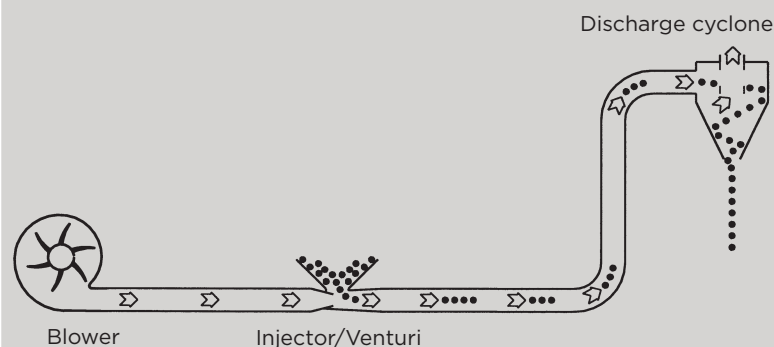
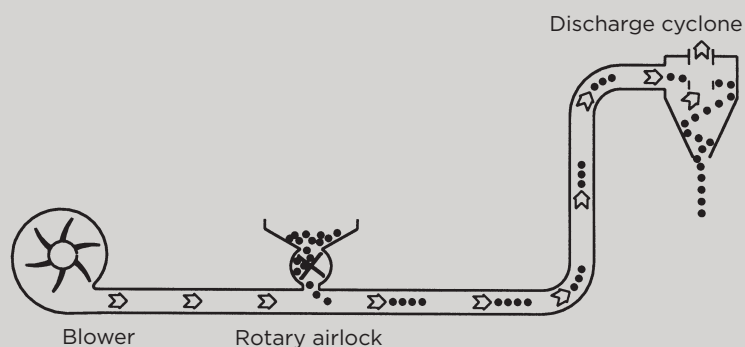




**Flexible Pneumatic  
Conveying Solutions**

# High Pressure Blowers TRL



## You've got grain here. You need grain there. How to move it?

Our Kongskilde TRL blowers offer highly customized solutions to moving grain from A to B and beyond. TRL blowers are available from 3 to 100 hp. Some TRL blower models can use several sizes of motors, so increasing capacities later can be as easy as changing the motor and drive package.

Our pneumatic systems are economical and practical, with all the flexibility of a modular system that allows installation, expansion and rearrangement via Kongskilde's unique OK160 piping system that requires no tools — so changing the layout to fit current needs is simple. Whether crops need to be conveyed horizontally, vertically or around corners, the quality will be protected by the Electronic Air Regulator. The Kongskilde solution is to use a high volume of air at low pressure to safely convey the product. The grain is truly moved on a cushion of air. This system provides an ideal way to fill bins, silos or flat storage. All the components are easily transportable, making it easy to move them from one site to another, keeping investment costs low.

The TRL pneumatic conveying systems are suitable for wheat, barley, oats, rye, corn, canola, soybeans, and many other grains and granular products. Grain quality is protected by the Electronic Air Regulator to assure gentle conveyance.

The Kongskilde single- and multi-stage "turbo impeller" fan is precision balanced and rotates freely to ensure a low noise level and continuous capacity regardless of age. The TRL 500, a three-stage blower, can deliver a pressure of no more than 5.63 PSI - 155 WG water gauge.

To introduce grain into the grain handling system, choose one of multiple sizes of air locks or Injector/Venturis. CAD rotary valves are used in pressure conveying for delivery into a horizontal pipeline, while CAE rotary valves are used in suction conveying systems for gravity discharge from cyclones. For lower capacities, the TF Venturi is used as an alternative to CAD rotary airlocks.

# Direct Drive TRL



TRL 100 blower with TF 55 injector

The motor directly drives the blower rotor

TRL 50 blower for conveying fines

The TRL blower creates an airflow in the pipes that conveys the grain. The amount of grain that can be blown through the pipes depends on the blower's power. Kongskilde provides blowers with different output to meet different needs. The small blower models are directly driven, i.e. the blower's rotor is fitted directly to the motor shaft.

