

Diffuser Dplus for Axial Fans

📅 22 July 2021

🖨️
Print

The new, retrofittable Dplus diffuser is an ideal solution for converting dynamic pressure into static pressure.

Due to the constant cross-sectional expansion, the speed in the direction of flow decreases and the losses are converted into usable static pressure. On the one hand, the gain in static pressure can reduce the fan's drive power, which lowers the fan's operating costs. On the other hand, the gain in static pressure can also be used in such a way that the fan delivers more volume flow with the same drive power. The Dplus is made of 1.5 mm thick sheet steel and is available in three different colours (red, black or white).



Advantages of the Dplus diffuser:

- » Optimisation of the flow range
- » Conversion of dynamic pressure into static pressure
- » Reduce operating costs by reducing the drive power
- » Due to the increase in static pressure, the fan can deliver more air volume at the same drive power
- » Easy retrofitting to existing fans
- » Uncomplicated and quick assembly in a few minutes

You can find a video illustrating the simple assembly on our YouTube channel (<https://www.youtube.de/user/RosenbergGruppe>).

Example of savings potential: AKFG 800 K.6IF A6 Gen3 vs. AKFG 800 K.6IF A6 Gen3 (Dplus)

Operating Point	Short-term 100%	Daytime Operation 80%	Night Operation 60%
Volume flow	20.800 m ³ /h	16.600 m ³ /h	12.450 m ³ /h
Static pressure	160 Pa	102 Pa	58 Pa
Fan power without diffuser	2.370 W	1.220 W	555 W
Fan power with diffuser	2.050 W	1.070 W	494 W
Runtime per day	2 Hours	10 Hours	12 Hours
	Energy consumption per year		Total

Input power without diffuser	1.730,1 kWh/a	4.453 kWh/a	2.430,9 kWh/a	8.614 kWh/a
Input power with diffuser	1.496,5 kWh/a	3.905,5 kWh/a	2.163,72 kWh/a	7.565,72 kWh/a
Power savings	233,6 kWh/a	547,5 kWh/a	267,18 kWh/a	1.048,28 kWh/a
Savings in %	13,5 %	12,3 %	11,0 %	12,2 %
Cost savings per year				335,45 EUR
Emission reduction per year				0,42 t CO ₂

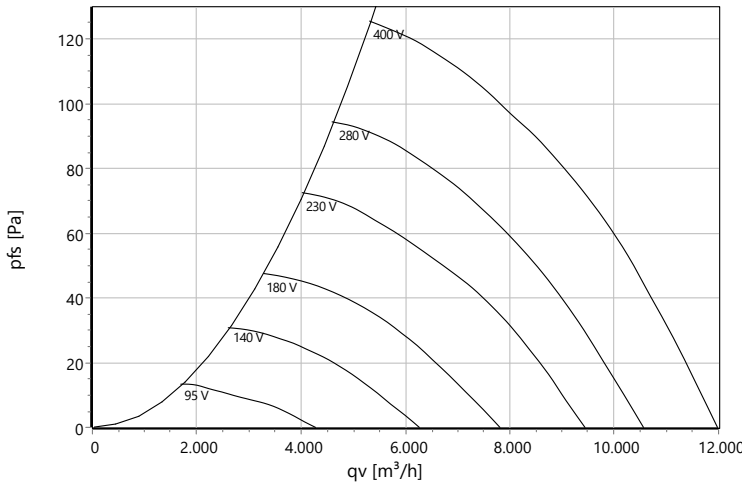
Electricity costs per kWh (2020): 0.32 EUR / Data from the Federal Environment Agency of Germany (2020): 0.398 kg CO₂/kWh



Type: **AKSD 630-6 N.5HA A4**
Installation type 4 direction of airflow V with protection guard
Part no.: E64-63062



Curve:



p: 1,2 kg/m³

ErP-Data:

(EU) Nr. 327/2011 (Lot11)		
q _v	7630	m³/h
p _{fs}	103	Pa
η _{fs}	33,3	%
P _e	0,66	kW
n	880	r/min
N	40	N
v	6,686	m/s

Nominal Data:

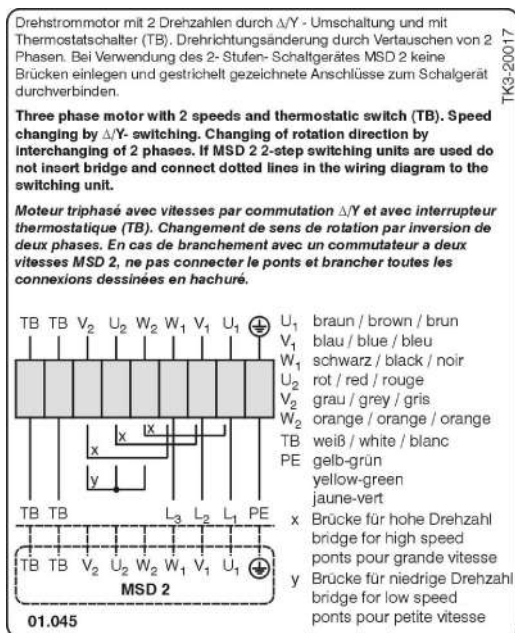
Δl 4,5 %

U [V]	f [Hz]	C [μF]	P _e [kW]	I _N [A]	n _N [r/min]	t _r [°C]	k ₁₀ [m²s/h]	I _A / I _N	IP	m [kg]
400 D	50	-	0,69	1,31	875	-25 .. +55	-	3	IP 54	-
400 Y			0,45	0,73	667					

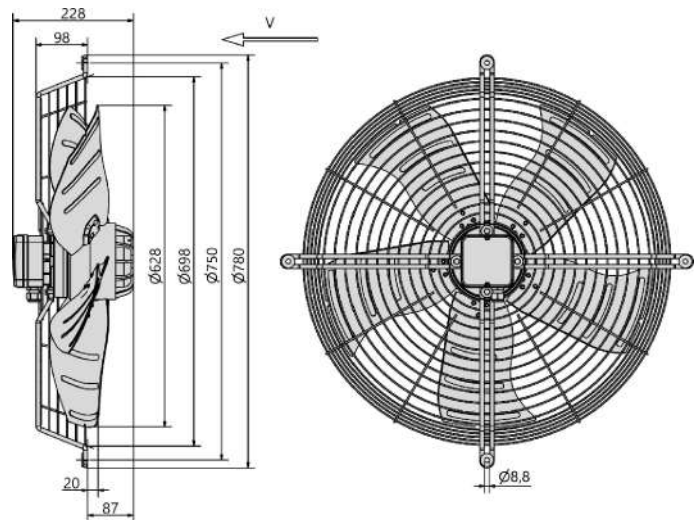
Sound Data:

Frequency	Σ	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
LwA(A,in) [dB(A)]	-	-18	-10	-8	-6	-6	-9	-19	LpA(A,in) [dB(A)]	-7	-18

Wiring Diagram:



Drawing:

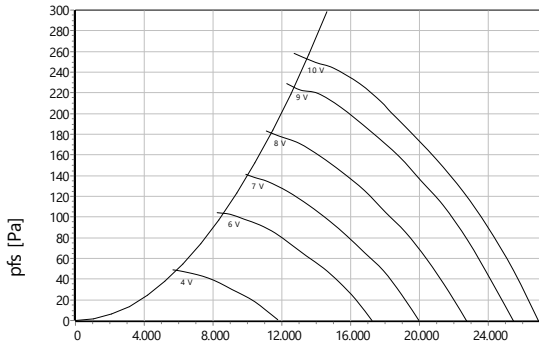




Type: **AKFG 800 K.6IF A6 Gen3**
 Installation type 6 direction of airflow V with square nozzle plate
 Part no.: E66-80669



