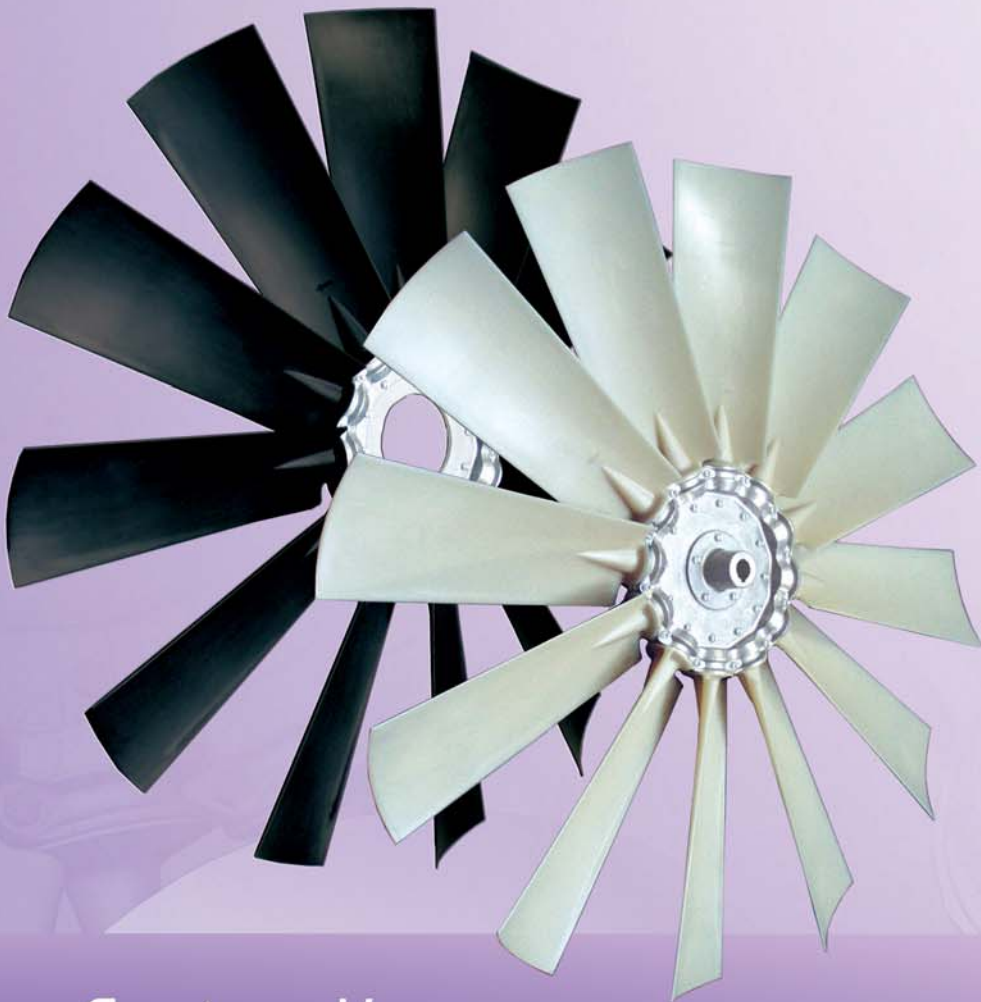


K7Z English / metric



Diameter 357 - 1.254 mm

Series K circular arc profile

K7Z

compressors, construction machines, cooling installations, fork lift trucks, generator sets, harvesting machines, internal combustion engines, municipal service vehicles, vehicles



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## K7Z

The K7Z - series was specifically developed as a cooling fan for internal combustion engines and is an enhanced version of the successful 6Z-series of impellers.



The following operational requirements are typical for stationary, industrial and commercial vehicles engines:

- relatively large radial clearance between blade tips and shroud
- high overall flow resistance of the air stream due to objects in the flow path such as grids and additional coolers (i.e. oil coolers, charge air coolers, radiators and / or fuel coolers)
- Engine encapsulations (for noise, etc.) also reduce the air flow rate.