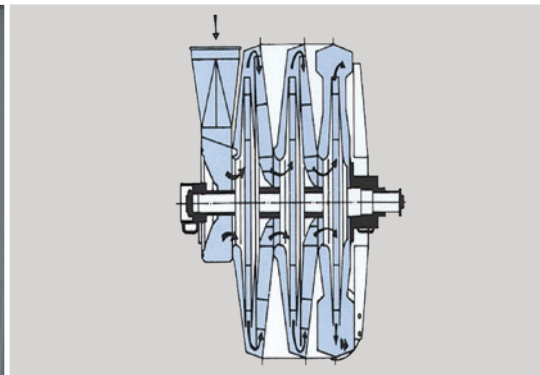
## Benefits

- Blower housings shaped in press toolings.
- Dynamically balanced rotors provide smooth running.
- Control of the air provides efficient conveying and minimizes pipe wear.
- Minimal maintenance.

Technical specifications	Motor HP (kW)	Power supply	Air volume Max CFM	Air pressure Max PSI (mm WG)	Weight lbs. (kg)	rpm Motor
TRL 30	3 (1.5)	115/230V or 230/460V or 575V	1,118*	.36 (10)	80 (36)	3,450
TRL 50	5 (4)		1,530*	.51 (14)	170 (77)	3,450
TRL 100	10 (5.5)		1,883	1.37 (38)	203 (92)	3,450

\* Injector required (Minimum back pressure from the injector necessary in order not to overload the motor.)

# Belt Driven TRL



Electronic air regulator

Construction of high pressure blower with 3 rotors

V-belt drive for TRL 300

Higher capacities require higher pressure output from the blower. The most effective way to achieve this is by increasing the rpm. For this reason, the large blowers use a belt drive between the motor shaft and the blower shaft. In order to achieve more pressure for larger capacities, the large blowers have multiple rotors.

## Benefits

- Effective modular system to build blowers with different outputs
- Proven design
- Air control ensures constant airflow for grain transport
- Can be used for both pressure and suction systems

Technical specifications	Motor HP (kW)	Air volume Max CFM (m <sup>3</sup> /h)	Air pressure Max Pa (mm WG)	Weight lbs. (kg)	Blower RPM	Motor RPM
TRL 210	10 (7.5)	1,060 (1,800)	9,330 (950)	284 (129)	3,650	3,450
TRL 215	15 (11)	1,060 (1,800)	12,770 (1,300)	311 (171)	4,200	3,450
TRL 220	20 (15)	1,060 (1,800)	17,000 (1,700)	454 (206)	4,700	3,450
TRL 300	30 (22)	1,060 (1,800)	22,600 (2,300)	764 (347)	4,100	3,450
TRL 500	50 (37)	1,060 (1,800)	34,400 (3,500)	1,030 (468)	4,300	3,450
TRL 750	75 (55)	1,060 (1,800)	92,800 (6,400)	2,123 (965)	4,310	3,450
TRL 1000	100 (75)	1,060 (1,800)	61,700 (7,900)	2,343 (1,065)	4,780	3,450

# Twin Turbo



The Kongskilde TRL system allows for future expansion by pairing two blowers together.

The two blowers can be connected together - twin - turbo- when an increase in capacity is needed. The blowers are connected via permanent pipe requiring both blowers to

run. The other option is to connect the blowers using 2-way switches. This allows the operator to use one blower when conveying to a bin that is close by. When moving grain a longer distance, just activate the second blower and move the handle on the switches. The Electronic Air Regulator adapts to the twin blowers thus ensuring gentle conveyance of the commodity.

## Electronic Air Regulator



The Electronic Air Regulator (EAR) is an intriguing component of the TRL conveying system. It allows the operator to adjust the air velocity according to specific criteria (conveying distance, crop, moisture etc.) of the conveying system. This provides the conveyance at maximum capacity while moving the grain gentle to limit damage.

The EAR assures gentle conveyance of the grain in the pipe line. It is therefore ideally suited to act as a safeguard when conveying commodities such as corn, soybeans, peas, and similar crops.

Minimum damage is achieved by conveying the product through the pipe

system at a low air velocity. The orifice/sensing pipe provides the control box with the air pressure and flow data from the blower outlet. The control box houses the main controller and power supply for the system. It contains the flow rate settings, startup time delay and operating parameters. The menu buttons are used for the system set up and flow rate while the light bar display indicates the conveying range the TRL is operating in. In addition, the control box formulates the data received from the orifice/sensing tube. Using the flow rate menu allows the baffle in the shutter to be adjusted until the indicator needle is in the conveying range. The baffle position controls the amount of air going into the blower.

