Grain transport

Flexible pneumatic solutions

TUNETANKEN

Let the air do the work

It is the air that does the work
in our flexible pneumatic solutions within grain transport

We offer products in the field of transport fans that help to solve very different needs. This applies to transport, cleaning and separation of grains and raw materials – quickly, efficiently and environmentally friendly.

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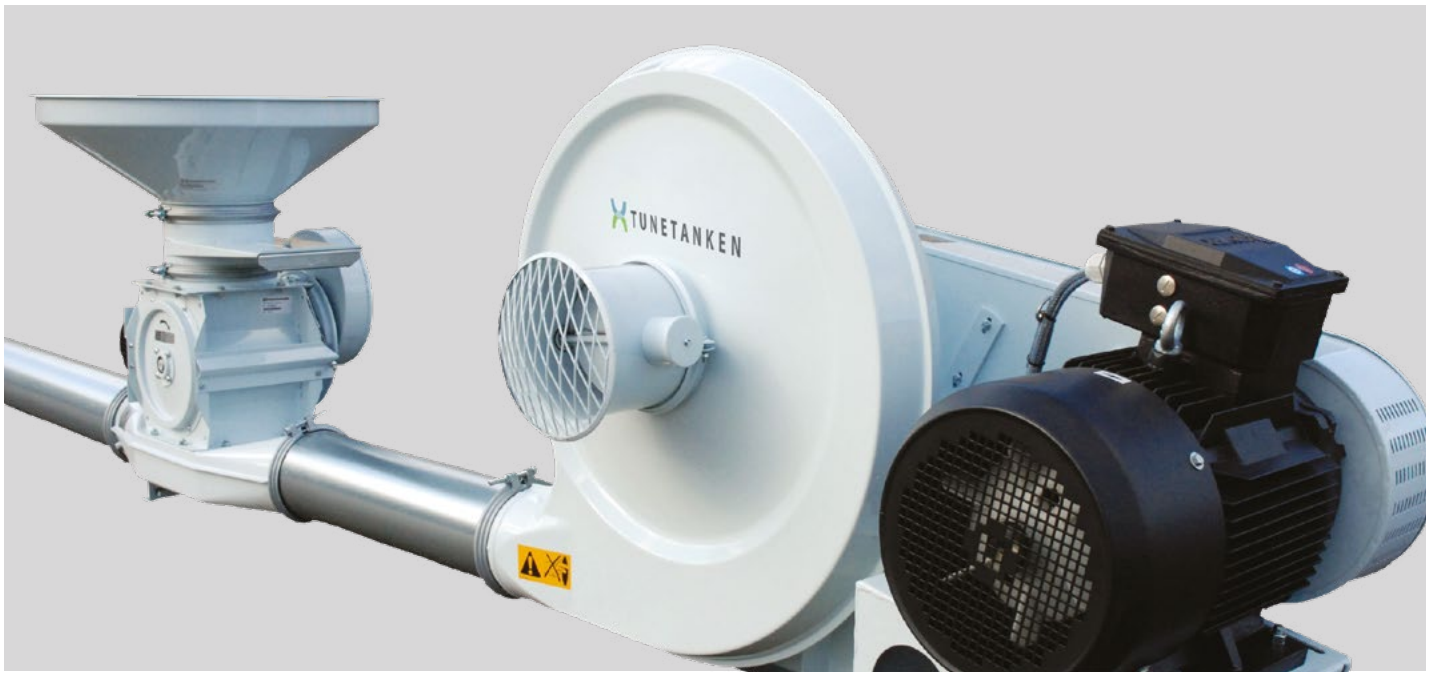
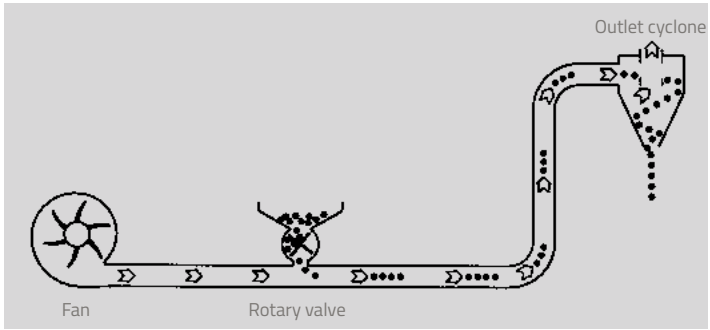
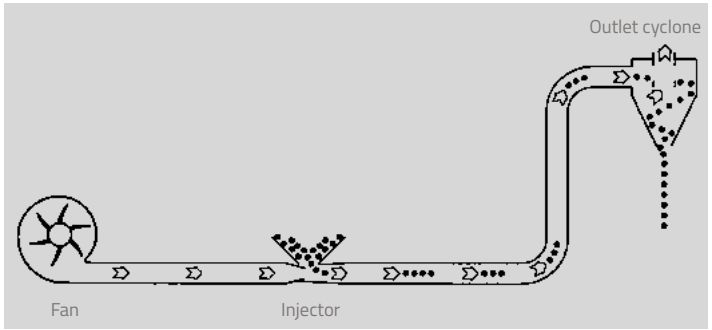
High pressure fans **TRL**







You use pressure transport for systems that transport from one place to another. The pressure transport system requires that the grain can be led directly into a funnel over the injector or rotary valve.

