

KONČAR

MOTORS AND ELECTRICAL
SYSTEMS



AXIAL FANS
for transformer cooling

ABOUT US

KONČAR-MES Ltd. is a member of Končar Group with a long tradition of over 100 years and delivers its products to customers worldwide.

KONČAR-MES with a wide range of products, supported by its development, technology, and quality service which represents an excellent basis for our long-term goals.

Through our business strategy, we strive to be present within a successful group of drive technology manufacturers in the world market.

One of our most valuable assets is competent and educated employees with an emphasis on our engineers who use their knowledge and capabilities when applying new ideas to Končar-MES products.

KONČAR-MES strive for constant growth of production by fulfilling the desires of customers as well as meeting various market demands. The excellence in the production of electromotors and drives is essential, and we strive to fulfil these demands by constantly improving the technology and production processes.

ABOUT TRANSFORMER COOLING FANS APPLICATION

Axial fans used for transformer cooling are part of our series of axial fans for cooling and air handling. High efficiency and low fan noise are achieved with a special blade design, a low-pressure design with an integrated fan casing construction with the intake mouth, and motor support with a protective net.

Many years of experience in developing and producing fans and electric motors guarantees benefits such as:

- Low noise level with high airflow
- High efficiency and low power consumption
- Safe work under all climatic conditions
- Long lifetime and long service intervals
- Special corrosion protection for open space installations
- Operating characteristics that meet the requirements of different manufacturers of transformers
- Fan casing with integrated intake mouth
- Adjusted for all installation positions
- Protective grill on intake and outlet side
- Lightweight fan
- A large number of design options for casings and motors
- ERP 2015 compliant
- Transformer cooling FAN range

TRANSFORMER COOLING FANS RANGE

Dimensions - casing diameter in mm: **470-500-630-710-800-910-1000-1250**

Volume flow m³/s: 0,8 – 14,0

Power consumption kW: 0,08-3,4kW

STANDARD DESIGN

Axial fans for transformer cooling acc. to EN 50216-12:2011,

Corrosion class acc. To EN 12944-5 – Class C4, fans for worldwide installation

FAN CASING AND MOTOR SUSPENSION	IMPELLER
Casing: steel sheet, hot deep galvanized (min. 55 µm), coating EP+PU=80mic	Blade and hub material is aluminum AlSi12Cu, unpainted, bolts-AISI316-A4
Motor suspension: steel sheet, zinc galvanized layer (min. 10 µm)	Balancing: class G 6, 3 according to ISO 14694 / ISO 10816-3
ELECTRIC MOTOR	PROTECTION GRILL
Series 5AZ – aluminium AlSi12Cu production KONČAR-MES; PU=60mic	Mounted on the intake side
Installation form: IM B30, Cooling: IC 418	Mounted on the exhaust side
Voltage/Frequency: 400V (±10%)/ 50Hz/ 60Hz	Material: stainless steel AISI304
Protection index: IP55	Pressure plugs for prevention of condensation
Isolation class F (temperature rise in B)	Airflow vertical upwards or horizontal
Ambient temperature: -30 - +55 C for outdoor installation	Mounting material: stainless steel AISI316-A4

All nonstandard features-voltage, flange, volume flow, EC motor, material on request



FLANGE

The complete fan casing is In-house made from steel sheet bending, automatic plasma welding and flange forming with automatic machine.

Končar-MES has the strength and possibility to adapt and develop together with their customers, and to deliver custom-made fan flange versions from different mounting holes positions to additional mounting brackets.



ELECTRIC MOTOR

By installing the asynchronous induction motor from our production, Končar-MES keeps quality and adaptability for the application within our factory. With more than 75-years of experience in motor production, Končar-MES is an expert in motor development and motor quality. Our motors for transformer cooling fans are equipped with high-quality bearings and a pressure equalizer which reduces the influence of temperature change in condensation. We produce our windings with a semi-automatic winding and winding insertion line where the repeatability of the process is ensured. This process and knowledge enable us to make a variety of motors for different voltages and frequencies which together with our impregnation line makes an electric motor for all applications.