# Rotary Airlocks and Injectors



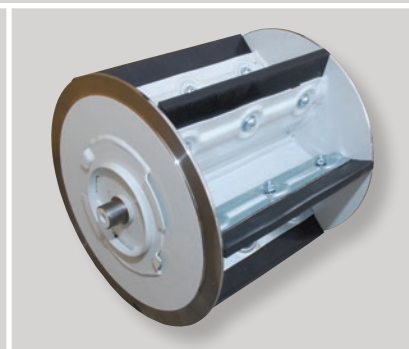
TF Injector/Venturi with inlet hopper



CAD 20 rotary airlock with inlet hopper and slide gate



CAE 20 rotary airlock mounted below the cyclone for bottom discharge



Rotary airlock rotor with rubber paddles

A rotary valve or injector delivers grain into the pipeline as part of a Kongskilde pneumatic conveying system. Injectors are ideal for low pressure conveying, while a rotary airlock is more appropriate for heavier material. The airlock is driven by a small HP motor.

## Benefits

- CAD rotary airlock is equipped with polyurethane paddles and a gear motor to run the unit
- Rubber paddles provide an excellent seal against air loss and they can bend to minimize clogging of material
- Standard inlet hoppers and shutters regulate the inlet volume.

CAD Rotary valve units are used for pressure conveying, while CAE models are used for suction conveying.

<b>Blower</b>	TRL 30	TRL 50	TRL 100
<b>Injector</b>	TF 20	TF 40	TF 55

Technical specifications	Capacity t/hour	Motor HP (kW)	Cell wheel/motor rpm	Weight lbs. (kg)	Connection top/bottom	Max pressure Pa (mm WG)	Blower Model
CAD 20	16	0.75 (0.55)	65/1750	82 (37)	OK200/OK160	19,600 (2,000)	TRL 100-220
CAD 30	26.5	2.0 (1.5)	65/1750	135 (61)	OK200/OK160	39,200 (4,000)	TRL 300
CAD 40	53	2.0 (1.5)	65/1750	214 (97)	OK250/OK160	49,100 (5,000)	TRL 500
CAE 20	16	0.75 (0.55)	65/1750	71 (32)	OK200/OK200*	19,600 (2,000)	TRL 100-220
CAE 40	53	2.0 (1.5)	65/1750	196 (89)	OK200/OK200*	49,100 (5,000)	TRL 500
CAD 50	100	2.0 (1.5)	65/1750	88 (40)	OK160	80,000 (8,000)	TRL 750/1000

# Capacities for TRL Systems

Conveying Capacity For Clean Dry Corn - Bu/Hour	Total Transport Length (Horizontal & Vertical) Feet Includes 40 Feet of Vertical Height															
	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340
TRL 30 + TF 20	88	69	57	47	41											
TRL 50 + TF 40	140	126	114	104	96	88	79	73	67	62	56	51				
TRL 50 + CA 20	196	176	160	146	134	123	111	102	93	86	79	72				
TRL 100 + TF 55	343	315	285	250	229	208	190	178	164	151	137	122				
TRL 100 + CA 20	489	451	408	363	335	307	279	258	241	227	213	200	190	180	171	162
TRL 100 + Twin Turbo	880	812	734	653	603	552	502	465	434	408	384	360	342	324	308	292
TRL 210 + CA 20	543	501	453	403	372	341	310	287	268	252	237	222	211	200	190	180
TRL 210 + Twin Turbo	977	902	815	725	670	614	558	517	482	454	427	400	380	360	342	324
TRL 215 + CA 20	554	543	526	505	484	459	428	406	386	371	355	340	320	299	279	258
TRL 220 + CA 30	723	712	691	664*	628	587	541	511	486	466	445	425	404	383	363	344
TRL 220 + Twin Turbo	1,301	1,282	1,244	1,195	1,130	1,057	974	920	875	839	801	765	727	689	653	619
TRL 300 + CA 30	910	881	856	823	772	716	654	617	587	561	536	510	489	468	448	430
TRL 500 + CA 40	1,411	1,391	1,340	1,273	1,150	1,054	992	963	943	922	901	881	860	840	819	802
TRL 700 + CA 50	1,834	1,808	1,742	1,655	1,495	1,370	1,290	1,252	1,226	1,199	1,171	1,145	1,118	1,092	1,065	1,043

Conveying capacities for pneumatic conveying systems depend on variables such as commodity, moisture content, temperature, humidity and pipe layout. Above capacities calculated with two bends in the line. For each additional bend deduct 2%. For soybeans and wheat deduct 20% off above capacities.