Additional resistance results from the close proximity of radiator, fan and engine. The engine itself is a large obstruction in the flow path for both suction and blower type applications. Due to the reduction in the cross sectional area of the upstream and downstream flow path, a very special blade profile is required to overcome this resistance.

Under these difficult conditions, fan blades with a circular arc profile operate much more effectively than with an airfoil profile, which operates best under ideal flow conditions. Even greater efficiency is achieved when the blades are widening from the roots to the tips, while the largest blade area is situated in the region of the highest circumferential speeds and while the flow path around the engine forces the air to flow primarily in the region of the blade tips.

### The new K7Z-series presents the following additional advantages:

By twisting the blade, the efficiency is improved and two additional blade angle positions are available for an even better approximation of the working point.

Comparative tests clearly show :

- / **10 to 15 % Improvement in efficiency**
- / **lower absorbed power**
- / **reduced noise levels**

### The Blades

The Z-blade root (Patent No. 24 39 767) has established itself all over the world as the standard and allows eight blade angles from 20° to 37.5° in all the Z-hubs.

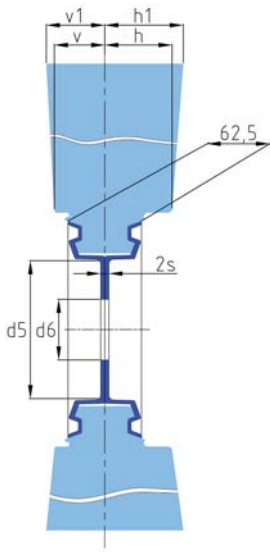


The blades are injection moulded from high technology materials, therefore WingFan products present the following advantages:

- **High strength to weight ratio**
- **Resistance to corrosion\***
- **Optimized design for your specific application requirements**

\* For heavily corrosive atmospheres, the aluminum hubs can be supplied with a protective coating and stainless steel bolts and nuts.

## Flange Mount version



Hub size *	Impeller Diameter D min max K7Z	Spigot hole		Hub face dia		Thick-ness s
		min d6	max	max d5		
5	357 - 1.028	12	55	76	3,5	
7	394 - 1.065	24	83	115	3,5	
8	474 - 1.145	15	165	190	3,5	
9	408 - 1.079	25	95	131	3,5	
12	488 - 1.159	25	170	208	4	
16	583 - 1.254	40	240	302	4	

\* Maximum number of blades in the hub

The maximum diameters are valid for the blade materials PA and PAG. For PAGST and PACAS the information is available on request and on our selection software SELECT.

## Leading / Trailing Edge

**v (+/- 3)**

Series	20°	22,5°	25°	27,5°	30°	32,5°	35°	37,5°
K7Z	12	13	15	17	20	23	25	27

**h (+/- 3)**

Series	20°	22,5°	25°	27,5°	30°	32,5°	35°	37,5°
K7Z	41	43	45	47	50	52	54	55

**v<sub>1</sub> (+/- 8)**

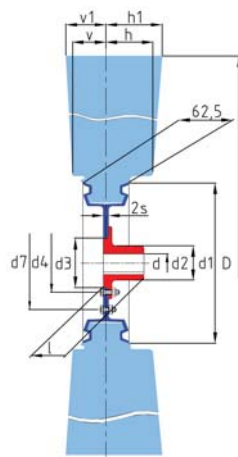
Series	20°	22,5°	25°	27,5°	30°	32,5°	35°	37,5°
K7Z	12	15	15	17	21	24	28	29

**h<sub>1</sub> (+/- 8)**

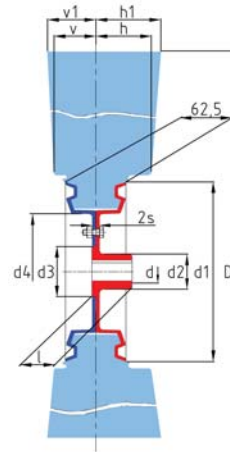
Series	20°	22,5°	25°	27,5°	30°	32,5°	35°	37,5°
K7Z	27	30	35	37	43	47	50	54

The measurements v<sub>1</sub> and h<sub>1</sub> are valid for the maximum impeller diameter. For smaller impeller diameters the information is available on application.