Curve:



qv [m³/h]

p: 1,15 kg/m³; Data @ 400 V

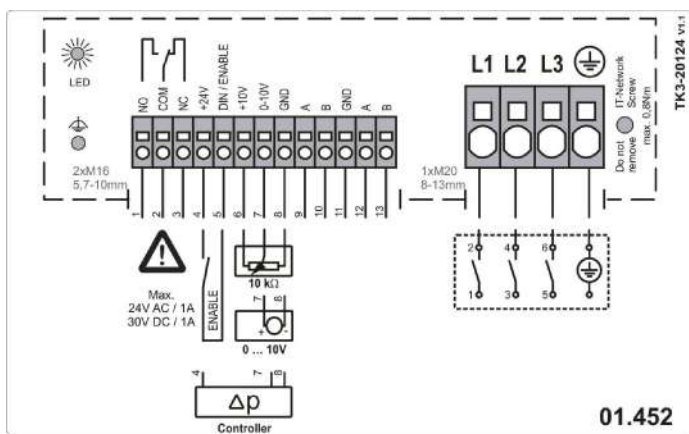
Nominal Data:

U [V]	f [Hz]	Data @ [V]	P _{ed} [kW]	I _N [A]	n _N [r/min]	t _R [°C]	k ₁₀ [m²/s/h]	Eff.-Rating	IP	m [kg]
3~380-480	50/60	400	2,71	4,21	1085	-25 .. +60	-	IE5	IP 54	43
		460		3,76						

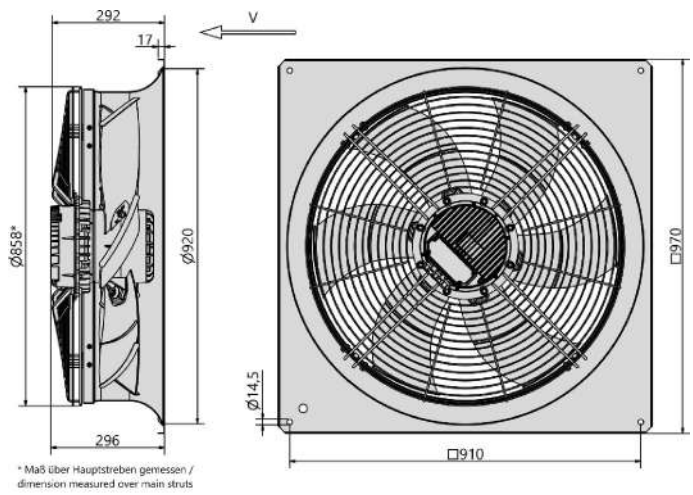
Sound Data:

Frequency	Σ	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	4 m
LwA(A,in) [dB(A)]		-30	-19	-13	-7	-4	-6	-12	-16	LpA(A,in) [dB(A)]	-7	-17
LwA(A,out) [dB(A)]	2	-23	-11	-8	-6	-2	-5	-9	-17	LpA(A,out) [dB(A)]	-5	-15

Wiring Diagram:



drawing:

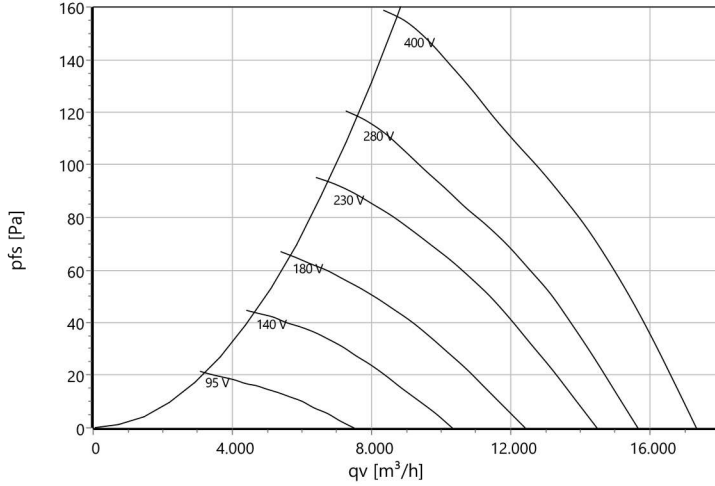




Type: **AKFD 710-6 K.6HF A4**
Installation type 4 direction of airflow V with protection guard
Part no.: E64-71260



