

Movement by Perfection



Fans

for transformer cooling
06/2017 edition

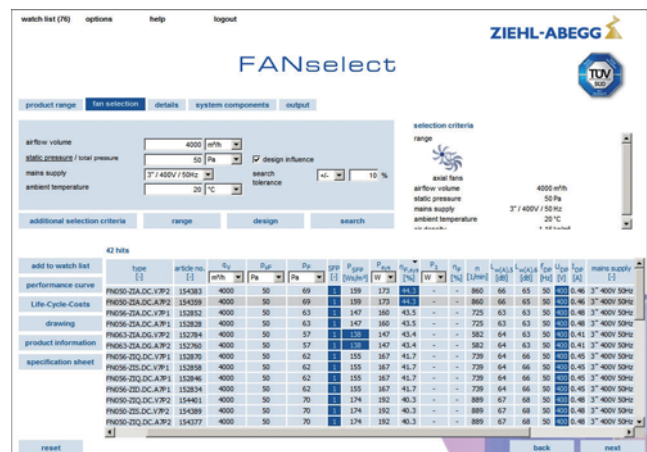
The Royal League in ventilation, control and drive technology

Using air intelligent-ly

Air is always there but is hardly perceived consciously. Directing air in a specific form of movement is the competence of ZIEHL-ABEGG. As the world's leading provider of fans with adapted control technology, ZIEHL-ABEGG relies on the efficiency and reliability of the products. With the trailblazing solutions from ZIEHL-ABEGG, customers use air and energy optimally for their individual requirements.

FANselect The fan selection program

With the first fully comprehensive certified fan selection program FANselect the customer can find the optimum fans and system components for his needs conveniently, precisely and quickly. The specified values conform to reality. They are determined in the ZIEHL-ABEGG InVent technology centre which houses the world's biggest combined air and noise test benches of the ventilation system branch. More information on www.fanselect.info



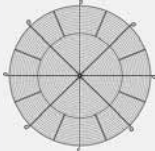



Other catalogues

In the ZIEHL-ABEGG catalogues, the reader can find out all about ZIEHL-ABEGG fans, motors and the perfectly adapted control technology. All the catalogues are available on www.ziehl-abegg.de website in the "Downloads" section.



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ZAvblue

ZIEHL-ABEGG

Die Königsklasse

*der Lufttechnik,
Regeltechnik und Antriebstechnik*

**Mehr
Volumen
bei kleinerer
Baugröße**



Welcome to the world of ZIEHL-ABEGG

Top technology "Made by ZIEHL-ABEGG"

A pioneering spirit and the courage of innovation were the driving forces behind Emil Ziehl's development of his first external rotor motor over a hundred years ago. With this he laid the corner stone for the success story of ZIEHL-ABEGG in 1910. Today, the family company ZIEHL-ABEGG, with its headquarters in Künzelsau, develops, produces and sells high quality, high-tech components: Fans, special electric motors and their perfectly adapted, state-of-the-art control technology. Still today, Emil Ziehl's pioneering spirit is the motivator for making good even better and finding new, revolutionary solutions. ZIEHL-ABEGG is based in Southern Germany but is at home all over the world. At the world-wide production and sales sites, thousands of employees develop, produce and sell technical, economical and ecological progress.

Welcome to the world of ventilation, control and drive technology.

Your contact into the world of ZIEHL-ABEGG

Would you like to learn more about the company ZIEHL-ABEGG, its products and applications? Your current direct contact partners can always be found at www.ziehl-abegg.com



One-stop expertise



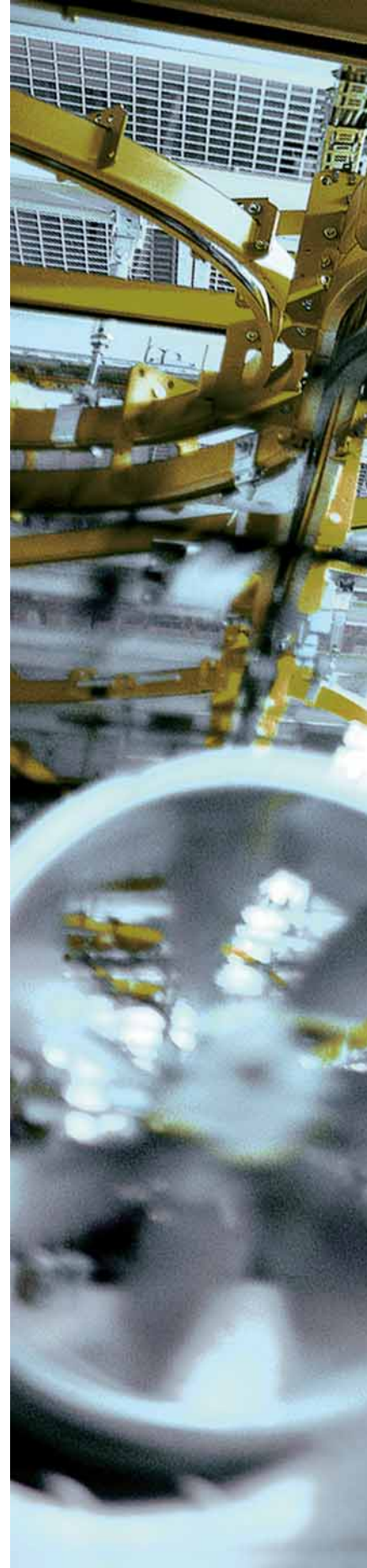
Fan, motor and control technology

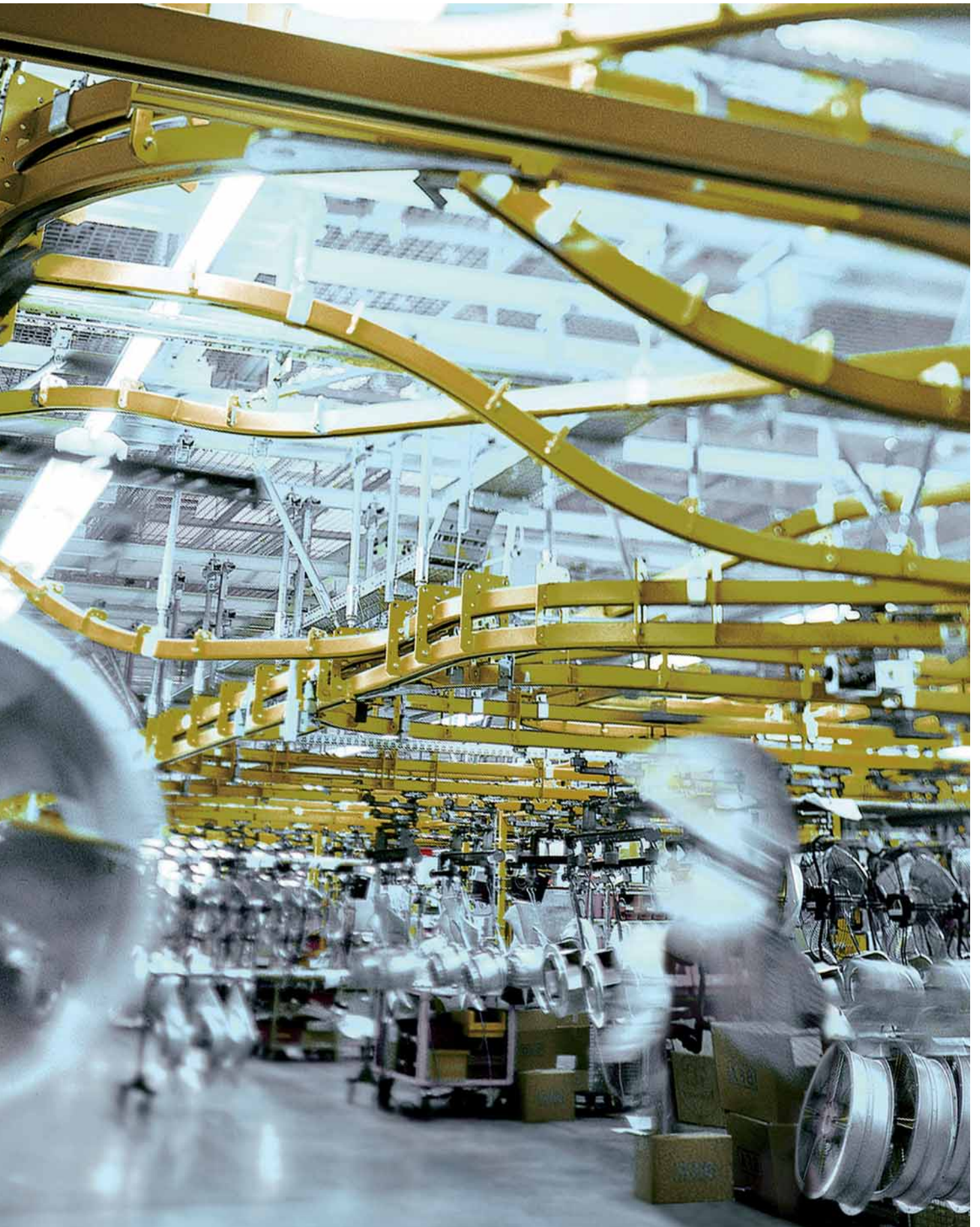
Whether air conditioning, drying, cooling or ventilating, the efficient fans with adapted drive and control technology from ZIEHL-ABEGG cope with these tasks safely and reliably. Individual and also complex customer requirements are welcome challenges.

At ZIEHL-ABEGG headquarters in Künzelsau, more than 300 engineers and technicians concentrate daily on finding the best solution. In the InVent, one of the most modern technology centres of its kind, they work on the innovations of the future. Their ideas are put into practice by excellently trained specialists on state-of-the-art plants. The production as well as all processes are accompanied by prudent quality management. ZIEHL-ABEGG products are subjected to rigorous testing before being put into operation at the customer's. On the world's biggest air and noise test bench, vibrations and external noises are eliminated and thus ensure top class fan measurements in accordance with ISO and DIN. The result is top class products and services which are marked by the seals "Premium Quality" and "Premium Efficiency".

The world's most modern and largest test-bench for fans at the main location in Künzelsau

Right picture:
Most modern production lines for fans with the highest demands in the world





Information

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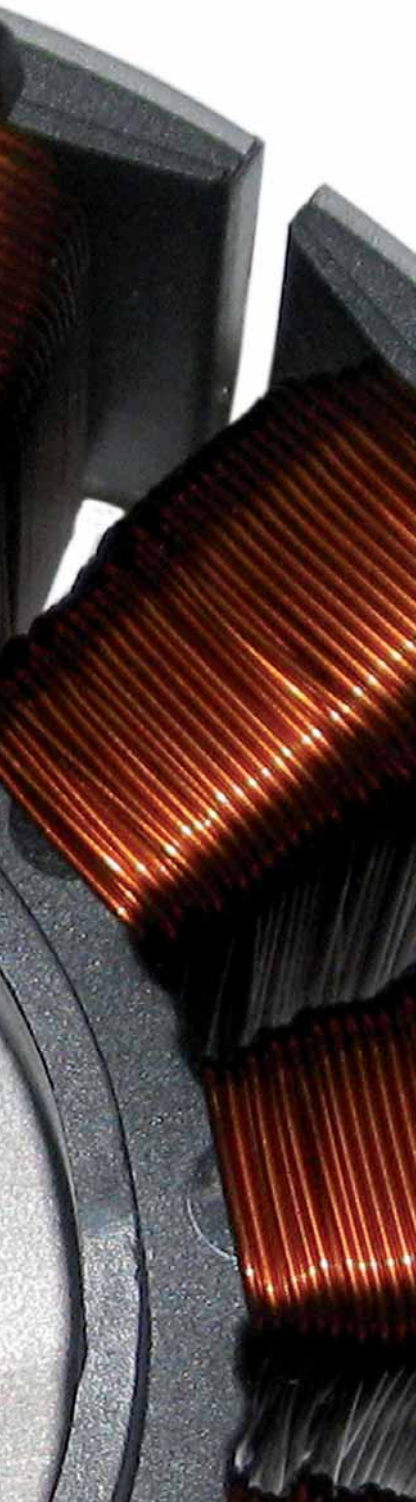
Control technology

Appendix

EC fans of the Royal League

Quiet, efficient, environmentally friendly

EC fans from ZIEHL-ABEGG unite state-of-the-art motor technology with innovative aerodynamics. This symbiosis scores high marks by merging revolutionary ECblue technology with premium fans. The result is efficiency and absolutely economical operation. The new generation of axial fans heads the ECblue technology: The FE2owlet has biologically designed rotor blades for almost noiseless conveyance of air. Moreover, the FE2owletbio is made from 100% recyclable bio-polyamides. Further highlights of material development at ZIEHL-ABEGG are shown in the Cpro centrifugal fan with the new ZAmid® technology. The new high performance composite material is as hard as steel but only half the weight. This is kind on the bearings and saves energy. Greater efficiency also comes from the newly developed blade geometry in the centrifugal impellers which has only become possible thanks to the innovative composite material. In standard application, EC-fans achieve maximum volume flows with extraordinary efficiency despite their low noise. Together with the ECblue motors, ZIEHL-ABEGG fans achieve a dynamic response which makes them absolute leaders in environmental friendliness and efficiency.

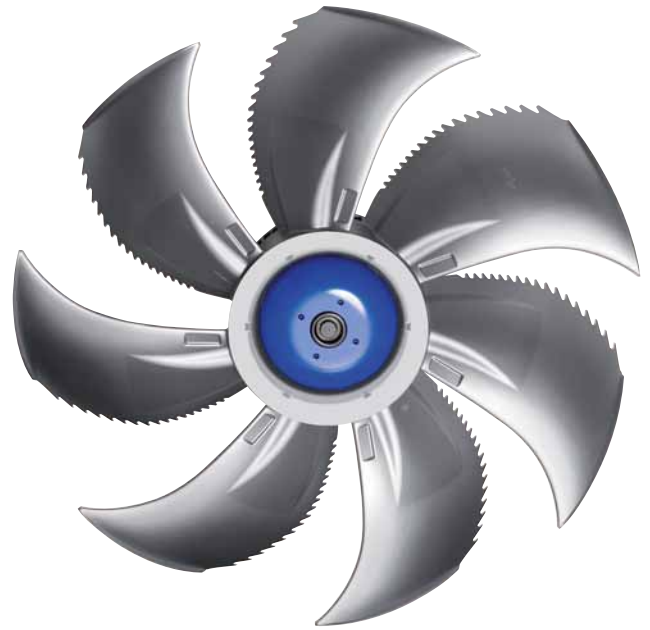


ECblue motor technology

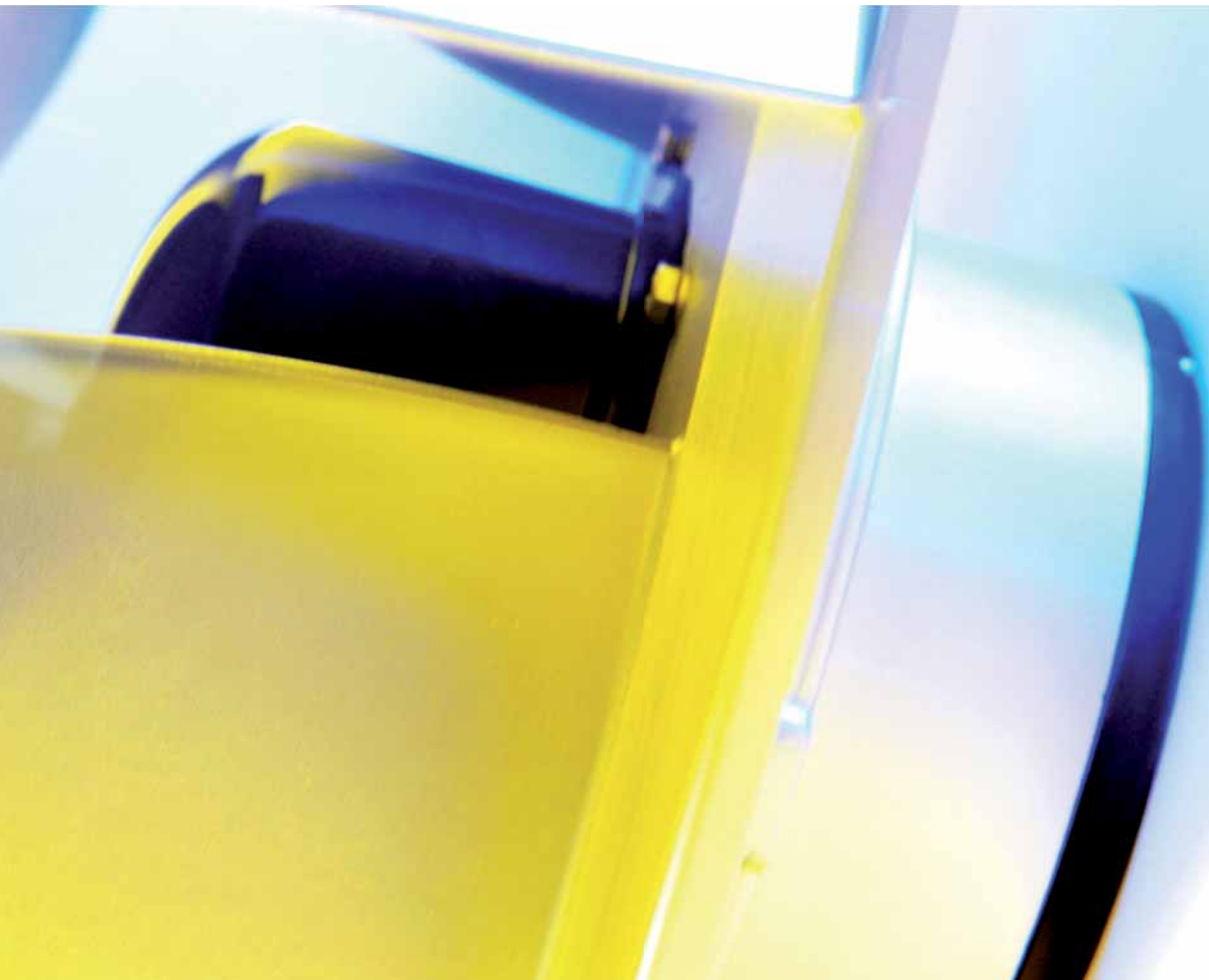




Maximum efficiency and minimum consumption
ECblue with the latest **ZAmid**® Technology
Radial fans sector



Unique bionic profile FE2owlet,
combined with ECblue technology



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AC-fans of the Royal League



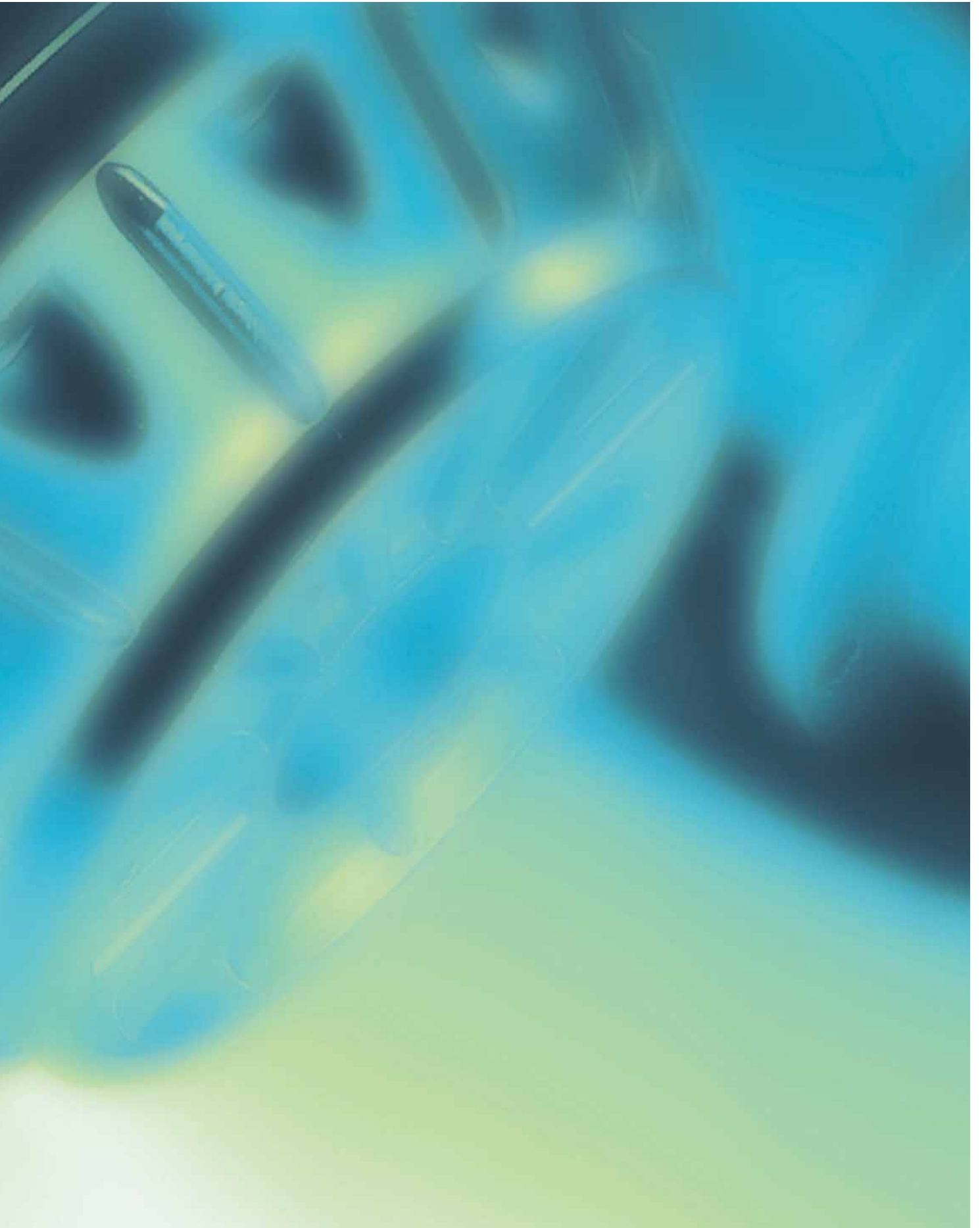
Strong, robust, extraordinary

In all applications in which the material is exposed to immense stress, the AC fans from ZIEHL-ABEGG demonstrate their quality and ability. Their solid components and robust design and technology are able to withstand even the greatest stresses. The fans are therefore used in many different areas of industry or agriculture - wherever absolute insensitivity and stability is important.

The high quality motor technology is the result of decades of experience at ZIEHL-ABEGG. Intelligently used components such as the Fcontrol frequency inverter make them environmentally friendly and efficient key players. Maintenance-free and extraordinarily performant, AC fans from ZIEHL-ABEGG are a safe and rewarding investment.

AC motor technology, robust in operation





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Expertise in ventilation

ErP directive

With the Kyoto protocol, the European Union pledged to reduce CO₂ emissions by at least 20 per cent by the year 2020. One measure for achieving this is the ErP directive for improved energy efficiency and general environmental compatibility of electrical equipment – also known in Germany as the Eco Design directive. It supports a resource-friendly and energy-efficient product design. With the implementation of the ErP directive, stricter efficiency requirements for fans in the output range from 125 W to 500 kW apply since 2013 and 2015 in two stages. A further stage is planned for 2020. Energy efficiency is thus given the same standing as the compliance with the low voltage or EMC directive. The system efficiency requirement is a prerequisite for a CE mark and is thus essential for a product to be used in EU member states. An own label as for refrigerators is not planned for fans because the fan manufacturers do not usually have any influence on the installation conditions.

Products for use in EU countries and world-wide markets are listed in this catalogue. For the fans for the EU countries, the respective ErP identification is included directly in the description of the fan.



The **European Ventilation Industry Association (EVIA)** represents the European ventilation industry with national and European institutions.

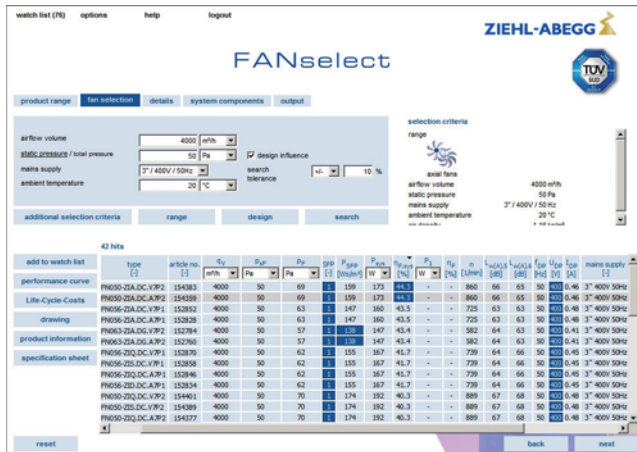
The EVIA is the key platform for fan manufacturers and is their interface to politicians, decision-makers in the European Union, and other associations that use fans in their products. The EVIA supports the use of high efficiency fans in Europe to implement the EU targets for increased efficiency.

ZIEHL-ABEGG played a leading role in its foundation and supports the EVIA with active involvement in its working groups. ZIEHL-ABEGG also provides the chairman.



Selection program FANselect

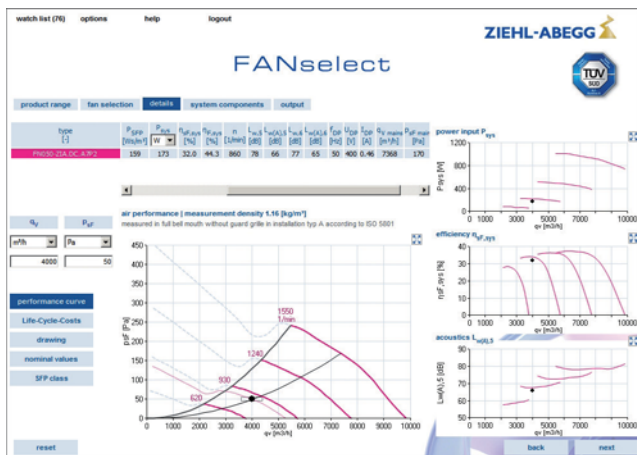
The world's best selection program for fans



At www.fanselect.info, we are offering you FANselect, a selection program for axial and centrifugal fans with the matching system components.

With FANselect, you can, for instance, select and calculate the fans listed in this catalogue. FANselect provides you with an option to calculate the efficiency, the acoustics, the SFP and much more. In addition, you can also select the matching systems components. You can conveniently save your configuration in a file or print it out.

The FANselect selection program, including the customer DLL, is available for you to download at any time at www.fanselect.info.



Application transformer cooling

General information

As globally important connection points to ensure a reliable electricity supply, power transformers play a key role in society and its infrastructure. This kind of system can be found in electricity plants, substations, solar and wind-driven power stations and in many other areas of energy generation and distribution.

During operation, heat losses occur. These are concentrated in what are known as hot spots and significantly inhibit the service life of the transformer. Overheating of the winding core would bring the system to a stop, which could result in a "blackout".

Reliable cooling must be guaranteed, so the reliability of the fans used is of huge importance. According to studies by the University of Stuttgart, the service life of a transformer is reduced by a factor of 2 if the hot spot temperature increases by just 6 K. For decades, axial and radial flow fans have proved effective for use with powerful directly and indirectly air-cooled transformers.

ZIEHL-ABEGG fans produce an optimised, uniform air movement within the system, which is crucial to ensure a long transformer service life.

This ensures long-term compliance with worldwide regulations for efficiency, noise emissions and safety issues.

With its innovative developments based on over 100 years of experience, ZIEHL-ABEGG provides premium quality state-of-the-art technology.

Standards

This complies with the EN 50216-12 standard applicable in Europe, which describes fans in oil/air coolers for transformers.

The fan drive meets the requirements of the internationally applicable IEC 60034-1 standard. Further installation and usage information can be found in the Appendix to this catalogue.

Example oil transformer





Example dry transformer

Dry transformers

In this design, the high-voltage winding is cast in resin, while other solid insulating materials are used in the low-voltage winding. Insulation of the coils from one another and from the core is guaranteed by sufficiently large air gaps. A vertical air flow along the surfaces of the coils and in cooling ducts in the coils ensures dissipation of the heat losses.

Oil transformer

A transformer that is completely installed in a vessel containing oil that circulates between the winding and heat exchangers. The oil provides insulation and cooling, enabling transformers to be operated at higher power.

Whether they are used for electrical power generation, transmission and distribution or for industrial and special applications, oil transformers have to satisfy the very highest standards in terms of reliability and efficiency, and meet constantly increasing performance requirements. To guarantee this, reliable temperature management is a prerequisite. To achieve this, radiators emit the heat to the ambient air, supported by fans.

Technical description

FE2owlet

Product specification for transformer cooling

Fluted, sickle-shaped blades based on bionic insights. Available frame sizes 450 - 1,250 mm, volume flow rates up to 52,000 m³/h and static pressure increase up to 418 Pa.

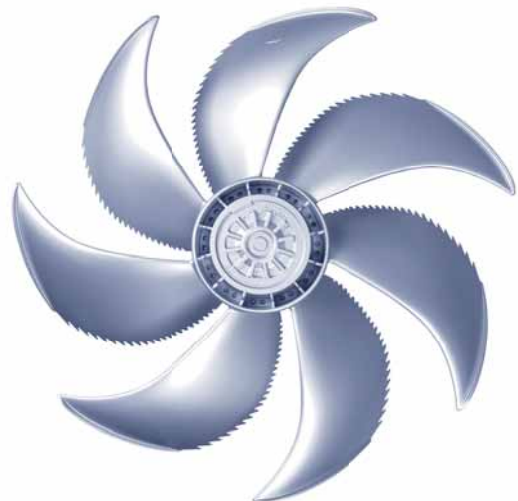
Characteristics and special features

- Maximum quality in all components
- Reliable motor protection
- Optimum corrosion protection (resistance in salt spray test complying with ISO 9227)
- Very smooth running and high durability due to dynamic balancing in 2 planes
- Low operating costs due to optimum efficiency with minimum noise emissions
- High flexibility due to 100% speed controlled volume flow rate
- Compact dimensions for every installation situation
- Meets ErP directive (327/2011)
- Numerous approvals (incl. VDE, UL, CCC, CE)

Motor concepts

External rotor motors

- ECblue EC technology with integrated controller matched to the fan
- Efficient continuous RPM control via 0-10V PWM and MODBUS
- Easy connection to common bus systems (actuation/data acquisition)
- Integrated motor protection
- Active temperature management
- Top EMC standard
- Degree of protection (IEC 60259) IP54, IP55 optional
- AC technology
- Voltage controllable
- Degree of protection (IEC 60259) IP54, IP55 optional
- Thermal contact for monitoring the winding temperature



Technical description

FE2owlet with ZAplus

Product specification for transformer cooling

Optimised full nozzle with guide vane, motor suspension, and short diffuser. Fluted, sickle-shaped blades based on bionic insights. Available frame sizes 450 - 910 mm, volume flow rates up to 36,500 m³/h and static pressure increase up to 420 Pa.