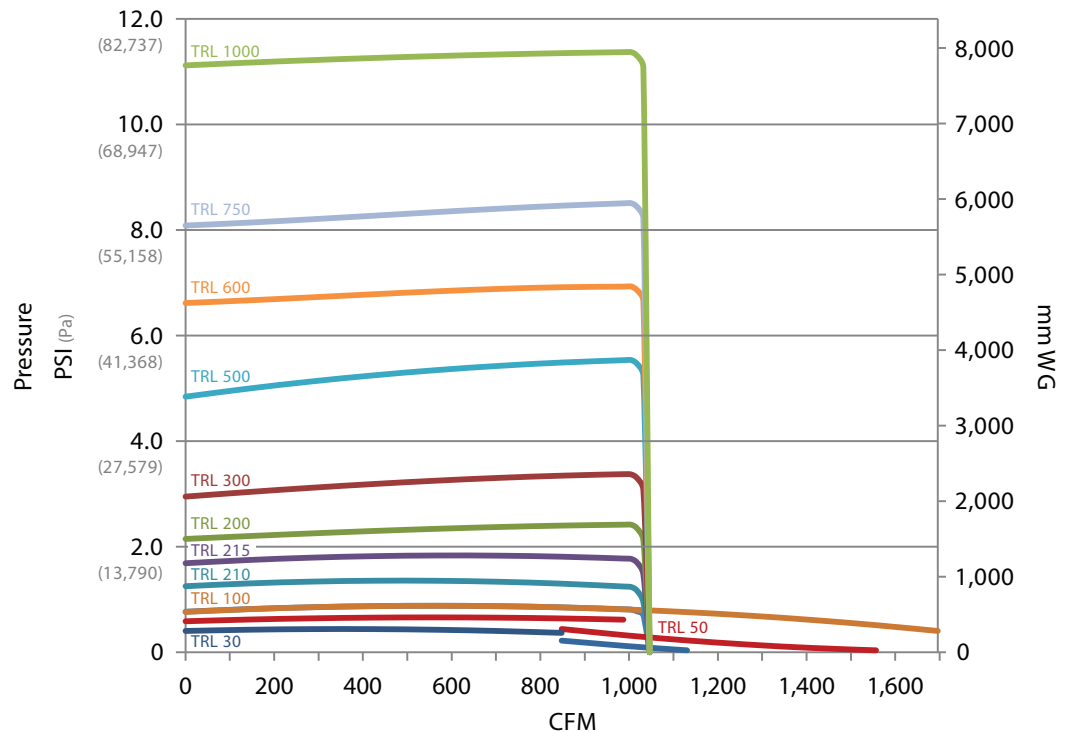
\*Example: TRL 220 + CA 30 total pipe length 100 feet - 60' horizontal and 40' vertical = 664 Bu/hour.

## Capacities

Various factors affecting the conveying capacity:

- Multiple bends reduce capacity.
- Extra vertical pipe reduces capacity.
- Moisture contents, above figures based on 14%.
- Purity of the grain.
- Air temperature, barometric and altitude pressure.

## Blower Curves



# Electric-Powered SUC-E



Model SUC-E is trolley mounted for easy maneuverability



SUC 300 E with mechanical air regulation



Belt transmission protects drive of both blower and cell wheel



## Grain Vacs/Suction Blowers

Whether you need a temporary or permanent conveying system, Kongskilde has the vacuum and suction systems that will help you move grain where it needs to be. The wide range of electrical and tractor-powered grain vacs with capacities of up to 5,000 bushels of grain (120 tons) per hour means there's a blower for every job. The OK Pipe System makes it quick and easy to establish temporary or permanent pipelines.

## How they work

Suction blowers, also referred to as grain vacs, operate by the vacuum created by the turbine-style blower. The grain is drawn into the suction cyclone and is separated from the air inside the suction cyclone while the air is returned to the blower. The grain drops into the rotary valve, where it is fed into the air stream coming from the blower. The grain is directed through

the pipeline to the discharge cyclone. A discharge cyclone decelerates the grain and allows it to drop out of the bottom of the cyclone. Excess air is blown through the top of the discharge cyclone.