IMPELLER

By developing the Končar-MES line of impellers, we achieved significant improvements in this narrow industry niche. Those improvements are low noise, high efficiency, and uniform volume flow. All modern findings and developments are composed into our blades, such as serrated exit edge and wingtip devices to maximize the needed performance.



FAN GRID

Housing, motor, and fan grids are completely Končar-MES in-house production made from high-quality AISI 304 grade stainless steel.



NOISE MEASUREMENT

Measurement of our fans in the accredited anechoic chamber according to ISO 13347-3:2004 and ISO 3744:2011 to determine the sound power level and sound energy level of noise sources using sound pressure. All our measurements are done in the same way and same points.

The sound pressure level measurement for the determination of the sound power level was carried out at 1m. In the case of a relatively large difference between the highest and lowest measured values in the basic 5 measuring points (M1-M5), following 7.3.2. ISO 3744, 4 additional metering points are added (M6-M9).

Sound pressure measurement at 2m, on the suction side, was conducted on 5 points on the 2m radius at 45° distance. The overall sound power level was obtained by adding +3dBA to the suction side.



CORROSION PROTECTION

Corrosivity category-System No. ISO 12944-5	Environment classification	Dry film thickness- DFT
C3-G3.01/ C3-M	Industrial areas and coastal areas with moderate salinity; chemical plants, swimming pools, coastal ship, and boatyards	80µm
C4-G4.02/C4-M	Industrial areas with high humidity and aggressive atmosphere; buildings or areas with almost permanent condensation and with high pollution	120µm
C5-G5.04/C5-M	Coastal areas with high salinity; areas with almost permanent condensation and with high pollution	200µm

***other dry film thickness possible on request (up to 320 microns of color thickness)**

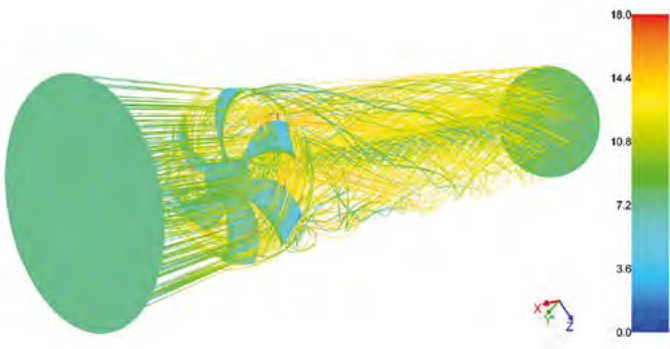
Končar MES standards in corrosion protection are C3-M, C4-M, and C5-M. Those standards are within the new ISO 12944-5 recommended standard.

The paint system relies on good praxis applying uniform Epoxy-paint ground in the needed number of layers with strict quality control of each layer on a light sweep blasted metal surface. The topcoat color tone is an option and can be chosen by the customer to match his needed color tone.

PRODUCT DEVELOPMENT

The R&D department permanently works on developing and improving our products by listening to the needs of the markets and the science community. Končar MES is also using the advantages of modern software tools for CFD (Computational Fluid Dynamics) to get the most out of the impeller and the whole fan.

We delivered a dozen new and developed impellers in the last ten years, among them also a different version of axial fans as standard. We are capable to deliver new products regarding our customers' needs for special projects where we adapt the fan for the specific needs while maintaining the performance.