## Shaft Mount version



with flange hub



with cast-on hub flange (5-bladed)

Hub size *	Impeller Diameter D min max K7Z	shaft size		flange hub		Ø outer d1	Thickness s	Hub Spigot hole dia d3	Bolt pattern	
		min d	max	length l	Ø d2				inner d4	outer d7
5	357 - 1.028	12,00 14,00	25,40 34,00	42 62	44 52	145	3,5	55	-	-
7	394 - 1.065	10,00 12,70 22,00 22,00 34,00	17,00 22,23 25,40 31,75 42,00	31 42 52 62 82	28 40 45 51 73	186	3,5	74,75	5 x M6 on BCD 90	-
8	474 - 1.145	10,00 12,70 22,00 22,00 34,00 41,00	17,00 22,23 25,40 31,75 42,00 50,80	31 42 52 62 82 112	28 40 45 51 73 90	266	3,5	74,75	5 x M6 on BCD 90 9 x M8 on BCD110	8 x M6 on BCD 176
9	408 - 1.079	10,00 12,70 22,00 22,00 34,00 41,00	17,00 22,23 25,40 31,75 42,00 50,80	31 42 52 62 82 112	28 40 45 51 73 90	200	3,5	74,75	5 x M6 on BCD 90 9 x M8 on BCD110	-
12	488 - 1.159	10,00 12,70 22,00 22,00 34,00 41,00	17,00 22,23 25,40 31,75 42,00 50,80	31 42 52 62 82 112	28 40 45 51 73 90	280	4	74,75	5 x M6 on BCD 90 9 x M8 on BCD110	12 x M6 on BCD 185
16	583 - 1.254	10,00 12,70 22,00 22,00 34,00 41,00	17,00 22,23 25,40 31,75 42,00 50,80	31 42 52 62 82 112	28 40 45 51 73 90	375	4	74,75	5 x M6 on BCD 90 9 x M8 on BCD110	16 x M6 on BCD 280

\* Maximum number of blades in the hub

subject to technical alterations

## Blade Materials

PA	PAG	PAGST	PACAS*
Glass fiber reinforced polyamid (nylon 6, black)	Glass fiber reinforced polyamid (nylon 6, beige)	Glass fiber reinforced polyamid (nylon 6, black)	Carbon fiber reinforced polyamid (nylon 6, slate grey)
-40°C to +110°C	-40°C to +110°C	-40°C to +110°C	-35°C to +100°C
Heat ageing stabilized	Heat ageing stabilized	Extremely vibration resistant, high impact strength	Electrically conductive, flame-retardant
Standard Duty	Heavy Duty	where extreme vibrations may occur	Duty where explosions may occur

\* For European compliance with regulations ATEX 100 and VDMA 24169, hubs are available with three layers of conductive paint.

## Mounting Arrangement

WingFan impellers are suitable for all known methods of mounting. Examples include:

- Flanged mount
- Shaft mount (parallel and taper)
- Mounting with taperlock bushings

WingFan would be pleased to offer special fitting solutions to your specific application requirements.

### Flange Mount Version



The impeller is supplied with a spigot hole and bolt pattern according to user specifications. The impeller is centred on the spigot hole and fixed with suitable bolts.

### Shaft Mount Version

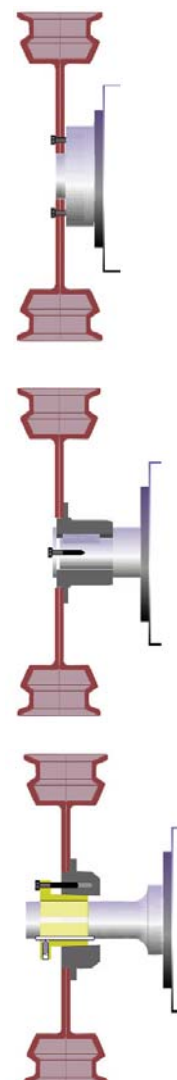


The boss face butts against the shaft shoulder and is located by either an axial bolt in the shaft end or with a radial grub screw. The drive torque is transmitted using a woodruff key.

