

MIETZSCH

GmbH Lufttechnik Dresden

USER INFORMATION

INLINE DUCT FANS

SERIES VRK



Inline duct fans

Series VRK

Usable in ventilation engineering of all branches of industry


High chemical resistivity by use of plastic materials and motor arrangement outside the medium conveyed

Little floor space required; universal assembly facilities

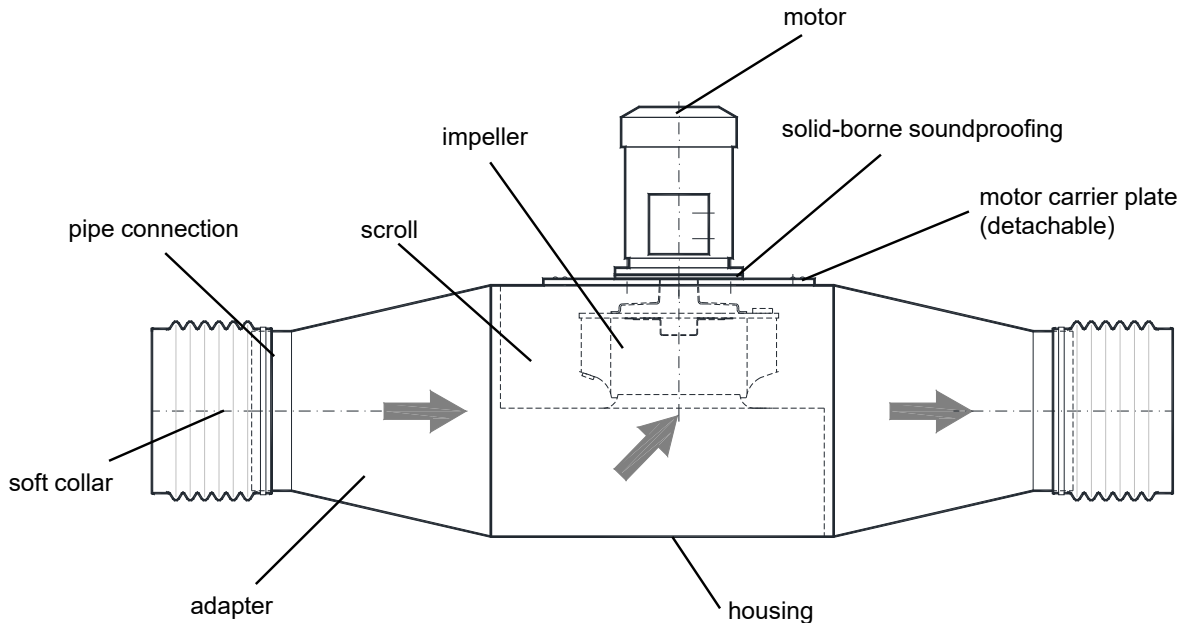
Volumetric flow up to 2,800 m³/h

Pressure increase up to 1,330 Pa

Stepped capacity by four sizes (larger versions on request)

Explosion-proof versions according to European Directive EN 2014/34/EU (ATEX) 

Wide range of electrical and ventilation accessories



APPLICATION

Inline duct fans of type VRK are employed in all branches of industry and agriculture. They are an easily assembled alternative to conventional radial fans with complicated diversions wherever the capacity of usual axial fans is not sufficient and straight ducts are necessary mainly due to lack of space.

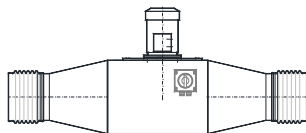
High resistivity to corrosion makes VRK fans suitable in particular for process exhaust systems in the chemical and pharmaceutical industries, for ventilation of laboratories, battery compartments, pickling and washing units, galvanic and agricultural facilities etc.

TECHNICAL DESCRIPTION

The standard version of inline duct fans consists of the impeller and channel housing with integrated scroll as major components. Adapters with pipe connection and soft collars are elements of the range of delivery. The motor is carried with vibration insulation outside the medium conveyed. Motors are suitable for three-phase current (also pole-changing or explosion-proof) and single-phase ac.

The impeller with balancing quality G 6.3 according to ISO 1940 is arranged directly on the motor shaft stud. Rubber elements between the motor and motor carrier plate prevent transmission of noise and vibrations.

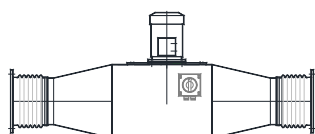
The impeller and housing are made of PPs (PVC or electrically conductive plastic material on request) are made with state-of-the-art joining methods of single components. Steel components such as screws, hub, and hub connections are protected by plastic covers from corrosion or connecting elements are made of stainless and acid-resistant steel. Four different connections meet diverse assembly demands:



Standard version
with pipe connection and soft collars



Version FF
with flange

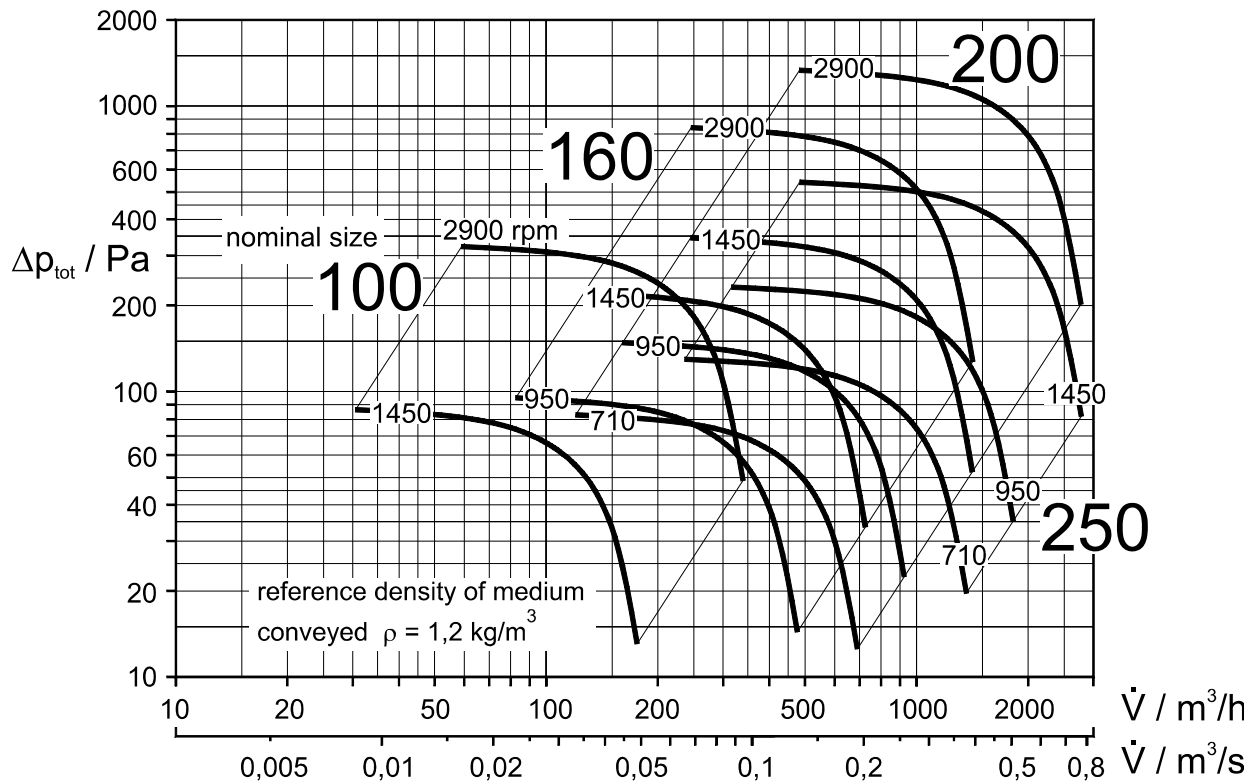


Version FK
with compensator and flange



Version RR
with (rectangular) frame, without adapters

TYPE SURVEY - PRESELECTION



CONDITION OF USE

permissible ambient temperature: $-30 \text{ }^\circ\text{C} \dots 40 \text{ }^\circ\text{C}$ (EX motors $-20 \text{ }^\circ\text{C} \dots 40 \text{ }^\circ\text{C}$)
 permissible temperature of medium conveyed: $-30 \text{ }^\circ\text{C} \dots 40 \text{ }^\circ\text{C}$
 Higher temperatures depend on the speed rate and are possible after consultation with the manufacturers.

The applied materials have good **chemical resistance** against many substances. It should be considered, however, that even plastic materials are attacked by certain chemicals.

Many applications in fields such as laboratories and stockrooms for chemicals, in agriculture and damp-loaded processes led to good results with "standard materials" such as PVC or PPs that can be used without any problem in most cases. Critical applications may occur in the process-technological industry - surface refinement, pickling plants, process exhaust air in microelectronics.

For selection of suitable materials the purpose of use of the fan and the type of medium conveyed should be specified in requests or orders.

Slightly **dust-laden media** can also be conveyed but lead to increased wear.

Explosion-proof types are produced for zone 1 and zone 2 (See information series VRE).

Working range: The fans show stable operation in the entire range of the characteristic shown.

ASSEMBLY / MAINTENANCE

The inline duct fan is preferably integrated in a horizontal pipeline. The motor can be arranged in top or bottom position. Consultation of the manufacturers is required in cases of horizontal motor axis or vertical fan arrangement.

For assembling the housing is placed on two wall or ceiling consoles. Suction and pressure lines are connected by means of soft collars (in range of delivery). Flange connection is optionally possible. Connected plant components must not stress the fan mechanically.

If needed, a line for condensate draining has to be connected to the relevant bore in the deepest housing position.

Motor cooling must not be impaired by adjacent components and ceilings. The distance between motor cooling air inlet and ceiling must not be **less than 50 mm**. In cases of outdoor installation especially the motor must be protected against direct weather effects such as ice, snow, and hail (weather hood is part of accessories).

The housing may be opened on its motor end for cleaning and repair. A condensate drain can be arranged in addition (accessories).

EXPLOSION PROTECTION



Directive 2014/34/EU (ATEX) re-regulates explosion protection for non-electrical devices as of 29/03/2014. Aside from complying with design and safety regulations as per DIN EN 14986 and DIN EN ISO 80079, the fan must be assigned to the respective protection type and be marked accordingly. The manufacturer must provide proof of compliance.