Advantage

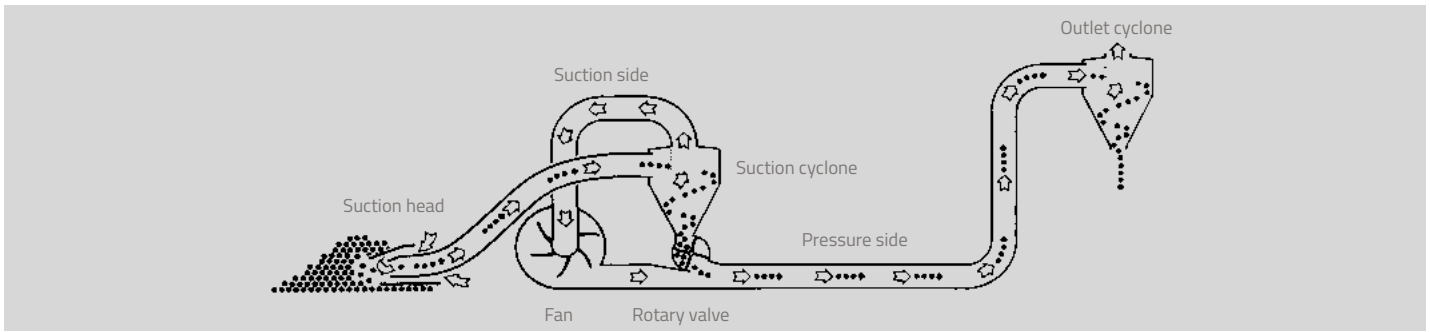
- Minimal space for installation, the transporter can come forward everywhere.
- Low weight on the transporter puts only a small load on the building.
- No heavy components should be mounted in inconvenient places.
- Large assortment of modular pipe components and branches means flexible installation options.
- Only electrical installation for fan and cell feeder that is centrally located.
- Easily regulates the capacity with dampers on the inlet of the cell feeder.

How a fan system works

When the transport pipe is connected to the pressure side of the fan, a strong air flow blows through the transport pipe. The transported material is fed into the pipe system via the rotary valve or the injector.

With the help of branches, the transport is easily directed to different recipient locations.

Suction pressure fans **SUC**



The suction pressure fan is a unique solution where flexible transport is needed and it is used everywhere for transporting grain. It sucks the grain directly from the floor or pit through a flexible or fixed pipe system.

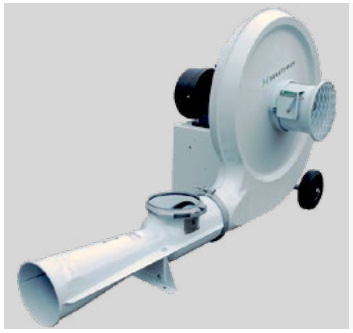
Advantage

- Tractor-driven models are independent of electricity supply.
- Can be used in the field for loading grain.
- Moves the grain horizontally, vertically and around corners.
- No requirements for the design of buildings or grain pits.
- If higher capacity is required, the suction pressure fan can be replaced with a larger model without the need to replace the piping.
- Indoor storage protects against weather.

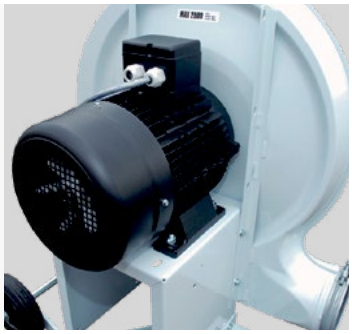
How a suction system works

The grain is sucked in on the suction side of the fan. The suction side of the fan is connected to the top of a suction cyclone. In this cyclone, the grain is separated from the air. The grain falls into the rotary valve, which is mounted below the bottom outlet of the cyclone. The cell lock directs the grain into the pipeline on the pressure side of the fan. When the grain reaches the outlet cyclone, this cyclone slows down the velocity of the grain before the grain falls out of the cyclone outlet.

Directly operated **TRL'S**



TRL 55 blower with TF 55 injector.



Directly driven rotor.

TRL 55 transport fan with damper for automatic regulation of air volume.

TRL 75 blower for grain transport and aeration.

The TRL blower creates an air flow in the pipes, which transports the grain. The amount of grain that can be blown through the pipes depends on the pressure output of the blower.

The Tunetanken offers fans with different services to meet different needs. The smaller fans are directly driven, i.e. the rotor of the fan is mounted directly on the motor shaft.