## SUC-E 200, 215, 220, 300 and 500

The SUC-E models are often used at locations where tractor power units are not an option. They can be used both indoors and outdoors for all types of conveying jobs, including seed operations.

The SUC-E is equipped with a three-wheeled trolley, which makes the unit easy to move from place to place on hard surfaces. The five different sizes are designed to fit various capacity needs and power availability. Models from 10 HP to 50 HP are available with capacities of up to 1,800 bushels per hour.

Technical specifications	SUC 210 E	SUC 215 E	SUC 220 E	SUC 300 E	SUC 500 E
Blower Motor Power, HP (kW)	10 (7.5)	15 (11)	20 (15)	30 (22)	50 (37)
Rotary Airlock Motor Power, HP (kW)	.75 (0.3)	.75 (0.37)	.75 (0.37)	2 (1.1)	2 (1.5)
Electrical connection, V/hz	115/230V - 230/460V - 575V				
Number of Rotors	1	1	1	2	3
Min. amp. fusing (recommended)	25	35	50	63	100
Weight incl. motors, lbs. (kg)	462 (210)	535 (243)	627 (285)	1,050 (477)	1,470 (668)
Max. air output, CFM (m <sup>3</sup> /h)	1,060 (1,800)	1,060 (1,800)	1,060 (1,800)	1,060 (1,800)	1,060 (2,000)
Type of conveying pipe	OK / OKR	OK / OKR	OK / OKR	OK / OKR	OK / OKR
Diameter of the conveying pipe, in (mm)	6 (160)	6 (160)	6 (160)	6 (160)	6 (160)



# PTO-Powered SUC-T



Mounting frame for attachment to 3-point hitch

SUC 500 T compact design makes it easy to maneuver

Three-state blower on SUC 500 T provides high capacity

Mechanical air regulator is standard on all PTO-powered vacs

## SUC-T 300, 500 and 700

The SUC-T models are three-point hitch PTO-driven grain vacs. The blowers can be used to convey commodities to where high-capacity conveying is required and when no electrical power

source is available. The capacity of the SUC-T 500 is up to 1,800 bu/h (33 t/h).

Technical specifications	SUC 300 T	SUC 500 T	SUC 700 T
Recommended min. power of tractor PTO, HP (kW)	45 (34)	65 (48)	85 (62)
PTO shaft speed, rpm	540	540	1,000
PTO shaft dimension / tractor side	1 3/8" / 6 splines	1 3/8" / 6 splines	1 3/8" / 21 splines
Weight, lbs. (kg)	770 (350)	1,309 (595)	2,200 (1,000)
Blower max. air output, CFM (m <sup>3</sup> /h)	1,060 (1,800)	1,060 (1,800)	1,060 (1,800)
Type of conveying pipe	OK / OKR	OK / OKR	OK / OKR
Diameter of the conveying pipe, in (mm)	6 (160)	6 (160)	6 (160)

# PTO-Powered SUC-TR



The vac's loading equipment ready for road transport



The TR models loading equipment is ideal for loading trucks and trailers



Powerful blower with up to 4 steps provides great conveying output



The belts can be tightened without using tools

## SUC-TR 500, 700 and 1000

The SUC-TR models are pull-type PTO-driven grain vacs that can be used to load trucks or grain wagons directly from the on-floor storage, silos or grain bins. They can also be used to

convey commodities to storage where high-capacity conveying is required. The SUC-TR is available in three sizes with conveying capacities up to 3,000 bu/h (90 t/h).