Explosion hazard areas are found in the chemical industry, gasworks, coking plants, painting facilities, fuelling stations, sewage treatment plants, and laboratories, etc.

Requirements for an explosion are

- flammable substance (e.g. gas, dust)
- sufficient oxygen (air)
- source of ignition (sparks, fire, hot surfaces, electrostatic discharge)

The following measures must be implemented in areas with a potential explosion hazard:

- An explosive atmosphere is prevented from developing
- Avoidance of sources of ignition
- Measures to weaken the deleterious effects of an explosion

In many cases, an efficient and monitored ventilation system is sufficient to prevent the formation of an ignitable atmosphere and thus an explosion hazard.

The protection requirements for a fan are based on the probability of occurrence of an explosive atmosphere in the medium and/or the environment. There are three types of explosion hazard zone:

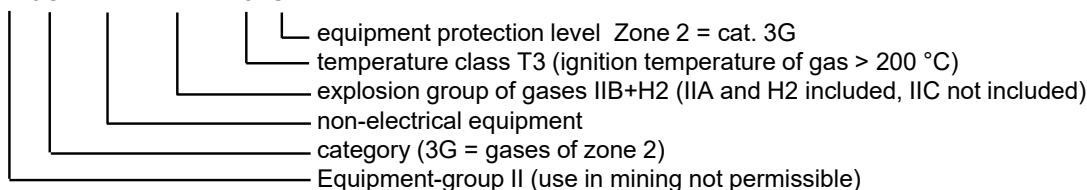
Explosion hazard	Hazard zone	Avoidance of sources of ignition	Category acc. to ATEX
Continuous or long-term	Zone 0	that are very unlikely to occur	1
Occasional	Zone 1	that are likely to occur frequently	2
Only rarely and briefly	Zone 2	During routine operation	3

Which protection is required and the additional requirements to be observed is the responsibility of the system operator or the relevant supervisory authority. This means that the customer's order must specify the protection the fan is to have.

The VRK fans are supplied for the following ignition protection types:

Zone 1: **CE**  II 2G Ex h IIB+H2 T3 Gb

Zone 2: **CE**  II 3G Ex h IIB+H2 T3 Gc



Use in Zone 0 is not possible as a matter of principle. Gases of explosion group IIC (except hydrogen), gases with an ignition temperature below 200°C as well as flammable dusts are also excluded.

In the rating, the internal (medium conveyed) and external (environment) areas are distinguished in general. Depending on the hazard zone, certain design variants are prescribed. Explosion protected devices (motors, switches etc.) are used and electrically conductive plastics (preferably conductive and flame retardant polypropylene --> PPsX). Basically, this results in the following ratings:

Hazard zone		MIETZSCH Designation	Motor		Impeller/casing material
internal	external		without converter	with converter	
Zone 2	Zone 2	Z2Z2	Ex eb II, Ex ec II	Ex db (eb) II, Ex ec II	not conductive
Zone 2	none	Z2Z3	Ex eb II, Ex ec II, Standard	Ex ec II, Standard	not conductive
Zone 1	Zone 1	Z1Z1	Ex eb II	Ex db (eb) II	conductive
Zone 1	Zone 2	Z1Z2	Ex eb II	Ex db (eb) II	conductive

Special requirements for operation on the frequency converter

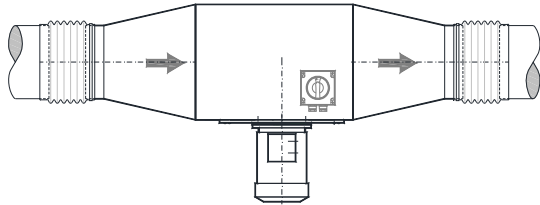
Motors with increased safety Ex eb II are not approved for converter operation: Pressure-resistant encapsulated Ex db eb II motors can run on the converter if they are equipped with winding protection (design TS).

If there is no EX zone on the outside and fan and installation location meet certain design requirements, standard motors may also be used which can then also be operated with a converter.

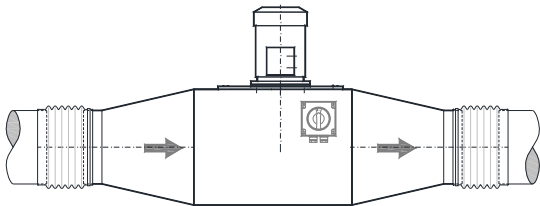
MOUNTING POSITION ²⁾

horizontal

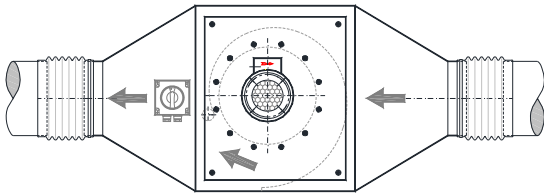
- HUR** ¹⁾ motor in bottom position, operator's side right (see Fig.)
- HUL** ¹⁾ motor in bottom position, operator's side left



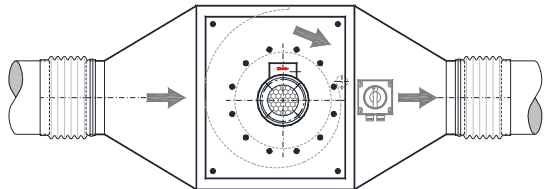
- HOR** motor in top position, operator's side right (see Fig.)
- HOL** motor in top position, operator's side left



- HSL** horizontal motor axis, operator's side left (see Fig.)

