P4Z + P5Z + P6Z English/metric

Axial WingFan Impellers

Diameter 305 - 1.343 mm

Series P airfoil profile

P4Z+P5Z+P6Z

air conditioning plants, ceramics industry, cold storage plants, compressors, condensers, construction machines, cooling installations, dry cooling towers, earth movers, electric motors, evaporative cooling towers, fork lift trucks, gearboxes, generator sets, greenhouses, harvesting machines, hot air generators, hovercraft, internal combustion engines, industrial plant, municipal service vehicles, plant protection installations, transformers, ventilating fans, vehicles,

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P4Z + P5Z + P6Z

The P4Z, P5Z and P6Z-Series of axial impellers utilize blades with an airfoil profile. This profile is chosen for a wide range of applications including HVAC, compressor and engine driven equipment. The blade dimension is chosen to provide a uniform blade area, resulting in optimum performance. Advantages this WingFan series of impellers has over common one-piece injection molded or stamped impellers include:

- **Improved efficiency**
- **Lower absorbed power**
- **Lower noise levels**

The Blades

Impeller diameters range from 305 to 1.343 mm with pitch angles from 20° to 50° to meet your specific application requirements*. The blade profiles of the P5Z and P6Z are geometrically scaled-up versions of the P4Z blade mounted by means of a common blade root design (Patent No. 2439767). The patent has established this design as the worldwide standard.
The blades are fixed in the hub by means of a steel pin, ensuring a preset blade angle that cannot move or change under load. The blades are made from high strength injection molded thermal plastics or die cast aluminum offering:

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

Blade Materials

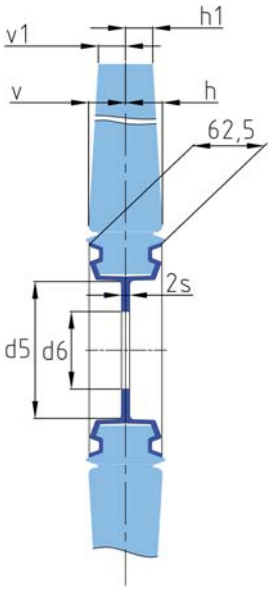
Symbol	Material description	Temperature Range	Characteristic	available	Application Suitability
PA	Glass fiber reinforced polyamid(nylon 6, black)	-40°C to +110°C	Heat ageing stabilized	P4Z, P5Z, P6Z	Standard Duty
PAG	Glass fiber reinforced polyamid(nylon 6, beige)	-40°C to +110°C	Heat ageing stabilized	P4Z, P5Z, P6Z	Heavy Duty
PAGST	Glass fiber reinforced polyamid(nylon 6, black)	-40°C to +110°C	Extremely vibration resistant, high impact strength	P4Z, P5Z	where extreme vibrations may occur
PACAS ***	Carbon fiber reinforced polyamid(nylon 6, black)	-35°C to +100°C	Electrically conductive, flame-retardant	P4Z, P5Z, P6Z	Duty where explosions may occur
ALU	Die cast aluminum	-40°C to +150°C	Greater temperature range	P4Z, P5Z	High temperature

* P4Z available with 20° to 45° pitch angles, P5Z and P6Z available with 25° to 50° pitch angles,
P4Z aluminium blades currently available for clockwise and counter clockwise rotation
P5Z aluminium blades currently available only for clockwise rotation

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

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

Flange Mount Version



Hub size *	Impeller Diameter D min max P4Z	min max P5Z	min max P6Z	Hub Spigot hole min max d6		face dia max d5	Thick-ness s
5	323 - 764	305 - 1.035	339 - 1.117	12	55	76	3,5
7	360 - 801	342 - 1.072	376 - 1.154	24	83	115	3,5
8	440 - 881	422 - 1.152	456 - 1.234	15	165	190	3,5
9	374 - 815	356 - 1.086	390 - 1.168	25	95	131	3,5
12	454 - 895	436 - 1.166	470 - 1.248	25	170	208	4
16	549 - 990	531 - 1.261	565 - 1.343	40	240	302	4