Characteristics and special features

- Intelligent ventilation system with built-in efficiency guarantee
- Extremely low operating costs due to optimum efficiency with minimum noise emissions as a result of bionic blade design and aerodynamically optimised ZAplus nozzle
- High flexibility due to 100% speed controlled volume flow rate
- High corrosion protection with corrosion-free nozzle made of high-performance composite material
- Very smooth running and high durability due to dynamic balancing in 2 planes
- Fast and easy assembly, as no packaging is required
- Meets ErP directive (327/2011)
- Numerous approvals (incl. VDE, UL, CCC, CE)

Motor concepts

External rotor motors

- ECblue EC technology with integrated controller matched to the fan
- Efficient continuous RPM control via 0-10V PWM and MODBUS
- Easy connection to common bus systems (actuation/data acquisition)
- Integrated motor protection
- Active temperature management
- Top EMC standard
- Degree of protection (IEC 60259) IP54, IP55 optional
- AC technology
- Voltage controllable
- Degree of protection (IEC 60259) IP54, IP55 optional
- Thermal contact for monitoring the winding temperature



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Technical description

MAXvent owlet - On request

Product specification for transformer cooling

Medium pressure axial fan with high efficiency and higher performance due to high-output internal rotor motor. Blade adjustment angle that can be factory-set in order to meet the precise operating point requirements. Corrosion protection up to C5-M (based on DIN EN ISO 12944) possible, allowing use even in off-shore applications. Available frame sizes 315 - 1400 mm, volume flow rates up to 94,653 m³/h and static pressures up to 870 Pa.

Characteristics and special features

- High output density as a result of internal rotor motors
- Corrosion protection up to C5-M for off-shore applications
- Low operating costs due to optimum efficiency
- Housing complying with Eurovent
- Very smooth running and high durability due to dynamic balancing in two planes
- Complies with ERP directive (327/2011)
- ATEX (optional)

Motor concepts

Internal rotor motors

- AC technology



Technical description

Q series

Product specification for transformer cooling

Cross-flow fans/cross-flow blower with 78 to 125 mm drum diameter and component lengths up to 780 mm. Housing with flow at 180° made of stable extruded aluminium profile.

Characteristics and special features

- Homogeneous and large-area winding cooling
- Low noise emission

Motor concepts

External rotor motors

- AC technology
- Voltage controlable
- Degree of protection (IEC 60259) IP10
- Thermal contact for monitoring the winding temperature



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S series

Product specification for transformer cooling

Double-sided extracting centrifugal fan in compact housing with forwards-curved blades. Available in frame size 130. This allows for volume flow rates of up to 725 m³/h and static pressures of up to 345 Pa.

Characteristics and special features

- Targeted winding cooling at hot spot
- Compact design
- High output density
- Low noise emission

Motor concepts

External rotor motors

- EC-Technology ECblue with integrated controller matched to the fan
 - Efficient continuous RPM control via 0-10V PWM
 - Integrated motor protection
 - Active temperature management
 - Top EMC standard
 - Degree of protection (IEC 60259) IP54
- AC-Technology
 - Voltage controllable
 - Degree of protection IP44; depending on installation and position as per EN60334-5
 - Thermal contact for monitoring the winding temperature



Type key

Crossflow fans

Example

QR 08A - G I M . 50 . D B

Cross flow fan

Version

with perforated guide vane **K**
90° flow **R**

Size (impeller diameter) approx.

06 cm
08 cm
10 cm
12 cm

Motor mounted on side A

Number of poles

2 pole **2**
4 pole **4**
DC **G**

Type of current

single phase alternating current **E**
three phase alternating current **D**
electrical DC motor with integrated controller **I**

External rotor motor

Component length

in cm, starting from 100 cm alpha numeric
example B8 = 118 cm

Motor size

Length of motor

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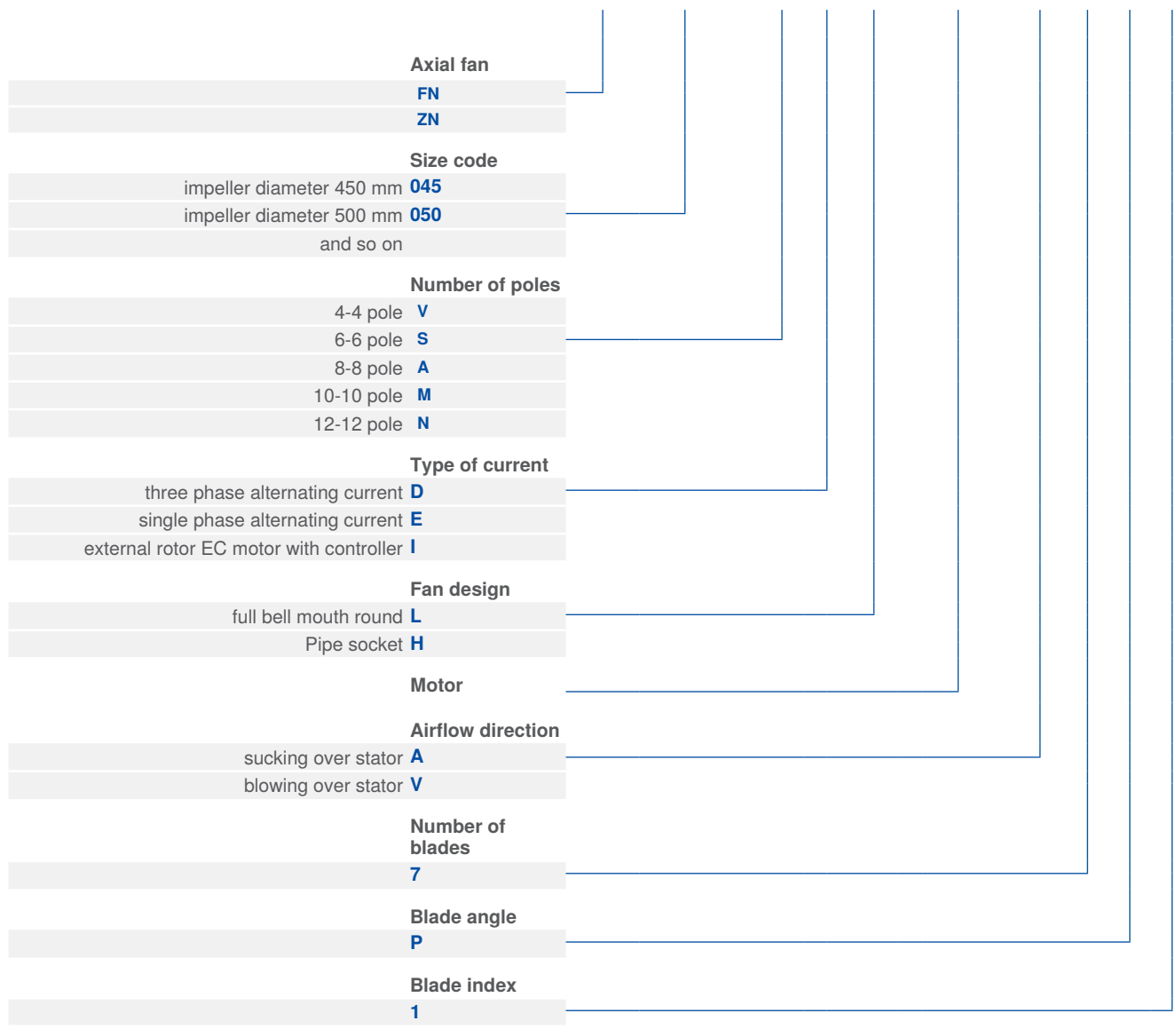
Appendix

Type key

Axial fans

Example

FN 050 - S D L . 4I . A 7 P 1



Extension article no.

Axial fans

Other mechanical variants can be ordered directly under the existing basic number plus additional article no. extension.

Example **168903 / 1 0 K 1**

Motor ingress protection		Corrosion protection*	
IP54	version 1	1	
IP54	version 2	2	
IP54	version 3	3	
IP55	version 1	4	
IP55	version 2	5	
IP55	version 3	6	

Colour	
Housing unpainted / ZAlplus black matt	0
RAL 9006 / white aluminium	1
RAL 7030 / stone grey	2
RAL 7031 / blue grey	3
RAL 7032 / pebble grey	4
RAL 7033 / cement grey	5
RAL 7035 / light grey	6
RAL 7038 / agate grey	7
RAL 9005 / jet black	8
RAL 9002 / grey white	9
ANSI 70 / light grey	A
BS 381 / admiral grey	B

Connection	Rating plate
D	Label K
Y	Label L
EC	Label C

Guard grille	
without	0
steel on suction side	1
steel on pressure side	2
steel on both sides	3
stainless steel on suction side	4
stainless steel on pressure side	5
stainless steel on both sides	6
steel on suction side / stainless steel on pressure side	7
OSHA on suction side / IP2X steel	8
OSHA on both sides / IP2X steel	9

Other versions on request.

*Corrosion protection

	version 1	version 2	version 3
Resistance salt spray test according to ISO 9227	480 hrs	720 hrs	1440 hrs
In dependence to DIN EN ISO 12944	C1 very low – C3 medium	C4 high – C5-I very high (industrial)	C5-M very high (industrial)



Oil transformer cooling

Product overview

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Fans overview

EC technology

FE2owlet-ECblue 3~380-480 V 50/60 Hz							
Volume flow rate at $p_{st} = 0\text{Pa}$		Motor input power P_{sys} W	Sound power level suction side L_{WA5} dB(A)	Speed n min ⁻¹	Size mm	Type	
q_v m ³ /s	q_v m ³ /h						
2.5	9072	740	81	1550	500	FN050-ZIL.DC.A7P2	Page 30
3.6	12965	780	79	1200	630	FN063-ZIL.DG.A7P2	Page 32
4.0	14369	580	75	960	710	FN071-ZIL.DG.A7P3	Page 34
4.8	17179	620	71	700	800	FN080-ZIL.DG.A5P4	Page 40
5.7	20407	1500	86	1150	710	FN071-ZIL.GG.A7P4	Page 36
6.6	23843	1400	82	950	800	FN080-ZIL.GG.A7P3	Page 42
6.9	24995	2700	92	1400	710	FN071-ZIL.GL.A7P4	Page 38
7.7	27838	2200	88	1100	800	FN080-ZIL.GL.A7P3	Page 44
8.1	29286	980	77	710	1000	FN100-ZIL.GG.A5P1	Page 46
9.8	35296	1650	83	850	1000	FN100-ZIL.GL.A5P1	Page 48
12.3	44132	1300	78	570	1250	FN125-ZIL.GL.A3P1	Page 50
14.4	50793	2000	81	650	1250	FN125-ZIL.GQ.A3P1	Page 52

FE2owlet-ECblue with ZAplus 3~380-480 V 50/60 Hz							
Volume flow rate at $p_{st} = 0\text{Pa}$		Motor input power P_{sys} W	Sound power level suction side L_{WA5} dB(A)	Speed n min ⁻¹	Size mm	Type	
q_v m ³ /s	q_v m ³ /h						
2.6	9447	760	82	1550	500	ZN050-ZIL.DC.V7P2	Page 100
3.8	13619	740	79	1200	630	ZN063-ZIL.DG.V7P2	Page 102
4.2	14968	620	77	960	710	ZN071-ZIL.DG.V7P3	Page 108
4.8	17128	620	74	700	800	ZN080-ZIL.DG.V5P4	Page 114
4.8	17327	1550	85	1270	630	ZN063-ZIL.GG.V7P3	Page 104
5.1	18316	440	73	570	910	ZN091-ZIL.DG.V4P3	Page 120
5.6	20028	1500	84	1150	710	ZN071-ZIL.GG.V7P4	Page 110
6.1	21982	3100	92	1600	630	ZN063-ZIL.GL.V7P3	Page 106
6.5	23294	1550	82	950	800	ZN080-ZIL.GG.V7P3	Page 116
6.8	24312	2700	90	1400	710	ZN071-ZIL.GL.V7P4	Page 112
7.4	26787	2300	86	1100	800	ZN080-ZIL.GL.V7P3	Page 118
7.5	27074	1400	86	930	910	ZN091-ZIL.GG.V5P1	Page 122
8.9	32002	2300	92	1110	910	ZN091-ZIL.GL.V5P1	Page 124



AC technology 50 Hz

FE2owlet 3~400 V 50 Hz							
Volume flow rate at $p_{sF} = 0\text{Pa}$		Motor input power P_1 W	Sound power level suction side L_{WAS} dB(A)	Speed n min^{-1}	Size mm	Type	
q_v m^3/s	q_v m^3/h						
0.85	3044	65	54	620	450	FN045-ADL.4C.A7P1	Page 58
1.28	4612	170	66	930	450	FN045-SDL.4F.A7P1	Page 56
1.93	6930	460	76	1390	450	FN045-VDL.4F.A7P1	Page 54
1.2	4215	120	62	680	500	FN050-ADH.4C.A7P1	Page 70
1.23	4422	110	58	680	500	FN050-ADL.4C.A7P1	Page 68
1.6	5764	260	70	900	500	FN050-SDH.4F.A7P1	Page 66
1.67	6016	220	67	920	500	FN050-SDL.4F.A7P1	Page 64
2.3	8359	650	81	1310	500	FN050-VDH.4I.A7P1	Page 62
2.45	8804	600	75	1340	500	FN050-VDL.4I.A7P1	Page 60
3.0	10726	480	73	930	630	FN063-SDL.4I.A7P1	Page 74
4.4	15668	1500	89	1420	630	FN063-VDL.6N.A7P6	Page 72
3.0	10642	330	68	710	710	FN071-ADL.6F.A7P1	Page 78
4.0	14231	680	74	950	710	FN071-SDL.6K.A7P1	Page 76
4.7	16937	700	72	680	800	FN080-ADL.6N.V7P5	Page 84
2.0	7105	110	52	290	800	FN080-NDL.6N.V7P5	Page 86
6.0	21667	1400	77	850	800	FN080-SDL.6N.V7P5	Page 82
6.3	22597	1500	79	900	800	FN080-SDL.6N.V7P5	Page 80
7.9	28399	1050	76	680	1000	FN100-ADL.7M.A5P1	Page 90
6.5	23488	700	72	570	1000	FN100-MDL.7M.A5P1	Page 92
5.3	18961	400	65	470	1000	FN100-NDL.7M.A5P1	Page 94
10.0	36022	2200	84	870	1000	FN100-SDL.7Q.A5P1	Page 88
11.8	42472	1550	79	550	1250	FN125-MDL.7Q.A3P1	Page 96
9.8	35378	940	74	450	1250	FN125-NDL.7Q.A3P1	Page 98

FE2owlet with ZAPlus 3~400 V 50 Hz							
Volume flow rate at $p_{sF} = 0\text{Pa}$		Motor input power P_1 W	Sound power level suction side L_{WAS} dB(A)	Speed n min^{-1}	Size mm	Type	
q_v m^3/s	q_v m^3/h						
1.25	4529	113	60	692	500	ZN050-ADL.4C.V7P1	Page 134
1.3	4769	170	67	930	450	ZN045-SDL.4F.V7P1	Page 128
2.0	7113	460	77	1380	450	ZN045-VDL.4F.V7P1	Page 126
1.7	5956	230	68	910	500	ZN050-SDL.4F.V7P1	Page 132
2.4	8789	640	78	1340	500	ZN050-VDL.4I.V7P1	Page 130
2.2	8022	230	66	690	630	ZN063-ADL.4I.V7P1	Page 142
3.0	10915	460	74	920	630	ZN063-SDL.4I.V7P1	Page 140
4.6	16578	1350	86	1420	630	ZN063-VDL.6N.V7P6	Page 136
5.4	19523	2100	89	1360	630	ZN063-VDL.6N.V7P7	Page 138
2.9	10376	330	71	710	710	ZN071-ADL.6F.V7P1	Page 146
3.9	14033	660	78	950	710	ZN071-SDL.6K.V7P1	Page 144
4.7	16742	700	75	680	800	ZN080-ADL.6N.V7P5	Page 152
3.1	11218	270	66	450	800	ZN080-NDL.6N.V7P5	Page 154
5.9	21381	1400	82	840	800	ZN080-SDL.6N.V7P5	Page 150
6.2	22268	1500	83	900	800	ZN080-SDL.6N.V7P5	Page 148
5.5	19888	680	77	690	910	ZN091-ADL.6N.V7P2	Page 160
3.6	13092	240	65	460	910	ZN091-NDL.6N.V7P2	Page 162
7.4	26639	1450	85	930	910	ZN091-SDL.6N.V7P2	Page 158
10.6	38079	4200	94	1300	910	ZN091-VDL.7Q.V5P1	Page 156

Fans overview

AC technology 60 Hz

FE2owlet 3~460 V 60 Hz							
Volume flow rate at $p_{st}=0\text{Pa}$		Motor input power	Sound power level suction side	Speed	Size	Type	
q_v m ³ /s	q_v m ³ /h	P_1 W	L_{WA5} dB(A)	n min ⁻¹	mm		
0,94	3387	95	57	690	450	FN045-ADL.4C.A7P1	Page 58
1,5	5397	260	70	1090	450	FN045-SDL.4F.A7P1	Page 56
1,35	4892	170	66	780	500	FN050-ADH.4C.A7P1	Page 70
1,44	5201	150	64	800	500	FN050-ADL.4C.A7P1	Page 68
1,85	6604	400	74	1030	500	FN050-SDH.4F.A7P1	Page 66
1,94	6989	350	70	1070	500	FN050-SDL.4F.A7P1	Page 64
2,7	9676	1000	85	1510	500	FN050-VDH.4I.A7P1	Page 62
2,84	10220	920	79	1550	500	FN050-VDL.4I.A7P1	Page 60
3,5	12602	780	78	1090	630	FN063-SDL.4I.A7P1	Page 74
5,1	18503	2400	94	1670	630	FN063-VDL.6N.A7P6	Page 72
3,5	12667	500	72	840	710	FN071-ADL.6F.A7P1	Page 78
4,7	16986	1050	78	1120	710	FN071-SDL.6K.A7P1	Page 76
5,4	19566	1100	75	780	800	FN080-ADL.6N.V7P5	Page 84
2,0	7083	140	52	280	800	FN080-NDL.6N.V7P5	Page 86
6,7	24179	2100	80	940	800	FN080-SDL.6N.V7P5	Page 82
9,1	32889	1650	81	790	1000	FN100-ADL.7M.A5P1	Page 90
7,7	27730	1050	76	670	1000	FN100-MDL.7M.A5P1	Page 92
6,2	22288	600	69	550	1000	FN100-NDL.7M.A5P1	Page 94
11,4	41050	3400	88	990	1000	FN100-SDL.7Q.A5P1	Page 88
11,4	40892	1400	78	530	1250	FN125-NDL.7Q.A3P1	Page 98

FE2owlet with ZAplus 3~460 V 60 Hz							
Volume flow rate at $p_{st}=0\text{Pa}$		Motor input power	Sound power level suction side	Speed	Size	Type	
q_v m ³ /s	q_v m ³ /h	P_1 W	L_{WA5} dB(A)	n min ⁻¹	mm		
1,47	5295	163	64	809	500	ZN050-ADL.4C.V7P1	Page 134
1,5	5567	260	74	1080	450	ZN045-SDL.4F.V7P1	Page 128
2,3	8300	760	81	1610	450	ZN045-VDL.4F.V7P1	Page 126
1,9	6878	360	72	1050	500	ZN050-SDL.4F.V7P1	Page 132
2,8	10246	980	82	1560	500	ZN050-VDL.4I.V7P1	Page 130
2,6	9418	340	71	800	630	ZN063-ADL.4I.V7P1	Page 142
3,5	12756	720	78	1070	630	ZN063-SDL.4I.V7P1	Page 140
5,4	19469	2200	90	1680	630	ZN063-VDL.6N.V7P6	Page 136
3,4	12300	500	76	830	710	ZN071-ADL.6F.V7P1	Page 146
4,6	16582	1050	82	1120	710	ZN071-SDL.6K.V7P1	Page 144
5,3	19177	1050	79	780	800	ZN080-ADL.6N.V7P5	Page 152
3,6	13123	390	69	530	800	ZN080-NDL.6N.V7P5	Page 154
6,7	23947	2100	85	940	800	ZN080-SDL.6N.V7P5	Page 150
6,4	23138	1050	81	800	910	ZN091-ADL.6N.V7P2	Page 160
4,2	15229	350	69	530	910	ZN091-NDL.6N.V7P2	Page 162
8,6	30940	2300	89	1070	910	ZN091-SDL.6N.V7P2	Page 158



FE2owlet 3~400 V 60 Hz

Volume flow rate at $p_{sF} = 0\text{Pa}$		Motor input power P_1 W	Sound power level suction side L_{WAS} dB(A)	Speed n min^{-1}	Size mm	Type	
q_v m^3/s	q_v m^3/h						
0,83	3005	80	54	620	450	FN045-ADL.4C.A7P1	Page 58
1,3	4655	160	65	750	500	FN050-ADH.4C.A7P1	Page 70
1,42	4984	140	61	760	500	FN050-ADL.4C.A7P1	Page 68
1,4	5128	240	68	1040	450	FN045-SDL.4F.A7P1	Page 56
1,7	5974	110	49	240	800	FN080-NDL.6N.V7P5	Page 86
1,7	6078	360	72	950	500	FN050-SDH.4F.A7P1	Page 66
1,83	6596	320	69	1010	500	FN050-SDL.4F.A7P1	Page 64
2,55	9184	910	83	1430	500	FN050-VDH.4I.A7P1	Page 62
2,72	9791	820	78	1480	500	FN050-VDL.4I.A7P1	Page 60
3,4	12106	720	76	1050	630	FN063-SDL.4I.A7P1	Page 74
3,4	12314	460	71	820	710	FN071-ADL.6F.A7P1	Page 78
4,6	16592	980	78	1100	710	FN071-SDL.6K.A7P1	Page 76
5,0	17933	2300	93	1620	630	FN063-VDL.6N.A7P6	Page 72
5,1	18311	960	73	730	800	FN080-ADL.6N.V7P5	Page 84
6,0	21652	540	69	530	1000	FN100-NDL.7M.A5P1	Page 94
6,2	22332	1750	78	870	800	FN080-SDL.6N.V7P5	Page 82
7,5	27009	1000	75	650	1000	FN100-MDL.7M.A5P1	Page 92
8,7	31445	1500	79	750	1000	FN100-ADL.7M.A5P1	Page 90
10,7	38674	3000	86	930	1000	FN100-SDL.7Q.A5P1	Page 88
10,8	39048	1250	77	500	1250	FN125-NDL.7Q.A3P1	Page 98

FE2owlet with ZAPLUS 3~400 V 60 Hz

Volume flow rate at $p_{sF} = 0\text{Pa}$		Motor input power P_1 W	Sound power level suction side L_{WAS} dB(A)	Speed n min^{-1}	Size mm	Type	
q_v m^3/s	q_v m^3/h						
1,41	5084	149	62	779	450	ZN050-ADL.4C.V7P1	Page 134
1,5	5265	240	70	1030	450	ZN045-SDL.4F.V7P1	Page 128
1,8	6357	330	71	970	500	ZN050-SDL.4F.V7P1	Page 132
2,2	7845	720	79	1530	450	ZN045-VDL.4F.V7P1	Page 126
2,5	8974	310	69	760	630	ZN063-ADL.4I.V7P1	Page 142
2,7	9752	900	80	1480	500	ZN050-VDL.4I.V7P1	Page 130
3,3	11985	460	75	800	710	ZN071-ADL.6F.V7P1	Page 146
3,4	12197	660	77	1030	630	ZN063-SDL.4I.V7P1	Page 140
3,5	12661	350	68	500	800	ZN080-NDL.6N.V7P5	Page 154
4,1	14618	320	68	510	910	ZN091-NDL.6N.V7P2	Page 162
4,5	16159	960	82	1090	710	ZN071-SDL.6K.V7P1	Page 144
5,0	18091	940	77	730	800	ZN080-ADL.6N.V7P5	Page 152
5,3	18961	2100	89	1640	630	ZN063-VDL.6N.V7P6	Page 136
6,1	21960	1750	83	870	800	ZN080-SDL.6N.V7P5	Page 150
6,1	21978	960	79	760	910	ZN091-ADL.6N.V7P2	Page 160
8,1	29170	2100	87	1010	910	ZN091-SDL.6N.V7P2	Page 158

FE2owlet-ECblue

for three phase alternating current, 380-480 V

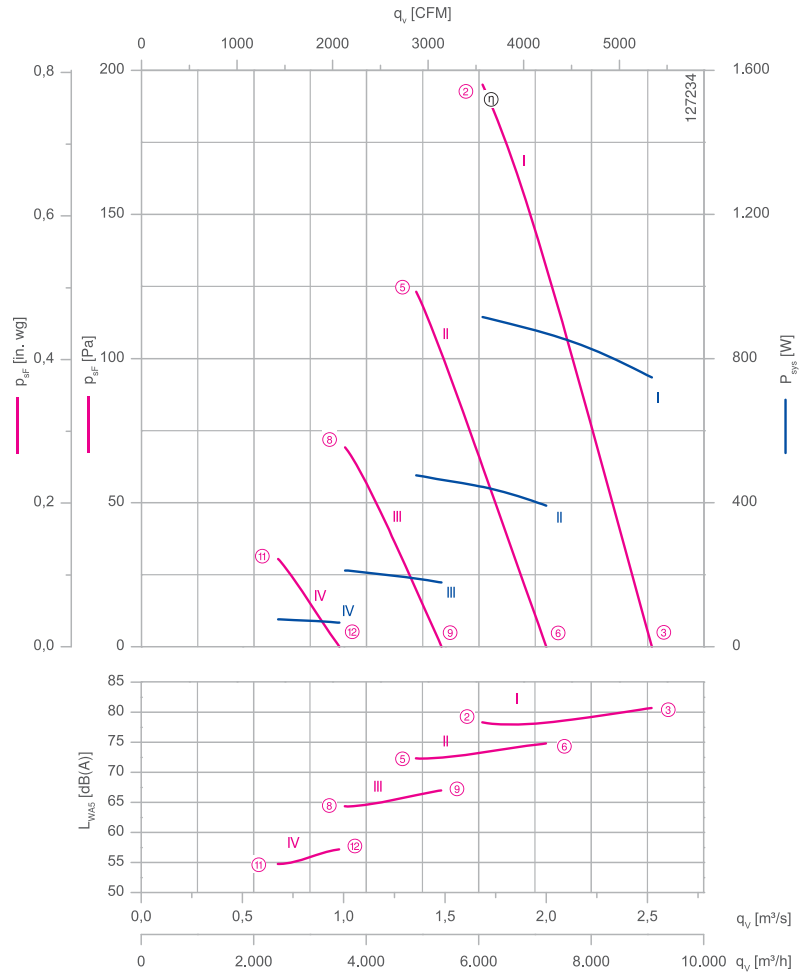
FN050



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 920 W*
 Rated current I_N : 1.55- 1.20 A*
 Rated speed n_n : 1550 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1550 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 740 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 2.5 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 60 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL
ErP-data
 Efficiency η_{statA} : 41.8 %
 Efficiency: $N_{actual} = 48.1 / N_{target} = 40$ **
 * Rated data
 **ErP 2015
 *** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

Connection diagram Page 250
1360-403

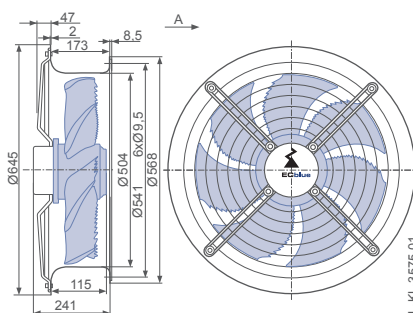
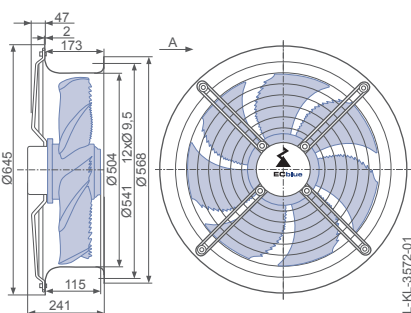
System components Page 184

Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side

Design L - round full bell mouth, guard grille two-sided






Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN050-ZIL.DC.A7P2	I	1550	②	1.45	920	78
			③	1.20	740	81
	II	1240	⑤	0.88	480	72
			⑥	0.78	390	75
	III	930	⑧	0.52	210	64
			⑨	0.46	180	67
	IV	620	⑪	0.28	75	55
			⑫	0.26	65	57

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN050-ZIL.DC.A7P2	FN050-ZIL.DC.A7P2
Article no.	175936/10C1	175936/10C3
Weight kg	18.50	19.90

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue

for three phase alternating current, 380-480 V

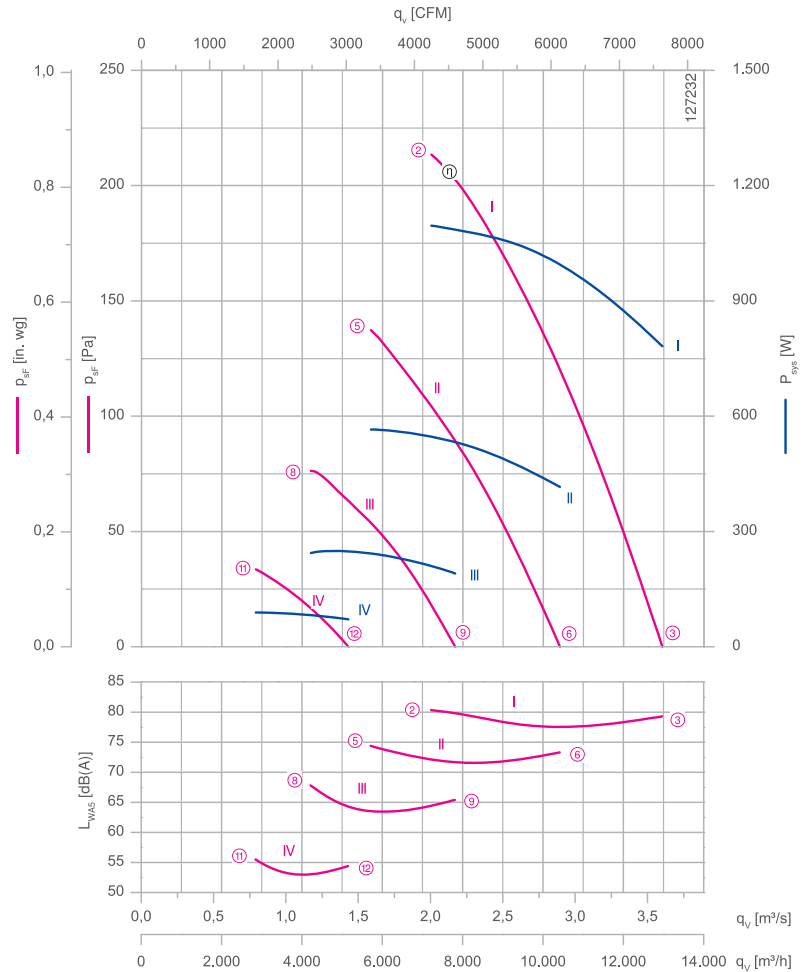
FN063



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 1.10 kW*
 Rated current I_N : 1.80- 1.45 A*
 Rated speed n_n : 1200 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1200 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 780 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 3.6 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 60 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 9005 (jet black)
 Conformity: ErP 2015, CE, UL
ErP-data
 Efficiency η_{statA} : 48.5 %
 Efficiency: $N_{actual} = 54.6 / N_{target} = 40$ **
 * Rated data
 **ErP 2015
 *** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