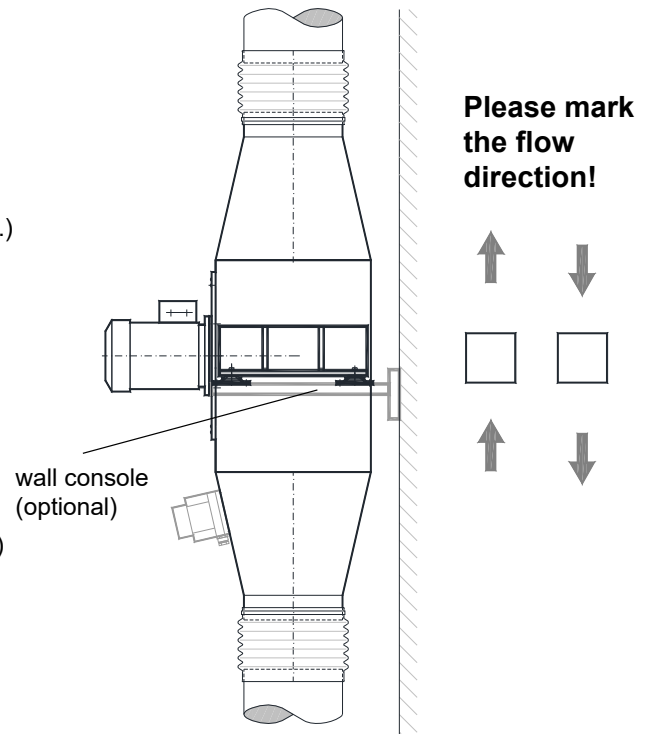


- HSR** horizontal motor axis, operator's side right (see Fig.)



vertical WM - for wall mounting only (incl. vibration isolators)

- V - WM**
- V - WM+** incl. wall console

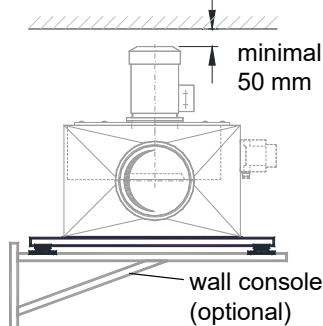


MOUNTING TYPE horizontal ²⁾

For all variantes „Mounting position horizontal“ (incl. Metal rails, silencing elements / vibration isolators)