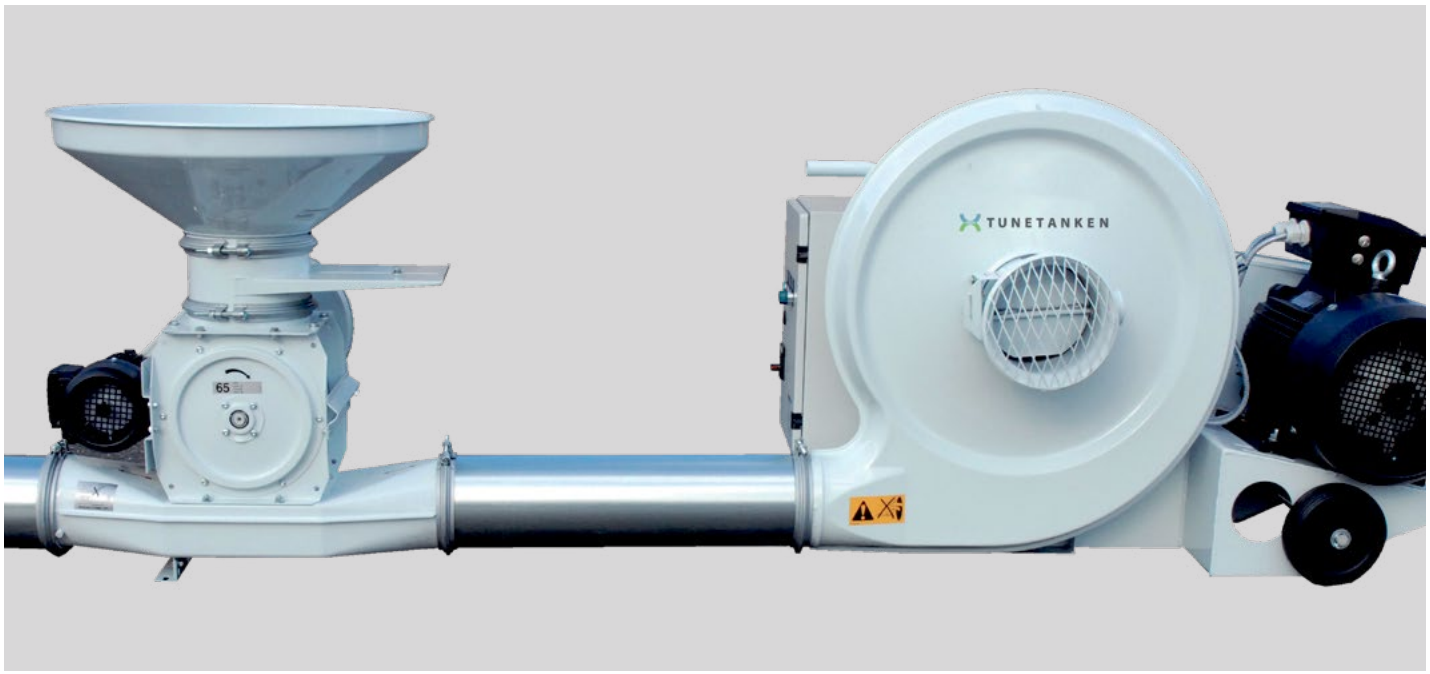
Advantage

- The pressed fan house with soft shapes provides low resistance to air flow.
- Dynamically balanced rotors result in smooth running.
- Air regulation provides efficient transport and minimal wear on pipes.
- Minimal maintenance.

Technical data	Engine kW/hp	Power supply 50 Hz	Min. front fuse. rec. A	Power consumption A	Air volume max. m^3/t	Air pressure max mm VS/Pa	Weight kg	RPM
TRL 20	1,5/2	3 x 400V	10	3.1	1900*	250/2455	36	2850
TRL 40	3/4	3 x 400V	16	4.4	2600*	350/3440	68	2890
TRL 55	4/5,5	3 x 400V	16	7.5	1800	650/6380	77	2900
TRL 75	5,5/7,5	3 x 400V	20	10.5	3200	650/6380	92	2880

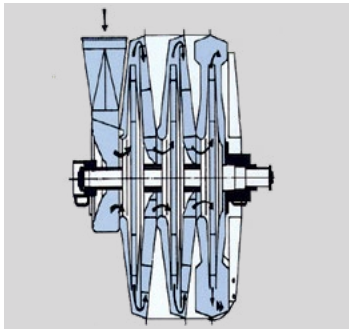
*) Injector required (Min. back pressure from the injector is required to avoid overloading the motor.)

V-belt **TRL'S**

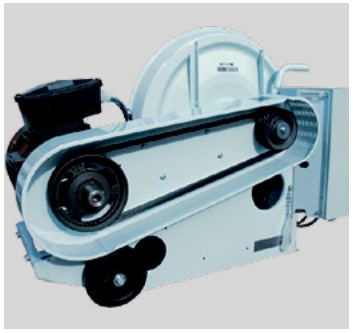


Control cabinet for TRL 150.

Automatic air control on TRL 1000. The damper closes automatically during start-up.



Building a high-pressure fan with 3 steps.



V-belt drive for TRL 150.

Higher capacities require higher pressure on the fan. The most effective solution to achieve this is in-creased speed. Therefore, the larger fans have belt drive between the motor shaft and the fan shaft. To achieve enough pressure to larger capacities, the largest fans have several rotors.