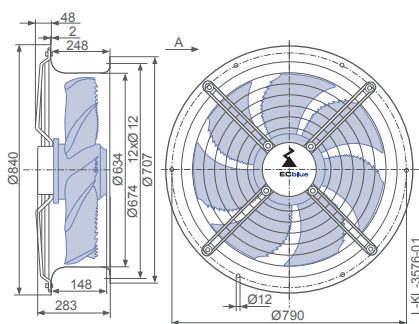
Connection diagram Page 250
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System components Page 184

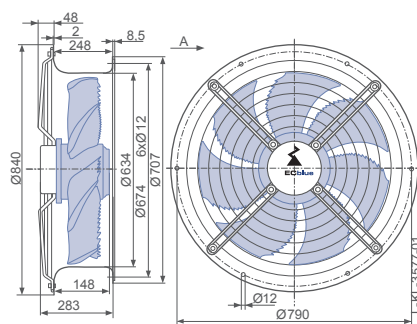
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided



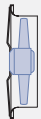

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
FN063-ZIL.DG.A7P2	I	1200	②	1.70	1100	80	
			③	1.30	780	79	
			④	0.98	560	75	
	II	960	⑤	0.80	420	73	
			⑥	0.58	240	68	
			⑦	0.48	190	65	
	III	720	⑧	0.30	90	56	
			⑨	0.27	70	54	
			⑩				
	IV	480	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN063-ZIL.DG.A7P2	FN063-ZIL.DG.A7P2
Article no.	175291/10C1	175291/10C3
Weight kg	27.50	29.60

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue

for three phase alternating current, 380-480 V

FNO71



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 800 W*
 Rated current I_N : 1.35- 1.10 A*
 Rated speed n_N : 960 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 960 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 580 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 4.0 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

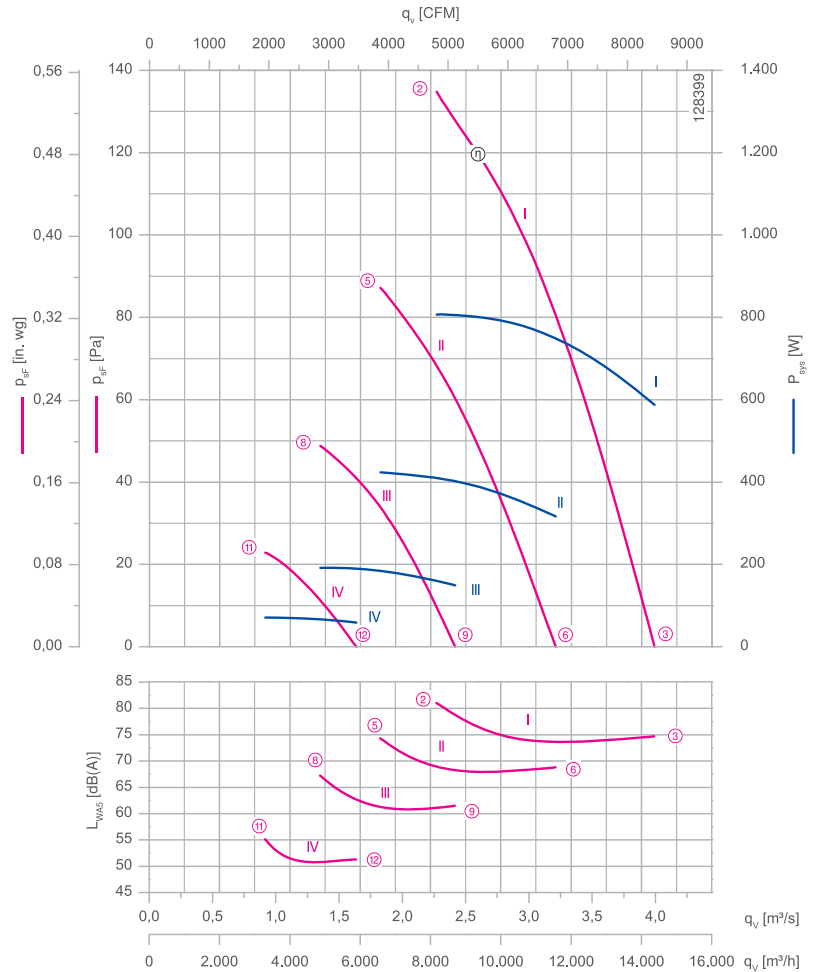
Efficiency η_{statA} : 48.2 %
 Efficiency: $N_{actual} = 55.4 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

Connection diagram

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System components

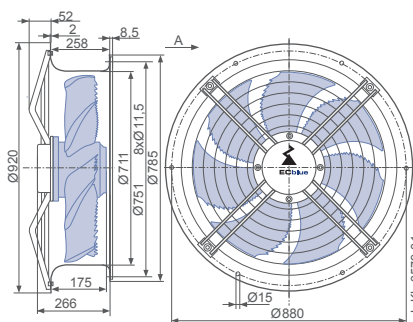
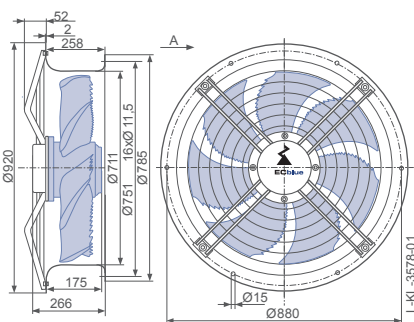
Page 184

Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side

Design L - round full bell mouth, guard grille two-sided




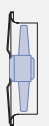
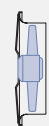
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
FN071-ZIL.DG.A7P3	I	960	②	1.30	800	81	
			③	1.00	580	75	
			④	0.80	420	75	
	II	770	⑤	0.68	320	69	
			⑥	0.50	190	67	
			⑦	0.42	150	62	
	III	580	⑧	0.27	70	55	
			⑨	0.24	60	51	
			⑩				
	IV	390	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN071-ZIL.DG.A7P3	FN071-ZIL.DG.A7P3
Article no.	175937/10C1	175937/10C3
Weight kg	29.50	32.10

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue

for three phase alternating current, 380-480 V

FNO71



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.90 kW*
 Rated current I_N : 3.00- 2.40 A*
 Rated speed n_n : 1150 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1150 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1500 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 5.7 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

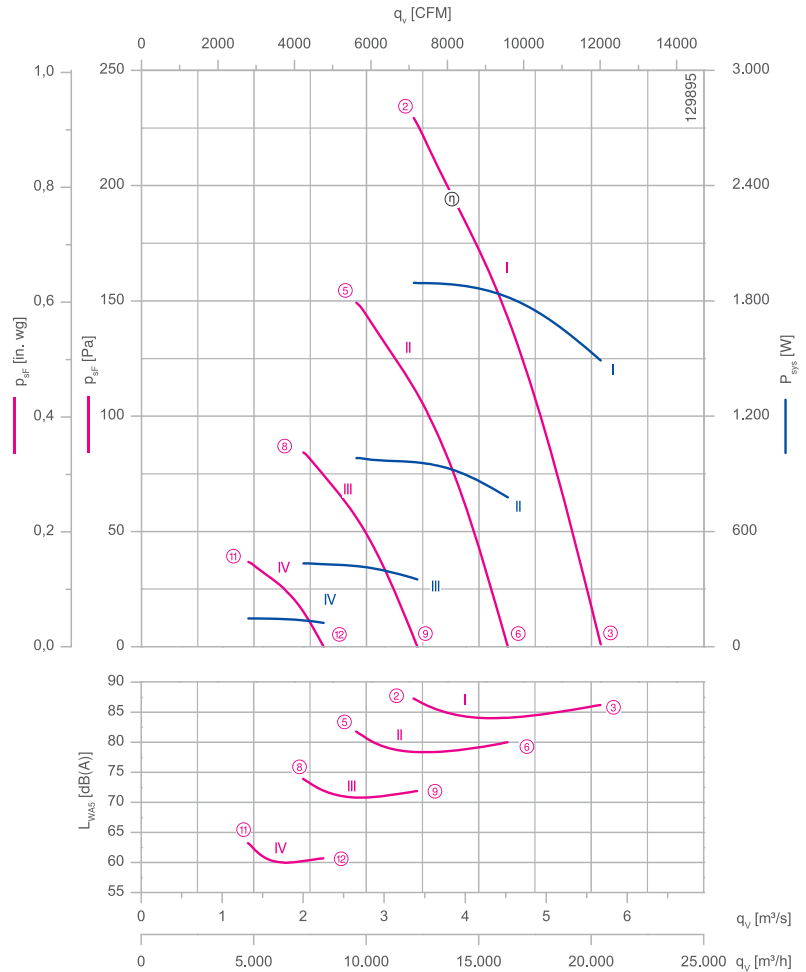
Efficiency η_{statA} : 46.1 %
 Efficiency: $N_{actual} = 50.8 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

Connection diagram

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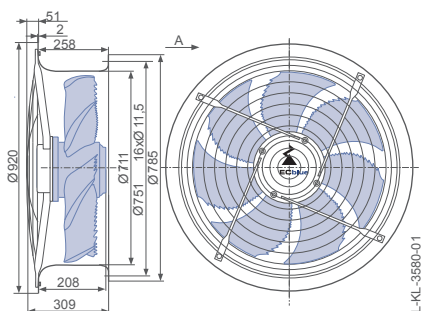
System components

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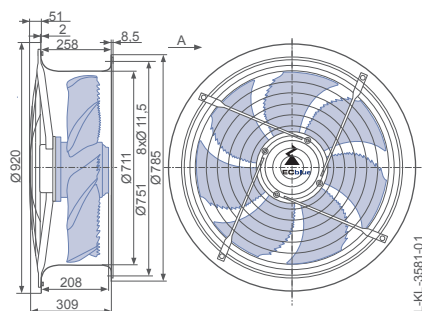
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided






Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN071-ZIL.GG.A7P4	I	1150	②	2.80	1900	88
			③	2.20	1500	86
	II	920	⑤	1.55	980	82
			⑥	1.25	780	80
	III	690	⑧	0.84	440	74
			⑨	0.74	350	72
	IV	460	⑪	0.42	150	63
			⑫	0.38	120	61

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN071-ZIL.GG.A7P4	FN071-ZIL.GG.A7P4
Article no.	175938/10C1	175938/10C3
Weight kg	43.80	46.40

Control technology

Control modules	Add-on modules	Operating terminal
		
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Information
Oil transformer cooling
Dry transformer cooling
System components
Control technology
Appendix

FE2owlet-ECblue

for three phase alternating current, 380-480 V

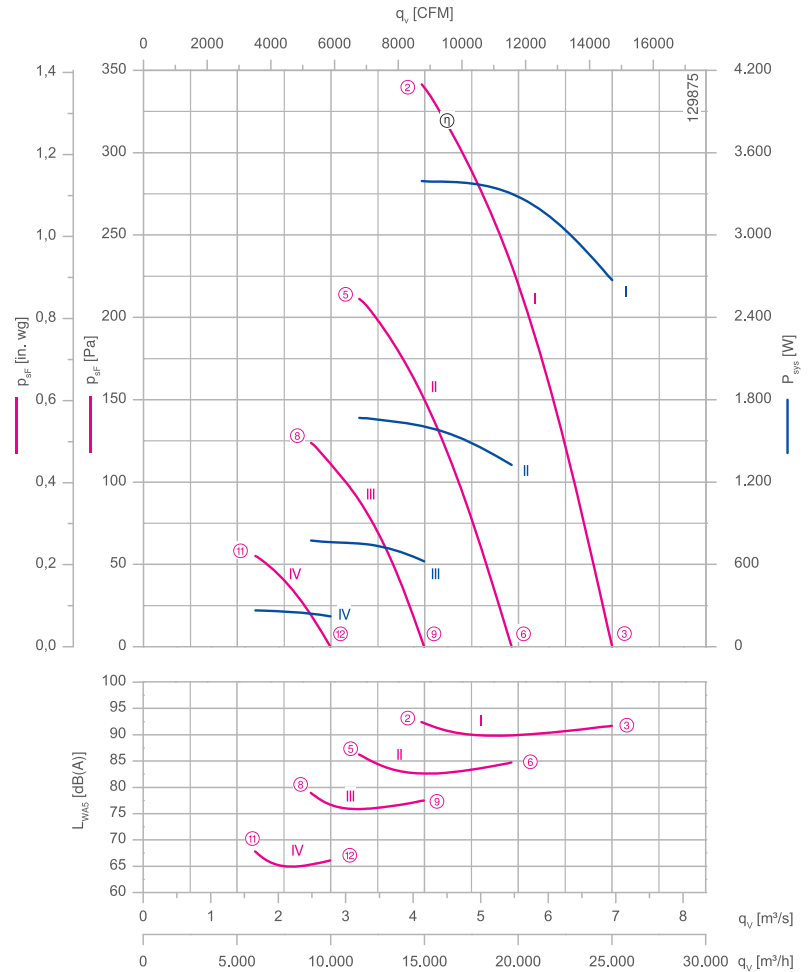
FNO71



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 3.40 kW*
 Rated current I_N : 5.20- 4.20 A*
 Rated speed n_n : 1400 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1400 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2700 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 6.9 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL
ErP-data
 Efficiency η_{statA} : 46.1 %
 Efficiency: $N_{actual} = 49.2 / N_{target} = 40$ **
 * Rated data
 **ErP 2015
 *** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

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1360-403

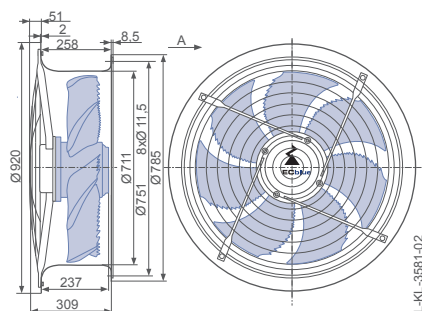
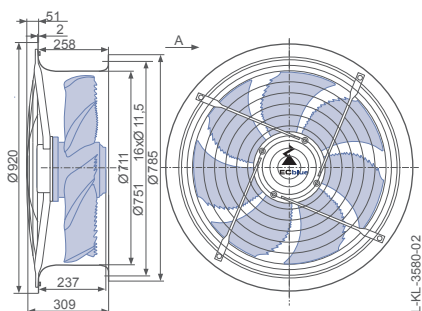
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Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side

Design L - round full bell mouth, guard grille two-sided




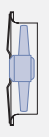

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN071-ZIL.GL.A7P4	I	1400	②	5.00	3400	93
			③	3.90	2700	92
	II	1100	⑤	2.50	1650	86
			⑥	2.00	1300	85
	III	840	⑧	1.25	760	79
			⑨	1.05	620	78
	IV	560	⑪	0.60	260	68
			⑫	0.54	220	66

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN071-ZIL.GL.A7P4	FN071-ZIL.GL.A7P4
Article no.	175939/10C1	175939/10C3
Weight kg	48.20	50.80

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN080



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 800 W*
 Rated current I_N : 1.35- 1.10 A*
 Rated speed n_N : 700 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 700 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 620 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 4.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

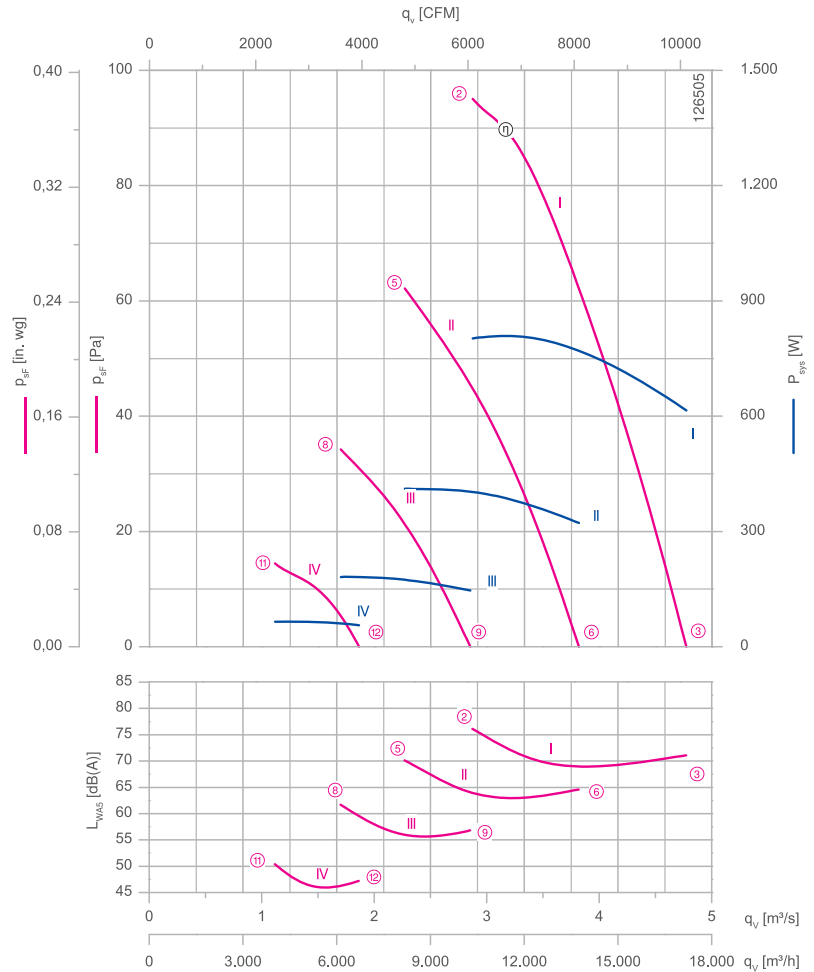
Efficiency η_{statA} : 44.1 %
 Efficiency: $N_{actual} = 51.1 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

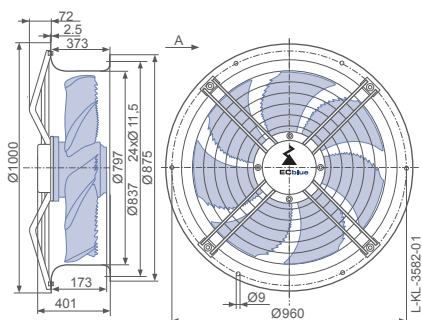
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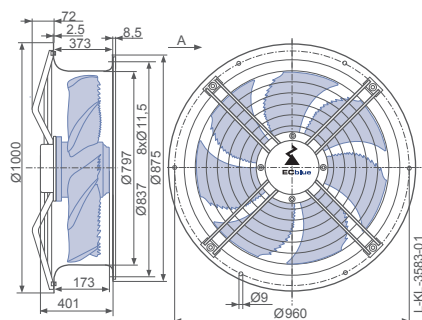
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided






Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN080-ZIL.DG.A5P4	I	700	②	1.30	800	76
			③	1.05	620	71
	II	560	⑤	0.78	400	70
			⑥	0.68	320	65
	III	420	⑧	0.48	180	62
			⑨	0.42	150	57
	IV	280	⑪	0.25	65	51
			⑫	0.24	55	47

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-ZIL.DG.A5P4	FN080-ZIL.DG.A5P4
Article no.	175940/10C1	175940/10C3
Weight kg	45.10	48.70

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN080



Description

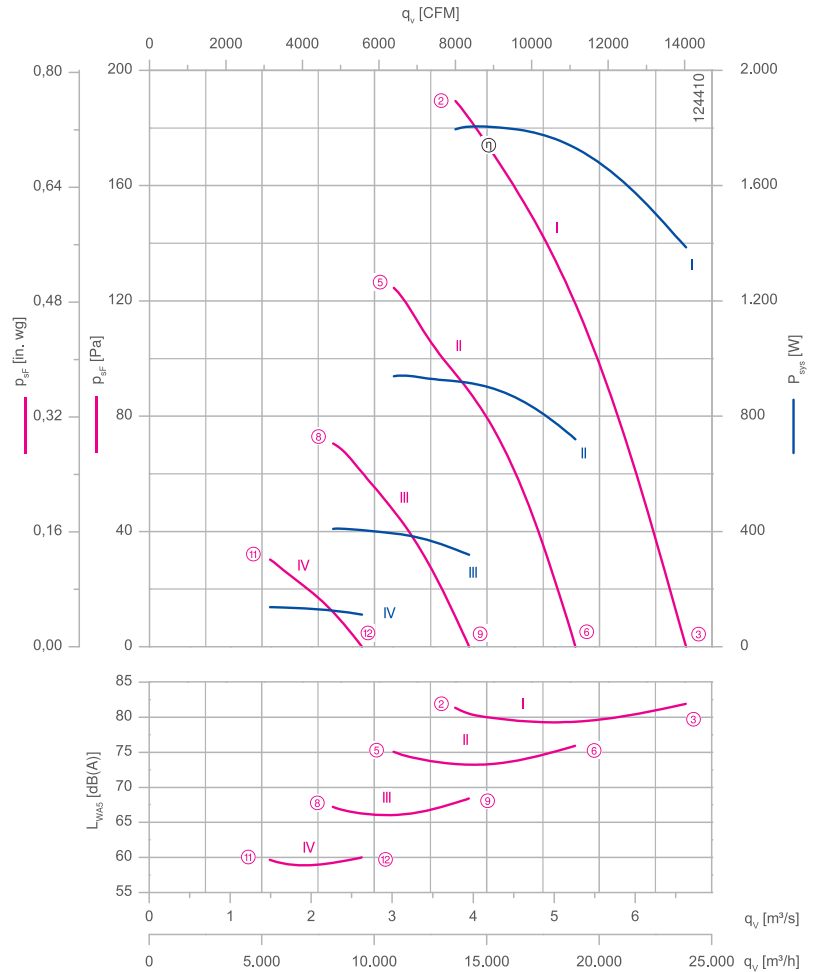
Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.80 kW*
 Rated current I_N : 2.90-2.30 A*
 Rated speed n_n : 950 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 950 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1400 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 6.6 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 60 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection: IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

Efficiency η_{statA} : 47.3 %
 Efficiency: $N_{actual} = 52.1 / N_{target} = 40$ **
 * Rated data

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

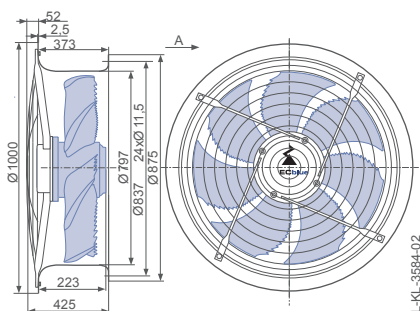
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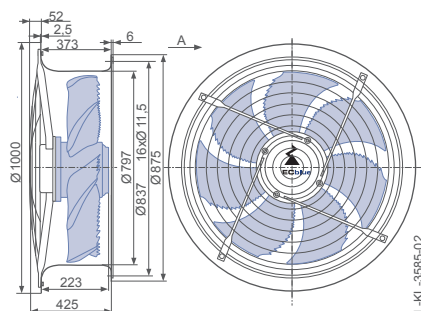
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided



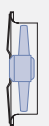
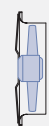
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN080-ZIL.GG.A7P3	I	950	②	2.70	1800	82
			③	2.10	1400	82
	II	760	⑤	1.45	920	75
			⑥	1.20	720	76
	III	570	⑧	0.78	400	67
			⑨	0.66	320	68
	IV	380	⑪	0.39	140	60
			⑫	0.35	110	60

Current values determined at 400V

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-ZIL.GG.A7P3	FN080-ZIL.GG.A7P3
Article no.	175942/10C1	175942/10C3
Weight kg	58.70	62.30

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

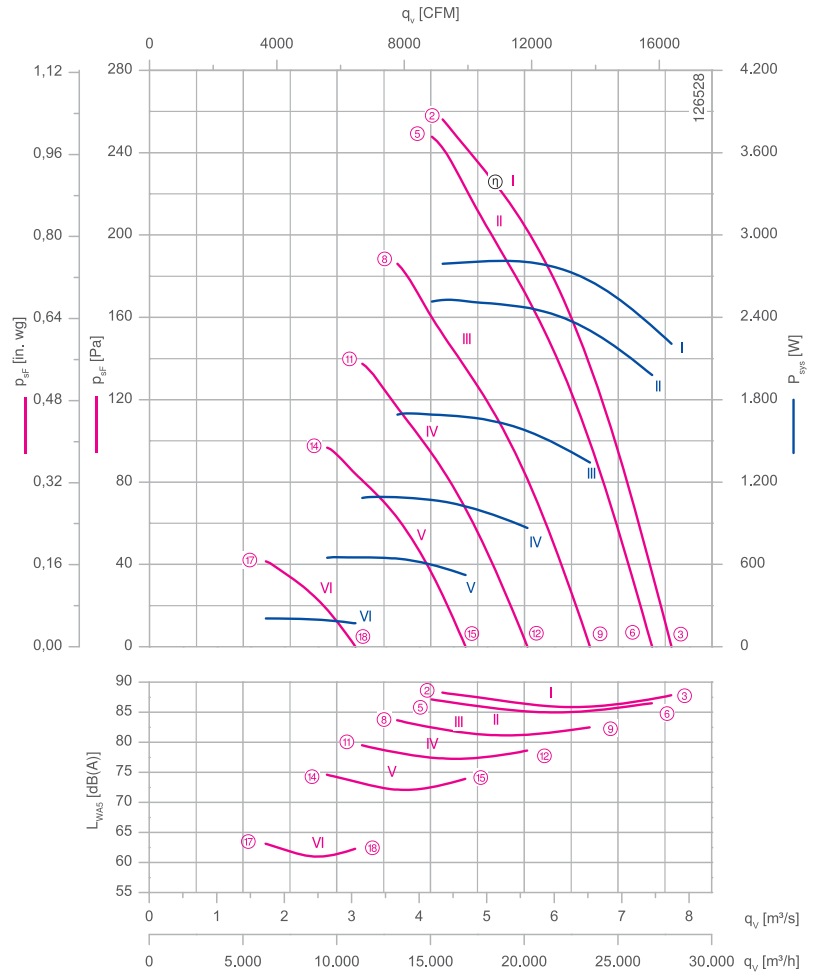
FN080



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 2.80 kW*
 Rated current I_N : 4.40- 3.50 A*
 Rated speed n_n : 1100 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1100 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2200 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 7.7 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL
ErP-data
 Efficiency η_{statA} : 48.0 %
 Efficiency: $N_{actual} = 51.5 / N_{target} = 40$ **
 * Rated data
 **ErP 2015
 *** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

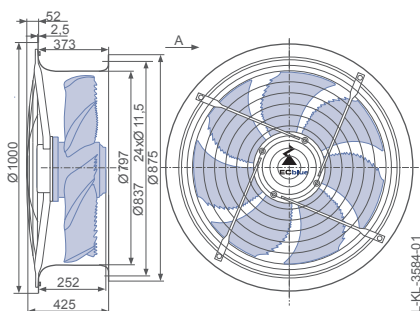
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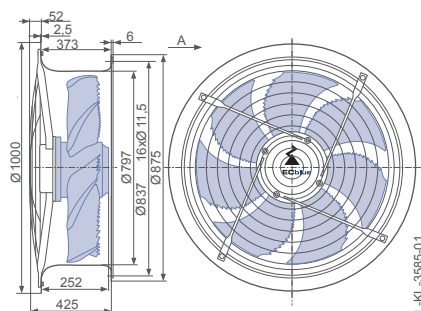
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided





Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN080-ZIL.GL.A7P3	I	1100	②	4.20	2800	88
			③	3.30	2200	88
	II	1060	⑤	3.70	2500	87
			⑥	3.00	2000	87
	III	930	⑧	2.60	1700	84
			⑨	2.10	1350	83
	IV	800	⑪	1.70	1100	80
			⑫	1.40	860	79
	V	670	⑭	1.10	640	75
			⑮	0.94	520	74
	VI	440	⑰	0.52	200	63
			⑱	0.46	170	62

Current values determined at 400V

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-ZIL.GL.A7P3	FN080-ZIL.GL.A7P3
Article no.	175941/10C1	175941/10C3
Weight kg	63.10	66.70

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN100



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{syn} : 1.45 kW*
 Rated current I_N : 2.30- 1.80 A*
 Rated speed n_N : 710 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 710 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 980 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 8.1 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 60 °C
 Electrical connection: Integrated controller
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

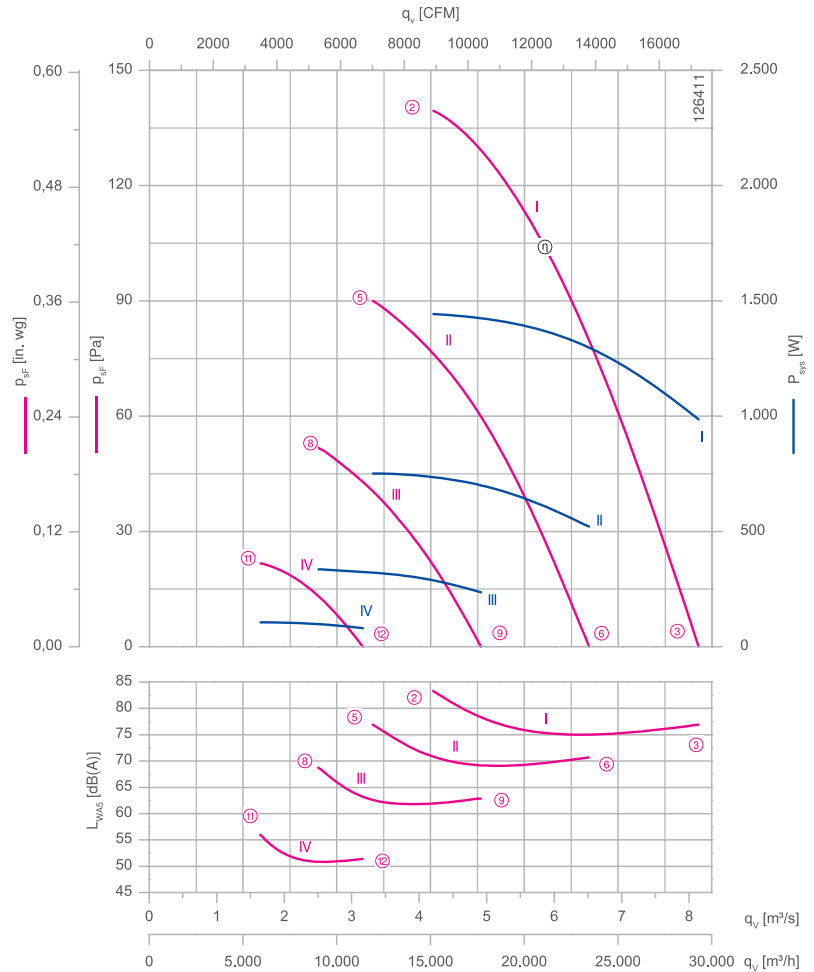
Efficiency η_{statA} : 50.8 %
 Efficiency: $N_{actual} = 56.4 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