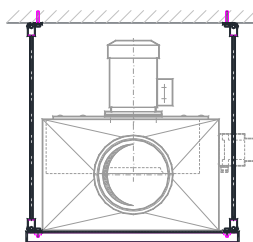
Wandmontage

- WM** (on existing consoles)
- WM+** incl. wall consoles

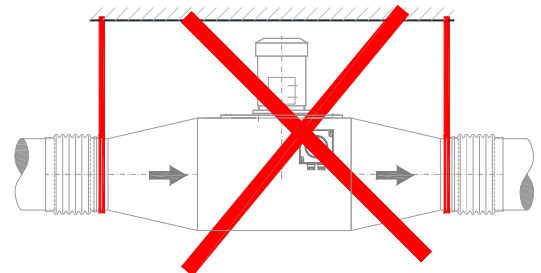


Deckenmontage

- DM** (with existing threaded rods)
- DM+** incl. threaded rods

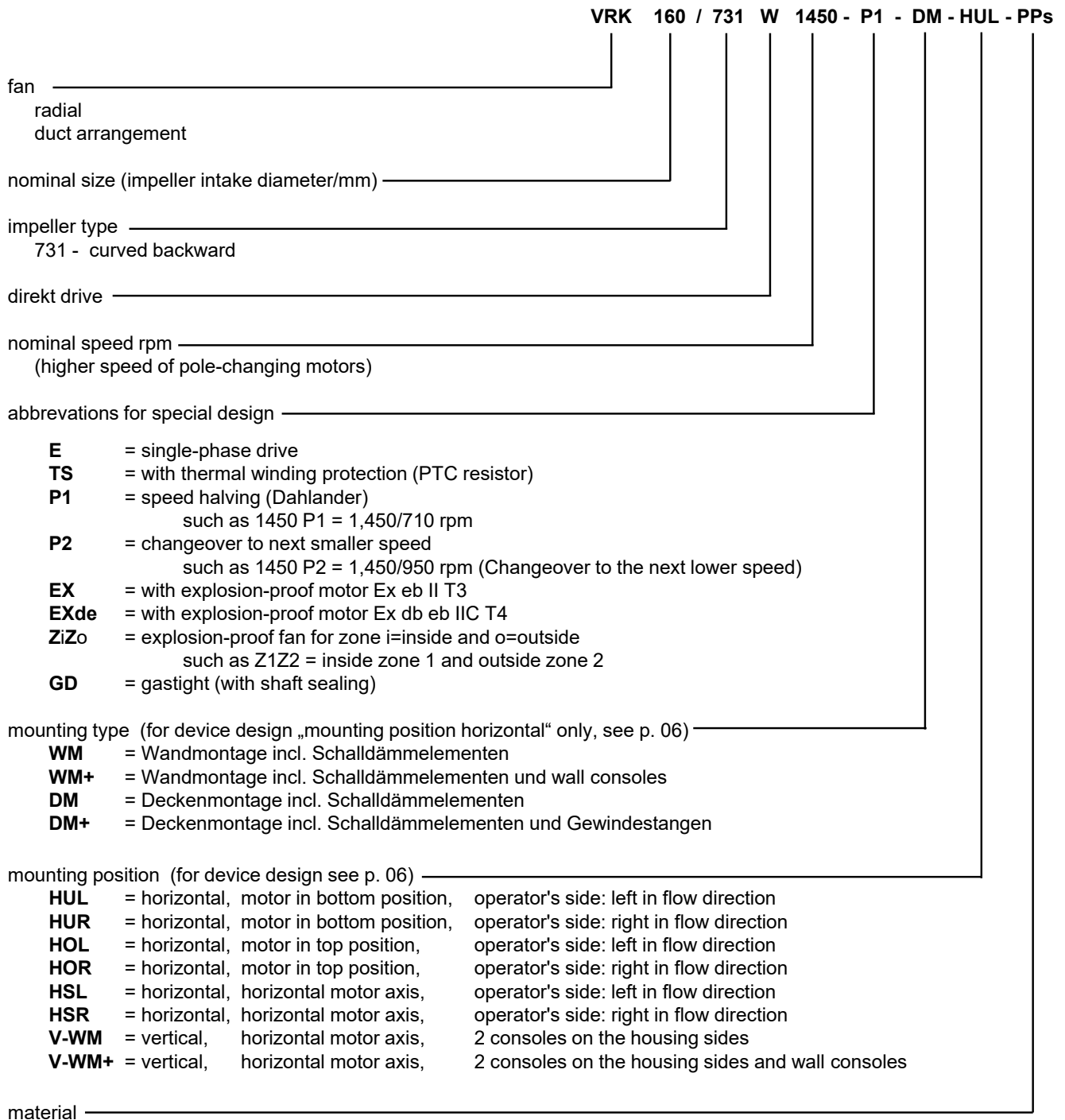


Suspension is only permitted on the duct fan housing!

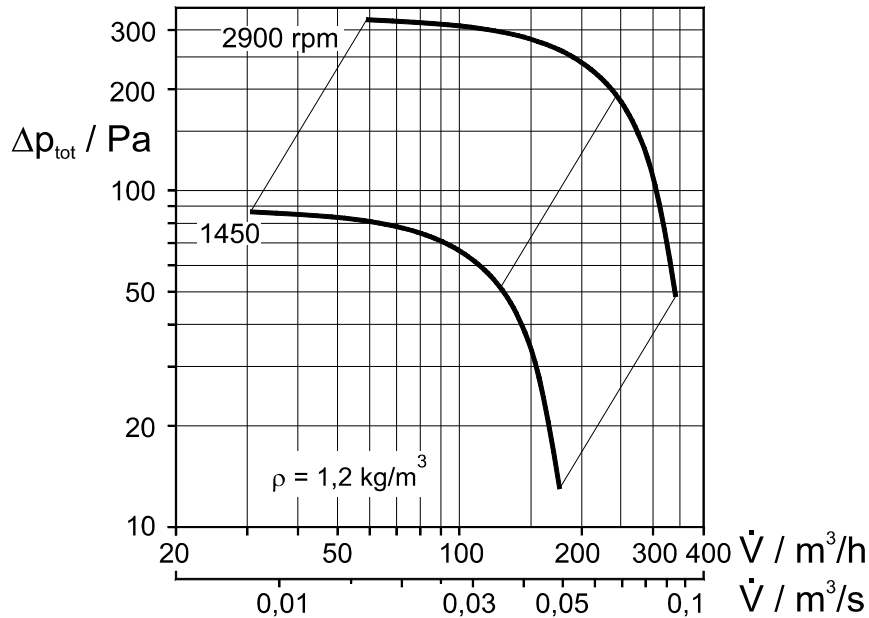


¹⁾ Condensate drain required at „motor in bottom position“
²⁾ If a repair switch is required: Please inform us exactly of any deviating position