Technical specifications	SUC 500 TR		SUC 700 TR	SUC 1000 TR
Recommended min. power of tractor PTO, HP (kW)	65 (48)	65 (48)	85 (62)	120 (90)
PTO shaft speed, rpm	540	1,000	1,000	1,000
PTO shaft dimension / tractor side	1 3/8" / 6 splines	1 3/8" / 21 splines	1 3/8" / 21 splines	1 3/8" / 21 splines or 20 splines
Weight, lbs. (kg)	1,804 (820)	1,606 (730)	1,694 (770)	2,310 (1,050)
Blower max. air output, CFM (m <sup>3</sup> /h)	1,060 (1,800)	1,060 (1,800)	1,060 (1,800)	1,060 (1,800)
Type of conveying pipe	OK/OKR	OK/OKR	OK/OKR	OK/OKR
Diameter of the conveying pipe, in (mm)	6 (160)	6 (160)	6 (160)	6 (160)

# PTO-Powered **SupraVac 2000**



Hydraulically folded into transport position



Connection of discharge pipe line when filling bins or silos



Fan guard reduces wear removing abrasive material before it enters the fan

The SupraVac 2000 has a capacity of up to 5,000 bu/h (150 t/h), making it the ideal grain vac for farmers and commercial users. The power takeoff-driven SupraVac 2000 requires 150 hp. It has a hydraulic-folding truck loading boom that allows for quick setup. It conveniently locks into place for transport and storage.

Pipes can be connected quickly to the rear of the SupraVac 2000 to blow into grain bins, flat storage or sealed tower silos. It uses OK200 (8") piping for maximum capacity or can use existing OK160 (6") pipelines on storage structures at reduced capacity.

Technical specifications	SupraVac 2000
Recommended min. power of tractor PTO, HP (kW)	170 (125)
PTO shaft speed, rpm	1,000
PTO shaft dimension, tractor side	1 3/8" / 21 splines or 20 splines
Weight, lbs. (kg)	3,520 (1,600)
Blower max. air output, CFM (m <sup>3</sup> /h)	1,950 (3,300)
Type conveying pipe (suction side)	OKR
Type conveying pipe (pressure side)	OK/OKR
Diameter of the conveying pipe, in (mm)	8 (200)

# Suction Heads



All grain vacs, whether PTO or electric-powered, can be equipped with various suction heads to suit specific needs. Kongskilde offers a variety of suction heads for both OK160 and OK200 intake suction lines.



## **Round Suction Head:**

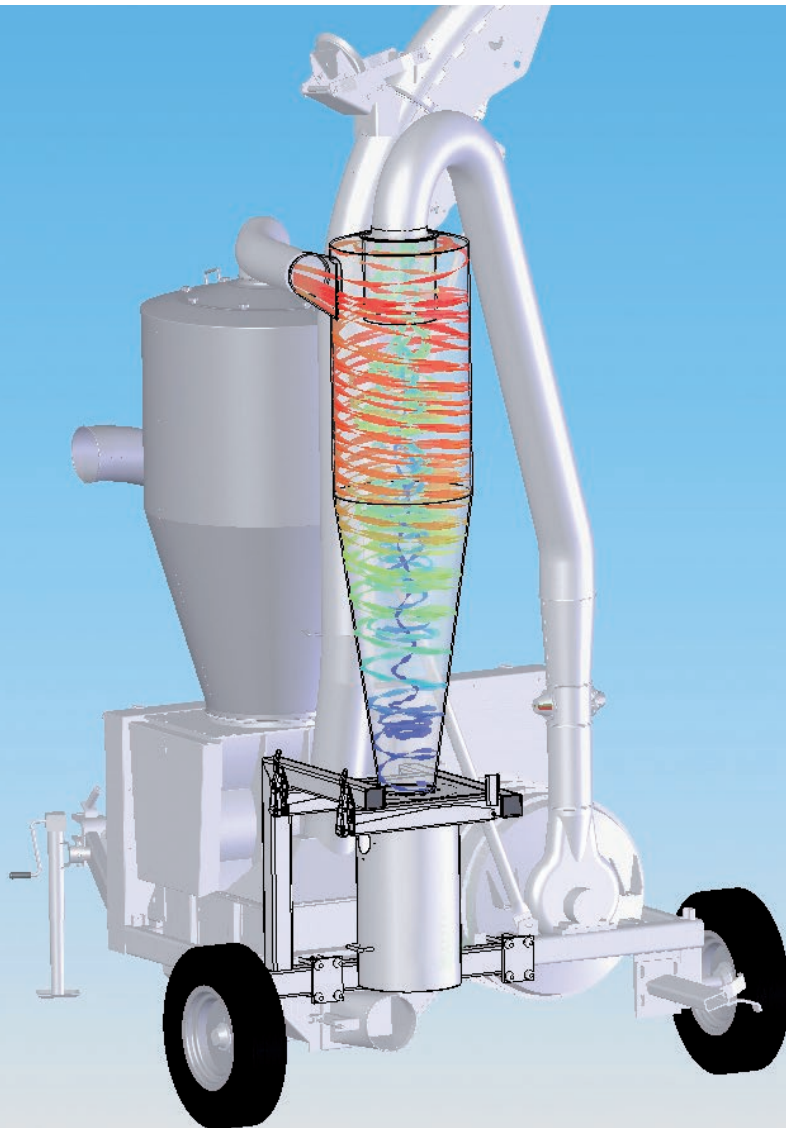
For sucking grain from bulk storage or for use in auger hoppers for maximum capacities. This head is available in both OK160 (6") for SUC Models 500-1000 and OK200 (8") for SupraVac 2000.