Curve:



$\rho: 1,2 \text{ kg/m}^3$

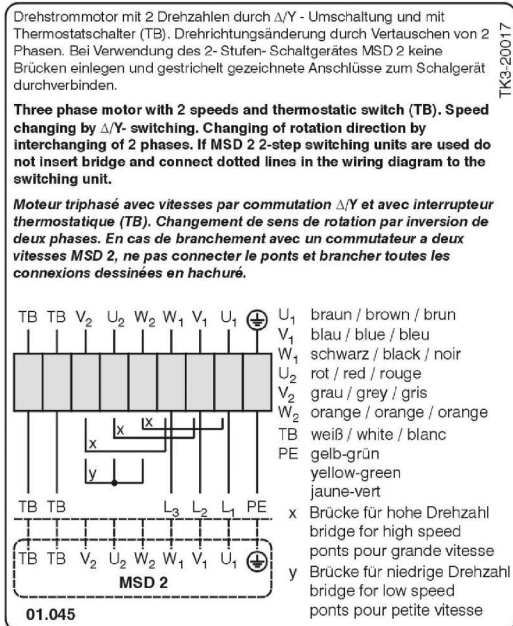
Nominal Data:

U [V]	f [Hz]	C [µF]	P _e [kW]	I _N [A]	n _N [r/min]	t _R [°C]	k ₁₀ [m²/s/h]	I _A / I _N	IP	m [kg]
400 D	50	-	1,15	2,5	880	-45 .. +70	-	3,5	IP 54	25,7
400 Y			0,74	1,3	710					

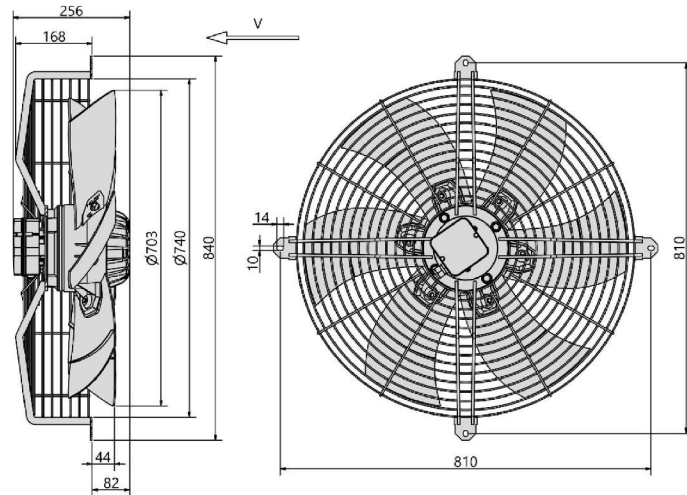
Sound Data:

Frequency	Σ	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
LwA(A,in) [dB(A)]		-27	-20	-13	-7	-5	-5	-10	-20	LpA(A,in) [dB(A)]	-7	-18

Wiring Diagram:



Drawing:

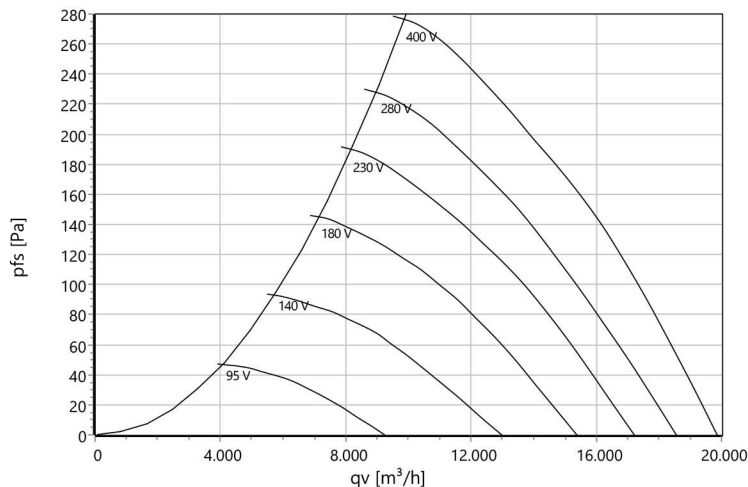




Type: **AKFD 630-4 N.6LA A6**
Installation type 6 direction of airflow V with square nozzle plate
Part no.: E66-63244



Curve:



p: 1,2 kg/m³

Nominal Data:

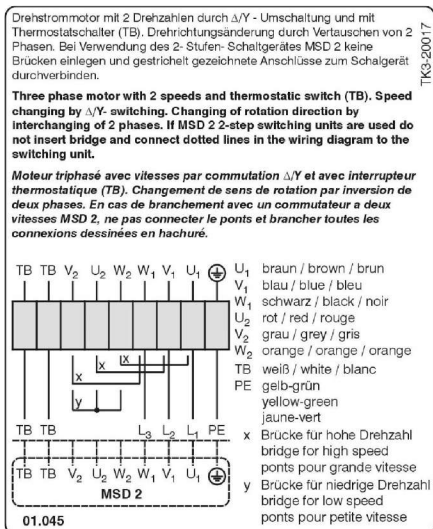
ΔI 4 %

U [V]	f [Hz]	C [μF]	P _e [kW]	I _N [A]	n _N [r/min]	t _R [°C]	k ₁₀ [m²s/h]	I _A / I _N	IP	m [kg]
400 D	50	-	2,3	4,66	1365	-45 .. +55	-	4,6	IP 54	38,1
400 Y			1,68	2,8	1220					

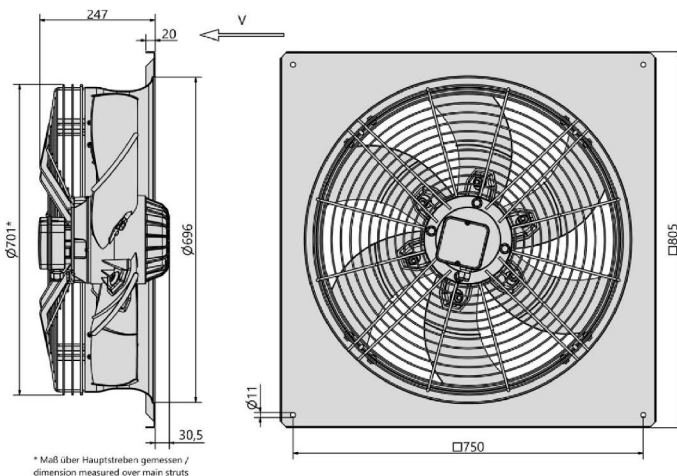
Sound Data:

Frequency	Σ	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
LwA(A,in) [dB(A)]	-	-15	-12	-8	-5	-5	-10	-15	LpA(A,in) [dB(A)]	-7	-18

Wiring Diagram:



Drawing:



t_R=45°C, Delta I=9% if using electronic controller

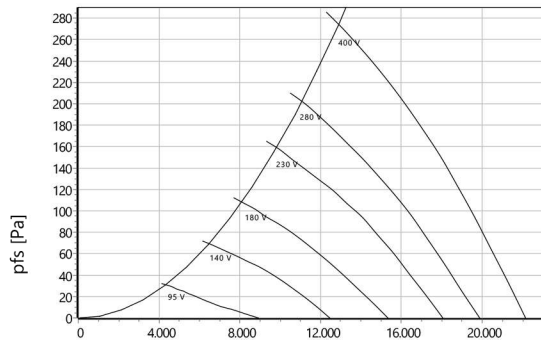


Type: **AKFD 710-4 G.6LA A6**
Installation type 6 direction of airflow V with square nozzle plate

Part no.: E66-71232



Curve:



q_v [m³/h]

ρ : 1,2 kg/m³

Nominal Data:

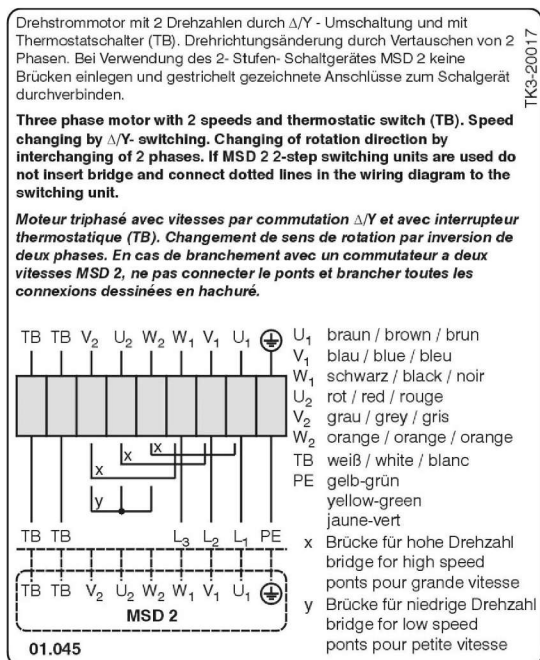
ΔI 4 %

U [V]	f [Hz]	C [μF]	P _e [kW]	I _N [A]	n _N [r/min]	t _r [°C]	k ₁₀ [m ² s/h]	I _A / I _N	IP	m [kg]
400 D	50	-	2,5	4,5	1280	-45 .. +50	-	3,3	IP 54	39,3
400 Y			1,6	2,6	990					

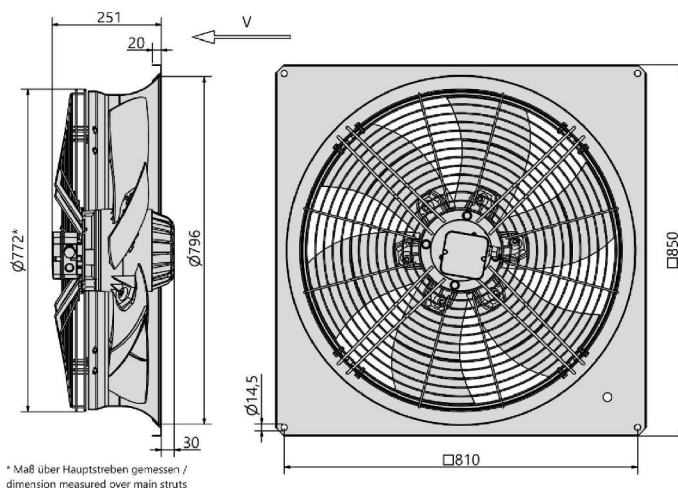
Sound Data:

Frequency	Σ	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
LwA(A,in) [dB(A)]	-	-21	-16	-8	-7	-4	-7	-19	LpA(A,in) [dB(A)]	-7	-18

Wiring Diagram:



Drawing:

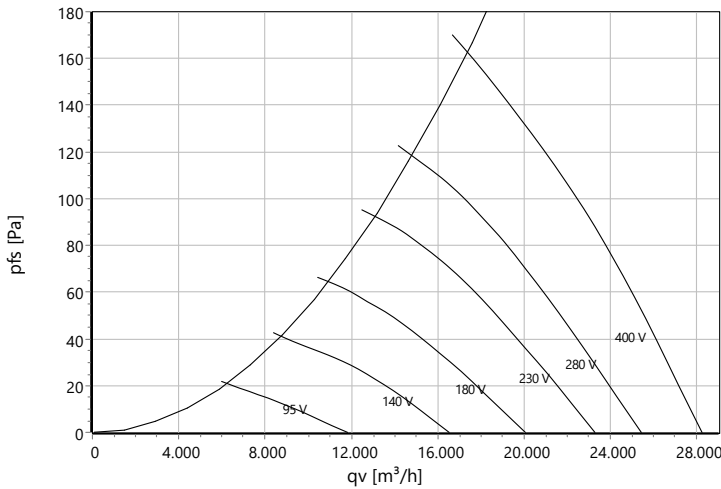




Type: **AKFD 900-6 G.6LA A6**
Installation type 6 direction of airflow V with square nozzle plate
Part no.: E66-90272



Curve:



p: 1,2 kg/m³

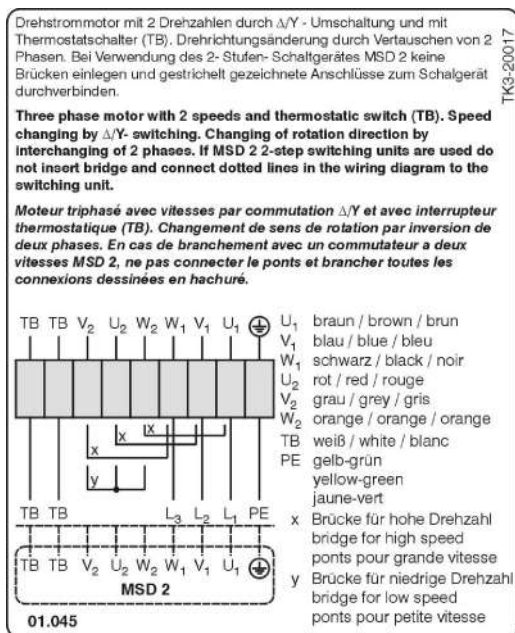
Nominal Data:

U [V]	f [Hz]	C [µF]	P _e [kW]	I _N [A]	n _N [r/min]	t _r [°C]	k ₁₀ [m²s/h]	I _A / I _N	IP	m [kg]
400 D	50	-	1,98	3,9	845	-25 .. +60	-	3,3	IP 54	51,7
400 Y			1,24	2	640					

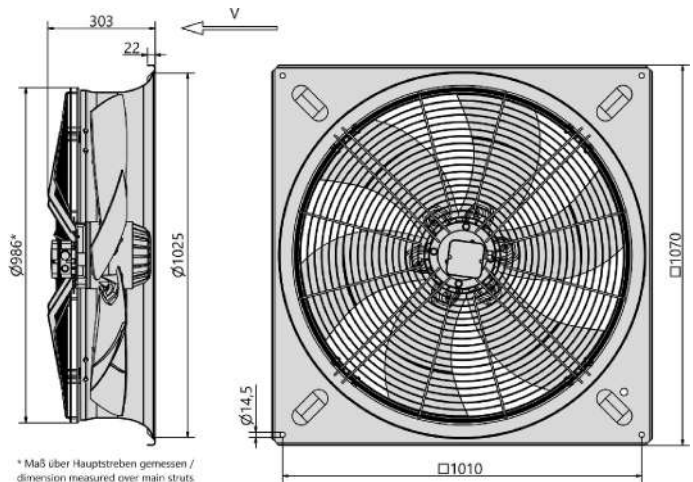
Sound Data:

Frequency	Σ	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
LwA(A,in) [dB(A)]	-	-18	-14	-7	-4	-6	-11	-19	LpA(A,in) [dB(A)]	-7	-18