* Maximum number of blades in the hub

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

Leading / Trailing Edge

v (+/- 2)

Series	20°	25°	30°	32,5°	35°	37,5°	40°	45°	50°
P4 Z	14	18	21	23	25	27	28	31	-
P5 Z	-	18	23	25	28	29	31	34	38
P6 Z	-	24	29	32	35	37	39	44	49

h (+/- 2)

Series	20°	25°	30°	32,5°	35°	37,5°	40°	45°	50°
P4 Z	31	35	39	42	45	46	48	52	-
P5 Z	-	42	47	50	54	56	58	63	67
P6 Z	-	56	64	67	71	74	77	84	89

v_1 (+/- 4)

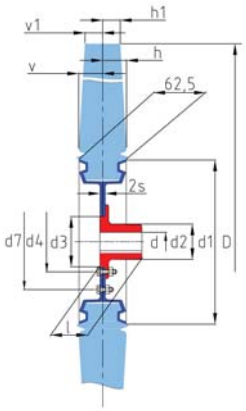
Series	20°	25°	30°	32,5°	35°	37,5°	40°	45°	50°
P4 Z	0	3	6	8	9	9	10	15	-
P5 Z	-	-4	3	3	5	3	2	8	10
P6 Z	-	-5	0	3	4	5	7	9	13

h_1 (+/- 4)

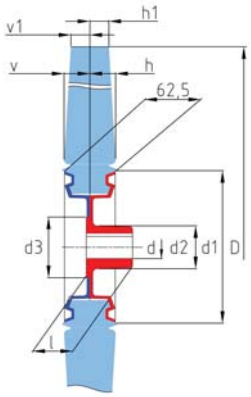
Series	20°	25°	30°	32,5°	35°	37,5°	40°	45°	50°
P4 Z	11	12	19	22	26	24	28	32	-
P5 Z	-	6	5	7	14	16	21	25	29
P6 Z	-	11	18	21	24	27	30	36	42

The measurements v_1 and h_1 are valid for the maximum impeller diameter. For smaller impeller diameters the information is available on request.

Shaft Mount Version



with flange hub



with hub flange (5-blade)

Hub size *	IMPELLER Diameter D min max P4Z	min max P5Z	min max P6Z	HUB shaft size min max d		flange hub length l	∅ d2	∅ outside d1	Thickness s	Spigot hole dia d3	Bolt pattern inner d4	outer d7
5	323 - 764	305 - 1.035	339 - 1.117	12,00 14,00	25,40 34,00	42 62	44 52	145	3,5	55	-	-
7	360 - 801	342 - 1.072	376 - 1.154	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	440 - 881	422 - 1.152	456 - 1.234	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	374 - 815	356 - 1.086	390 - 1.168	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	454 - 895	436 - 1.166	470 - 1.248	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	549 - 990	531 - 1.261	565 - 1.343	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

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

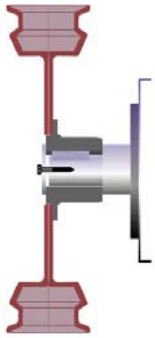
WingFan would be pleased to offer special fitting solutions to your specific application requirements.

Flange Mount Version

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

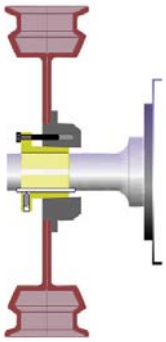
Shaft Mount Version

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.



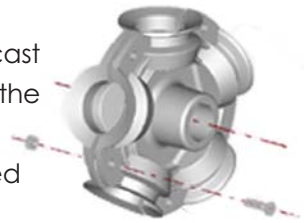
The Hubs

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 Z-hubs consist of two identical flange halves and an optional center boss.

Only 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.

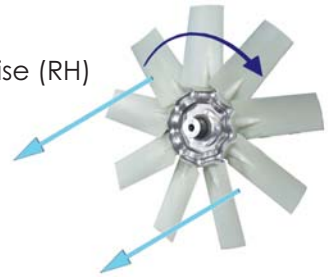


A large assortment of flanged bosses is available for nearly all applications. Forged and heat treated flanged hubs are available for hydraulic drives with their small diameter shafts (parallel and tapered).