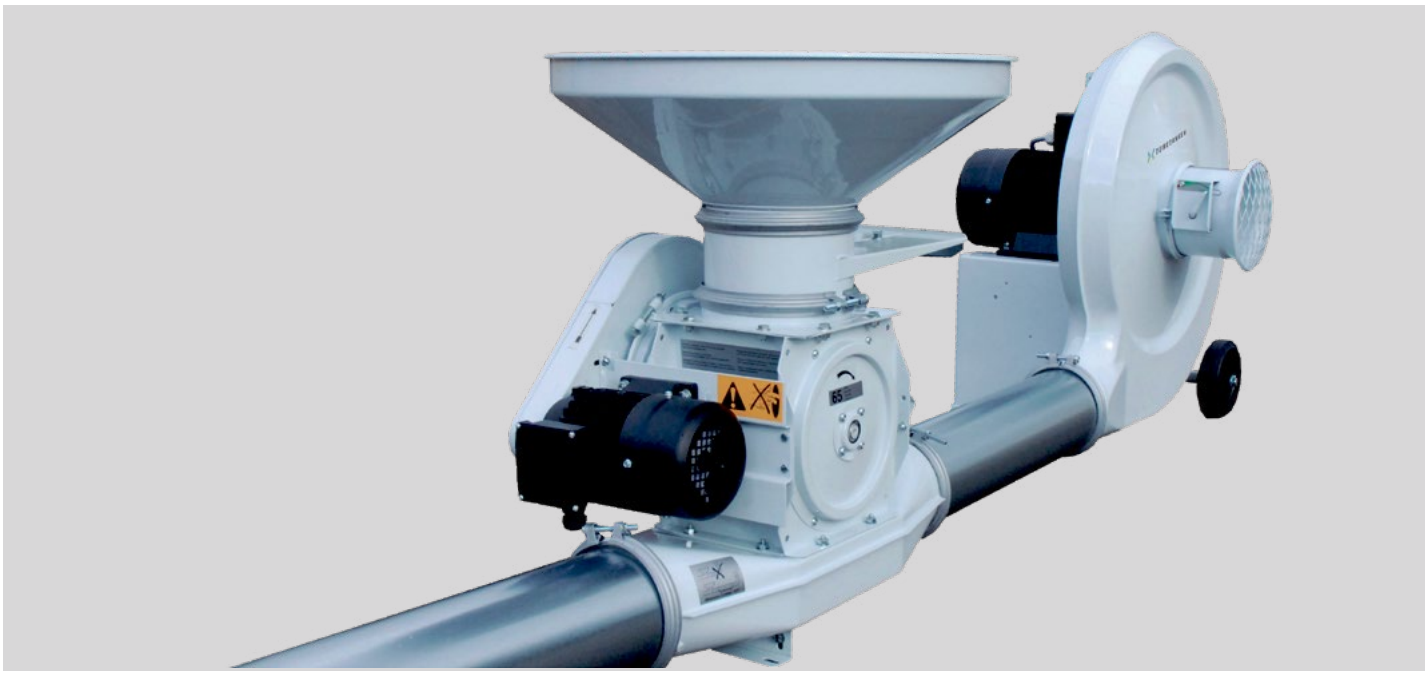
Advantage

- Efficient modular system for building fans with different performances.
- Proven construction.
- Air regulation ensures constant air flow for grain transport.
- Can be used for both pressure and suction systems.

Technical data	Engine kW/hp	Power supply 50 Hz	Min. front fuse. rec. A	Power con-sumption A	Air volume max. m3/t	Air pressure max mm VS/Pa	Weight kg	Fan RPM	Motor RPM
TRL 100	7,5/10	3 x 400V	25	20	1800	950/9330	129	3650	2930
TRL 150	11/15	3 x 400V	35	27	1800	1300/12770	171	4200	2930
TRL 200	15/20	3 x 400V	35	33	1800	1700/17000	206	4700	2930
TRL 300	22/30	3 x 400V	63	39	1800	2300/22600	347	4100	2940
TRL 500	37/50	3 x 400V	100	65	1800	3500/34400	468	4300	2950
TRL 600	45/60	3 x 400V	-	78	1800	5200/51050	950	3905	2960
TRL 750	55/75	3 x 400V	-	96	1800	6400/92800	965	4310	2960
TRL 1000	75/100	3 x 400V	-	129	1800	7900/61700	1065	4780	2960

The data above refers to electrical connection 3x400v/50Hz. For other power supplie, ask Tunetanken.

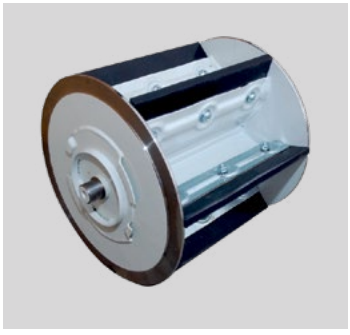
Rotary valves and **injectors**



TF injector with inlet funnel.

CAD 20 rotary valve with inlet funnel and damper.

CAE 20 rotary valve mounted under cyclone in clean suction system.



Rotor for CA 20 cell lock fitted with rubber slats.

It is a rotary valve or an injector that locks the grain into the pipeline during pressure transport. The injector is a suitable, simple solution for small capacities. For larger capacities, a cell feeder is used. This is powered by a small motor. By using a rotary valve instead of an injector, the capacity is signifi-cantly increased.

Fan	TRL 20	TRL 40	TRL 55	TRL 75
Injector	TF 20	TF 40	TF 55	TF 55

Advantage

- The CAD cell lock has polyurethane slats and a gear motor.
- The rubber slats provide a good seal against air loss.
- The rubber slats can bend so that blocking is limited.
- Standard inlet funnels and shutters for regulating inlet volume.

CAD cell feeders are used for pressure transport, while the CAE models are used for pure suction transport.

Technical data	Capacity t/hour 700 kg/m³	Motor kW/hp	Power supply 50 Hz	Power con-sumption A	Cell wheel / motor rpm	Weight kg	Connections top / bottom	Max pressure mm VS / Pa	Connects to control cabinet standard
CAD 20	16	0,55/0,75	3 x 400V	1,33	65/1400	37	OK200/OK160	2000/19600	TRL150-200
CAD 30	26,5	1,5/2,0	3 x 400V	2,3	65/1400	61	OK200/OK160	4000/39200	TRL 300
CAD 40	53	1,5/2,0	3 x 400V	3,1	65/1400	97	OK250/OK160	5000/49100	TRL 500
CAE 20	16	0,55/0,75	3 x 400V	1,33	65/1400	32	OK200/(OK200)*	2000/19600	TRL150-200
CAE 40	53	1,5/2,0	3 x 400V	3,1	65/1400	89	OK200/(OK200)*	5000/49100	TRL 500
CAD 50	100	1,5/2,0	3 x 400V	3,4	65/1400	40	OK160	8000/80000	TRL 600/750/1000

*Additional accessories.

Capacities for **TRL**

Transport capacity for purified and dried wheat (700 kg / m³) (t/hour)	Transport length (m)										
	10	20	30	40	50	60	80	100	120	150	200
TRL 20 + TF 20	2,3	1,9	1,6	1,3	1,1	0,9	0,7	0,5			
TRL 40 + TF 40	4,0	3,3	2,8	2,5	2,1	1,9	1,5	1,1			
TRL 55/75 + TF 55	4,3	3,7	3,1	2,7	2,4	2,1	1,6	1,3	1,1	0,8	
TRL 55/75 + CA 20	8,2	6,9	6,0	5,2	4,6	4,1	3,3	2,7	2,2	1,7	
TRL 100 + CA 20	15,3	12,9	11,1	9,7	8,5	7,5	6,0	4,9	4,0	3,0	1,9
TRL 150 + CA 20	18,5	17,9	16,2	14,1	12,3	10,9	8,7	7,1	5,8	4,3	2,7
TRL 150 + CA 30	22,3	18,8	16,2	14,1	12,3	10,9	8,7	7,1	5,8	4,3	2,7
TRL 200 + CA 20	17,5	17,4	17,3	17,3	16,3	14,6	11,8	9,8	7,8	6,4	4,3
TRL 200 + CA 30	27,9	23,8	20,6	18,1	16,0	14,3	11,7	9,7	7,8	6,3	4,3
TRL 300 + CA 30	29,7	28,7	27,0	23,8	21,2	19,0	15,7	13,2	11,2	9,0	6,5
TRL 300 + CA 40	36,1	31,0	27,0	23,8	21,2	19,0	15,7	13,2	11,2	9,0	6,5
TRL 500 + CA 40	49,5	44,0	39,5	35,8	32,6	30,0	25,6	22,3	19,6	16,5	12,7
TRL 600 + CAD 50	59,3	52,7	47,4	42,9	39,2	36,0	30,7	26,7	23,6	19,7	15,2
TRI 750 + CAD 50	74,0	65,8	59,2	53,6	48,9	44,9	38,3	33,3	29,4	24,6	19,0
TRL 1000 + CAD 50	91,6	81,4	73,2	66,3	60,5	55,5	47,3	41,2	36,4	30,4	23,5