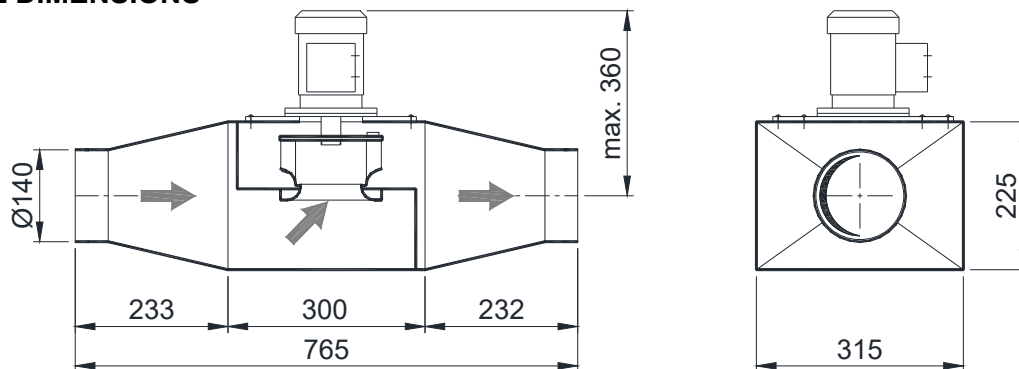
EXPLANATION OF TYPE DESIGNATION



PERFORMANCE



PRINCIPAL DIMENSIONS



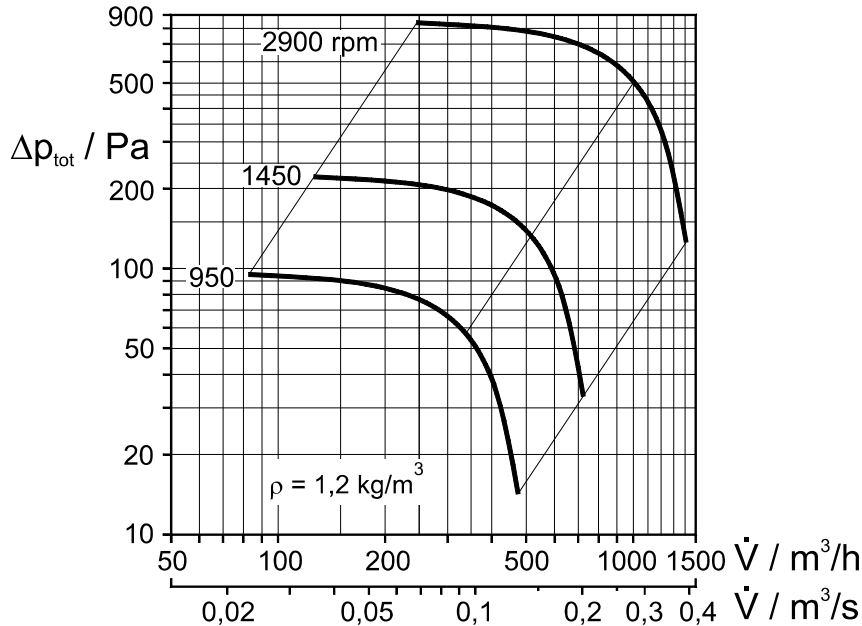
MOTOR VERSIONS (other motors, such as single-phase or Ex, upon inquiry)

fan type	speed rpm	motor type	nom. motor power kW	nom. motor current A	weight with motor kg	L_{A3m} dB(A)	L_{WA} dB(A)
VRK 100/731 W 1450	1450	3 ~ 400 V/50 Hz IP 55	0,12	0,42	10,0	45	
VRK 100/731 W2900	2900		0,18	0,51	10,0	51	
VRK 100/731 W 2900 P1	2900	3 ~ polumschaltbar	0,20	0,58	11,0	51	
VRK 100/731 W 1450 P1	1450		0,15	0,51		45	
VRK 100/731 W 1450 P1	1450	400 V/50 Hz IP 55					
	710						

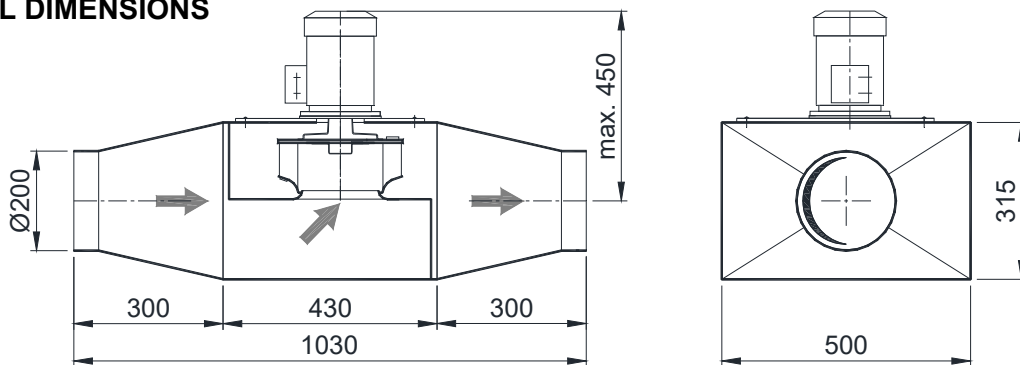
L_{A3m} = A - weighted sound pressure level at distance of 3 m