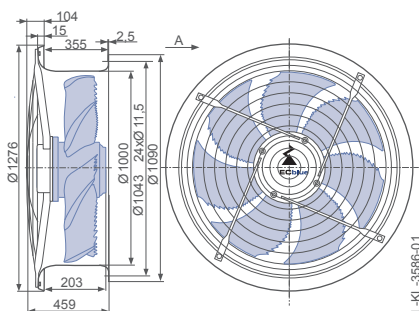
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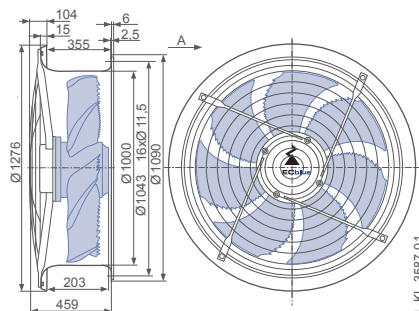
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided





Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN100-ZIL.GG.A5P1	I	710	②	2.10	1450	84
			③	1.50	980	77
	II	570	⑤	1.20	740	77
			⑥	0.92	520	71
	III	430	⑧	0.70	330	69
			⑨	0.56	240	63
	IV	280	⑪	0.34	110	56
			⑫	0.29	80	51

Current values determined at 400V

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-ZIL.GG.A5P1	FN100-ZIL.GG.A5P1
Article no.	175943/10C1	175943/10C3
Weight kg	69.30	74.10

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN100



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 2.40 kW*
 Rated current I_N : 3.80- 3.00 A*
 Rated speed n_N : 850 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 850 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1650 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 9.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 45 °C
 Electrical connection: Integrated controller
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

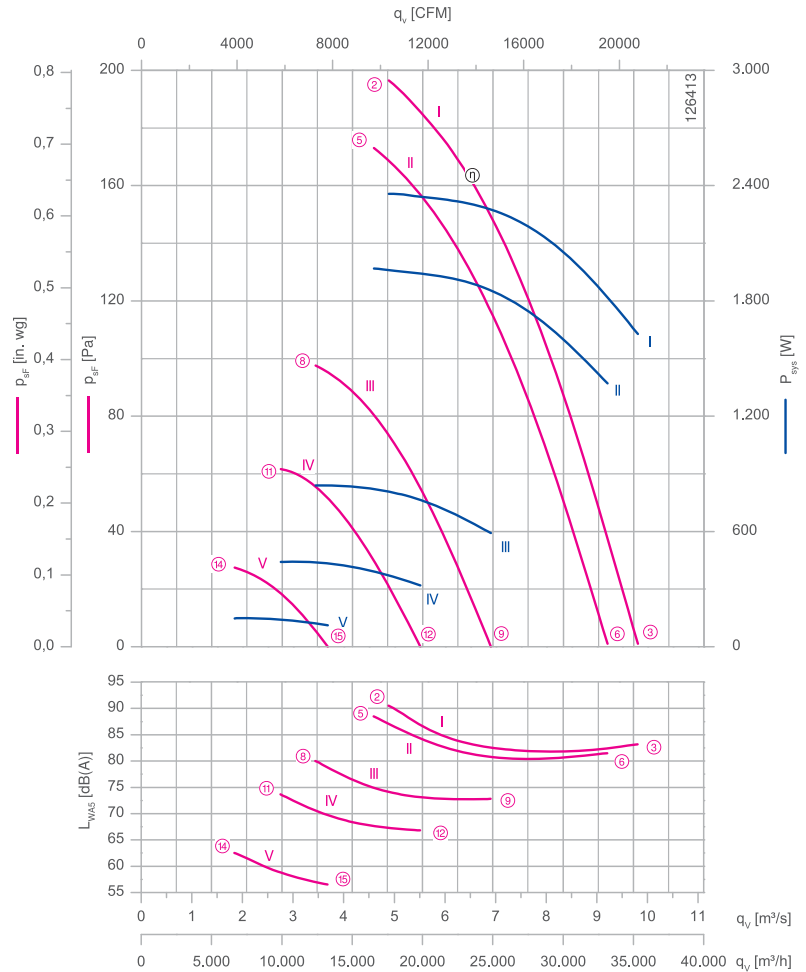
Efficiency η_{statA} : 51.4 %
 Efficiency: $N_{actual} = 55.5 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

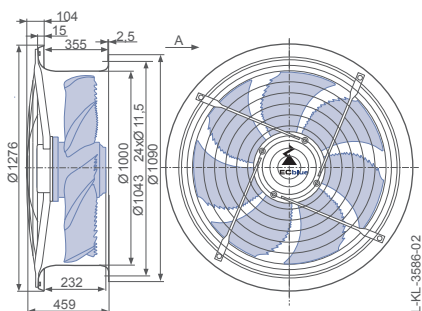
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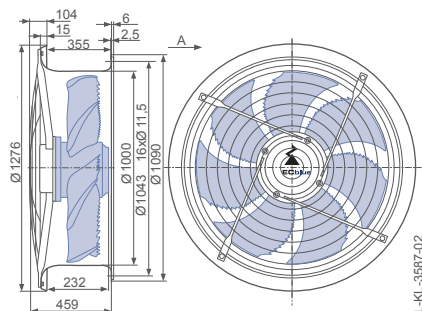
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided



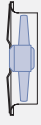
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
FN100-ZIL.GL.A5P1	I	850	②	3.70	2400	90
			③	2.50	1650	83
	II	800	⑤	3.10	2000	88
			⑥	2.20	1400	82
	III	600	⑧	1.40	860	80
			⑨	1.05	620	73
	IV	480	⑪	0.88	460	74
			⑫	0.70	330	67
	V	320	⑭	0.46	150	63
			⑮	0.37	120	57

Current values determined at 400V

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-ZIL.GL.A5P1	FN100-ZIL.GL.A5P1
Article no.	175944/10C1	175944/10C3
Weight kg	73.70	78.40

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN125



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 1.85 kW*
 Rated current I_N : 3.00- 2.40 A*
 Rated speed n_N : 570 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 570 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1300 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 12.3 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 40 °C
 Electrical connection: Integrated controller
 Number of blades: 3
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

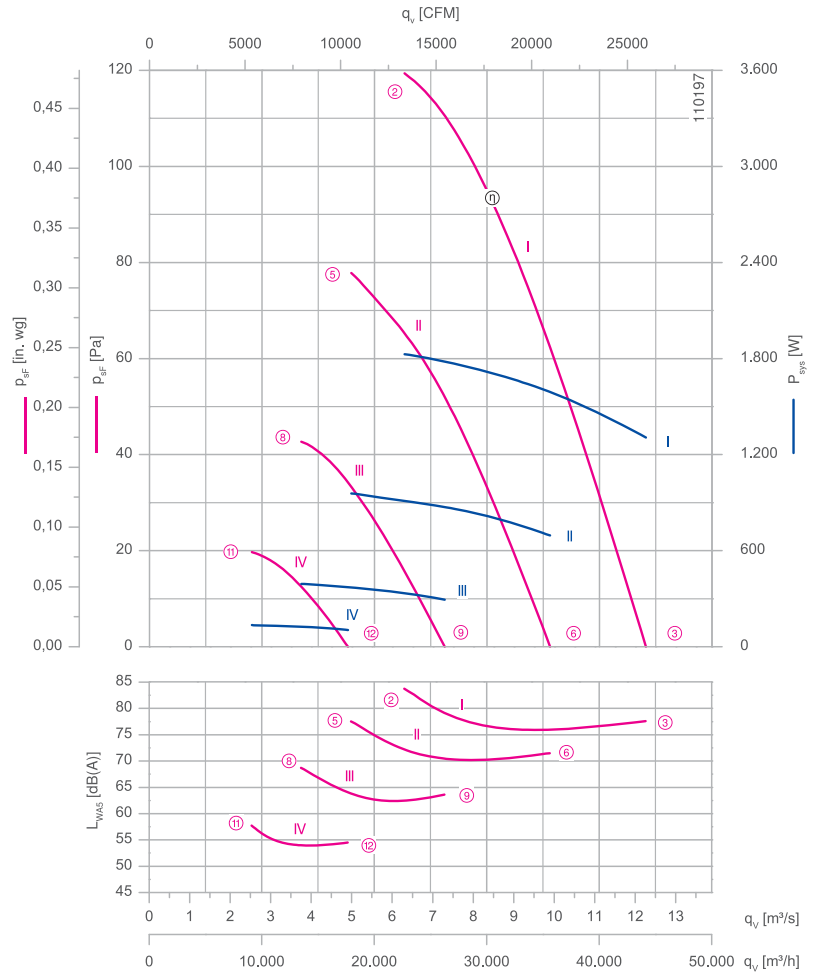
Efficiency η_{statA} : 47.8 %
 Efficiency: $N_{actual} = 52.5 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

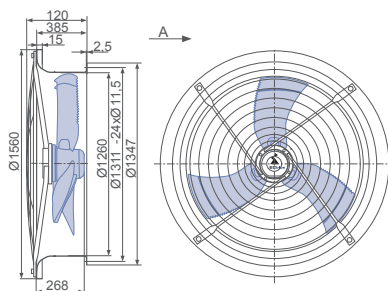
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Dimensions mm

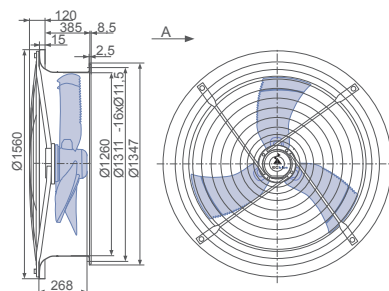
Airflow direction A

Design L - round full bell mouth, guard grille suction side



L-KL-3221-19

Design L - round full bell mouth, guard grille two-sided



L-KL-3222-18




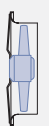
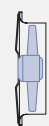
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
FN125-ZIL.GL.A3P1	I	570	②	2.80	1850	84	
			③	2.10	1300	78	
			④	1.55	960	77	
	II	460	⑤	1.20	700	72	
			⑥	0.84	390	69	
			⑦	0.68	290	64	
	III	340	⑧	0.46	130	58	
			⑨	0.40	100	55	
			⑩				
	IV	230	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN125-ZIL.GL.A3P1	FN125-ZIL.GL.A3P1
Article no.	175946/10C1	175946/10C3
Weight kg	91.40	97.50

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue

for three phase alternating current, 380-480 V

FN 125



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 2.80 kW*
 Rated current I_N : 4.60- 3.60 A*
 Rated speed n_n : 650 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 650 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2000 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 14.4 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 3
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, powder-coated, RAL 9006 (white aluminium)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

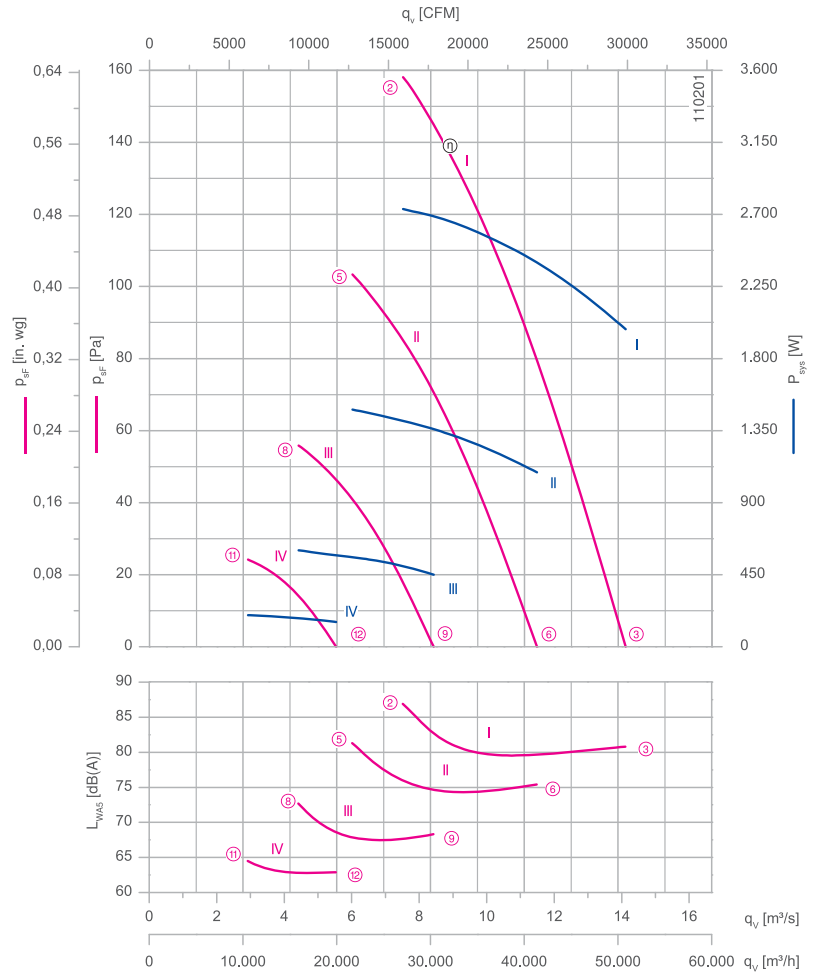
Efficiency η_{statA} : 51.0 %
 Efficiency: $N_{actual} = 54.7 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

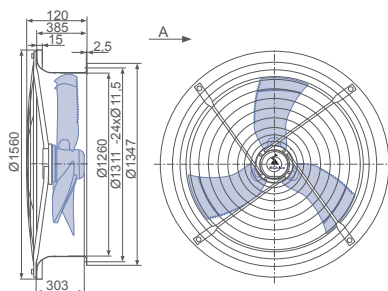
Connection diagram Page 250
1360-403

System components Page 184

Dimensions mm

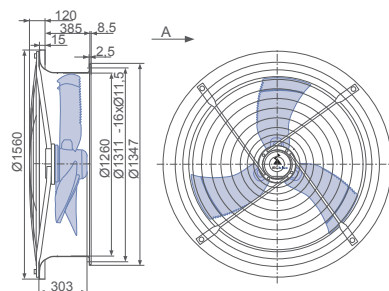
Airflow direction A

Design L - round full bell mouth, guard grille suction side



L-KL-3221-18

Design L - round full bell mouth, guard grille two-sided



L-KL-3222-17




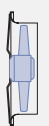
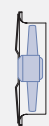
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
FN125-ZIL.GQ.A3P1	I	650	②	4.20	2700	87	
			③	3.00	2000	81	
			④	2.30	1500	82	
	II	530	⑤	1.75	1100	75	
			⑥	1.10	600	73	
			⑦	0.88	460	68	
	III	390	⑧	0.54	200	64	
			⑨	0.46	150	63	
			⑩				
	IV	260	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN125-ZIL.GQ.A3P1	FN125-ZIL.GQ.A3P1
Basic electronics		
Article no.	175945/10C1	175945/10C3
Weight kg	97.30	103.40

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet

for three phase alternating current, 4-4 pole

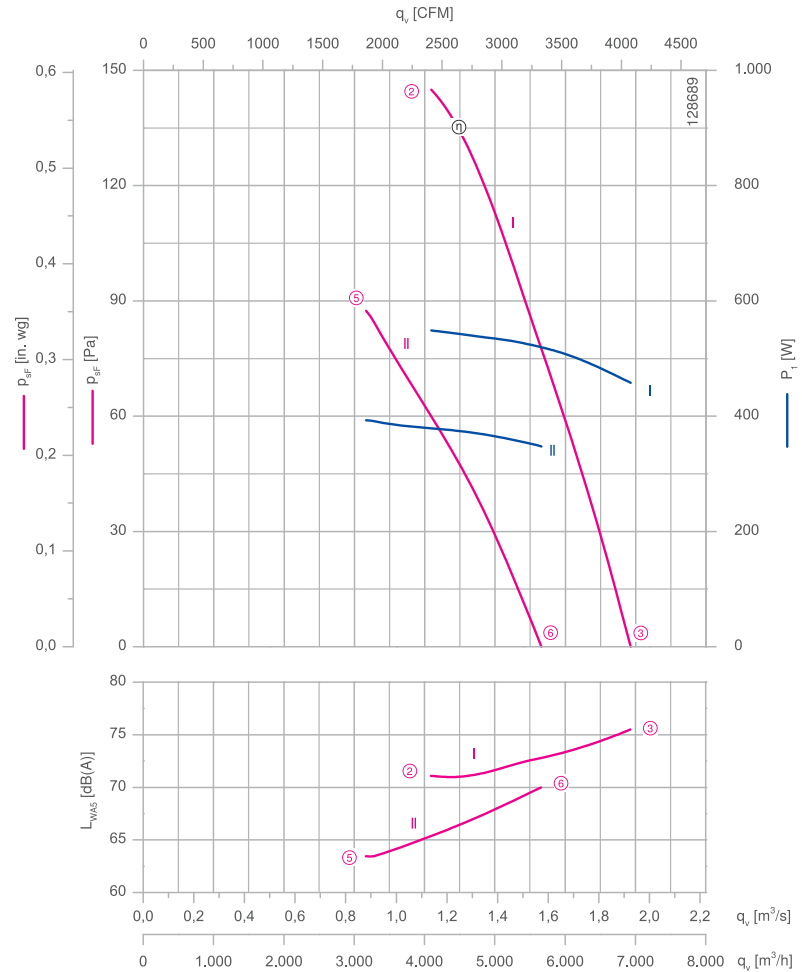
FNO45-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3- 400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
540/390 W*
 Rated current I_N :
1.05/0.68 A*
 Rated speed n_N :
1360/1050 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
1390/1140 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
460/350 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
1.93/1.57 m³/s*
 Starting current I_A : **4.0/1.2 A**
 Current increase ΔI : **10 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **70 °C**
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 34.4 %
 Efficiency: $N_{actual} = 42.5 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

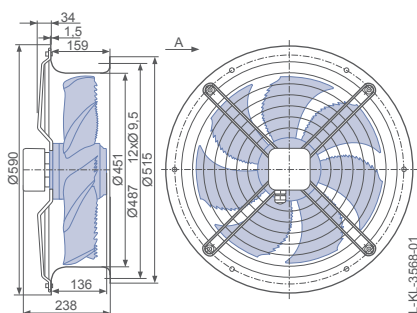
Connection diagram Page 252
1360-108XB

System components Page 184

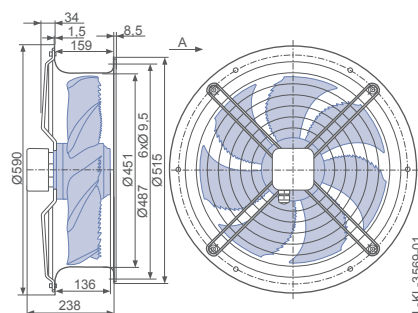
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided






Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN045-VDL.4F.A7P1	Δ	I	400*	50	②	1.05*	540*	1360*	71
					③	0.98*	460*	1390*	76
	Y	II			⑤	0.68*	390*	1050*	64
					⑥	0.60*	350*	1140*	70

*rated data

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN045-VDL.4F.A7P1	FN045-VDL.4F.A7P1
Article no.	174740/10K1	174740/10K3
Weight kg	14.90	16.10

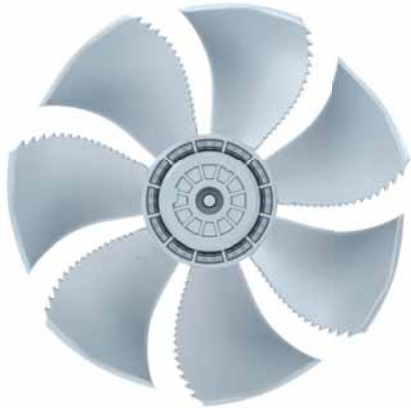
Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
Page 208	Page 206	Page 218

FE2owlet

for three phase alternating current, 6-6 pole

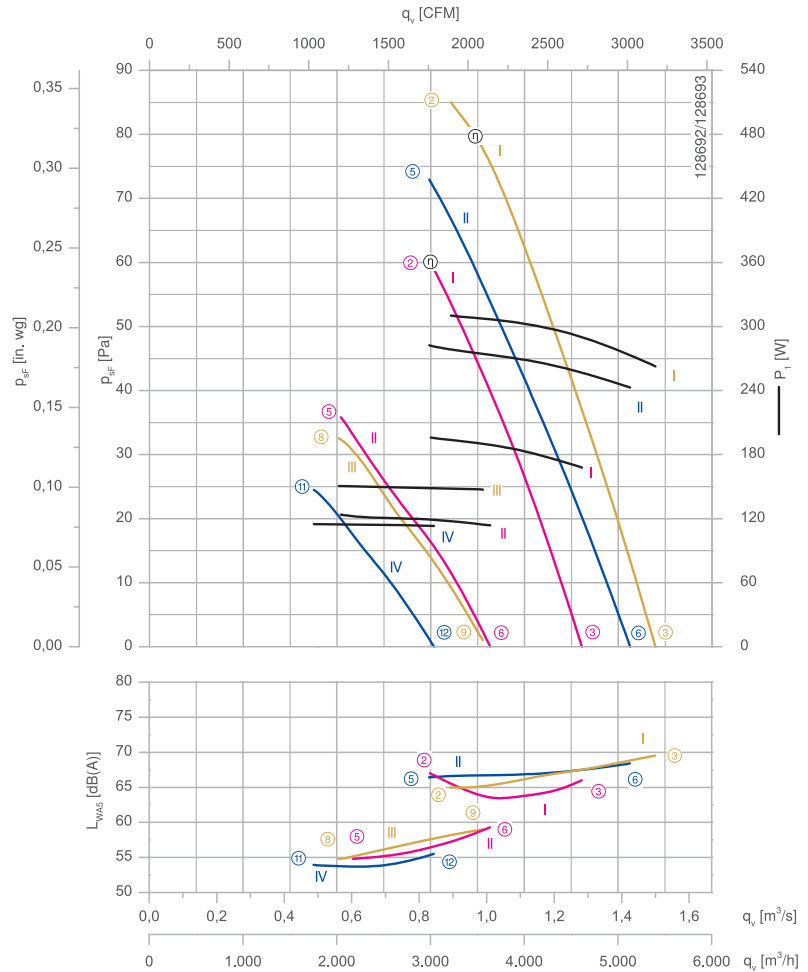
FNO45-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
200/120 W | 280/110 W | 310/150 W*
 Rated current I_N :
0.50/0.27 A | 0.62/0.28 A | 0.60/0.31 A*
 Rated speed n_N :
920/670 min⁻¹ | 970/560 min⁻¹ | 1050/650 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
930/740 min⁻¹ | 1040/620 min⁻¹ | 1090/730 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
170/110 W | 240/110 W | 260/150 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
1.28/1.0 m³/s | 1.42/0.84 m³/s | 1.5/1.0 m³/s*
 Starting current I_A : **1.1/0.32 A | 0.95/0.26 A | 1.1/0.3 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 29.0 %
 Efficiency: $N_{actual} = 40.0 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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1360-108XB

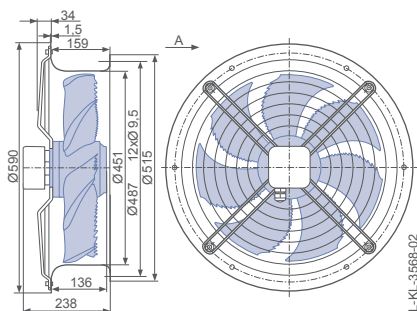
System components

Page 184

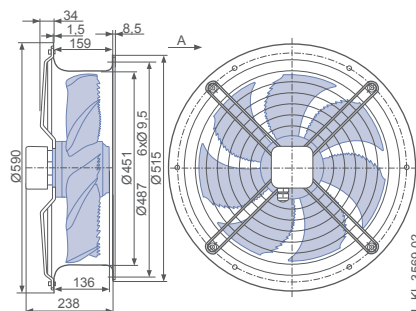
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

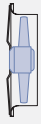



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)				
			U V	f Hz		I A	P_1 W	n min ⁻¹					
FN045-SDL.4F.A7P1	Δ	I	400*	50	②	0.50*	200*	920*	67				
					③	0.48*	170*	930*	66				
					⑤	0.27*	120*	670*	55				
		II			⑥	0.25*	110*	740*	59				
					Δ	I	460*	60	②	0.60*	310*	1050*	65
									③	0.54*	260*	1090*	70
	⑤	0.62*	280*	970*					67				
	II	⑥	0.54*	240*		1040*			68				
		Y	III	460*		60			⑧	0.31*	150*	650*	55
									⑨	0.30*	150*	730*	59
	IV		⑪		0.28*		110*	560*	54				
			⑫		0.27*		110*	620*	56				

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN045-SDL.4F.A7P1	FN045-SDL.4F.A7P1
Article no.	174741/10K1	174741/10K3
Weight kg	14.90	16.10

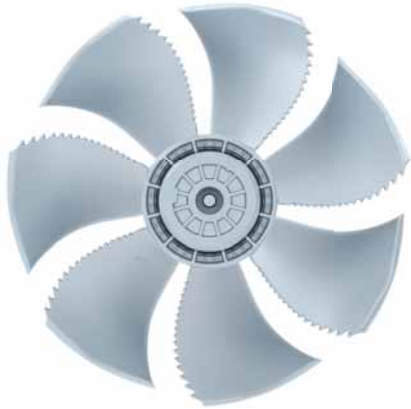
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 8-8 pole

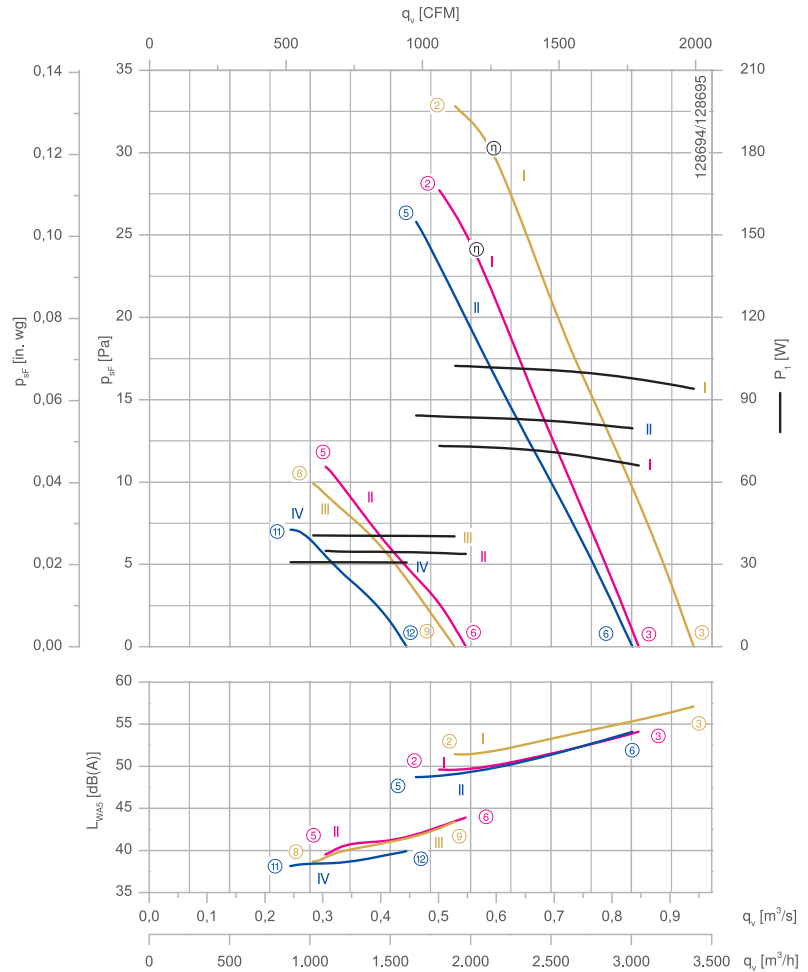
FNO45-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 75/34 W | 85/30 W | 100/40 W*
 Rated current I_N :
 0.16/0.072 A | 0.18/0.071 A | 0.19/0.08 A*
 Rated speed n_N :
 590/370 min⁻¹ | 560/300 min⁻¹ | 640/360 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 620/410 min⁻¹ | 620/330 min⁻¹ | 690/400 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 65/34 W | 80/30 W | 95/40 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 0.85/0.55 m³/s | 0.83/0.44 m³/s | 0.94/0.53 m³/s*
 Starting current I_A : 0.26/0.08 A | 0.22/0.07 A | 0.26/0.08 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_1 < 125$ W)
 * Rated data

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

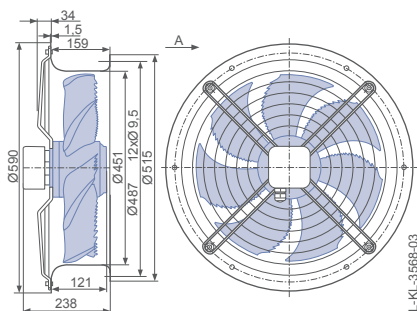
Connection diagram Page 252
1360-108XB

System components Page 184

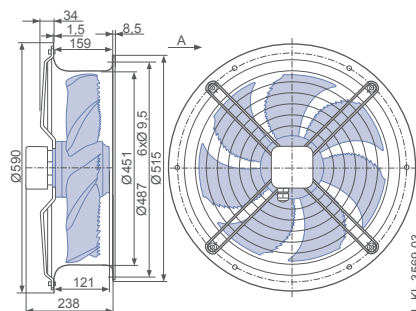
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

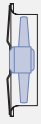



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)
FN045-ADL.4C.A7P1	Δ	I	400*	50	②	0.16*	75*	590*	50
					③	0.15*	65*	620*	54
					⑤	0.07*	34*	370*	40
	Y	II	460*	60	⑥	0.07*	34*	410*	44
					②	0.19*	100*	640*	51
					③	0.17*	95*	690*	57
		IV	400*	60	⑤	0.18*	85*	560*	49
					⑥	0.17*	80*	620*	54
					⑧	0.08*	40*	360*	39
	Y	III	460*	60	⑨	0.07*	40*	400*	43
					⑪	0.07*	30*	300*	38
					⑫	0.07*	30*	330*	40