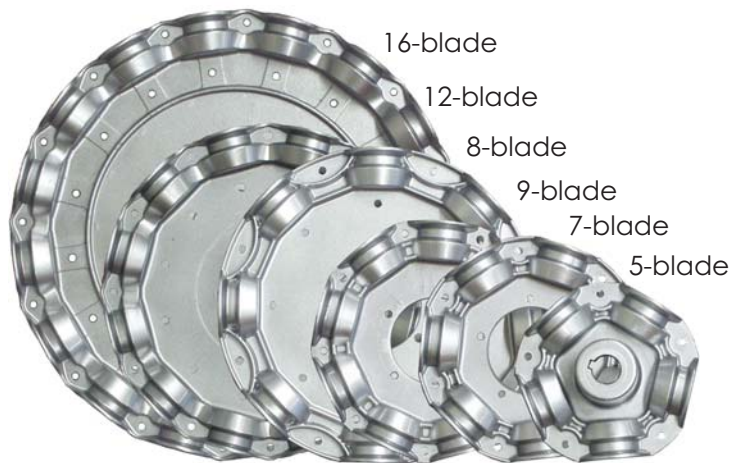
### Taperlock Version



With the taperlock version, the axial positioning of the impeller on the shaft is determined by the keyed taperlock bushing. A woodruff key transmits the drive torque from the shaft to the impeller.



## The Hubs



The Z-Series impeller utilizes six hub sizes ranging from 5-blade to 16-blade. The hubs are made from pressure die cast aluminium, inherently corrosion resistant and providing high strength for their low mass. They can be fitted with less than the maximum number of blades (i.e. a 12-cavity hub can be fitted with just six blades while the remaining cavities are plugged with spacers). The impeller configuration changes from 12-12 to 6-12.

## Hub Design



The seven, eight, nine, twelve and sixteen blade hubs consist of two identical flange halves and an optional center boss.

The five blade hubs have an integral cast center boss on one flange half eliminating the need for a bolted center boss. For flange mounted applications, an optional flanged half hub is utilized.



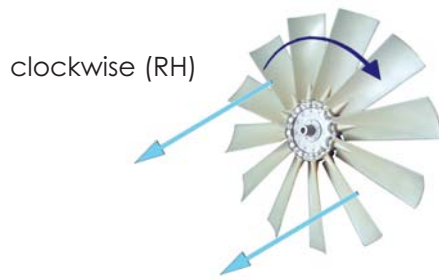
A large assortment of flanged bosses is available for nearly all applications. Forged and heat treated flanged hubs are available for hydraulic drives with their small diameter shafts (parallel or tapered).

The bore diameter, key and, if required, grub screw are supplied to user specified requirements.

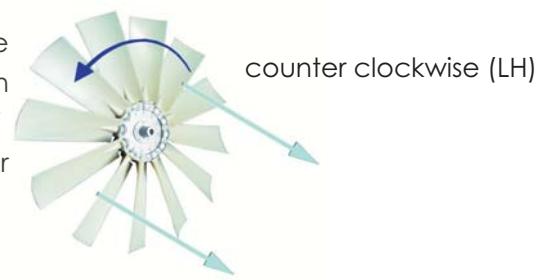
Unique or special hubs can be machined from solid bar stock.



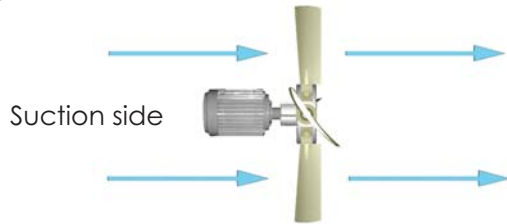
## Direction of Rotation



To determine the direction of rotation, the air must blow into the face of the observer. If the rotation is clockwise, then the direction of rotation is right handed – if counter clockwise, then left handed.