3D visualization of air flow



Contours and velocity vectors around the blade for the turbulence model



VAAZ C 470



VAAZ C 500



VAAZ C 630



VAAZ C 800



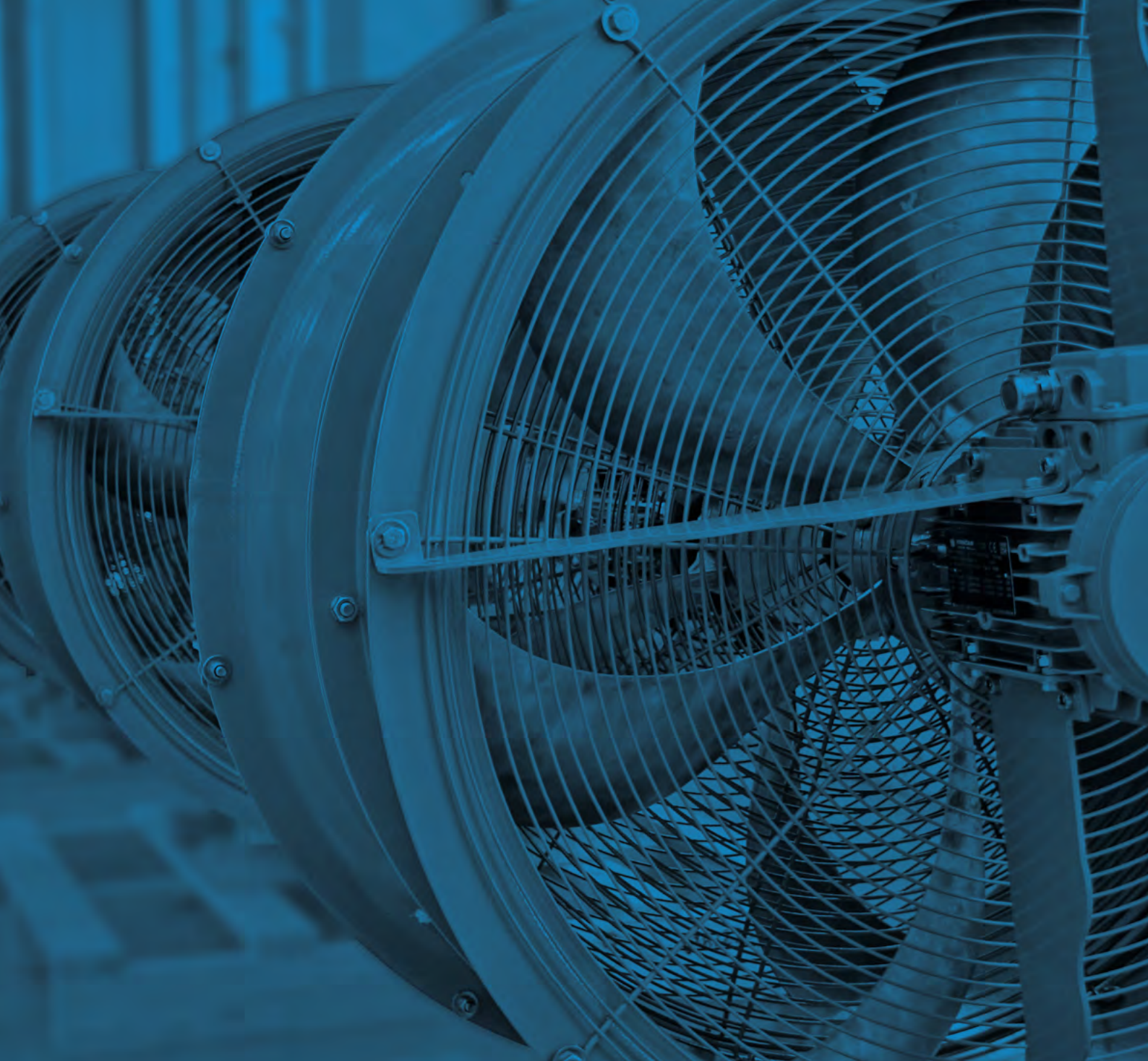
VAAZ C 1000



VAAZ C 1250

Technical data / Technische Daten

FAN TYPE / VENTILATOR TYP	2p=	n (1/min)	Q (m ³ /s)	PST (Pa)	P1 (kW)	I _r (A)	I _k (A)	P2 (kW)	I _n (A)	LWA dB(A)	LpA dB(A)
Y 400 V (-10%/+10%), 50 Hz											
VAAZ C 470-2,3 m ³ /s-0Pa M71-4	4	1430	2,3	100	0,62	1,6	6,4	0,6	1,8	82	69
VAAZ C 470-1,6 m ³ /s-0Pa M71-6	6	960	1,6	45	0,24	0,8	2,5	0,22	0,85	73	60
VAAZ C 470-1,2 m ³ /s-0Pa M71-8	8	700	1,2	30	0,13	0,45	0,8	0,09	0,45	67	53
VAAZ C 470-0,95 m ³ /s-0Pa M71-10	10	550	0,95	20	0,08	0,22	0,5	0,035	0,24	61	48
VAAZ C 470-0,76 m ³ /s-0Pa M71-12	12	460	0,76	16	0,075	0,23	0,4	0,03	0,25	55	39
VAAZ C 500- 2,5 m ³ /s-0Pa M71-4	4	1420	2,5	165	0,65	1,6	6,4	0,6	1,8	79	67
VAAZ C 500- 1,7 m ³ /s-0Pa M80-6	6	960	1,7	75	0,21	0,55	2	0,2	0,63	71	58
VAAZ C 500- 1,27m ³ /s-0Pa M71-8	8	710	1,27	45	0,13	0,45	0,8	0,09	0,45	64	51
VAAZ C 500- 1,0 m ³ /s-0Pa M71-10	10	575	1	30	0,065	0,2	0,5	0,035	0,24	59	46
VAAZ C 500-0,82 m ³ /s-0Pa M71-12	12	460	0,82	20	0,075	0,25	0,4	0,03	0,25	55	42
VAAZ C 630-4,5 m ³ /s-0Pa M80-4	4	1370	4,5	240	1,2	2,8	12	1,1	3	91	78
VAAZ C 630-3,2 m ³ /s-0Pa M80-6	6	940	3,2	110	0,5	1,2	3,8	0,37	1,2	81	68
VAAZ C 630-2,3 m ³ /s-0Pa M80-8	8	690	2,3	70	0,28	0,9	2,6	0,25	1	76	62