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN045-ADL.4C.A7P1	FN045-ADL.4C.A7P1
Article no.	174742/10K1	174742/10K3
Weight kg	13.50	14.70

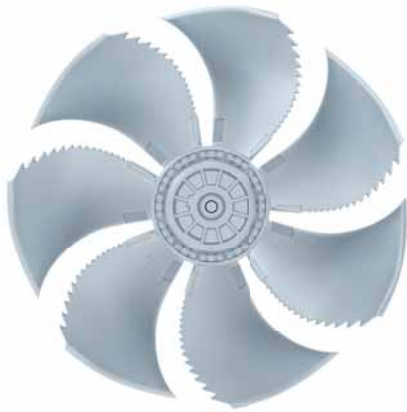
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 4-4 pole

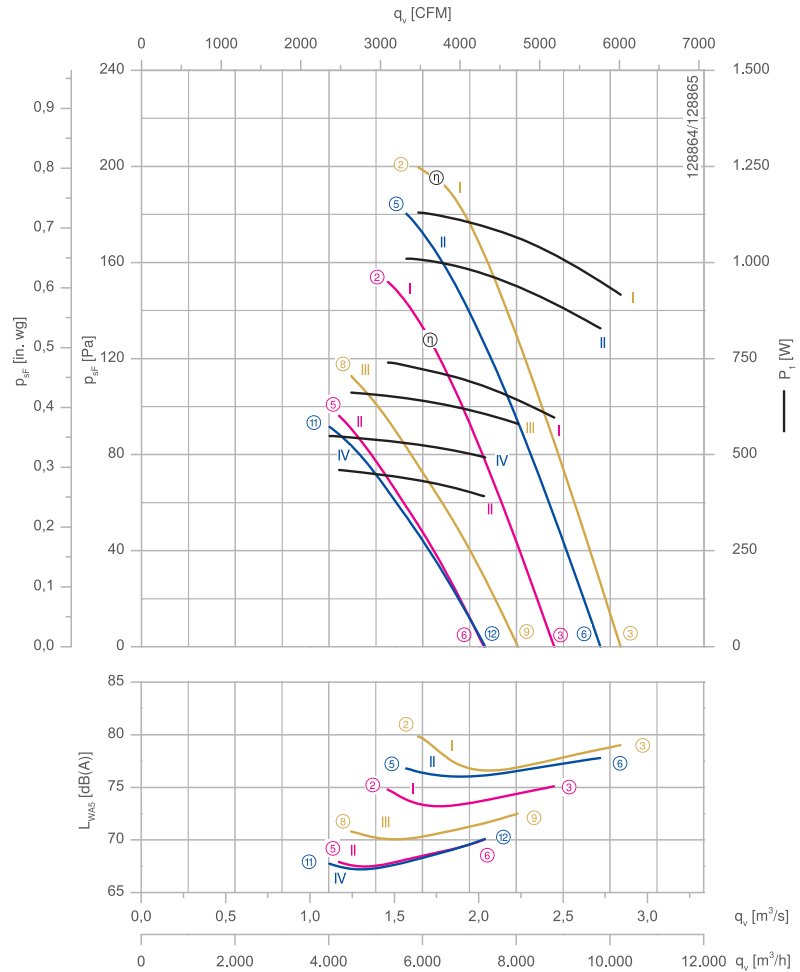
FN050-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 740/460 W | 1.00/0.54 kW | 1.15/0.66 kW*
 Rated current I_N :
 1.70/0.76 A | 1.80/0.90 A | 1.90/0.94 A*
 Rated speed n_N :
 1290/1030 min^{-1} | 1390/1000 min^{-1} | 1470/1100 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
 1340/1110 min^{-1} | 1480/1120 min^{-1} | 1550/1220 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
 600/390 W | 820/500 W | 920/580 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
 2.45/2.0 m^3/s | 2.72/2.0 m^3/s | 2.84/2.23 m^3/s *
 Starting current I_A : 5.5/1.7 A | 5.0/1.6 A | 6.0/1.8 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: -40 °C***
 Max. permitted ambient temperature $t_{R(\text{max})}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 35.0 %
 Efficiency: $N_{\text{actual}} = 42.3 / N_{\text{target}} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

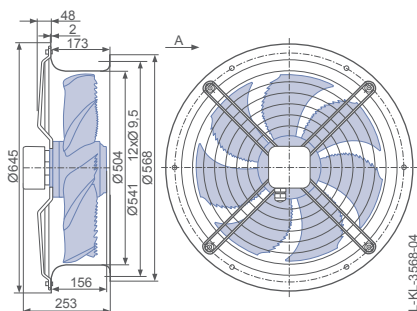
Connection diagram Page 252
1360-108XB

System components Page 184

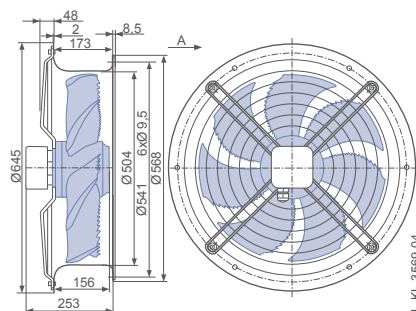
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

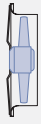



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN050-VDL.4I.A7P1	Δ	I	400*	50	②	1.70*	740*	1290*	75
					③	1.55*	600*	1340*	75
					⑤	0.76*	460*	1020*	68
	Y	II	460*	60	⑥	0.68*	390*	1110*	70
					②	1.90*	1150*	1470*	80
					③	1.65*	920*	1550*	79
		IV	400*	60	⑤	1.80*	1000*	1390*	77
					⑥	1.55*	820*	1480*	78
					⑧	0.94*	660*	1100*	71
	Y	III	460*	60	⑨	0.84*	580*	1220*	73
					⑪	0.90*	540*	1000*	68
					⑫	0.80*	500*	1120*	70

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN050-VDL.4I.A7P1	FN050-VDL.4I.A7P1
Article no.	174743/10K1	174743/10K3
Weight kg	20.00	21.40

Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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Information

Oil transformer cooling

Dry transformer cooling

System components

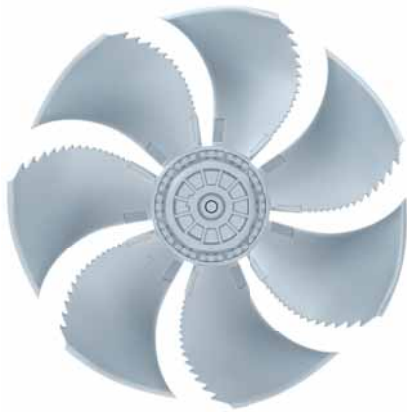
Control technology

Appendix

FE2owlet

for three phase alternating current, 4-4 pole

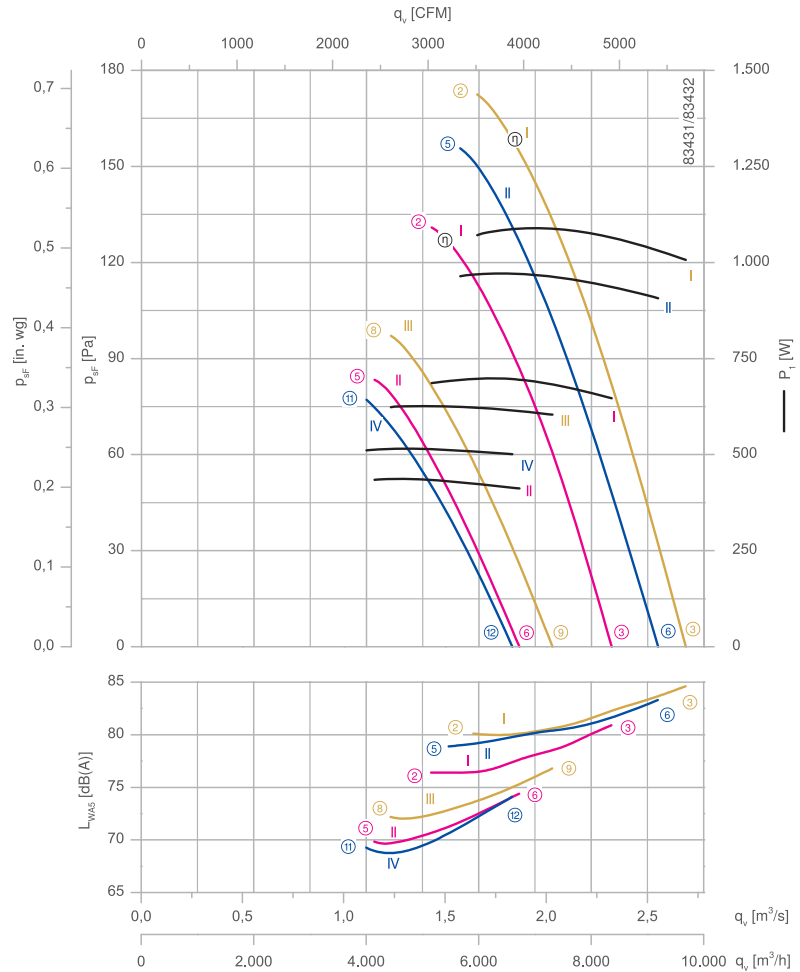
FN050-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_i :
 0.69/0.43 kW | 0.96/0.51 kW | 1.05/0.62 kW*
 Rated current I_N :
 1.60/0.75 A | 1.75/0.88 A | 1.80/0.92 A*
 Rated speed n_N :
 1290/1020 min^{-1} | 1390/990 min^{-1} | 1480/1100 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
 1310/1050 min^{-1} | 1430/1030 min^{-1} | 1510/1150 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
 650/410 W | 910/500 W | 1000/600 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
 2.3/1.85 m^3/s | 2.55/1.85 m^3/s | 2.7/2.0 m^3/s *
 Starting current I_A : 5.5/1.7 A | 5.0/1.6 A | 6.0/1.8 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: -40 °C***
 Max. permitted ambient temperature $t_{R(\text{max})}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency $\eta_{\text{stat}A}$: 33.4 %
 Efficiency: $N_{\text{actual}} = 40.7 / N_{\text{target}} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

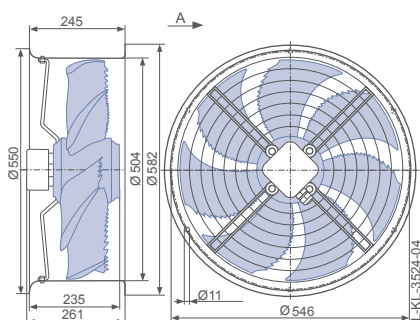
Connection diagram Page 252
1360-108XB

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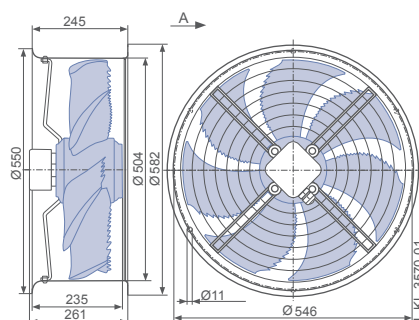
Dimensions mm

Airflow direction A

Design H - pipe sockets with a flange,
guard grille suction side



Design H - pipe sockets with a flange,
guard grille two-sided

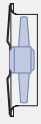



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN050-VDH.4I.A7P1	Δ	I	400*	50	②	1.60*	690*	1290*	76
					③	1.55*	650*	1310*	81
					⑤	0.75*	430*	1020*	70
	Y	II	400*	60	⑥	0.72*	410*	1050*	74
					②	1.80*	1050*	1480*	80
		III	460*	③	1.75*	1000*	1510*	85	
				⑥	1.75*	960*	1390*	79	
		IV	400*	⑥	1.65*	910*	1430*	83	
				⑧	0.92*	620*	1100*	72	
	Y	III	460*	60	⑨	0.90*	600*	1150*	77
					⑪	0.88*	510*	990*	69
						⑫	0.86*	500*	1030*

*rated data

Fan ordering information

Airflow direction A		
Design	H (guard grille suction side)	H (guard grille two-sided)
		
Type	FN050-VDH.4I.A7P1	FN050-VDH.4I.A7P1
Article no.	154276/10K1	154276/10K3
Weight kg	20.20	21.00

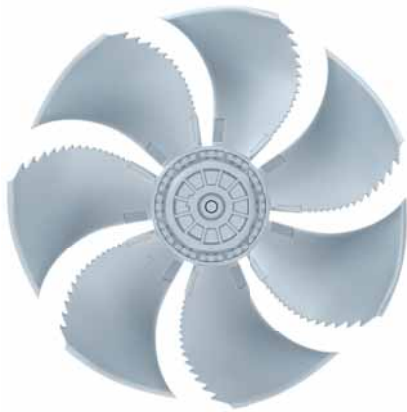
Control technology

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FE2owlet

for three phase alternating current, 6-6 pole

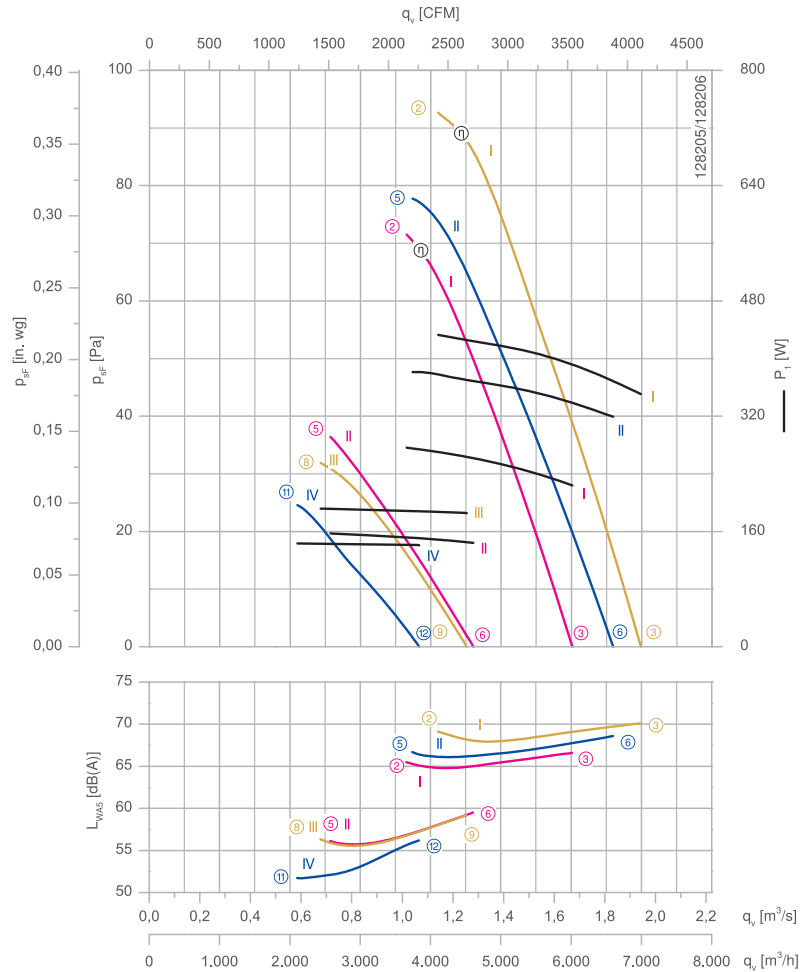
FN050-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 280/160 W | 380/140 W | 440/190 W*
 Rated current I_N :
 0.68/0.34 A | 0.82/0.34 A | 0.82/0.39 A*
 Rated speed n_N :
 890/630 min⁻¹ | 920/520 min⁻¹ | 1010/600 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 920/710 min⁻¹ | 1010/600 min⁻¹ | 1070/700 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 220/140 W | 320/140 W | 350/190 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 1.67/1.28 m³/s | 1.83/1.0 m³/s | 1.94/1.25 m³/s*
 Starting current I_A : 1.5/0.4 A | 1.2/0.32 A | 1.5/0.4 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 30.1 %
 Efficiency: $N_{actual} = 40.2 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

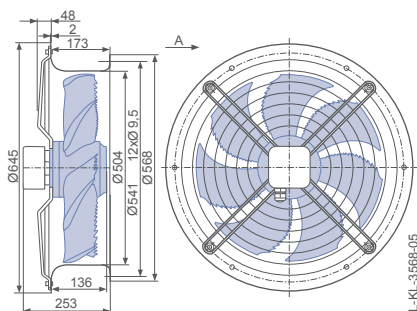
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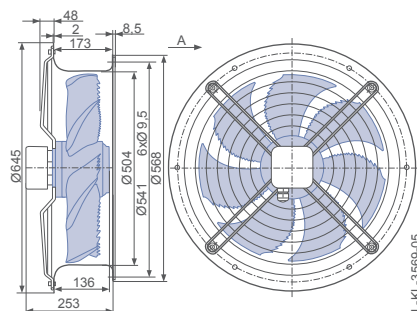
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

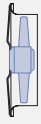



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level $L_{T_{WAS}}$ dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN050-SDL.4F.A7P1	Δ	I	400*	50	②	0.68*	280*	890*	66
					③	0.62*	220*	920*	67
					⑤	0.34*	160*	630*	56
	Y	II	460*	60	⑥	0.31*	140*	710*	60
					②	0.82*	440*	1010*	69
		II	400*	③	0.70*	350*	1070*	70	
				⑥	0.82*	380*	920*	67	
		Y	III	460*	⑥	0.70*	320*	1010*	69
					⑧	0.39*	190*	600*	56
	IV	400*	⑨	0.37*	190*	700*	59		
			⑪	0.34*	140*	520*	52		
					⑫	0.33*	140*	600*	56

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN050-SDL.4F.A7P1	FN050-SDL.4F.A7P1
Article no.	174744/10K1	174744/10K3
Weight kg	18.50	19.90

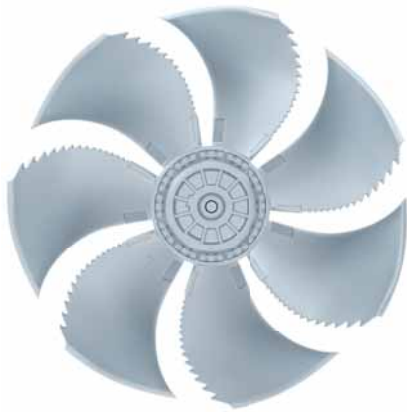
Control technology

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FE2owlet

for three phase alternating current, 6-6 pole

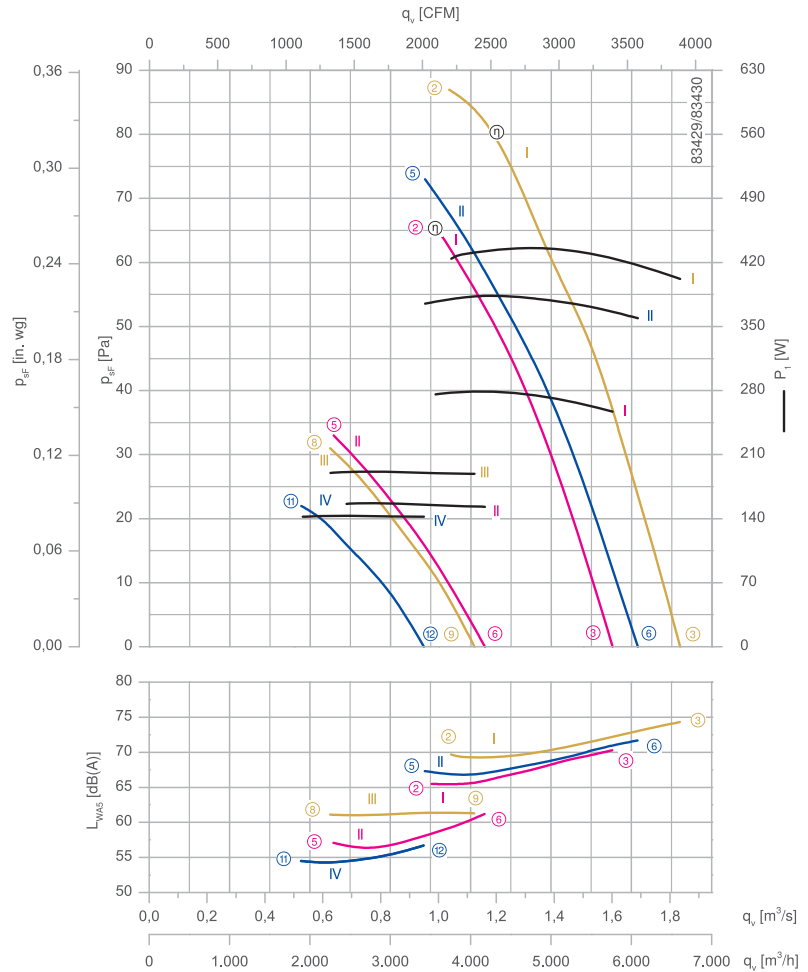
FN050-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 270/160 W | 380/140 W | 420/190 W*
 Rated current I_N :
 0.68/0.35 A | 0.83/0.35 A | 0.83/0.40 A*
 Rated speed n_N :
 890/610 min⁻¹ | 910/510 min⁻¹ | 1000/600 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 900/650 min⁻¹ | 950/540 min⁻¹ | 1030/640 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 260/150 W | 360/140 W | 400/190 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 1.6/1.15 m³/s | 1.7/0.95 m³/s | 1.85/1.1 m³/s*
 Starting current I_A : 1.5/0.4 A | 1.2/0.32 A | 1.5/0.4 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 65 °C | 65 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 30.1 %
 Efficiency: $N_{actual} = 40.2 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

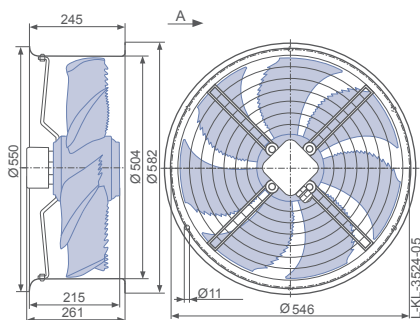
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1360-108XB

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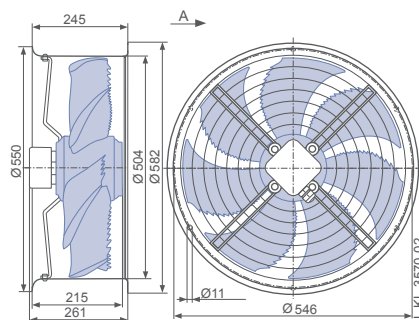
Dimensions mm

Airflow direction A

Design H - pipe sockets with a flange,
guard grille suction side



Design H - pipe sockets with a flange,
guard grille two-sided

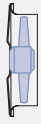



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{TWAS} dB(A)
FN050-SDH.4F.A7P1	Δ	I	400*	50	②	0.68*	270*	890*	66
					③	0.66*	260*	900*	70
					⑤	0.35*	160*	610*	57
	Y	II	460*	60	⑥	0.34*	150*	650*	61
					②	0.83*	420*	1000*	70
		II	400*	③	0.78*	400*	1030*	74	
				⑤	0.83*	380*	910*	67	
		Y	III	460*	⑥	0.78*	360*	950*	72
					⑧	0.40*	190*	600*	61
	IV	400*	⑨	0.40*	190*	640*	61		
			⑪	0.35*	140*	510*	55		
						⑫	0.35*	140*	540*

*rated data

Fan ordering information

Airflow direction A		
Design	H (guard grille suction side)	H (guard grille two-sided)
		
Type	FN050-SDH.4F.A7P1	FN050-SDH.4F.A7P1
Article no.	154277/10K1	154277/10K3
Weight kg	18.70	19.50

Control technology

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Information

Oil transformer cooling

Dry transformer cooling

System components

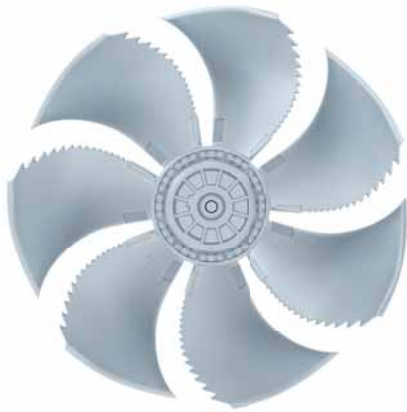
Control technology

Appendix

FE2owlet

for three phase alternating current, 8-8 pole

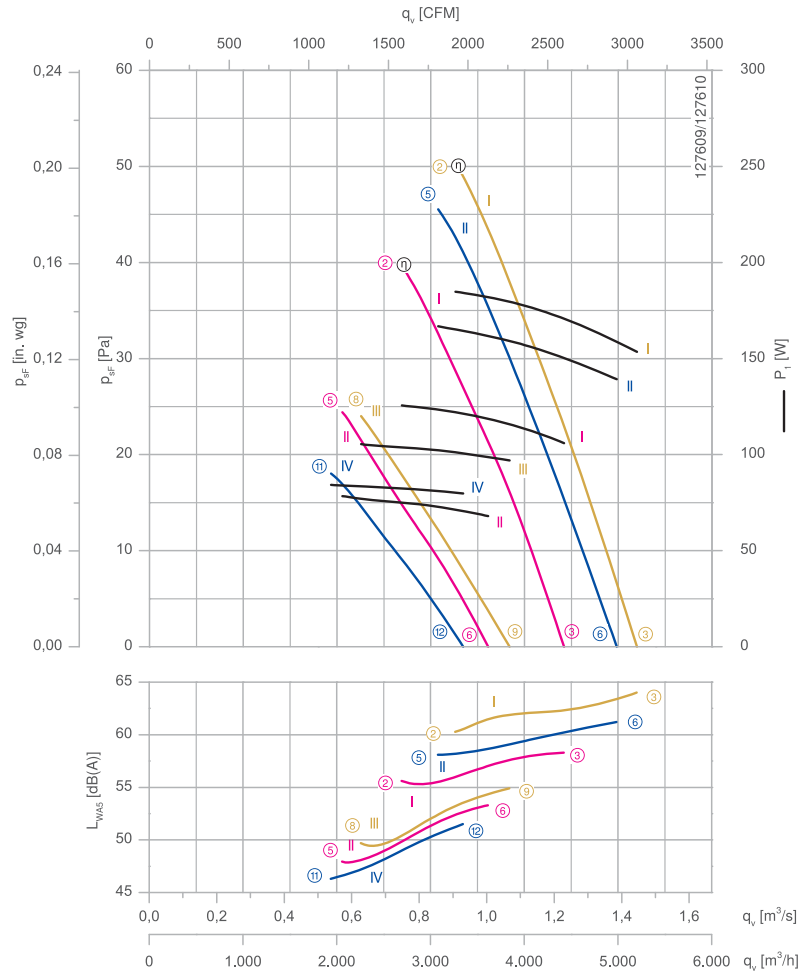
FN050-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
130/80 W | 170/85 W | 190/110 W*
 Rated current I_N :
0.29/0.14 A | 0.32/0.16 A | 0.33/0.17 A*
 Rated speed n_N :
670/510 min⁻¹ | 720/450 min⁻¹ | 760/520 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
680/560 min⁻¹ | 760/520 min⁻¹ | 800/590 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
110/70 W | 140/80 W | 150/95 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
1.23/1.0 m³/s | 1.4/0.93 m³/s | 1.44/1.1 m³/s*
 Starting current I_A : **0.7/0.22 A | 0.65/0.2 A | 0.75/0.24 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_1 < 125$ W)
 * Rated data

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

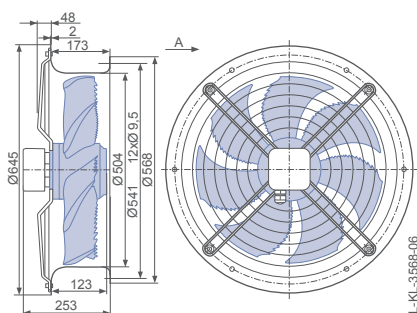
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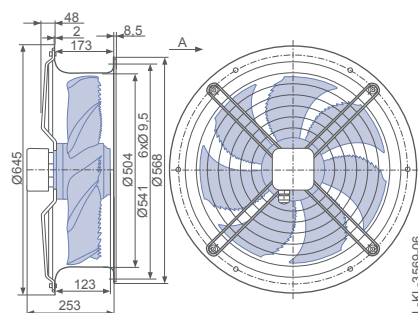
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

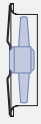



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)	
			U V	f Hz		I A	P_1 W	n min ⁻¹		
FN050-ADL.4C.A7P1	Δ	I	400*	50	②	0.29*	130*	670*	56	
					③	0.27*	110*	680*	58	
	Y	II	400*	50	⑤	0.14*	80*	510*	48	
					⑥	0.12*	70*	560*	53	
	Δ	I	460*	60	②	0.32*	190*	760*	60	
					③	0.29*	150*	800*	64	
		II	400*	60	⑤	0.32*	170*	720*	58	
					⑥	0.28*	140*	760*	61	
		Y	III	460*	60	⑧	0.17*	110*	520*	50
						⑨	0.15*	95*	590*	55
	Y	IV	400*	60	⑪	0.16*	85*	450*	46	
					⑫	0.15*	80*	520*	52	

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN050-ADL.4C.A7P1	FN050-ADL.4C.A7P1
Article no.	174745/10K1	174745/10K3
Weight kg	16.80	18.20