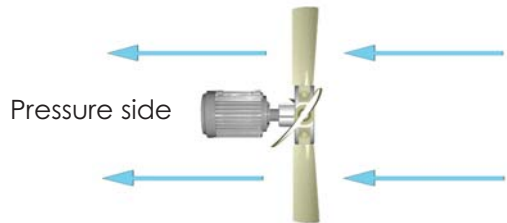


## Assembly Form A (air is sucked across the motor)



The assembly form is an indication of how the impeller should be fitted to the motor shaft. If the air is sucked across the motor (the drive motor is upstream of the impeller), this is described as “Assembly form A”.

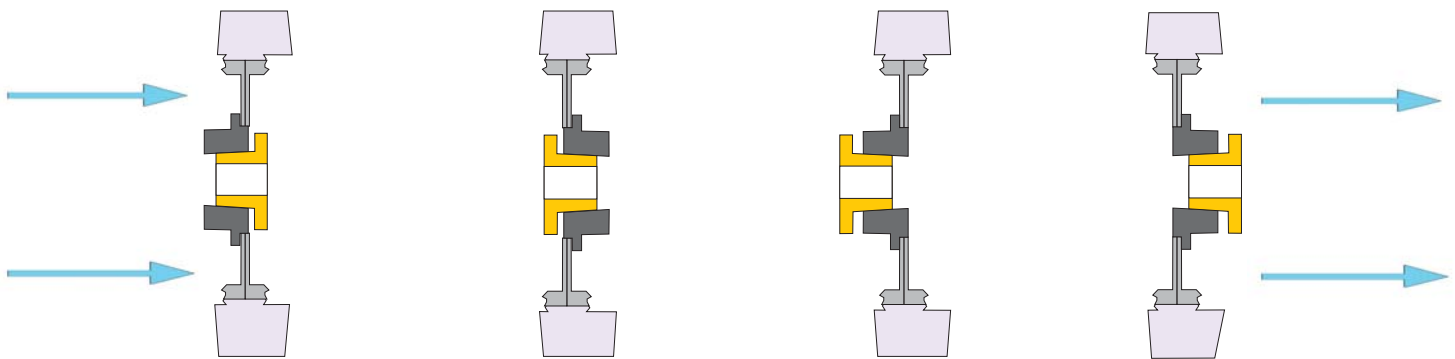
## Assembly Form B (air is blown over the motor)



If the drive motor is on the pressure side of the impeller (the drive motor is downstream of the impeller), then we have “Assembly form B”.

It is important to specify form A or form B to ensure that the impeller is assembled for correct airflow direction.

## Assembly Form When Using Taperlock Bushing



**Assembly form AS:**

Flanged hub suction side,  
Taperlock bushing pressure side

**Assembly form BS:**

Flanged hub pressure side,  
Taperlock bushing suction side

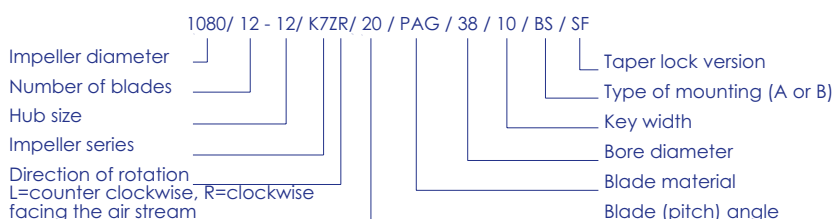
**Assembly form AR:**

Flanged hub suction side,  
Taperlock bushing suction side

**Assembly form BR:**

Flanged hub pressure side,  
Taperlock bushing pressure side

## Ordering Code\*



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\* For flange mounted impellers, the following information is required:

- Spigot hole diameter
- The number and size of bolt holes including bolt circle dimension (BCD).
- Additional information may be found at the website [www.wingfan.com](http://www.wingfan.com)