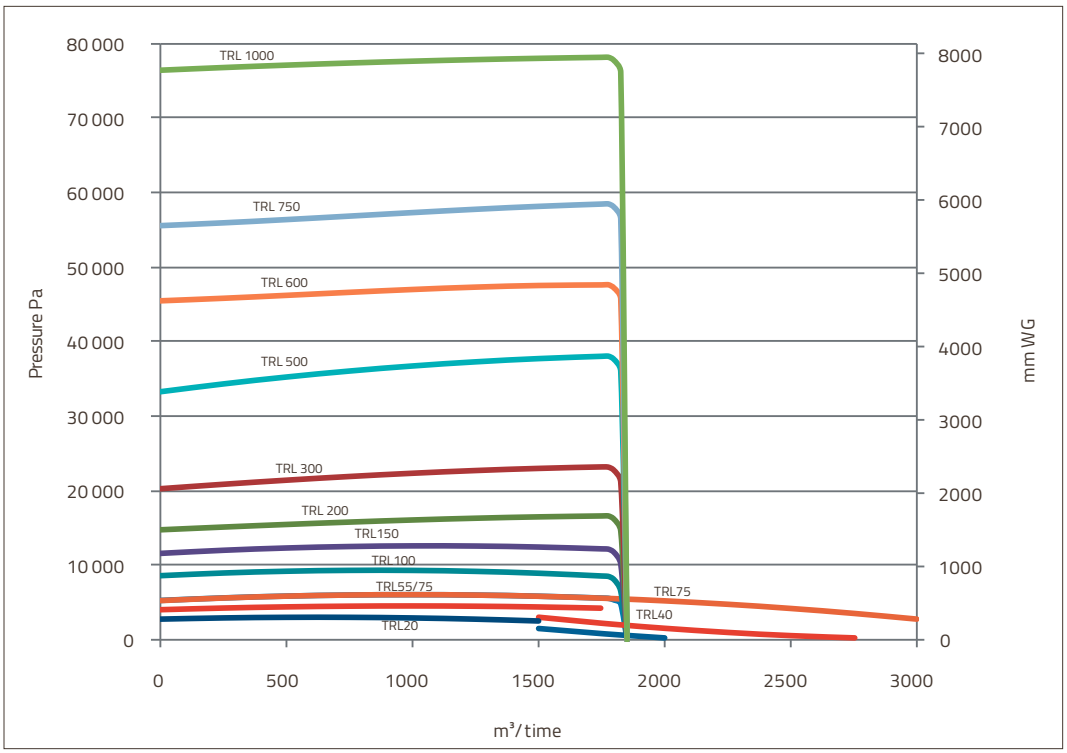
The table is based on 4 m vertical lifting and two 90° bends of the pipeline.
The rest of the pipeline is horizontal.

Capacities

Different factors that affect transport capacity:

- Multiple bends reduce capacity.
- Additional lifting height reduces capacity.
- The water content of the crop, the starting point is 15% for grain.
- The purity of the grain.
- Air temperature, barometric pressure and altimeter.

Fan-graphs



Electrically powered **SUC–E**

Type SUC-E is trolley mounted and is easy moveable.

Control cabinet for automatic start / stop of motor.

SUC 300E with automatic air control.

Belt transmission protects the fan and cell feeder.

The wide range of suction pressure fans can be supplied for either electric or tractor operation.
Transport systems of a more fixed nature are often based on electrically powered devices.

Electric suction blower SUC-E:

- For grain transport in the barn.
- Capacities up to 33 t / h.
- On wheels and easy to move.

Technical data	SUC 100 E	SUC 150 E	SUC 200 E S	UC 300 E	SUC 500 E
Motor power (fan), kW / hp	7,5/10	11/15	15/20	22/30	37/50
Motor power (cell lock), kW / hp	0,3/0,5	0,37/0,5	0,37/0,5	1,1/1,5	1,5/2,0
Electrical connection, V / hz	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50
Total ampere consumption	16	22	30	44	73
Min. amp. front fuse (rec.)	25	35	50	63	100
Weight incl. motors, kg	210	243	285	477	668
Max. air output, m^3 / hour	1800	1800	1800	1800	1800
Type of transport pipe	OK/OKR	OK/OKR	OK/OKR	OK/OKR	OK/OKR
Diameter of transport pipe, a.o.	160	160	160	160	160
Control cabinet with automatic star / triangle starter*	Ja	Ja	Ja	Ja	Ja

* Only fans with motors.
The above data refers to electrical connection 3x400V / 50Hz. For other power supplies, ask Tunetanken.

Tractor operated **SUC–T**

Three-point suspension for the tractor's lift.

SUC 500T compact construction.

The three-stage fan on the SUC 500T provides high pressure for transporting grain.

Automatic air control is standard on tractor operated fans.

Tractor operated suction pressure fans type SUC-T are connected to the tractor's three-point suspension. Capacities up to 44 t / h.
Can also be delivered without suction equipment for clean pressure transport, giving about 20% higher capacity.