Wiring Diagram:



Drawing:

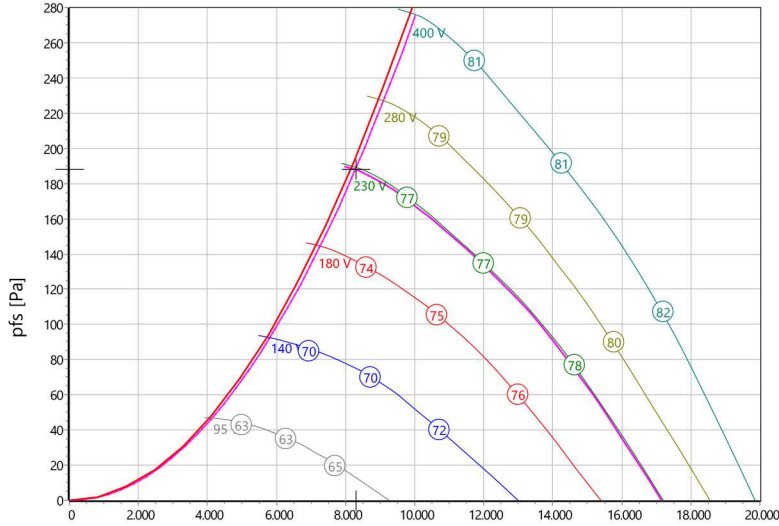




Type: **AKFD 630-4 N.6LA A4**
Installation type 4 direction of airflow V with protection guard
Part no.: E68-63255



Curve:



$\rho: 1.2 \text{ kg/m}^3$

$q_v \text{ [m}^3\text{/h]}$

ErP-Data:

(EU) Nr. 327/2011 (Lot11)		
q_v	12385	$\text{m}^3\text{/h}$
P_{fs}	234	Pa
η_{fs}	36	%
P_e	2,23	kW
n	1373	r/min
N	40	N
v	10,853	m/s

Operating Point:

q_v	8282	$\text{m}^3\text{/h}$
P_{fs}	188	Pa
P_{fd}	31,7	Pa
$\eta_{e,fs}$	27	%
$\eta_{e,tot}$	31	%
P_e	1,64	kW
I	5,1	A
n	1122	r/min
$L_{WA, A,IN}$	76	dB(A)
U	229	V
v	7,26	m/s
SFP	715	$\text{Ws/m}^3\text{/h}$
FEI	0,89	

Intersections:

Curve	$q_v \text{ [m}^3\text{/h]}$	$p_{fs} \text{ [Pa]}$	$P_e \text{ [kW]}$	$I \text{ [A]}$	$n_N \text{ [r/min]}$	$L_{WA, A,IN} \text{ [dB(A)]}$
400 V	10032	276	2,36	4,9	1363	81
280 V	9102	227	1,93	4,9	1229	78
230 V	8309	189	1,65	5,09	1125	76
180 V	7259	144	1,29	5,09	985	73
140 V	5813	93	0,918	4,7	802	69
95 V	4137	47	0,49	3,8	581	62

Nominal Data:

U [V]	f [Hz]	C [μF]	$P_e \text{ [kW]}$	$I_N \text{ [A]}$	$n_N \text{ [r/min]}$	$t_R \text{ [}^\circ\text{C]}$	$k_{10} \text{ [m}^2\text{s/h]}$	I_A / I_N	IP	ΔI	m [kg]
400 D	50	-	2,3	4,66	1365	-45 .. +55	-	4,6	IP 54	4 %	30,4
400 Y			1,68	2,8	1220						

Sound Data:

Frequency	Σ	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	5 m
$L_{wA(A,IN)} \text{ [dB(A)]}$	76	-	62	65	69	72	72	67	$L_{pA(A,IN)} \text{ [dB(A)]}$	69	58

$t_R=45^\circ\text{C}$, $\Delta I=9\%$ if using electronic controller