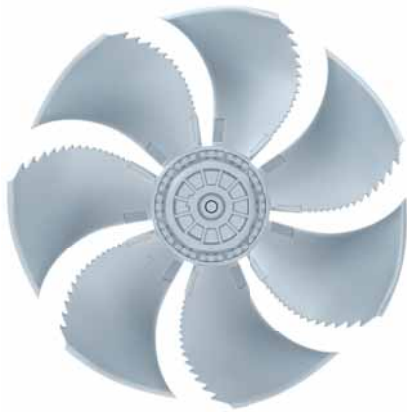
Control technology

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FE2owlet

for three phase alternating current, 8-8 pole

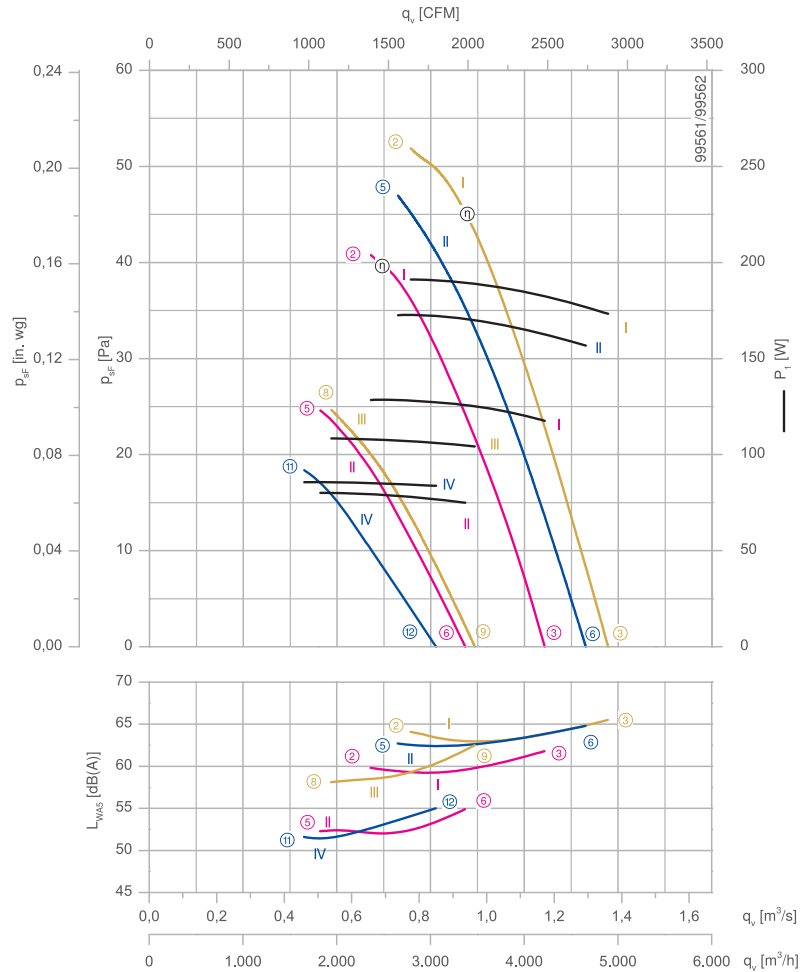
FN050-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_i :
 130/80 W | 170/85 W | 190/110 W*
 Rated current I_N :
 0.29/0.145 A | 0.33/0.165 A | 0.33/0.175 A*
 Rated speed n_N :
 670/510 min⁻¹ | 720/450 min⁻¹ | 770/520 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 680/540 min⁻¹ | 750/490 min⁻¹ | 780/560 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 120/75 W | 160/85 W | 170/100 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 1.2/0.95 m³/s | 1.3/0.85 m³/s | 1.35/0.95 m³/s*
 Starting current I_A : 0.7/0.22 A | 0.65/0.2 A | 0.75/0.24 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

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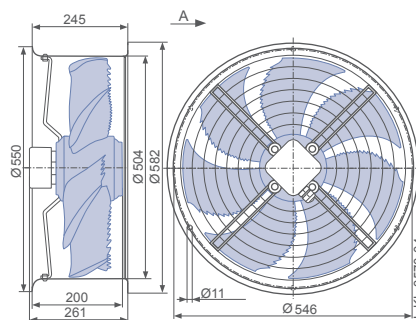
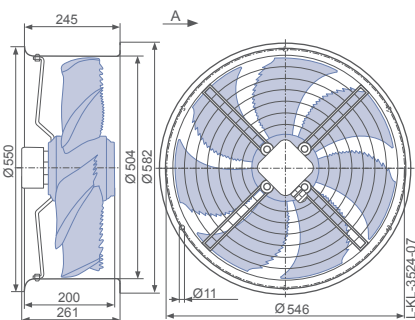
System components Page 184

Dimensions mm

Airflow direction A

Design H - pipe sockets with a flange, guard grille suction side

Design H - pipe sockets with a flange, guard grille two-sided

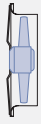



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)	
			U V	f Hz		I A	P_1 W	n min ⁻¹		
FN050-ADH.4C.A7P1	Δ	I	400*	50	②	0.29*	130*	670*	60	
					③	0.28*	120*	680*	62	
					⑤	0.14*	80*	510*	52	
	Δ	I	460*	60	②	0.33*	190*	770*	64	
					③	0.31*	170*	780*	66	
		II	400*	60	⑤	0.33*	170*	720*	63	
					⑥	0.30*	160*	750*	65	
		Y	III	460*	60	⑧	0.17*	110*	520*	58
						⑨	0.17*	100*	560*	63
	Y	IV	400*	60	⑪	0.16*	85*	450*	52	
					⑫	0.16*	85*	490*	55	

*rated data

Fan ordering information

Airflow direction A		
Design	H (guard grille suction side)	H (guard grille two-sided)
		
Type	FN050-ADH.4C.A7P1	FN050-ADH.4C.A7P1
Article no.	162085/10K1	162085/10K3
Weight kg	17.00	17.80

Control technology

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Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix

FE2owlet

for three phase alternating current, 4-4 pole

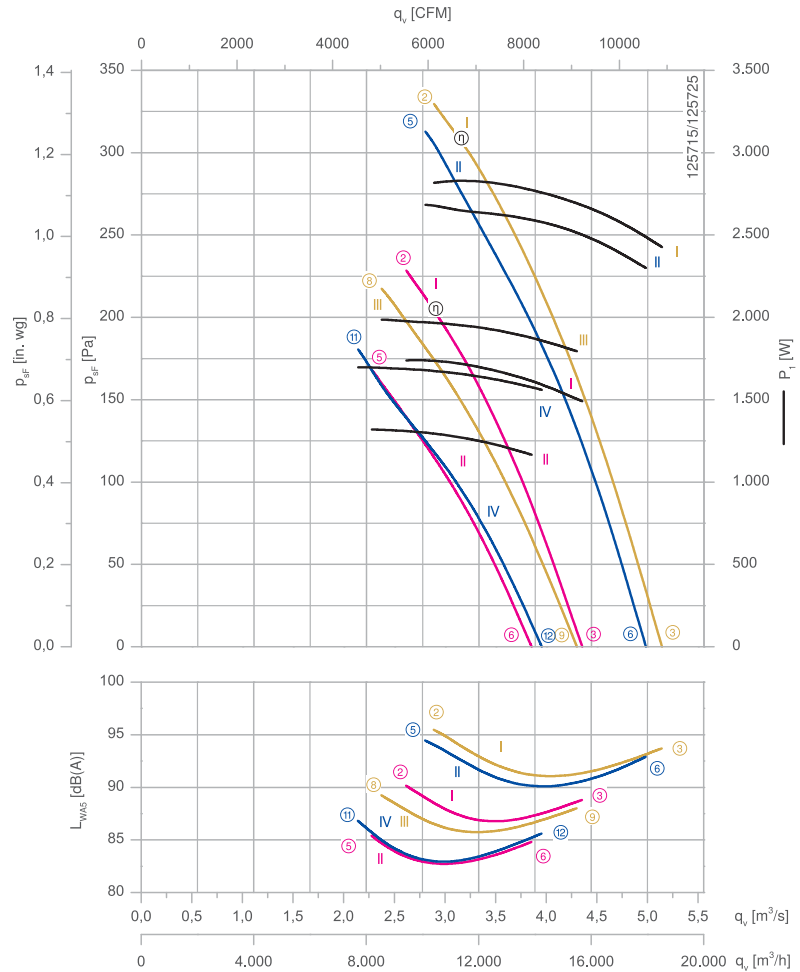
FN063-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_i :
1.75/1.30 kW | 2.70/1.70 kW | 2.80/2.00 kW*
 Rated current I_N :
3.70/2.20 A | 4.60/2.80 A | 4.60/2.80 A*
 Rated speed n_N :
1400/1210 min^{-1} | 1590/1210 min^{-1} | 1640/1330 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
1420/1250 min^{-1} | 1620/1290 min^{-1} | 1670/1400 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
1500/1150 W | 2300/1550 W | 2400/1800 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
4.4/3.9 m^3/s | 5.0/4.0 m^3/s | 5.1/4.3 m^3/s *
 Starting current I_A : **20/6.5 A | 19/6.0 A | 22/7.0 A**
 Current increase ΔI : **0 % | 5 % | 10 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(\text{max})}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency $\eta_{\text{stat}A}$: 42.5 %
 Efficiency: $N_{\text{actual}} = 47.4 / N_{\text{target}} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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1360-108XB

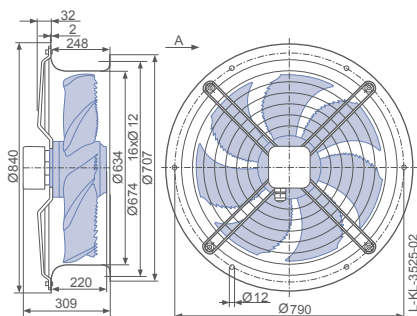
System components

Page 184

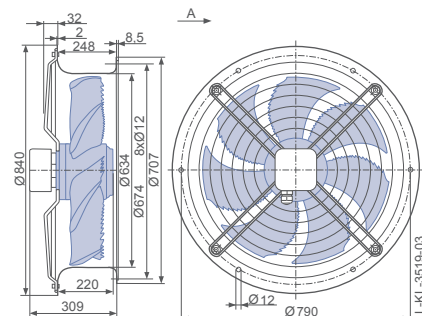
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

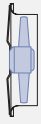



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN063-VDL.6N.A7P6	Δ	I	400*	50	②	3.70*	1750*	1400*	90
					③	3.50*	1500*	1420*	89
					⑤	2.20*	1300*	1210*	86
	Y	II	460*	60	⑥	1.95*	1150*	1250*	85
					②	4.60*	2800*	1640*	95
					③	4.20*	2400*	1670*	94
		IV	400*	60	⑤	4.60*	2700*	1590*	94
					⑥	4.00*	2300*	1620*	93
					⑧	2.80*	2000*	1330*	89
	Y	III	460*	60	⑨	2.60*	1800*	1400*	88
					⑪	2.80*	1700*	1210*	87
					⑫	2.60*	1550*	1290*	86

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN063-VDL.6N.A7P6	FN063-VDL.6N.A7P6
Article no.	173164/10K1	173164/10K3
Weight kg	37.90	40.10

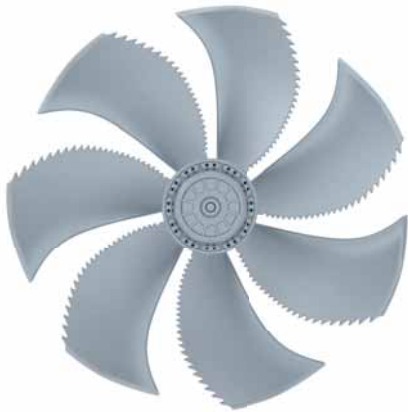
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 6-6 pole

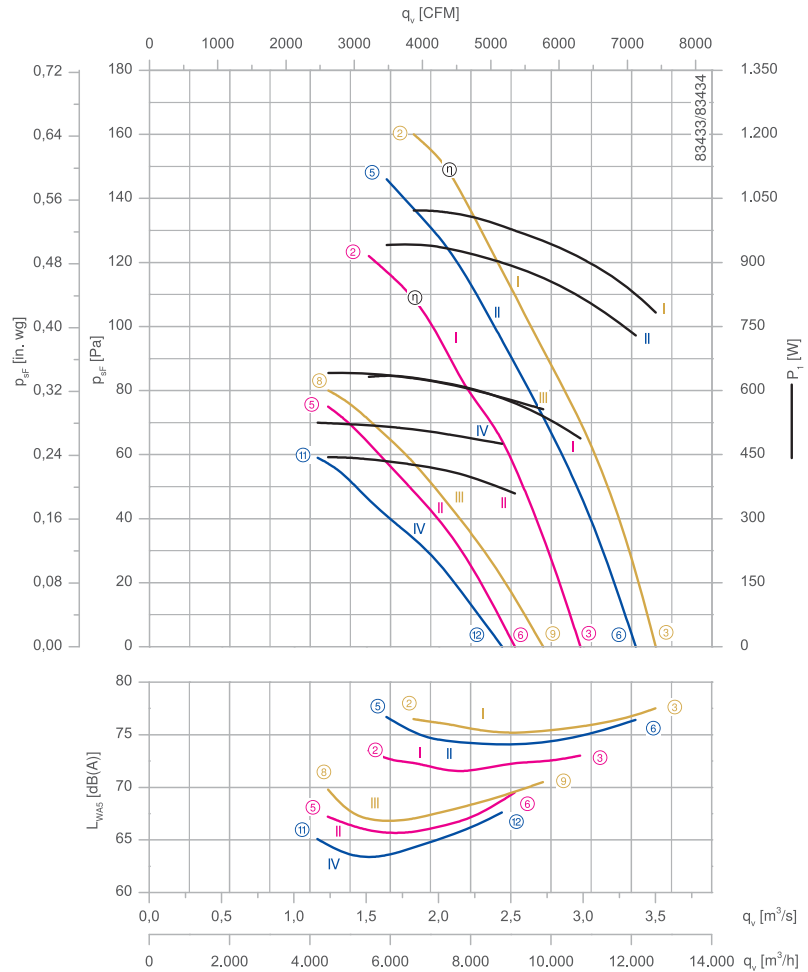
FN063-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 630/440 W | 940/520 W | 1.00/0.64 kW*
 Rated current I_N :
 1.25/0.72 A | 1.55/0.87 A | 1.55/0.91 A*
 Rated speed n_N :
 900/720 min⁻¹ | 980/640 min⁻¹ | 1040/740 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 930/790 min⁻¹ | 1050/760 min⁻¹ | 1090/850 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 480/360 W | 720/470 W | 780/550 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 3.0/2.5 m³/s | 3.4/2.4 m³/s | 3.5/2.7 m³/s*
 Starting current I_A : 4.4/1.4 A | 4.0/1.3 A | 4.8/1.5 A
 Current increase ΔI : 0 % | 5 % | 5 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 50 °C | 50 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 33.8 %
 Efficiency: $N_{actual} = 41.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

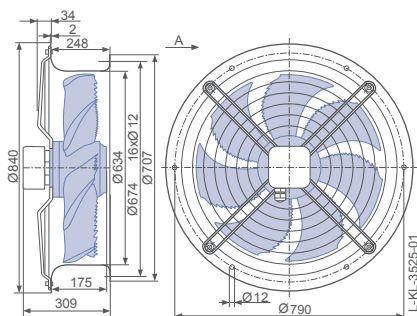
Connection diagram Page 252
1360-108XB

System components Page 184

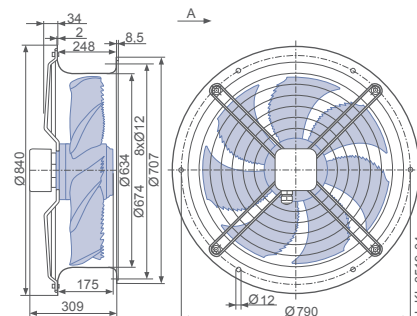
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

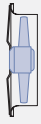



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN063-SDL.4I.A7P1	Δ	I	400*	50	②	1.25*	640*	900*	74
					③	1.10*	480*	930*	73
					⑤	0.72*	440*	720*	66
	Y	II	400*	60	⑥	0.60*	360*	790*	70
					②	1.55*	1000*	1040*	77
					③	1.25*	780*	1090*	78
		III	460*	400*	⑤	1.55*	940*	980*	76
					⑥	1.25*	720*	1050*	76
					⑧	0.92*	640*	740*	67
	IV	400*	460*	⑨	0.80*	560*	850*	71	
				⑪	0.88*	520*	650*	64	
				⑫	0.78*	480*	760*	68	

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN063-SDL.4I.A7P1	FN063-SDL.4I.A7P1
Article no.	154279/10K1	154279/10K3
Weight kg	26.50	28.70

Control technology

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FE2owlet

for three phase alternating current, 6-6 pole

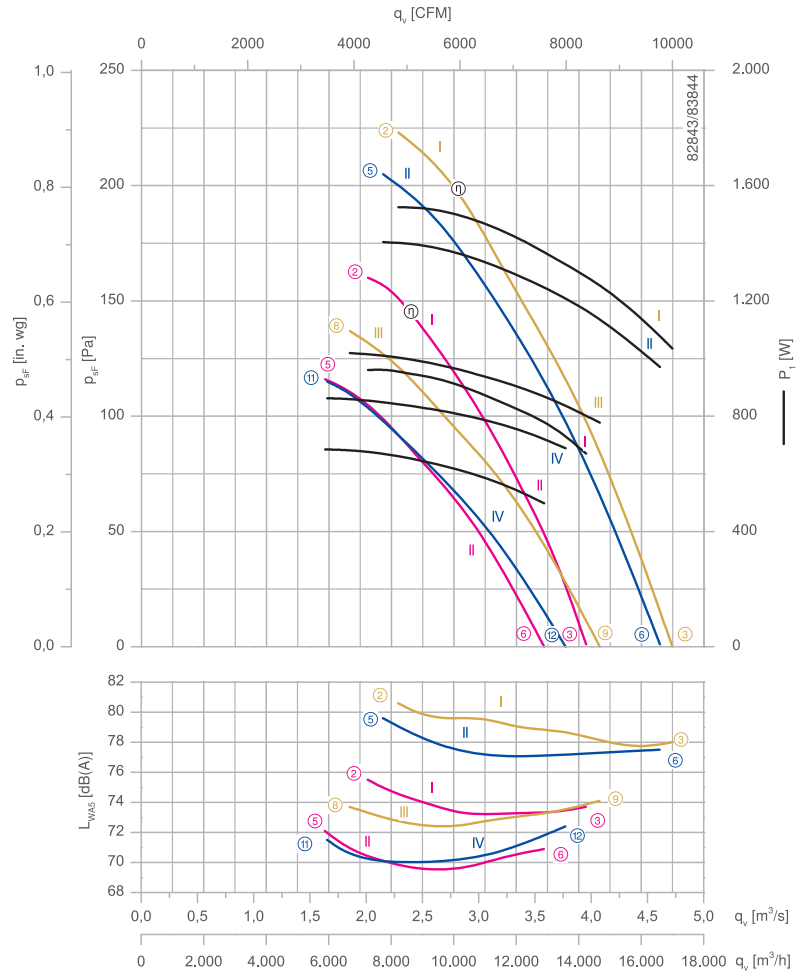
FNO71-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 960/680 W | 1.40/0.86 kW | 1.50/1.0 kW*
 Rated current I_N :
 2.40/1.20 A | 2.60/1.50 A | 2.70/1.55 A*
 Rated speed n_N :
 920/780 min⁻¹ | 1030/770 min⁻¹ | 1070/850 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 950/850 min⁻¹ | 1090/900 min⁻¹ | 1120/970 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 680/500 W | 970/690 W | 1050/780 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 4.0/3.6 m³/s | 4.6/3.8 m³/s | 4.7/4.1 m³/s*
 Starting current I_A : 9.5/3.0 A | 9.0/2.8 A | 10/3.2 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 37.4 %
 Efficiency: $N_{actual} = 44.0 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

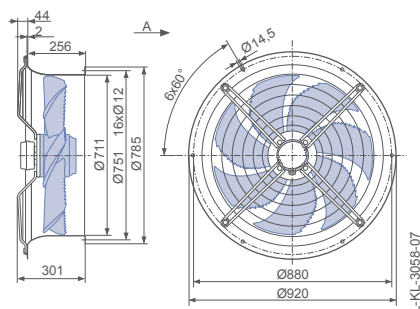
Connection diagram Page 252
1360-108XB

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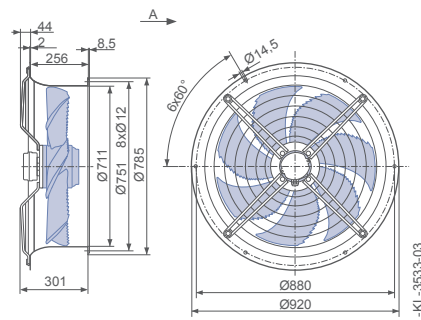
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

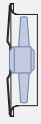



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN071-SDL.6K.A7P1	Δ	I	400*	50	②	2.40*	960*	920*	75
					③	2.10*	680*	950*	74
					⑤	1.20*	680*	780*	72
	Y	II	460*	60	⑥	0.94*	500*	850*	71
					②	2.70*	1500*	1070*	81
					③	2.20*	1050*	1120*	78
		IV	400*	60	⑤	2.60*	1400*	1030*	79
					⑥	2.00*	970*	1090*	78
					⑧	1.55*	1000*	850*	75
	Y	III	460*	60	⑨	1.20*	780*	970*	74
					⑪	1.50*	860*	770*	72
					⑫	1.20*	690*	900*	72

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN071-SDL.6K.A7P1	FN071-SDL.6K.A7P1
Article no.	154280/10K1	154280/10K3
Weight kg	38.90	41.40

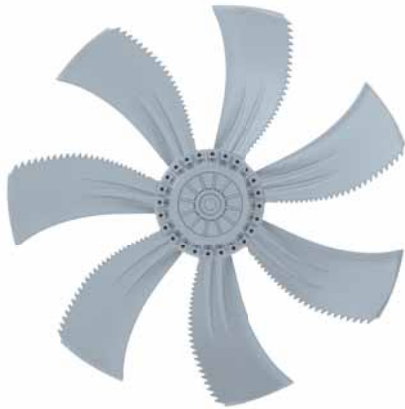
Control technology

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FE2owlet

for three phase alternating current, 8-8 pole

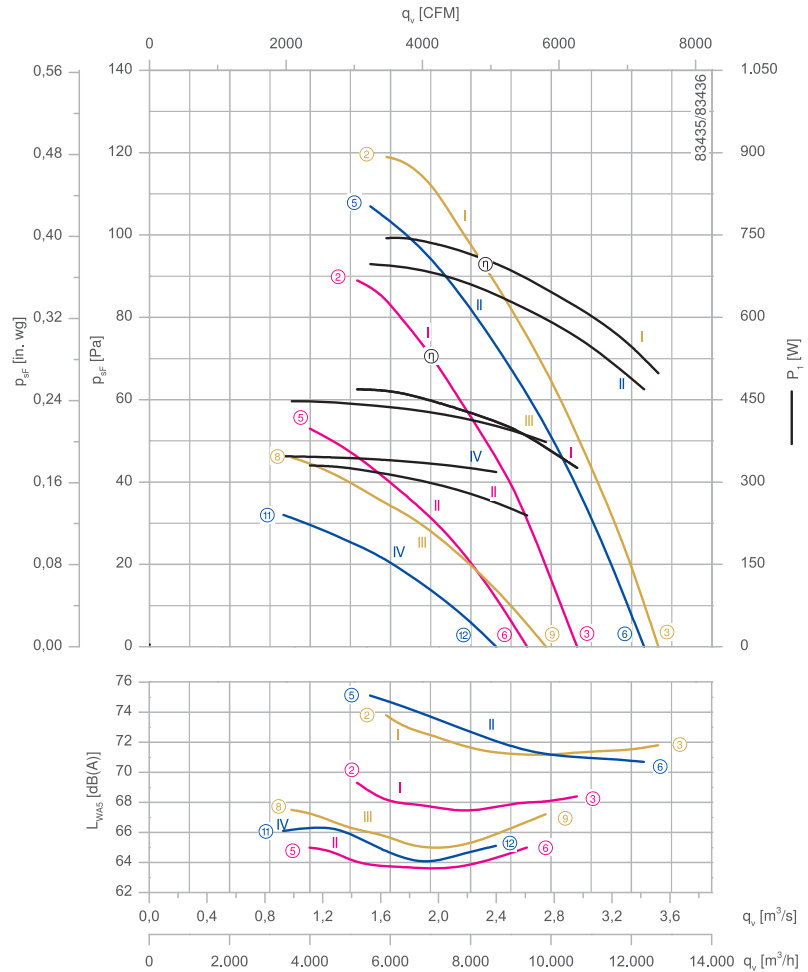
FNO71-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3- 400 V (Δ/Y) | 3-400 V (Δ/Y) | 3-460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
470/330 W | 700/350 W | 740/450 W*
 Rated current I_N :
1.05/0.61 A | 1.30/0.72 A | 1.25/0.77 A*
 Rated speed n_N :
680/530 min⁻¹ | 750/410 min⁻¹ | 790/490 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
710/630 min⁻¹ | 810/570 min⁻¹ | 840/660 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
330/240 W | 470/320 W | 500/370 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
3.0/2.6 m³/s | 3.4/2.4 m³/s | 3.5/2.7 m³/s*
 Starting current I_A : **3.2/0.95 A | 2.8/0.85 A | 3.2/1.0 A**
 Current increase ΔI : **0 % | 5 % | 5 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 33.1 %
 Efficiency: $N_{actual} = 41.6 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

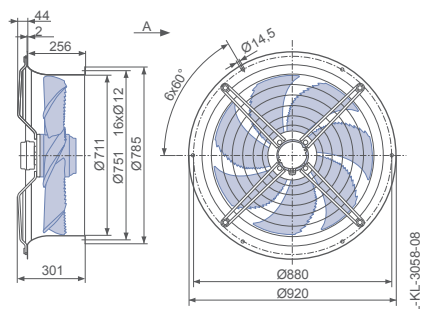
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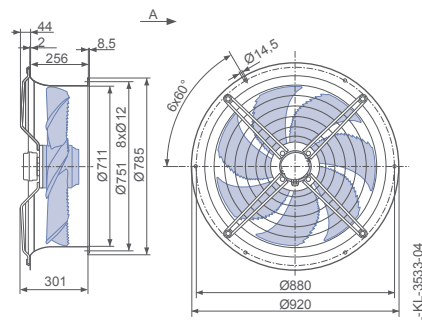
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

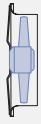



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN071-ADL.6F.A7P1	Δ	I	400*	50	②	1.05*	470*	680*	69
					③	0.93*	330*	710*	68
					⑤	0.61*	330*	530*	65
	Y	II	460*	60	⑥	0.46*	240*	630*	65
					②	1.25*	740*	790*	74
					③	0.99*	500*	840*	72
		IV	400*	60	⑤	1.30*	700*	750*	75
					⑥	0.96*	470*	810*	71
					⑧	0.77*	450*	490*	67
	Y	III	460*	60	⑨	0.62*	370*	660*	67
					⑪	0.72*	350*	410*	65
					⑫	0.64*	320*	570*	65

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN071-ADL.6F.A7P1	FN071-ADL.6F.A7P1
Article no.	154281/10K1	154281/10K3
Weight kg	35.30	37.80

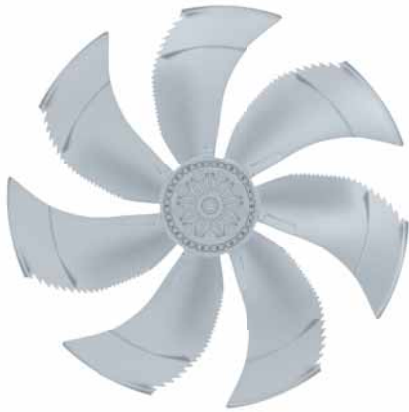
Control technology

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FE2owlet

for three phase alternating current, 6-6 pole

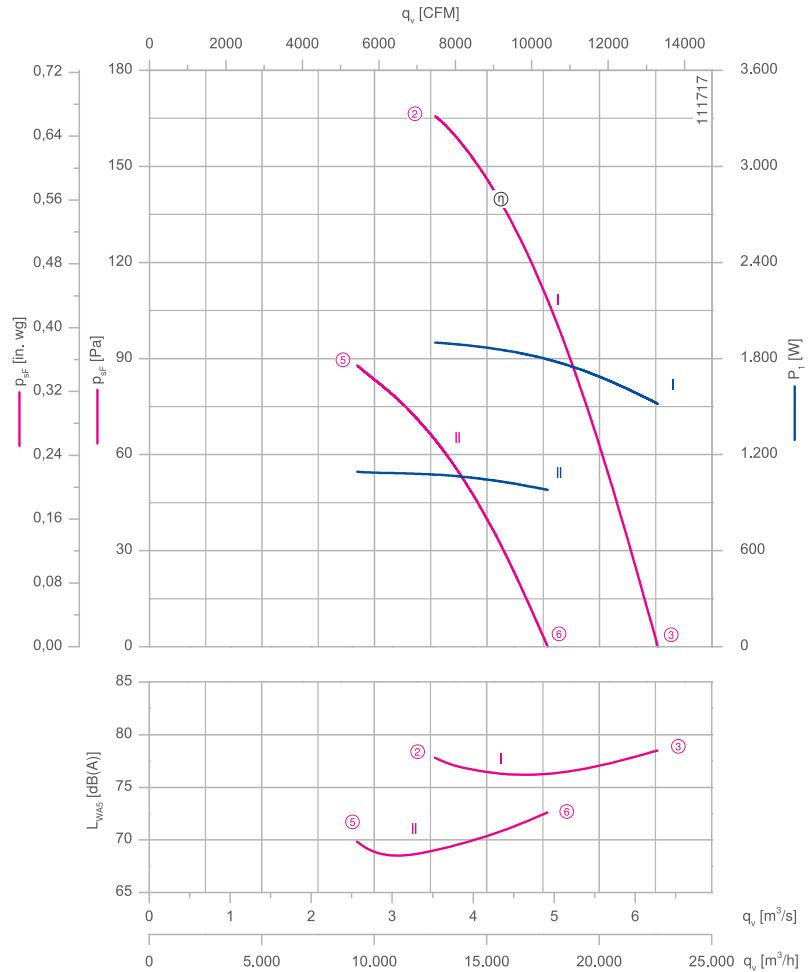
FNO80-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
1.90/1.10 kW*
 Rated current I_N :
3.80/2.00 A*
 Rated speed n_N :
870/640 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
900/710 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
1500/980 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
6.3/4.9 m³/s*
 Starting current I_A : **11/3.4 A**
 Current increase ΔI : **0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **60 °C**
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint, RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint, RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 35.5 %
 Efficiency: $N_{actual} = 40.1 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

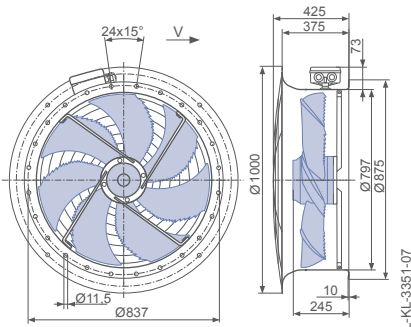
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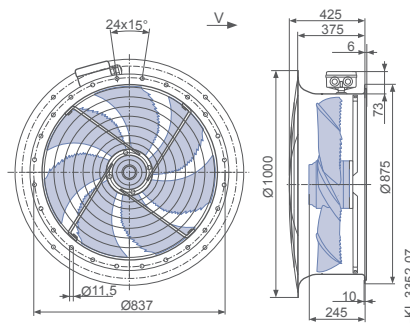
Dimensions mm

Airflow direction

Design L - round full bell mouth, guard grille suction side with connection box



Design L - round full bell mouth, guard grille two-sided with connection box






Performance data

Type	Connection	Characteristic curve	Voltage	Operating point	Current	Input power	Speed	Suction side sound power level
			U V		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
FN080-SDL.6N.V7P5	Δ	I	400*	②	3.80*	1900*	870*	78
				③	3.30*	1500*	900*	79
	Y	II		⑤	1.95*	1100*	640*	70
				⑥	1.80*	980*	710*	73