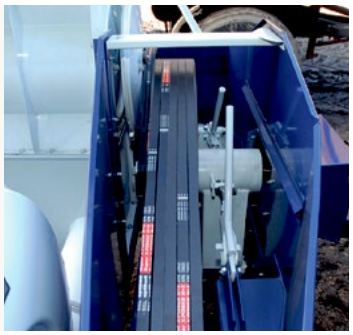
Technical data	SUC 300 T	SUC 500 T	SUC 700 T
Recommended min. power (P) on the tractor's PTO, kW / hp	34/45	48/65	62/85
PTO shaft speed, rpm.	540	40	1000
PTO shaft dimension, tractor side	1 3/8" / 6 noter	1 3/8" / 6 noter	1 3/8" / 21 noter
Weight, kg	350	595	1000
Fan max. air output, m^3 / hour	1800	1800	1800
Type of transport pipe	OK/OKR	OK/OKR	OK/OKR
Diameter of transport pipe, etc.	160	160	160

Tractor operated **SUC–TR**

Fan loader in position for road transport.

The loading equipment of the TR models is particularly suitable for loading wagons and trucks.

Powerful fan with up to 4 steps provides great transport performance.



The straps can be tightened without the use of tools, however, tools are required to access the straps.

The trailer models type SUC –TR are driven by the tractor's PTO shaft. Loading equipment is standard on the SUC-TR models.

You use the loading equipment when you have to load grain on a wagon or truck.

Technical data	SUC 500 TR		SUC 700 TR	SUC 1000 TR
Recommended min. power on the tractor's PTO, kW / hp	48/65	48/65	62/85	90/120
PTO shaft speed, rpm.	540	1000	1000	1000
PTO shaft dimension, tractor side	1 3/8" 6 noter	1 3/8" 21 noter	1 3/8" 21 noter	1 3/8" 21 noter
Weight, kg	820	730	70	1050
Fan max. air output, m3 / hour	1800	1800	1800	1800
Type of transporter	OK/OKR	OK/OKR	OK/OKR	OK/OKR
Diameter of transport pipe, etc.	160	160	160	160

Tractor operated **SupraVac 2000**

Loading equipment on SupraVac 2000 ready for loading grain on a wagon.

The loading equipment with hydraulics folded to transport position.

Connection of fixed pipe system. For example mounted e.g. on the silo for filling.

Transport box (extra) for suction head and pipe components.

SupraVac 2000 is the largest of our tractor operated suction pressure fans. With a capacity of up to 120 t / h, it loads even the largest wagons quickly.

Technical data	SupraVac 2000
Recommended min. power on the tractor's PTO, kW / hp	125/170
PTO shaft speed, rpm.	1000
PTO shaft dimension, tractor side	1 3/8" 21 noter
Weight, kg	1600
Fan max. air output, m³ / hour	3300
Type of transporter (suction side)	OKR
Type of transporter (pressure side)	OK/OKR
Diameter of transporter, etc.	200
Hydraulic connection	200, 1/2" ISO 0228
Hydraulic pressure, min.	50 bar

Choose the right **suction head**

The suction head makes the difference
The suction pressure fans can be equipped with different types of suction heads, depending on the task.

With the right suction head for the transport task in question ensures the highest capacity and easy handling.

Universal suction head:
A flexible solution for versatile tasks.

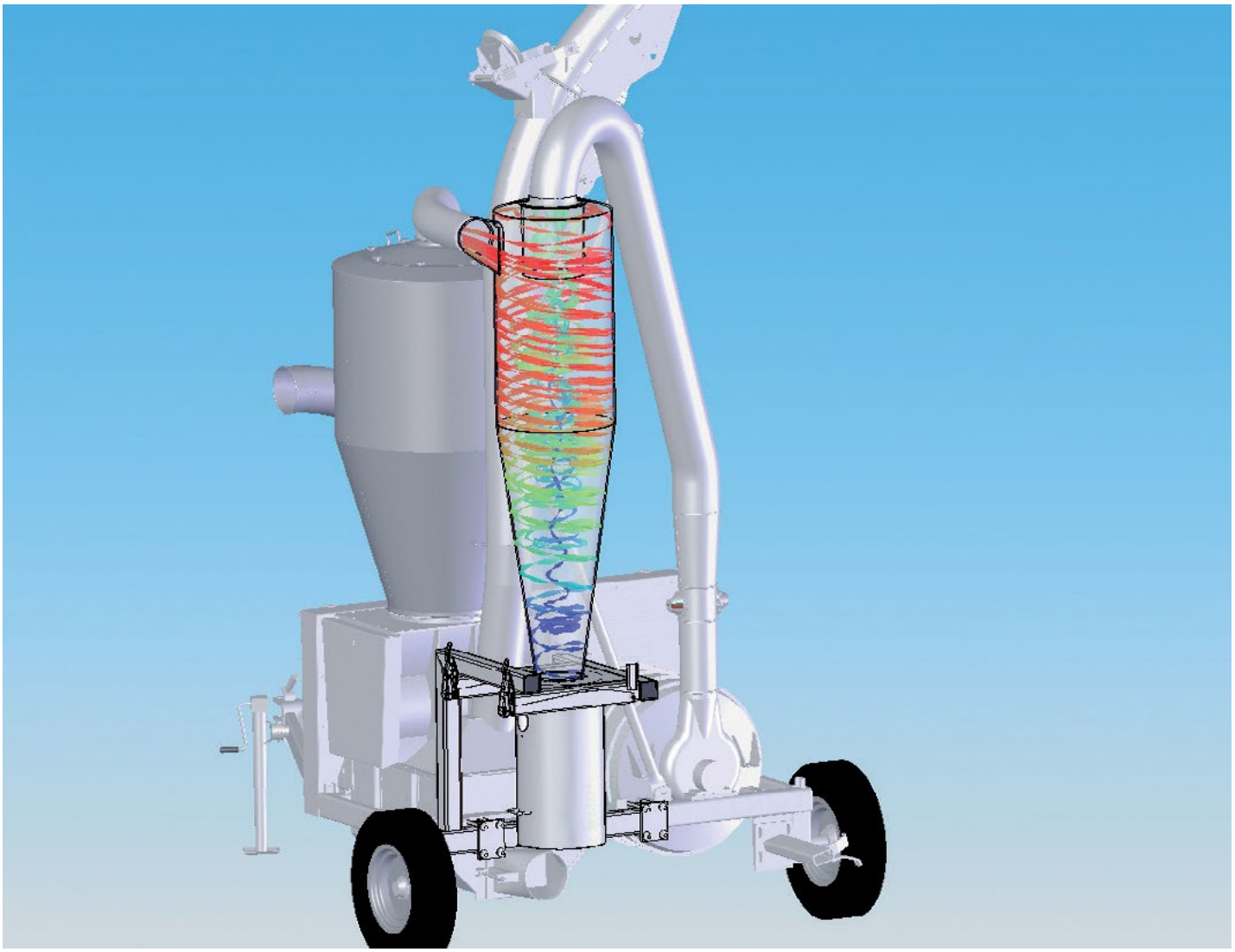
Long suction head:
Suitable for transport from grain pits.