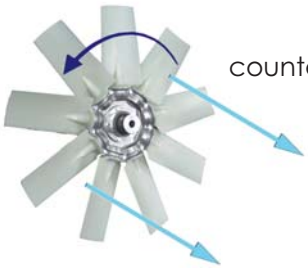
The bore diameter, key and, if required, grub screw are supplied to user specified requirements. Unique or special hubs can be machined from solid bar stock.

Direction of Rotation

clockwise (RH)

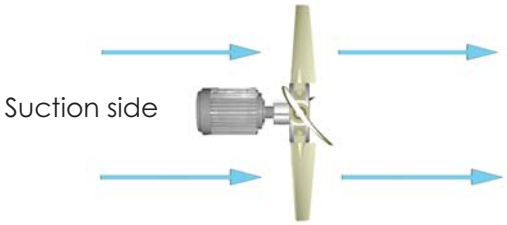


To determine the direction of rotation, the air must blow into the face of the observer. If the rotation is clockwise, then the direction of rotation is right handed – if counter clockwise, then left handed.

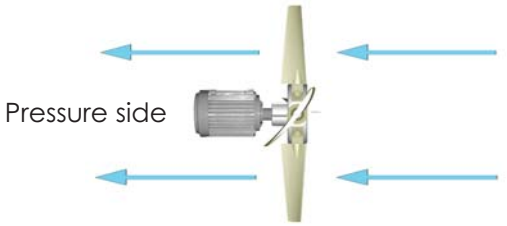


counter clockwise (LH)

Assembly Form A (air is sucked across the motor)

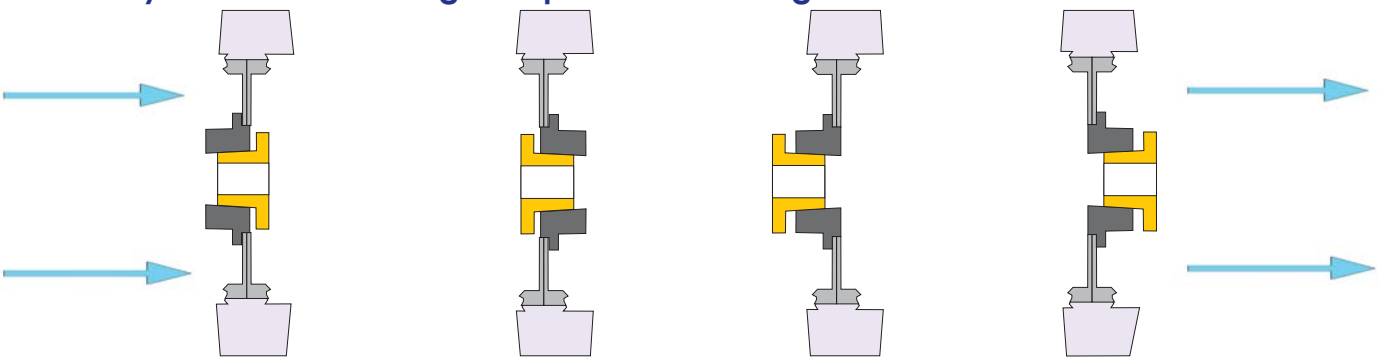


Assembly Form B (air is blown over the motor)



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".
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 a 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*

790 / 9 - 9 / P5ZL / 37,5 / PAG / 28 / 8 / BS / JA

- 790 – Impeller diameter
- 9 – Number of blades
- 9 – Hub size
- P5ZL – Impeller series
- 37,5 – Direction of rotation L=counter clockwise, R=clockwise facing the air stream
- PAG – Blade (pitch) angle
- 28 – Blade material
- 8 – Bore diameter
- BS – Key width
- JA – Type of mounting (A or B)
- Taper lock version

*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

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