L_{WA} = A - weighted sound power level in duct

PERFORMANCE



PRINCIPAL DIMENSIONS



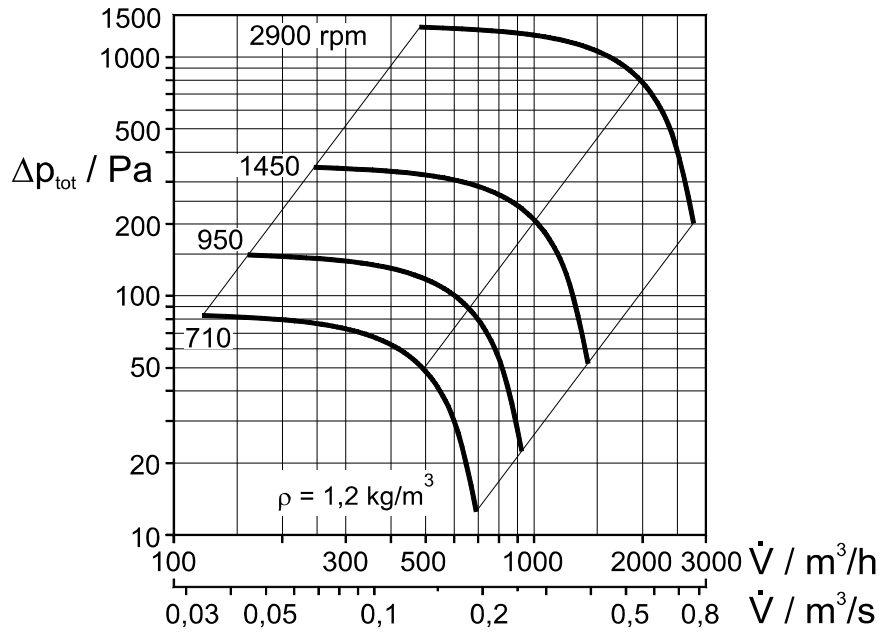
MOTOR VERSIONS (other motors, such as single-phase or Ex, upon inquiry)

fan type	speed rpm	motor type	nom. motor power kW	nom. motor current A	weight with motor kg	L_{A3m} dB(A)	L_{WA} dB(A)
VRK 160/731 W 950	950	3 ~ 400 V/50 Hz IP 55	0,09	0,44	20,0	39	
VRK 160/731 W 1450	1450		0,12	0,42	20,0	44	
VRK 160/731 W2900	2900		0,37	1,00	21,0	60	
VRK 160/731 W 2900 P1	2900	3 ~ polumschaltbar 400 V/50 Hz IP 55	0,43	1,30	22,0	60	
VRK 160/731 W 1450 P1	1450		0,30	0,89	22,0	44	
VRK 160/731 W 1450 P1	710		0,20	0,71	22,0	44	
VRK 160/731 W 1450 P2	950		0,035	0,30	21,0	32	
			0,18	0,58	21,0	44	
			0,06	0,35	21,0	39	

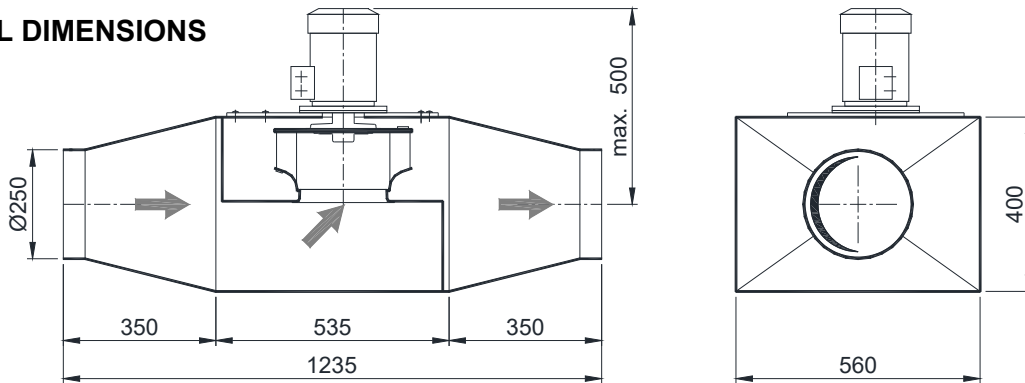
L_{A3m} = A - weighted sound pressure level at distance of 3 m

L_{WA} = A - weighted sound power level in duct

PERFORMANCE



PRINCIPAL DIMENSIONS



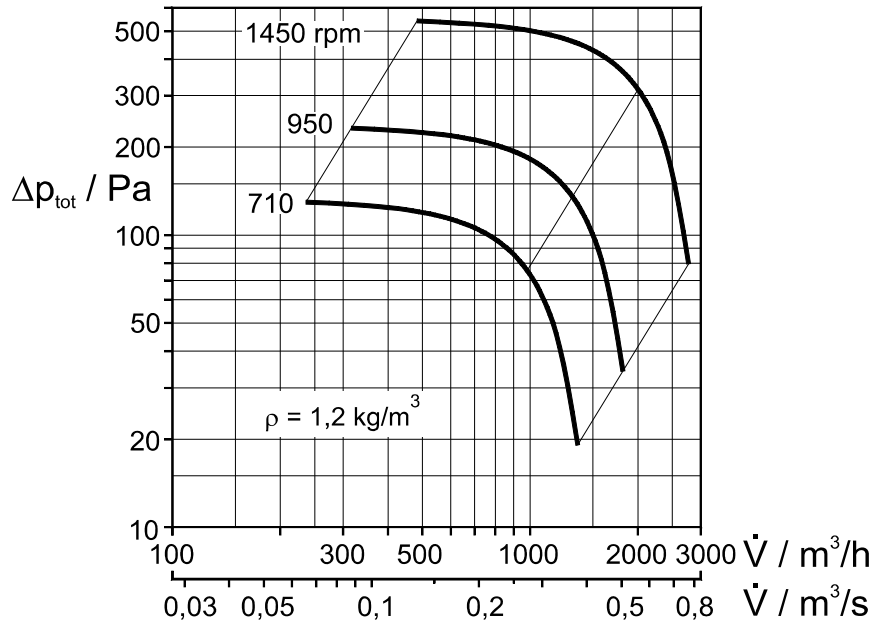
MOTOR VERSIONS (other motors, such as single-phase or Ex, upon inquiry)