## **Clean-up Head:**

Final clean-up made easy with the extended handle, roller wheels on the bottom and a swivel link between the head and suction hose.

# Fan Guard System



While conveying crops from one place to another, there's another problem to consider: wear of blower units. Crops such as soybeans, peas and edible beans often contain a lot of abrasive foreign material that accelerates wear of the blower unit. Kongskilde has developed the Fan Guard System to enhance the life of the blower of the SUC 100 TR and SupraVac 2000 models. The Fan Guard System removes the majority of the dust and dirt particles from the air stream before they reach the blower housing.

The Fan Guard utilizes a high-efficiency dust cyclone in which the air must pass before entering the blower housing. The cyclone removes fine material, which is collected in an easily emptied canister directly under the cyclone.

# Capacities for Grain Vacs

Conveying Capacity For Clean Dry Corn - Bu/Hour	Total Transport Length (Horizontal & Vertical) Feet Includes 20 Feet of Vertical Height								
	40	60	80	100	120	140	160	180	200
SUC 210 E	280	258	235	210	200	185	150		
SUC 215 E	469	434	399	364	341	322	311	290	268
SUC 220 E	563	521	479	437	409	386	373	348	322
SUC 300 E/T/TR	853	759	698	651	604	568	544	521	497
SUC 500 E/T/TR	1,324	1,253	1,166	1,074	1,003	943	896	849	804
SUC 700 T/TR	1,748	1,677	1,556	1,418	1,324	1,251	1,204	1,138	1,072
SUC 1000 TR	3,059	2,934*	2,723	2,481	2,316	2,189	2,106	1,991	1,875
SupraVac 2000	4,589	4,401	4,085	3,722	3,474	3,284	3,159	2,987	2,813

Conveying capacities for grain vacs depend on variables such as commodity, moisture content, temperature, humidity and pipe layout. Above capacities calculated with two bends in the line. For each additional bend deduct 2%. For each additional 6' 5" (2.0m) added to the inlet suction line deduct 2%. For soybeans and wheat deduct 20% off above capacities.

\*Example: SUC 1000 TR total pipe length 100 feet - 60' horizontal and 40' vertical and 15' of suction line = 2,934 Bu/hour.

## Example

### Inlet Suction Line

1 x Round suction head

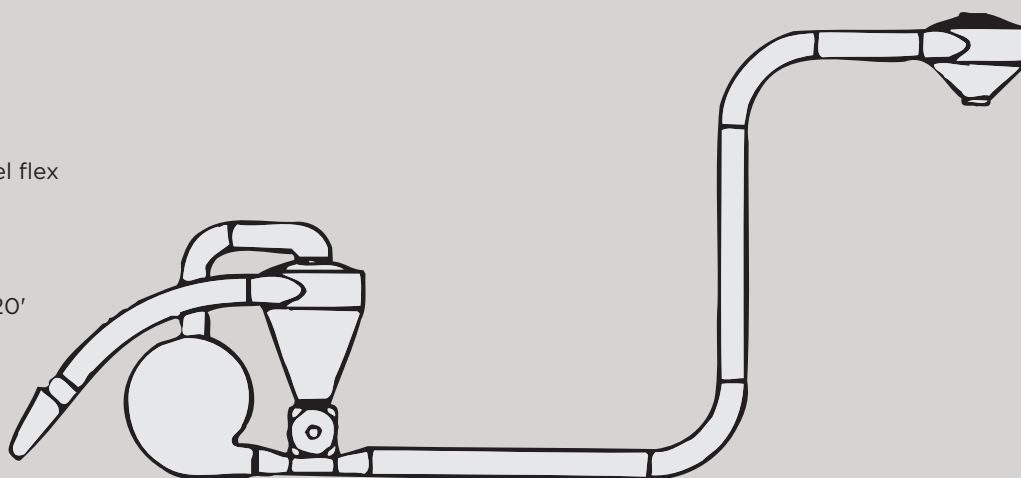
1 x 6' 5" (2.0m) pipe and 1 x 8' (2.5m) steel flex hose

