-D Pneumatics™ blowers & vacuum boosters, is a leader in the design and manufacture of high performance, reliable positive displacement blowers, mechanical vacuum pumps, vacuum boosters and engineered systems ready to install and run.

Dedicated to growth around the globe, Tuthill Vacuum & Blower Systems has built facilities in the U.S., Mexico, Europe, Argentina, Asia, and Australia.

At Tuthill Corporation, we strive to create an environment where individuals are both motivated and effective. One of the ways that this is accomplished is by treating people as the great individuals that they are instead of as business objects.

With unwavering confidence that each and every one of our employees has the potential to become a Radical Leader, Tuthill has invested a large amount of time in teaching the principles of a Conscious Company and Radical Leadership® at all levels within the organization.

It's wonderful that the benefit of becoming a Conscious Company doesn't stop here within the walls of Tuthill. In this ultimate personal expression of Continuous Improvement, we will join together to:

- Build a great company,
 - Grow healthy families, and
 - Have seismic impact on our world.
- And we'll accept nothing less!



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