VAAZ C 630-1,9 m ³ /s-0Pa M80-10	10	560	1,9	50	0,26	0,8	1,6	0,14	0,8	71	58
VAAZ C 630-1,6m ³ /s-0Pa M80-12	12	465	1,6	35	0,15	0,43	0,8	0,05	0,44	69	56
VAAZ C 800-7,4 m ³ /s-0Pa M100-6	6	950	7,4	170	2,2	4,5	21,5	1,8	4,6	89	74
VAAZ C 800-5,7 m ³ /s-0Pa M100-8	8	720	5,7	95	1	2,7	10,7	0,9	2,8	81	68
VAAZ C 800-4,5 m ³ /s-0Pa M100-10	10	580	4,5	65	0,65	2,4	7,2	0,45	2,5	76	62
VAAZ C 800-4,0m ³ /s-0Pa M100-12	12	480	4	45	0,36	1,55	3,7	0,37	1,6	71	57
VAAZ C 800-2,9 m ³ /s-0Pa M100-16	16	350	2,9	25	0,27	1	1,5	0,09	1	67	53
VAAZ C 1000-10,8 m ³ /s-0Pa M132-8	8	710	10,8	155	2,8	5,6	22	2,2	5,7	90	75
VAAZ C 1000-8,7 m ³ /s-0Pa M132-10	10	570	8,7	100	1,6	4,5	16,5	1,5	4,75	83	69
VAAZ C 1000-7,3 m ³ /s-0Pa M132-12	12	480	7,3	75	1,05	4,2	9,6	0,75	4,3	78	63
VAAZ C 1000-5,4 m ³ /s-0Pa M132-16	16	350	5,4	55	0,52	1,8	4	0,3	1,9	70	55
VAAZ C 1000-4,5 m ³ /s-0Pa M132-16	16	300	4,5	45	0,36	0,87	1,3	0,15	0,95	66	51
VAAZ C 1250-14,0 m ³ /s-0Pa M132-10	10	570	14	120	3,4	8,7	31	2,5	8,8	84	71
VAAZ C 1250-12,5 m ³ /s-0Pa M132-12	12	465	12,5	90	2,3	7,5	17,5	1,9	8,4	80	66
VAAZ C 1250-9,2 m ³ /s-0Pa M132-16	16	350	9,2	51	1,1	3,75	8,4	0,75	3,8	74	59
VAAZ C 1250-8,9 m ³ /s-0Pa M132-12	12	330	8,9	45	1,3	3,65	4,8	0,6	3,75	73	58
VAAZ C 1250-7,4 m ³ /s-0Pa M132-16	16	280	7,4	33	0,75	1,75	2,6	0,33	1,8	70	54



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