*rated data

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-SDL.6N.V7P5	FN080-SDL.6N.V7P5
Article no.	168790/10K1	168790/10K3
Weight kg	59.80	63.30

Control technology

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- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix

FE2owlet

for three phase alternating current, 6-6 pole

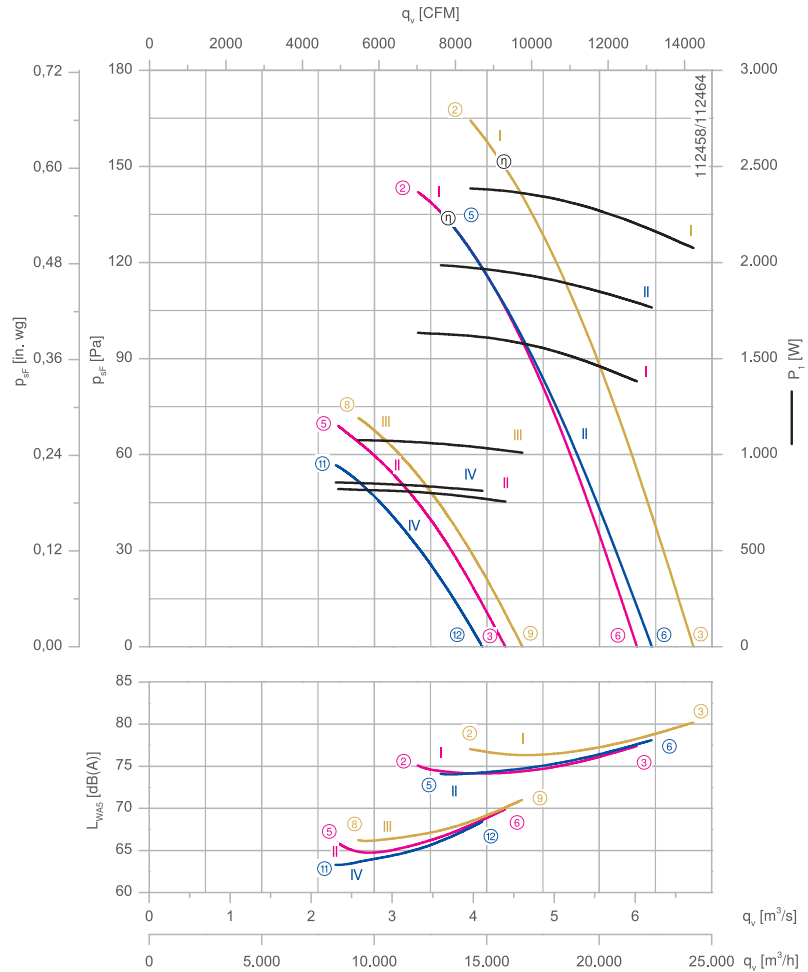
FN080-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
1.65/0.82 kW | 2.00/0.86 kW | 2.40/1.10 kW*
 Rated current I_N :
3.50/1.55 A | 3.80/1.60 A | 4.00/1.75 A*
 Rated speed n_N :
800/560 min⁻¹ | 800/520 min⁻¹ | 880/580 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
850/620 min⁻¹ | 870/580 min⁻¹ | 940/650 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
1400/760 W | 1750/820 W | 2100/1000 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
6.0/4.4 m³/s | 6.2/4.1 m³/s | 6.7/4.6 m³/s*
 Starting current I_A : **9.5/3.0 A | 8.5/2.6 A | 10/3.2 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 50 °C | 40 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 * Rated data

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

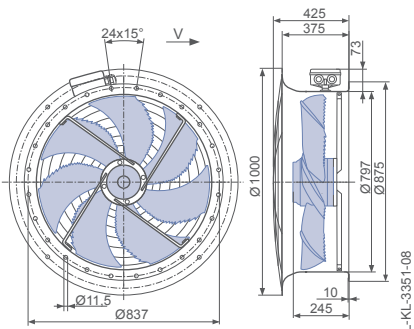
Connection diagram Page 252
1360-108XA

System components Page 184

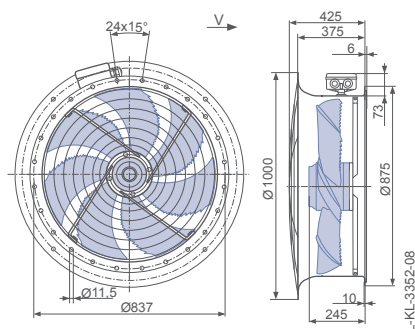
Dimensions mm

Airflow direction

Design L - round full bell mouth, guard grille suction side with connection box



Design L - round full bell mouth, guard grille two-sided with connection box





Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)
FN080-SDL.6N.V7P5	Δ	I	400*	50	②	3.50*	1650*	800*	75
					③	3.10*	1400*	850*	77
					⑤	1.55*	820*	560*	66
	Y	II	460*	60	⑥	1.45*	760*	620*	70
					②	4.20*	2400*	880*	77
					③	3.70*	2100*	940*	80
		IV	⑤	3.80*	2000*	800*	74		
			⑥	3.40*	1750*	870*	78		
			⑧	1.75*	1050*	580*	66		
	Y	III	460*	60	⑨	1.65*	1000*	650*	71
					⑪	1.60*	860*	520*	63
					⑫	1.50*	820*	580*	68

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-SDL.6N.V7P5	FN080-SDL.6N.V7P5
Article no.	168895/10K1	168895/10K3
Weight kg	59.80	63.30

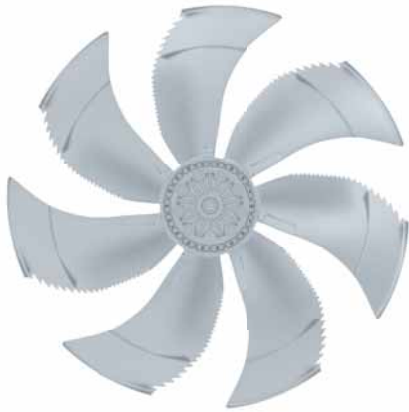
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 8-8 pole

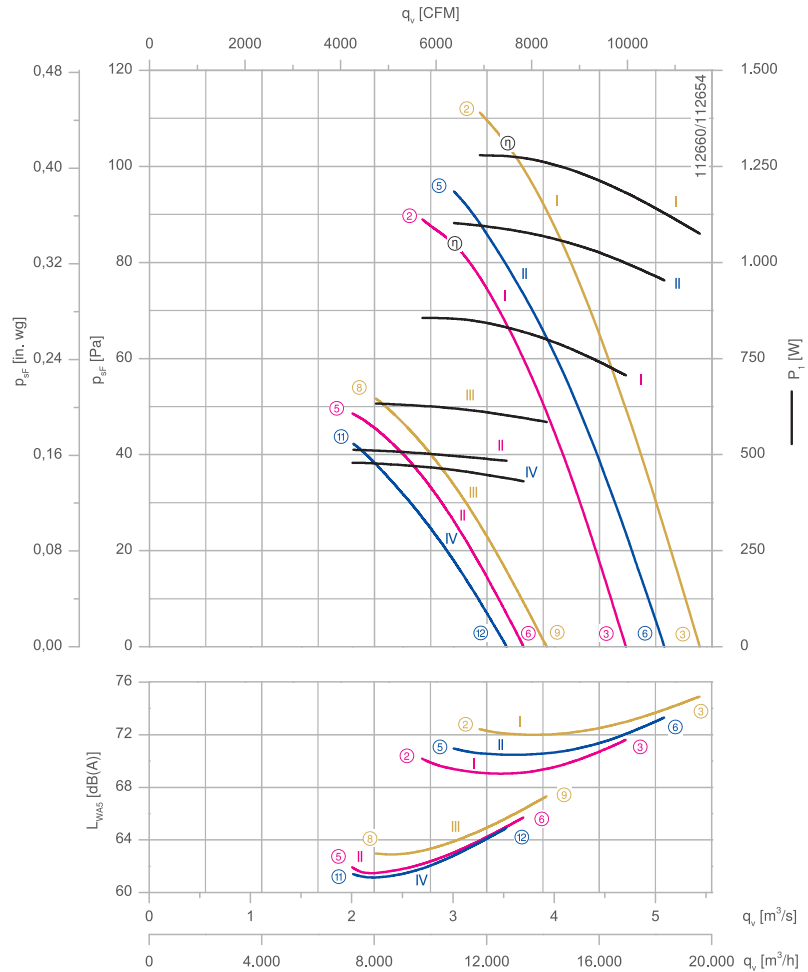
FNO80-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
860/480 W | 1.10/0.52 kW | 1.30/0.64 kW*
 Rated current I_N :
2.10/0.98 A | 2.30/1.00 A | 2.50/1.10 A*
 Rated speed n_N :
650/490 min⁻¹ | 680/460 min⁻¹ | 740/510 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
680/530 min⁻¹ | 730/510 min⁻¹ | 780/570 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
700/440 W | 960/480 W | 1100/580 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
4.7/3.7 m³/s | 5.1/3.5 m³/s | 5.4/3.9 m³/s*
 Starting current I_A : **5.5/1.6 A | 4.6/1.4 A | 5.5/1.7 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 65 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency $\eta_{stat A}$: 33.5 %
 Efficiency: $N_{actual} = 40.3 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

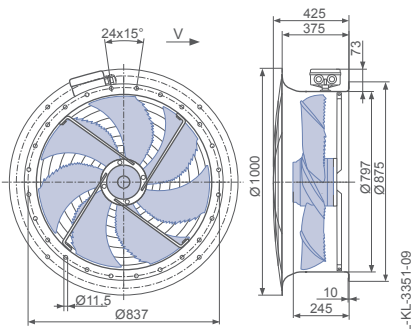
Connection diagram Page 252
1360-108XA

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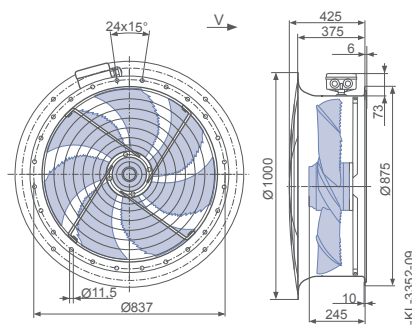
Dimensions mm

Airflow direction

Design L - round full bell mouth, guard grille suction side with connection box



Design L - round full bell mouth, guard grille two-sided with connection box





Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN080-ADL.6N.V7P5	Δ	I	400*	50	②	2.10*	860*	650*	70
					③	1.90*	700*	680*	72
					⑤	0.96*	480*	480*	62
	Y	II	460*	60	⑥	0.90*	440*	530*	66
					②	2.50*	1300*	740*	73
					③	2.20*	1100*	780*	75
		IV	⑤	2.30*	1100*	680*	71		
			⑥	2.10*	960*	730*	73		
			⑧	1.10*	640*	510*	63		
	Y	III	460*	60	⑨	1.00*	580*	570*	67
					⑪	1.00*	520*	460*	62
					⑫	0.96*	480*	510*	65

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-ADL.6N.V7P5	FN080-ADL.6N.V7P5
Article no.	168903/10K1	168903/10K3
Weight kg	59.80	63.30

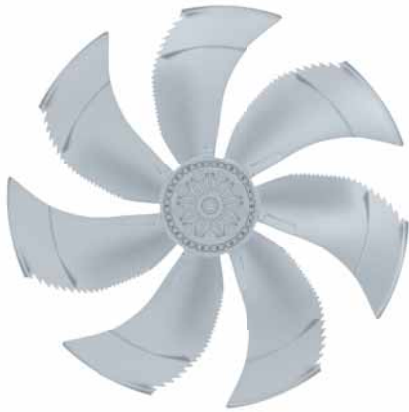
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 12-12 pole

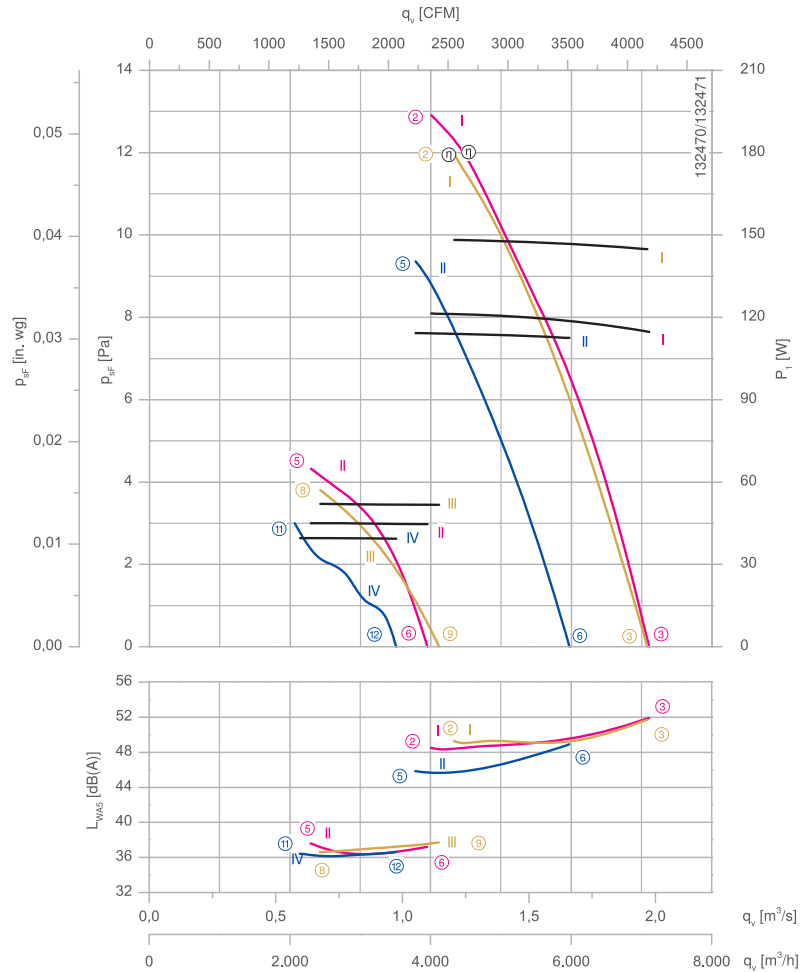
FN080-ND



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_i :
120/45 W | 110/40 W | 150/50 W*
 Rated current I_N :
0.24/0.09 A | 0.24/0.09 A | 0.27/0.10 A*
 Rated speed n_N :
250/150 min⁻¹ | 210/120 min⁻¹ | 250/140 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
290/160 min⁻¹ | 240/140 min⁻¹ | 280/160 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
110/45 W | 110/40 W | 140/50 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
2.0/1.1 m³/s | 1.7/1.0 m³/s | 2.0/1.1 m³/s*
 Starting current I_A : **0.3/0.1 A | 0.26/0.09 A | 0.3/0.1 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram Page 252
1360-108XA

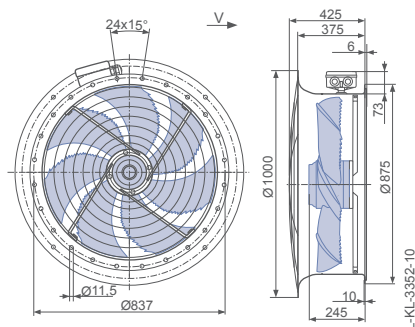
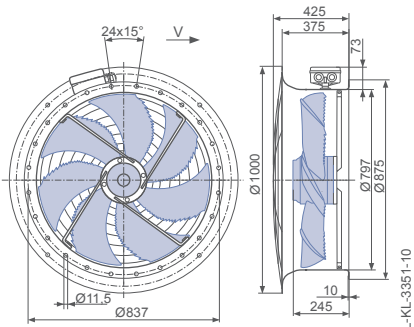
System components Page 184

Dimensions mm

Airflow direction

Design L - round full bell mouth, guard grille suction side with connection box

Design L - round full bell mouth, guard grille two-sided with connection box





Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN080-NDL.6N.V7P5	Δ	I	400*	50	②	0.24*	120*	250*	49
					③	0.23*	110*	290*	52
					⑤	0.09*	46*	140*	37
	Y	II	460*	60	⑥	0.09*	44*	160*	37
					②	0.27*	150*	250*	49
					③	0.26*	140*	280*	52
		IV	400*	60	⑤	0.24*	110*	210*	46
					⑥	0.24*	110*	240*	49
					⑧	0.10*	50*	140*	37
	Y	III	460*	60	⑨	0.10*	50*	160*	38
					⑪	0.09*	40*	120*	36
					⑫	0.09*	40*	140*	37

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN080-NDL.6N.V7P5	FN080-NDL.6N.V7P5
Article no.	174933/10K1	174933/10K3
Weight kg	59.80	63.30

Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 6-6 pole

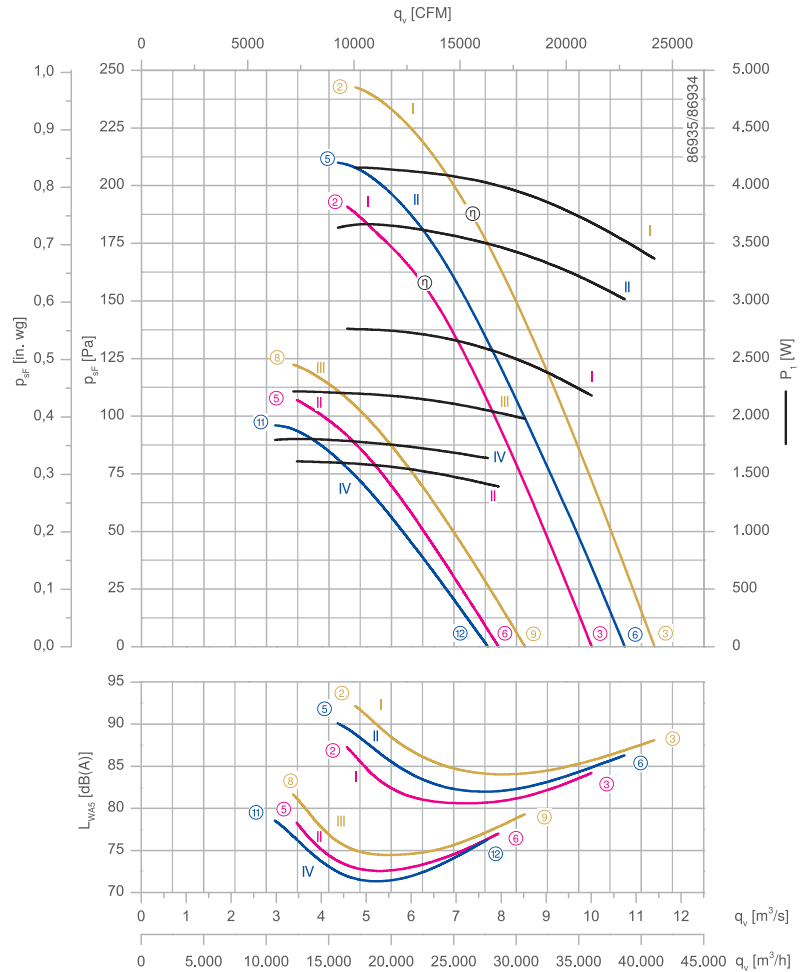
FN100-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 2.70/1.60 kW | 3.60/1.80 kW | 4.10/2.20 kW*
 Rated current I_N :
 5.30/2.80 A | 6.30/3.10 A | 6.50/3.30 A*
 Rated speed n_N :
 820/620 min⁻¹ | 860/590 min⁻¹ | 930/660 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 870/690 min⁻¹ | 930/670 min⁻¹ | 990/740 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 2200/1400 W | 3000/1650 W | 3400/2000 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 10.0/7.9 m³/s | 10.7/7.7 m³/s | 11.4/8.5 m³/s*
 Starting current I_A : 18/6.0 A | 17/5.0 A | 19/6.0 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 55 °C | 50 °C
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 36.8 %
 Efficiency: $N_{actual} = 40.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

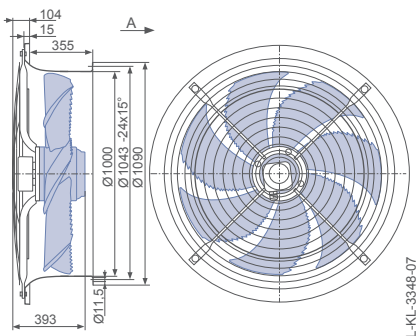
Connection diagram Page 252
1360-108XB

System components Page 184

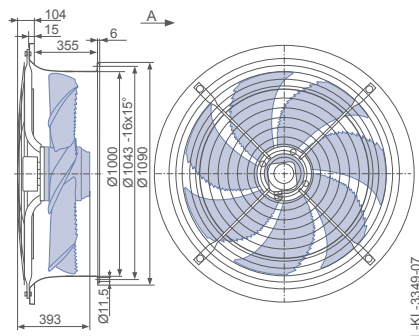
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

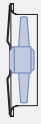



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level		
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)		
FN100-SDL.7Q.A5P1	Δ	I	400*	50	②	5.40*	2800*	820*	87		
					③	4.80*	2200*	870*	84		
					⑤	2.80*	1600*	620*	79		
	Y	II			⑥	2.40*	1400*	690*	77		
					Δ	I	②	6.40*	4200*	920*	92
							③	5.60*	3400*	990*	88
	⑤	6.40*	3600*	860*			90				
	Y	II	⑥	5.40*	3000*	930*	86				
			Y	III	⑧	3.30*	2200*	650*	82		
					⑨	3.00*	2000*	740*	79		
	⑪	3.10*			1800*	580*	79				
	⑫	2.80*	1650*	670*	76						

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-SDL.7Q.A5P1	FN100-SDL.7Q.A5P1
Article no.	156297/10K1	156297/10K3
Weight kg	87.20	92.00

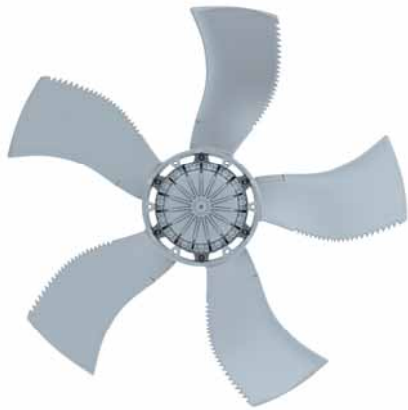
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 8-8 pole

FN100-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 1.40/0.85 kW | 1.90/0.92 kW | 2.10/1.15 kW*
 Rated current I_N :
 3.20/1.65 A | 3.70/1.85 A | 3.80/1.95 A*
 Rated speed n_N :
 650/510 min⁻¹ | 700/470 min⁻¹ | 750/530 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 680/560 min⁻¹ | 750/540 min⁻¹ | 790/610 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 1050/730 W | 1500/850 W | 1650/1050 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 7.9/6.5 m³/s | 8.7/6.2 m³/s | 9.1/7.0 m³/s*
 Starting current I_A : 11/3.4 A | 10/3.0 A | 12/3.6 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C

Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE

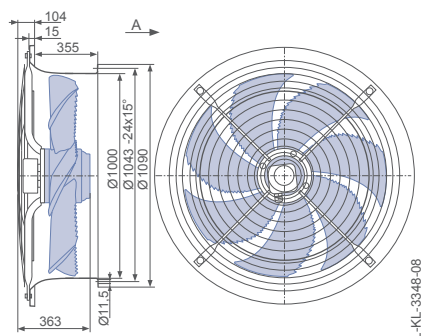
ErP-data

Efficiency η_{statA} : 39.5 %
 Efficiency: $N_{actual} = 44.9 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

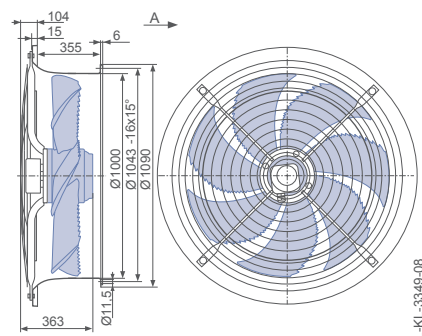
Dimensions mm

Airflow direction A

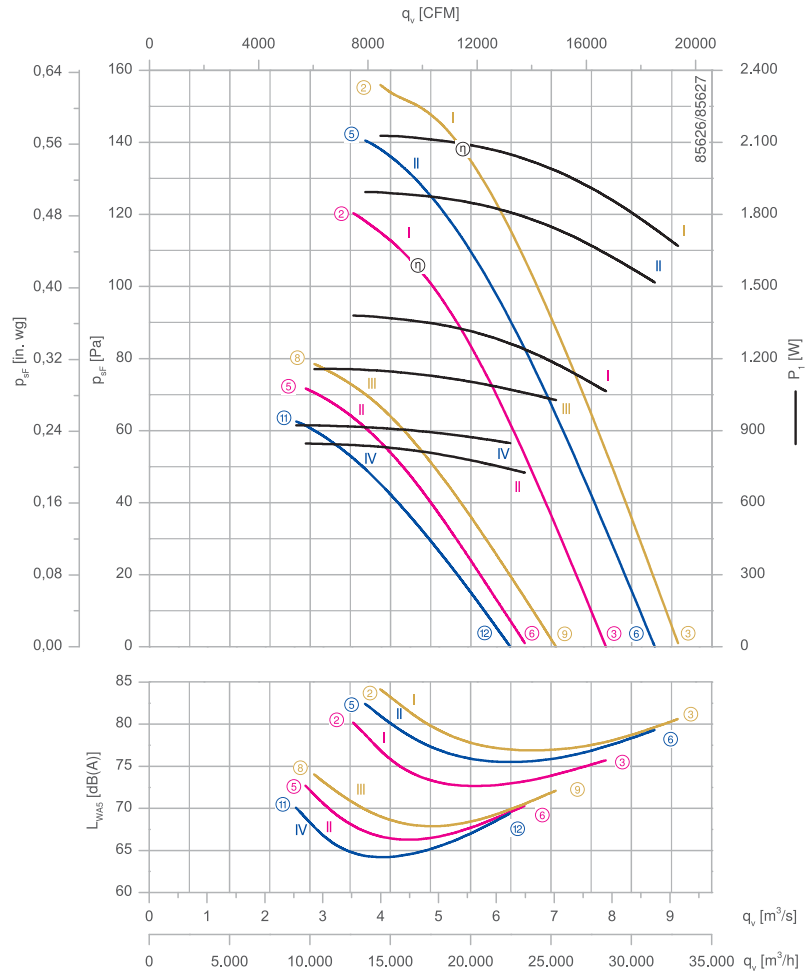
Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided



Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram Page 252
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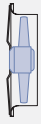

System components Page 184

Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN100-ADL.7M.A5P1	Δ	I	400*	50	②	3.20*	1400*	650*	81
					③	2.80*	1050*	680*	76
					⑤	1.65*	840*	500*	73
	Y	II	460*	60	⑥	1.40*	720*	560*	70
					②	3.80*	2100*	750*	84
					③	3.20*	1650*	790*	81
		IV	400*	60	⑤	3.70*	1900*	700*	82
					⑥	3.10*	1500*	750*	79
					⑧	1.95*	1150*	530*	74
	Y	III	460*	60	⑨	1.75*	1050*	610*	72
					⑪	1.85*	920*	470*	70
					⑫	1.65*	840*	540*	69

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-ADL.7M.A5P1	FN100-ADL.7M.A5P1
Article no.	155922/10K1	155922/10K3
Weight kg	80.70	85.50

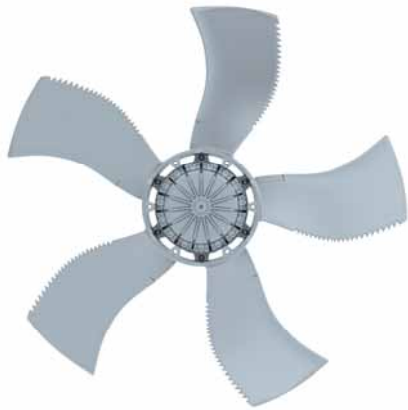
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 10-10 pole

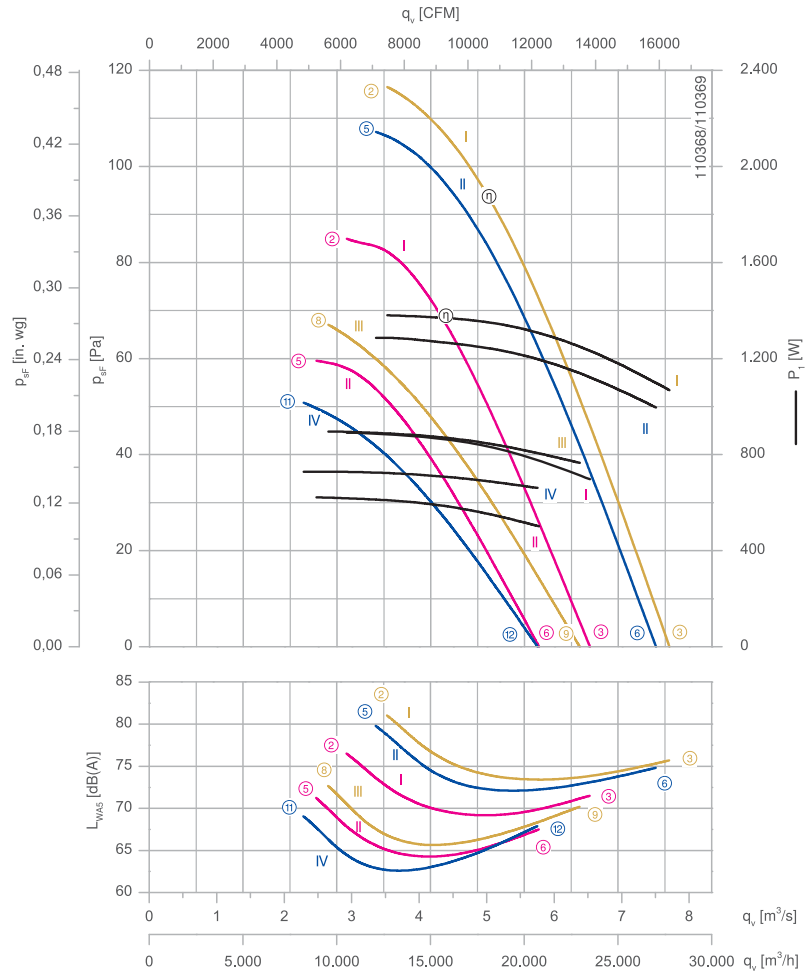
FN100-MD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz** *
 Input power P_1 :
900/620 W | 1.30/0.72 kW | 1.40/0.90 kW*
 Rated current I_N :
2.50/1.25 A | 2.70/1.60 A | 2.80/1.60 A*
 Rated speed n_N :
550/470 min⁻¹ | 620/430 min⁻¹ | 650/490 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
570/500 min⁻¹ | 660/500 min⁻¹ | 670/550 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
700/500 W | 1000/660 W | 1050/760 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
6.5/5.8 m³/s | 7.5/5.7 m³/s | 7.7/6.4 m³/s*
 Starting current I_A : **8.0/2.2 A | 6.5/1.9 A | 8.0/2.2 A**
 Current increase ΔI : **0 % | 5 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 35.4 %
 Efficiency: $N_{actual} = 42.1 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