### Discharge Line

Total transport length as noted includes 20' of vertical 4 m vertical piping

2 x 90° bends

1 x Discharge cyclone



The capacities for the SupraVac 2000 apply when using Kongskilde's OK200 pipe system (diameter approximately 8"/200mm). For all the other grain vacs, the capacities apply when using Kongskilde's OK160 pipe system (diameter approximately 6"/160mm).

- Keep the suction side of the system as short as possible.
- Limit the use of suction hoses.
- Moisture content of the crop will influence capacity ratings.
- Fines in grain, like soil and dust, also influence capacity.



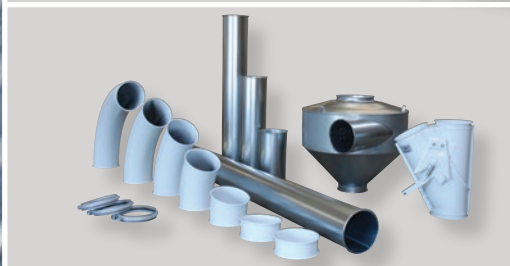
# Connecting It All Together: The OK/OKR/OKD pipe system



Bolt clamps and quick release coupling for assembly of pipe components



Assembly of pipes with quick release coupling



Wide range of pipe components for easy construction of pipe systems

Every operation will have different requirements for capacity and layout. That demands a high degree of flexibility in choosing the piping systems that will allow all your equipment to work together. The Kongskilde OK Pipe System is ideal for pneumatic conveying applications. The simple and flexible pipe systems may be adjusted to suit any specific purpose, resulting in shorter conveying distances and therefore the most efficient and economical solutions.

## Robust Construction

Galvanized sheet steel makes the OK pipe system sturdy. The rolled pipe ends serve as reinforcements, maintaining the circular shape and ensuring tight joints. Three choices of wall thickness are available, depending on the wear to which the pipe system will be exposed. Pipes are available in OK standard, OKR reinforced and OKD extra reinforced (for use after bends).

## Full Utilization of the Air Stream

The advanced production machinery ensures a continuous, smooth inner surface of the pipeline, providing gentle and efficient conveying with and maximum utilization of the air stream.

## Modular Pipe System

Designed in modular form, the OK pipe system comprises pipes, bends, branches, diverters, cyclones, outlets and other needed components, which are assembled quickly and easily using the unique OK quick-release clamp. The wide choice of OK pipes and accessories ensures flexibility and ease of installation in existing buildings. The modular design of the pipe system makes maintenance and alterations easier, and the relatively low weight of the OK pipes makes assembly easier.

## Temporary and Permanent Installations

Two types of OK couplings are available for temporary and permanent systems. If the pipe system is to be dismantled or altered frequently, the OK quick-release clamp will make assembly and removal easy without the use of tools. For permanent systems, the OK bolt clamp is recommended.

## Saved Floor Space

OK pipe supports permit wall and ceiling mounting, thus keeping clear valuable floor space in production areas or storage plants.

Note: OK160 and OK200 are standard piping systems while OKR160 and OKR200 are reinforced with heavier material thickness.



# Commodity Conveying and Cleaning Solutions for North America

## **New 28,000-square-foot Warehouse and Office with Training Center**

We appreciate the opportunity to continue serving our customers from this outstanding new location in the heart of the grain belt. Our new training and testing center will provide our team, customers and representatives with valuable information about our equipment.

## **A Global Company with a Renewed Focus**

From our humble beginning in 1949 in Denmark to the decades of expansion across the globe, we have a renewed focus on providing a complete line of pneumatic conveying, cleaning and separating equipment to the grain, plastic, paper and packaging industries in North America.



## **Kongskilde Industries USA Inc.**

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kna@kongskilde-industries.com

[www.kongskilde-industries.com](http://www.kongskilde-industries.com)