fan type	speed rpm	motor type	nom. motor power kW	nom. motor current A	weight with motor kg	L_{A3m} dB(A)	L_{WA} dB(A)
VRK 200/731 W 710	710	3 ~ 400 V/50 Hz IP 55	0,09	0,36	31,0	40	
VRK 200/731 W 950	950		0,09	0,55	29,0	46	
VRK 200/731 W 1450	1450		0,18	0,58	29,0	51	
VRK 200/731 W2900	2900		1,10	2,40	35,0	67	
VRK 200/731 W 2900 P1	2900	3 ~ polumschaltbar 400 V/50 Hz IP 55	1,40	3,50	37,0	67	
VRK 200/731 W 2900 P1	1450		0,33	0,76		46	
VRK 200/731 W 1450 P1	710		0,20	0,71	33,0	51	
VRK 200/731 W 1450 P2	1450		0,05	0,30		40	
VRK 200/731 W 1450 P2	950						

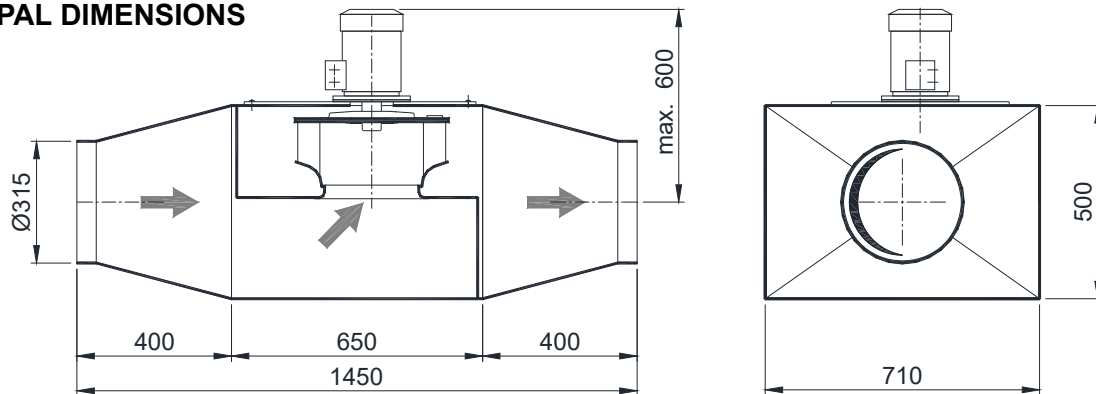
L_{A3m} = A - weighted sound pressure level at distance of 3 m

L_{WA} = A - weighted sound power level in duct

PERFORMANCE



PRINCIPAL DIMENSIONS



MOTOR VERSIONS (other motors, such as single-phase or Ex, upon inquiry)

fan type	speed rpm	motor type	nom. motor power kW	nom. motor current A	weight with motor kg	L _{A3m} dB(A)	L _{WA} dB(A)
VRK 250/731 W 710	710	3 ~ 400 V/50 Hz IP 55	0,09	0,36	47,0	42	
VRK 250/731 W 950	950		0,18	0,62	47,0	47	
VRK 250/731 W 1450	1450		0,37	1,03	46,0	55	
VRK 250/731 W 1450 P1	1450	3 ~ polumschaltbar 400 V/50 Hz IP 55	0,50	1,28	48,0	55	
VRK 250/731 W 1450 P2	710		0,10	0,57	48,0	42	
VRK 250/731 W 1450 P2	950		0,40	1,38	48,0	55	
VRK 250/731 W 950 P2	950	IP 55				47	
	710					42	

L_{A3m} = A - weighted sound pressure level at distance of 3 m

L_{WA} = A - weighted sound power level in duct

Our program of products and services

Roof fans

of all-plastic design, horizontally or vertically blowing out with many assembly accessories

Radial fans

of thermoplastic material and FRP, direct and belt driven up to about 150 000 m³/h and 6 500 Pa

Special fans

duct fans, built-in devices, mobile radial fans, Venturi injectors

Explosion-proof fans

according to ATEX for zone 1 and zone 2

Air technology systems and components

pipes, ducts, fittings, flaps, gas-tight shutoff flaps, exhaust air hoods, deflector hoods, suction hoods and many more of plastic material, complete air technology systems for industry and craft, air cleaning plants, laboratory and process exhaust systems

Central ventilation systems

in housing construction, special-purpose fans, exhaust elements, controlling and regulating devices

Noise protection

rectangular and cylindrical sound attenuators, silencing casings in corrosion-proof design

Exhaust gas cleaning

droplet eliminators and moisteners, gas scrubbers for separation of gaseous dangerous substances, dust filter

Heat exchangers

for heat recovery from moist and aggressive exhaust air

Tanks

of thermoplastic material for liquids endangering water, according to water resources regulations

Controlling and regulating elements and systems

switches, motor protection devices, speed controllers, frequency inverter, fan controls, flow supervision

Special designs

devices, linings, special components etc. of plastic material

Engineering performances

planning, calculation, and design, ventilation measurement on standardized test stands, low and high temperature test in company-own climatic test chambers