Around suction head:
For suction from opening in the silo wall.

Cleaning head:
Easily absorbs the last remnants of grain on the floor.

Short suction head:
For transport directly from the wagon or flat-drying wall.

Fan Guard System



Transport of crops with high dust content
Crops sometimes contain abrasive particles such as ground dust, and it is unavoidable that some of the dust is sucked through the fan itself. If the work is done with large capacity, it can turn into large amounts of dust that are transported together with the grain.

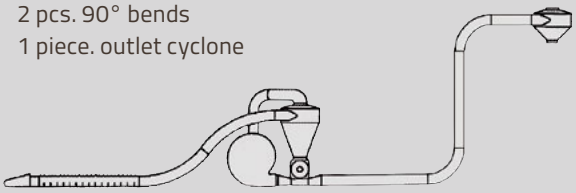
Unnecessary wear on the fan is avoided by applying the Fan Guard system, which sorts out the dust before it enters the fan. SUC 1000 TR and SupraVac 2000 can be supplied with a Fan Guard system.

Capacities for **SUC**

Example 1

Suction line
1 piece. universal suction head
1 piece. 2.5 m polyurethane suction hose
2 pcs. 2 m steel spiral suction hose

Pressure line
A number of meters of horizontal pipe
4 m vertical pipe
2 pcs. 90° bends
1 piece. outlet cyclone

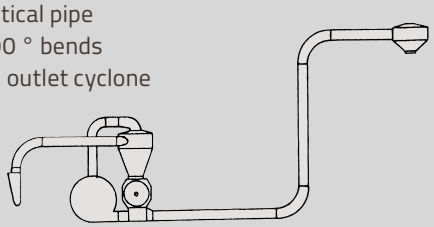


Transport flow	Meter							
Model	10	20	30	40	50	60	80	100
SUC 100	4,5	4,0	3,5	3,1	2,7	2,4	1,8	1,4
SUC 150	7,8	7,1	6,5	6,0	5,5	5,0	4,2	3,6
SUC 200	10,1	9,3	8,5	7,9	7,3	6,8	5,9	5,1
SUC 300	14,0	12,9	11,9	11,0	10,2	9,5	8,3	7,2
SUC 500	22,5	20,9	19,6	18,3	17,2	16,2	14,4	13,0
SUC 700	29,5	27,6	26,0	24,5	23,1	21,8	19,7	17,8
SUC 1000*	42,7	40,0	37,7	35,5	33,5	31,6	28,6	25,8
SupraVac 2000	68,1	65,4	64,0	58,5	55,8	60,0	44,3	39,1

Example 2

Suction line
1 piece. vertical universal suction head
1 piece. 90 ° bend
1 piece. horizontal 2 m pipe

Pressure line
A number of meters of horizontal pipe
4 m vertical pipe
2 pcs. 90 ° bends
1 piece. outlet cyclone



Transport flow	Meter							
Model	10	20	30	40	50	60	80	100
SUC 10 0	7,1	6,2	5,4	4,7	4,1	3,6	2,7	2,0
SUC 150	12,1	10,7	9,6	8,6	7,8	7,0	5,8	4,8
SUC 200	15,7	13,9	12,5	11,2	10,1	9,1	7,5	6,2
SUC 300	20,4	18,2	16,4	14,9	13,6	12,5	10,6	9,1
SUC 500	33,2	30,1	27,4	25,1	23,1	21,4	18,6	16,3
SUC 700	44,2	40,3	36,9	34,0	31,5	29,3	25,6	22,7
SUC 1000*	64,0	58,4	53,5	49,3	45,7	42,5	37,1	32,9
SupraVac 2000	120,0	106,0	92,0	81,0	71,0	64,0	55,0	50,0

The transport capacities in the tables are stated as t / hour with wheat in 700 kg / m³. The examples are indicative, as several factors influence the capacity.
The capacities in the table apply at the suction length specified at the top of the table.
*) Spec. a round suction head.

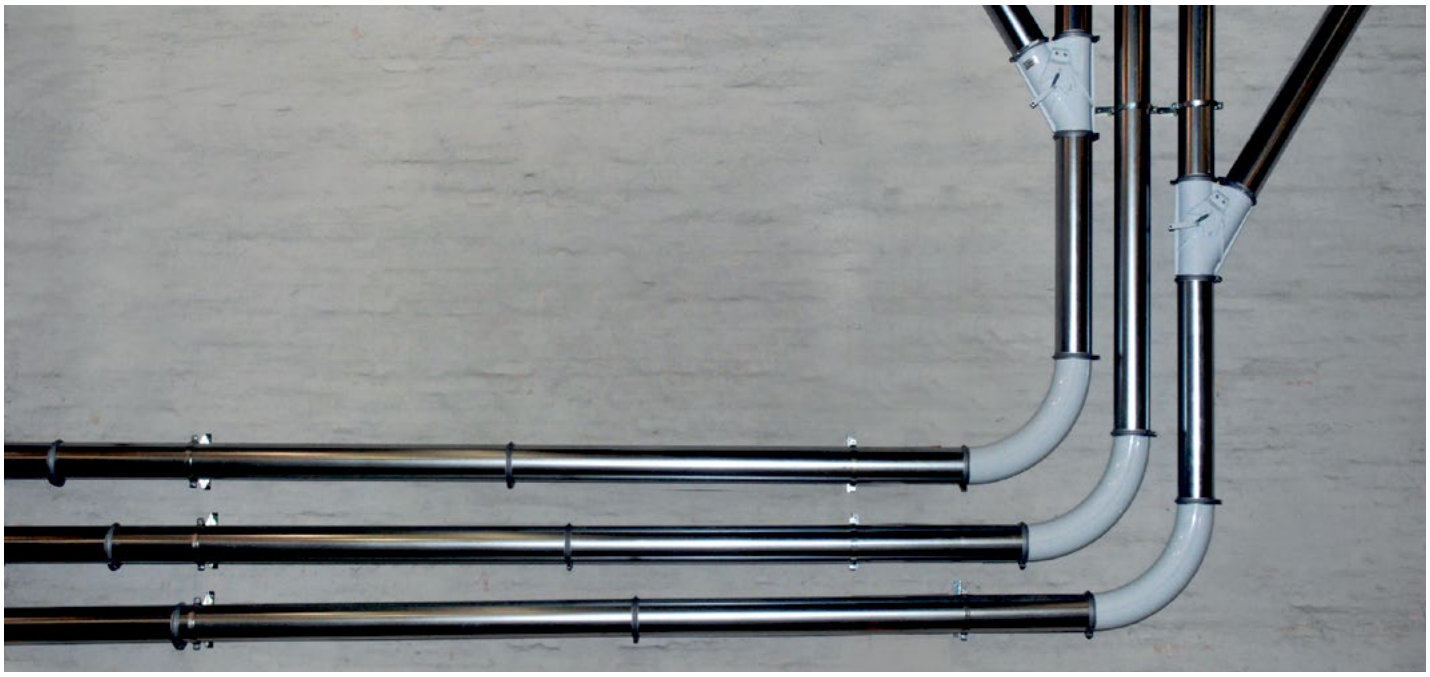
Take advantage of the wide range of OK pipe components available and take advantage of the pipe components' easy assembly method.

Capacity

In order to achieve high capacity, the following guidelines should be observed:

- Always use the correct pipe diameter, OK200 for SupraVac, OK160 for all other models.
- Keep the suction side as short as possible.
- Limit the use of suction hoses.
- The water content of the grain has an effect on the capacity, the above capacities are based on 15% of water.
- The content of impurities such as soil and dust also has an impact on capacity.

OK **Pipe Systems**



Bolt coupling and quick coupling for assembling pipe components.

Assembly of pipes with quick coupling.

Wide range of pipe components for simple construction of pipe systems.

Pipe assembly for filling outdoors steel silos.

OK pipe systems

Access to an efficient piping system is vital for the establishment of high-performance air transport systems. OK160 and OK200 pipe assortments are designed to meet the requirements for use in air transport systems.

Advantage

- OK160 and OK200 are standard pipe systems.
- OKR160 and OKR200 are reinforced pipe systems with stronger wall thickness.
- OKX160 bends have hardened wear surfaces that provide great wear resistance and extra long life.
- Quick couplings for pipelines where frequent relocation is required.
- Bolt couplings for mounting fixed pipelines.

More than silos and tanks

The tuna tank carries a large and varied product range for agriculture.

Indoor silos

Outdoor silos

Grain silos

Feed screws and systems

Fertiliser tanks

Irrigation systems

Odor and air purification

Covers

Slurry systems

Wastewater products

Water and drainage

Pump systems

Drying systems

Inventory and equipment

Grain handling

Personnel buildings

Carcass systems

Biogas systems

Moulded grating

Profiles

Garden and parks

Aeration system

Coverings

Coatings

Condition assessments

Renovations

Services

Tunetanken

With more than 50 years of experience working with fiber-reinforced composite materials, their unique advantages and a large standard product programme we have developed our market position as the leading Danish manufacturer of storage tanks, industry systems and silos in composite materials.

Tunetanken markets a large and varied programme of products and facilities for various purposes as well as supplies a large range of industries including agriculture, industry, wastewater and water treatment for energy sector. We produce all our solutions in fiber-reinforced composite materials – the same materials that are used in the manufacturing of space shuttles, air planes and wind mills. With benefits as strength, corrosion resistance and long life cycle, composites are among the popular materials of the future.

Agro

Tunetanken offers a broad programme of products, facilities and systems for agriculture. We produce silos, tanks, airtight silos, grain handling systems, hay and grain drying systems, carcass covers, slurry systems, shelters, buildings, irrigation systems, barn inventory et al.

Most of our products are made with the incorporation of fiber-reinforced composite materials, which with their unique properties are extremely suitable for the demanding agricultural environment.

Modern composite materials are materials of the future. The innovative and unmatched technical material properties contribute greatly to the development of new sustainable products and solutions, which are necessary for a sustainable future.

Composit

Composite is derived from the Latin word »componere«.

Composite materials are made by combining two or more materials (physically not chemically), thereby creating a new material with specially intended and superior properties.

Technical properties of composite materials derive from the initial qualities and properties of the combined materials, the combination of the fabrics (matrix, reinforcement, hardener, additives), as well as, the production processes and conditions.

Possibilities are endless!

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