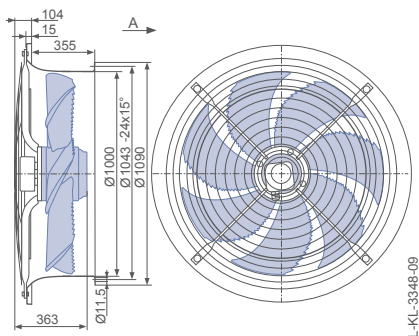
Connection diagram Page 252
1360-108XB

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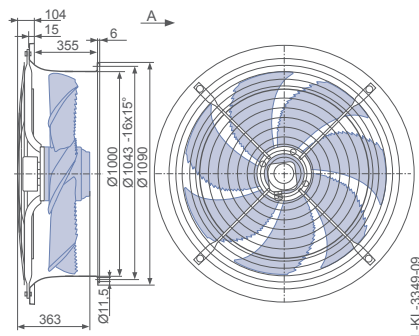
Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided

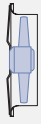



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN100-MDL.7M.A5P1	Δ	I	400*	50	②	2.50*	900*	550*	77
					③	2.30*	700*	570*	72
					⑤	1.25*	620*	460*	71
	Y	II	400*	60	⑥	1.05*	500*	500*	68
					②	2.80*	1400*	650*	81
					③	2.40*	1050*	670*	76
		IV	400*	60	⑤	2.70*	1300*	620*	80
					⑥	2.30*	1000*	650*	75
					⑧	1.60*	900*	490*	73
	Y	III	460*	60	⑨	1.35*	760*	550*	70
					⑪	1.55*	720*	430*	69
					⑫	1.35*	660*	500*	68

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-MDL.7M.A5P1	FN100-MDL.7M.A5P1
Article no.	167944/10K1	167944/10K3
Weight kg	80.70	85.50

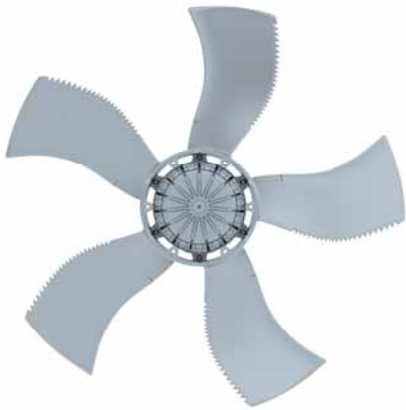
Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet

for three phase alternating current, 12-12 pole

FN100-ND



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz* |**
 Input power P_i :
500/330 W | 700/380 W | 760/460 W*
 Rated current I_N :
1.40/0.68 A | 1.55/0.80 A | 1.55/0.84 A*
 Rated speed n_N :
450/370 min⁻¹ | 500/350 min⁻¹ | 530/390 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
470/410 min⁻¹ | 530/410 min⁻¹ | 550/450 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
400/270 W | 540/340 W | 600/400 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
5.3/4.6 m³/s | 6.0/4.6 m³/s | 6.2/5.1 m³/s*
 Starting current I_A : **3.8/1.2 A | 3.2/1.0 A | 3.8/1.2 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C

Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint, RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint, RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE

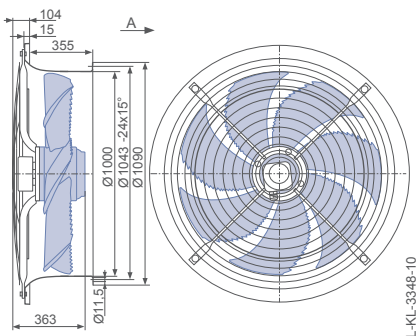
ErP-data

Efficiency η_{statA} : 33.5 %
 Efficiency: $N_{actual} = 41.9 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

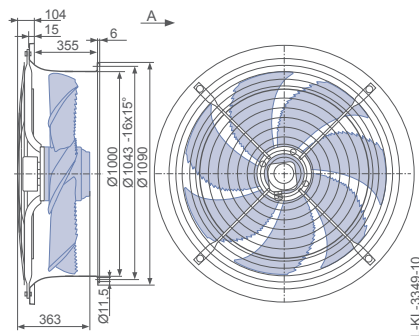
Dimensions mm

Airflow direction A

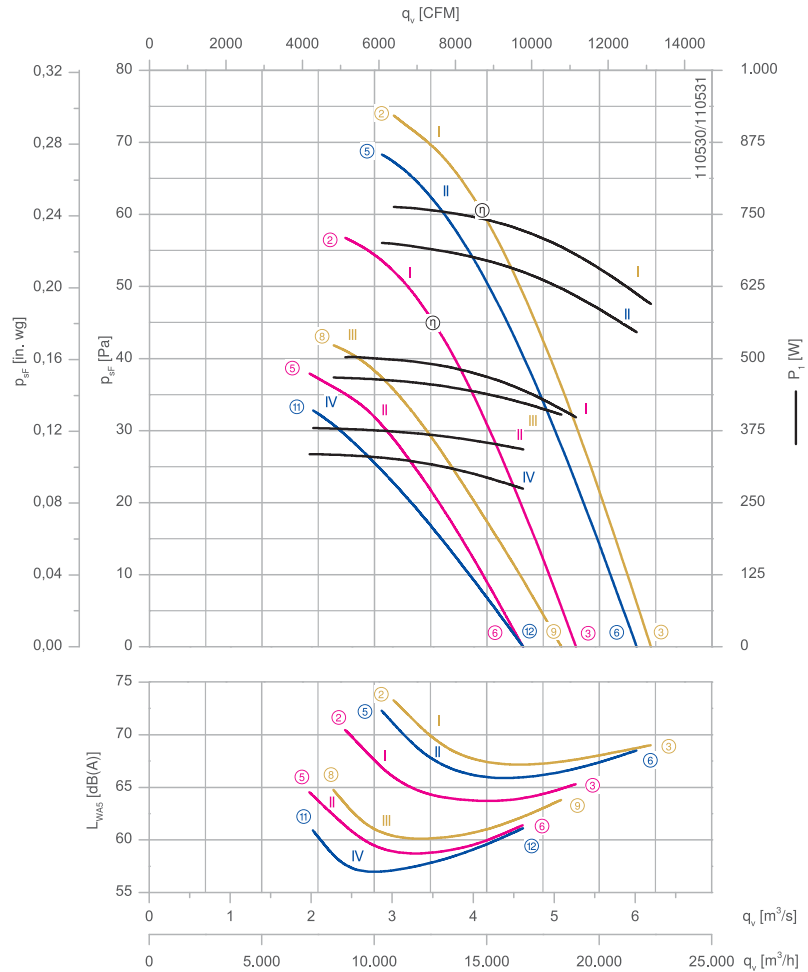
Design L - round full bell mouth, guard grille suction side



Design L - round full bell mouth, guard grille two-sided



Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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1360-108XB

System components


Page 184



Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)		
			U V	f Hz		I A	P_1 W	n min ⁻¹			
FN100-NDL.7M.A5P1	Δ	I	400*	50	②	1.40*	500*	450*	71		
					③	1.35*	400*	470*	65		
					⑤	0.70*	330*	370*	65		
	⑥	0.60*			270*	410*	61				
	Δ	I			460*	60	②	1.55*	760*	530*	74
							③	1.40*	600*	550*	69
			⑤	1.55*			700*	500*	72		
	⑥	1.30*	540*	530*			69				
	Y	III	460*	60			⑧	0.84*	460*	390*	65
							⑨	0.72*	400*	450*	64
					⑪	0.80*	380*	350*	61		
	Y	IV			400*	60	⑫	0.72*	340*	410*	61

*rated data

Fan ordering information

Airflow direction A 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN100-NDL.7M.A5P1	FN100-NDL.7M.A5P1
Article no.	167943/10K1	167943/10K3
Weight kg	80.70	85.50

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
Page 208	Page 206	Page 218

FE2owlet

for three phase alternating current, 10-10 pole

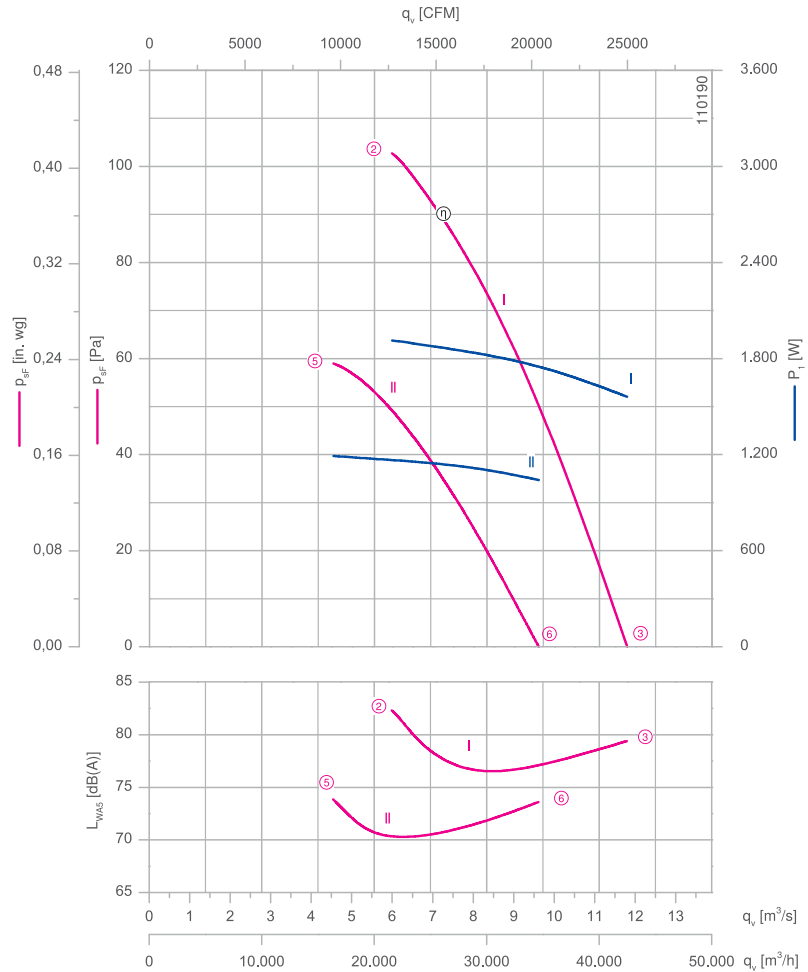
FN125-MD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
1.90/1.20 kW*
 Rated current I_N :
4.60/2.40 A*
 Rated speed n_N :
530/400 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
550/450 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
1550/1050 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
11.8/9.6 m³/s*
 Starting current I_A : **14/4.0 A**
 Current increase ΔI : **0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **65 °C**
 Electrical connection: Terminal box
 Number of blades: 3
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 35.9 %
 Efficiency: $N_{actual} = 40.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

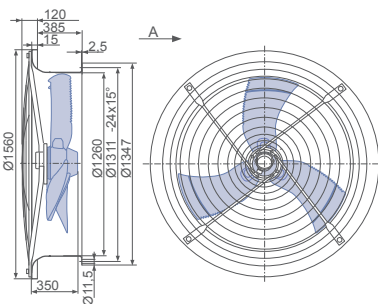
Connection diagram Page 252
1360-108XB

System components Page 184

Dimensions mm

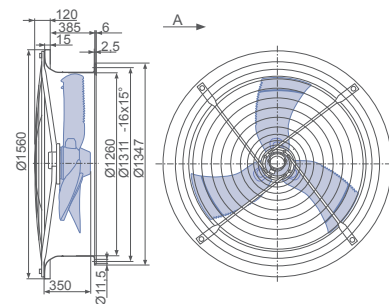
Airflow direction A

Design L - round full bell mouth, guard grille suction side



L-KL-3213-04

Design L - round full bell mouth, guard grille two-sided



L-KL-3214-03



Performance data

Type	Connection	Characteristic curve	Voltage	Operating point	Current	Input power	Speed	Suction side sound power level
			U V		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
FN125-MDL.7Q.A3P1	Δ	I	400*	②	4.60*	1900*	530*	83
				③	4.20*	1550*	550*	79
	Y	II		⑤	2.40*	1200*	400*	74
				⑥	2.10*	1050*	450*	74

*rated data

Fan ordering information

Airflow direction A

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN125-MDL.7Q.A3P1	FN125-MDL.7Q.A3P1
Article no.	167455/10K1	167455/10K3
Weight kg	108.70	114.80

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
Page 208	Page 206	Page 218

FE2owlet

for three phase alternating current, 12-12 pole

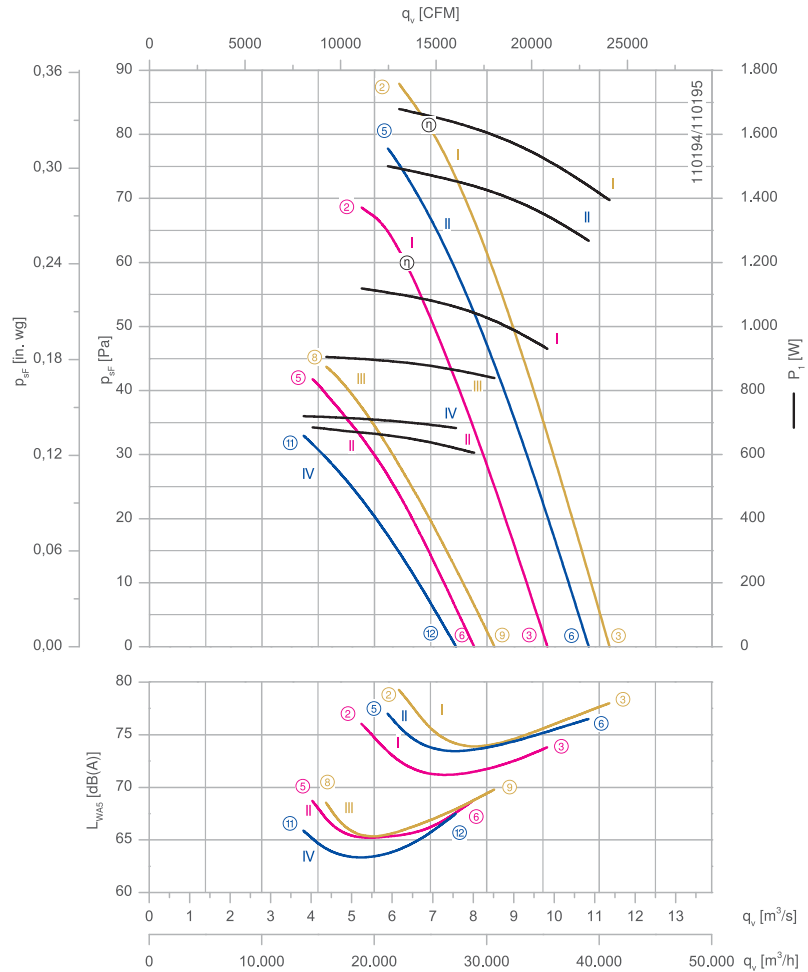
FN125-ND



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 1.15/0.68 kW | 1.50/0.72 kW | 1.70/0.90 kW*
 Rated current I_N :
 3.10/1.50 A | 3.40/1.65 A | 3.50/1.75 A*
 Rated speed n_N :
 440/340 min⁻¹ | 470/310 min⁻¹ | 500/350 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 450/370 min⁻¹ | 500/350 min⁻¹ | 530/400 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 940/600 W | 1250/680 W | 1400/840 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 9.8/8 m³/s | 10.8/7.6 m³/s | 11.4/8.5 m³/s*
 Starting current I_A : 7.5/2.4 A | 6.5/2.2 A | 8.0/2.4 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 65 °C
 Electrical connection: Terminal box
 Number of blades: 3
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Rotor: Aluminium, 2 coat paint,
 RAL 9006 (white aluminium)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 34.5 %
 Efficiency: $N_{actual} = 40.6 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured with nozzle for transformer cooling and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

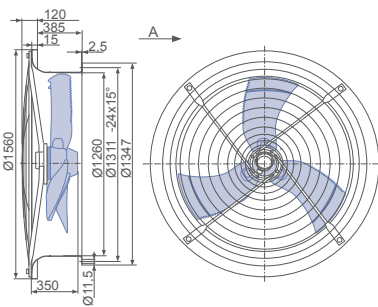
Connection diagram Page 252
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System components Page 184

Dimensions mm

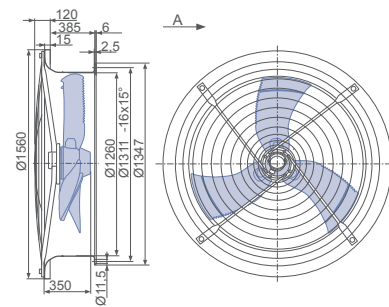
Airflow direction A

Design L - round full bell mouth, guard grille suction side



L-KL-3213-05

Design L - round full bell mouth, guard grille two-sided



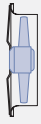

L-KL-3214-04

Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
FN125-NDL.7Q.A3P1	Δ	I	400*	50	②	3.10*	1100*	440*	76
					③	2.90*	940*	450*	74
					⑤	1.50*	680*	340*	69
	Y	II	400*	60	⑥	1.35*	600*	370*	69
					②	3.50*	1700*	500*	79
					③	3.20*	1400*	530*	78
		IV	400*	60	⑤	3.40*	1500*	470*	77
					⑥	3.00*	1250*	500*	77
					⑧	1.75*	900*	350*	69
	Y	III	460*	60	⑨	1.60*	840*	390*	70
					⑪	1.60*	720*	310*	66
					⑫	1.50*	680*	350*	68

*rated data

Fan ordering information

Airflow direction A		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	FN125-NDL.7Q.A3P1	FN125-NDL.7Q.A3P1
Article no.	167467/10K1	167467/10K3
Weight kg	108.70	114.80

Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet-ECblue with ZAplus

for three phase alternating current, 380-480 V

ZN050



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 940 W*
 Rated current I_N : 1.60- 1.25 A*
 Rated speed n_n : 1550 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1550 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 760 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 2.6 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

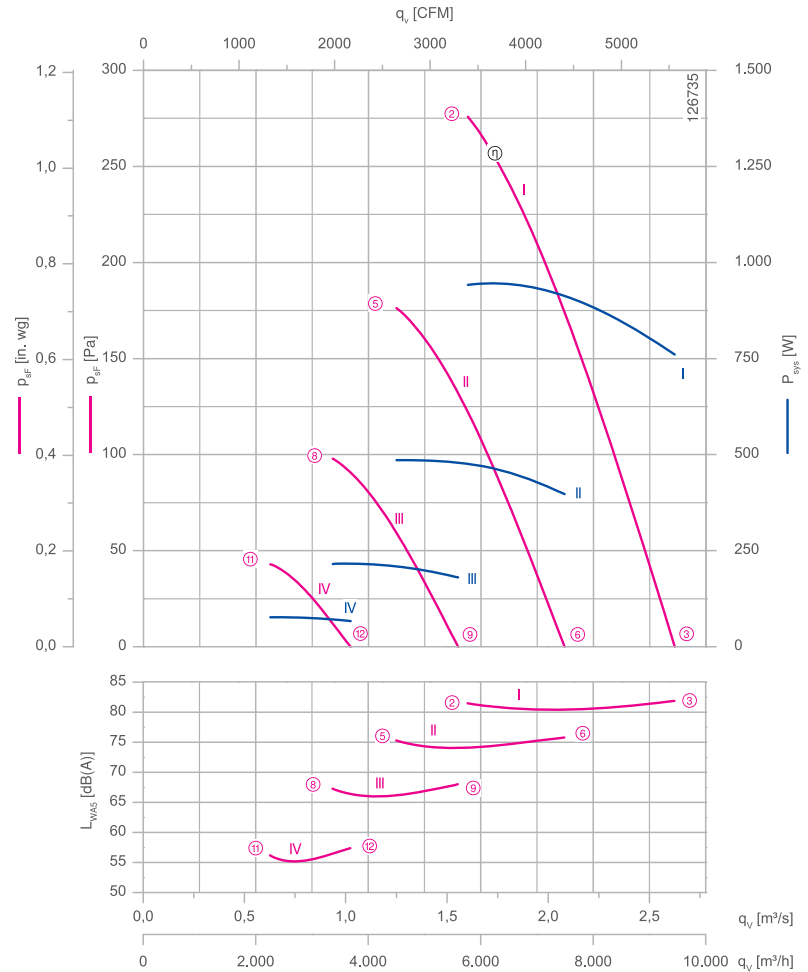
Efficiency η_{statA} : 56.3 %
 Efficiency: $N_{actual} = 62.9 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZAplus and guard grille on suction side in installation type A according to ISO 5801.

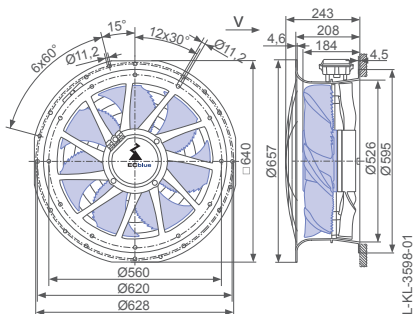
Connection diagram Page 250
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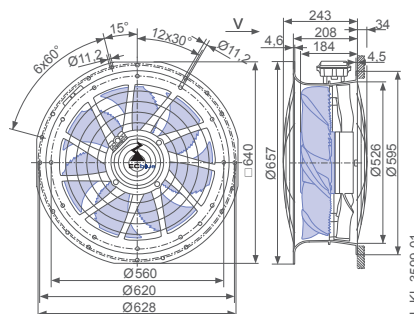
Dimensions mm

Airflow direction

Design L - ZAplus, guard grille suction side with connection box



Design L - ZAplus, guard grille two-sided with connection box




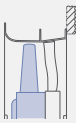

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
ZN050-ZIL.DC.V7P2	I	1550	②	1.50	940	82	
			③	1.25	760	82	
			④	0.92	480	75	
	II	1240	⑤	0.80	400	76	
			⑥	0.52	220	67	
			⑦	0.46	180	68	
	III	930	⑧	0.29	75	56	
			⑨	0.27	65	57	
			⑩				
	IV	620	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN050-ZIL.DC.V7P2	ZN050-ZIL.DC.V7P2
Article no.	176062/10C4	176062/10C6
Weight kg	14.30	15.70
ZApplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN063



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.15 kW*
 Rated current I_N : 1.90- 1.50 A*
 Rated speed n_n : 1200 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1200 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 740 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 3.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

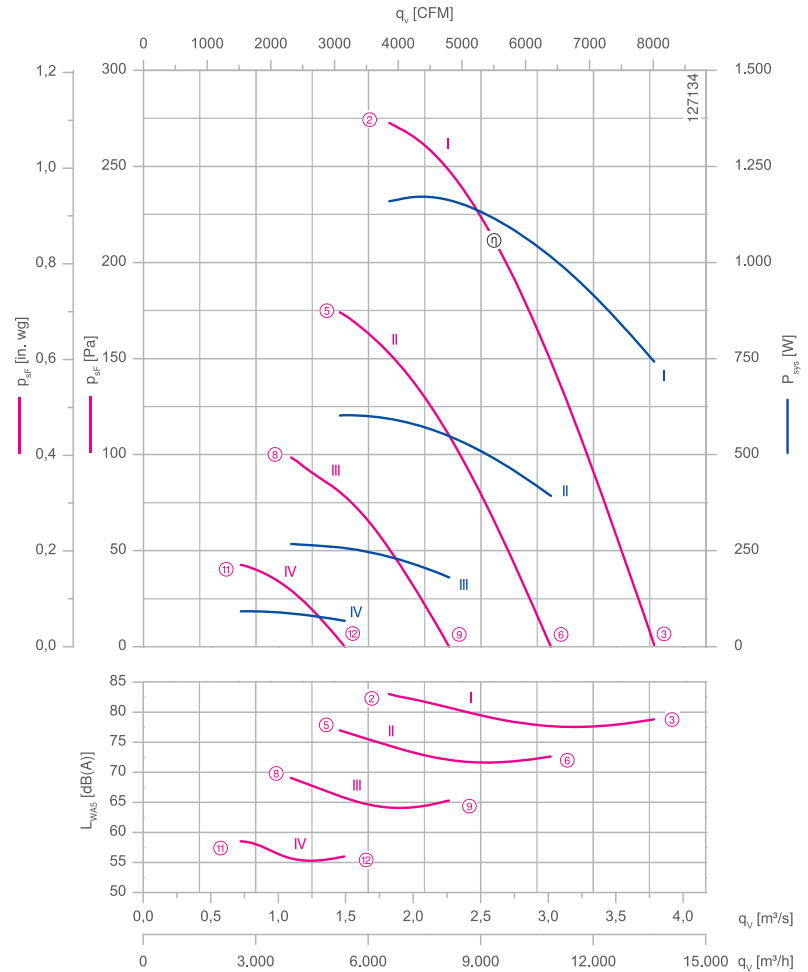
Efficiency η_{statA} : 58.7 %
 Efficiency: $N_{actual} = 64.8 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

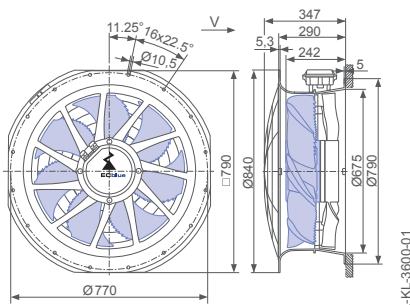
Connection diagram Page 250
1360-403

System components Page 184

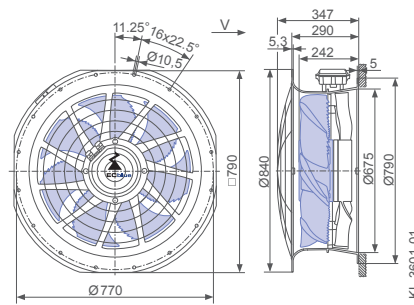
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box





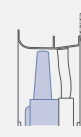
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
ZN063-ZIL.DG.V7P2	I	1200	②	1.80	1150	83	
			③	1.20	740	79	
			④	1.05	600	77	
	II	960	⑤	0.78	390	73	
			⑥	0.60	260	69	
			⑦	0.46	180	65	
	III	720	⑧	0.31	90	59	
			⑨	0.27	65	56	
			⑩				
	IV	480	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-ZIL.DG.V7P2	ZN063-ZIL.DG.V7P2
Article no.	176063/10C4	176063/10C6
Weight kg	21.60	22.60
ZApplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN063



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.90 kW*
 Rated current I_N : 3.00- 2.40 A*
 Rated speed n_n : 1270 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1270 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1550 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 4.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

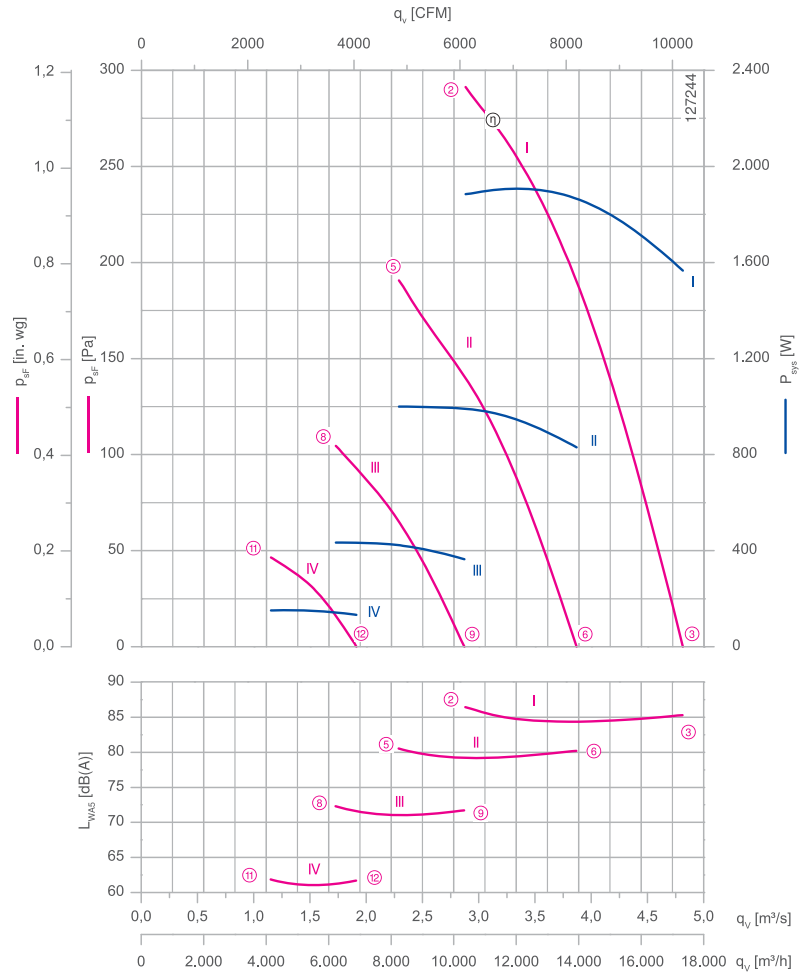
Efficiency η_{statA} : 52.8 %
 Efficiency: $N_{actual} = 57.5 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

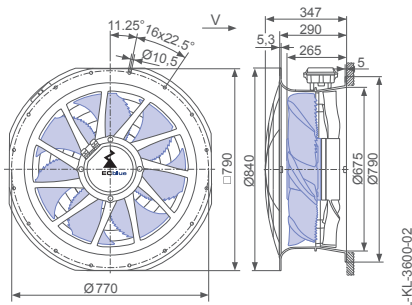
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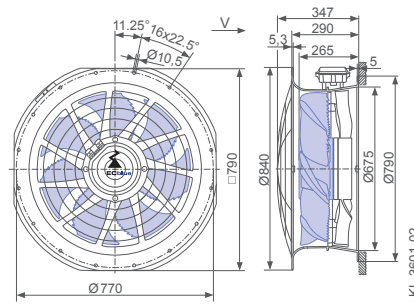
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box




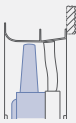

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN063-ZIL.GG.V7P3	I	1270	②	2.80	1900	87
			③	2.30	1550	85
		1020	⑤	1.55	1000	81
			⑥	1.35	840	80
		760	⑧	0.82	440	72
			⑨	0.74	360	72
	IV	510	⑪	0.42	150	62
			⑫	0.38	130	62

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-ZIL.GG.V7P3	ZN063-ZIL.GG.V7P3
Article no.	176064/10C4	176064/10C6
Weight kg	33.50	34.50
ZAplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
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Appendix



FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN063



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 3.80 kW*
 Rated current I_N : 6.00- 4.60 A*
 Rated speed n_n : 1600 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1600 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 3100 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 6.1 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 45 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

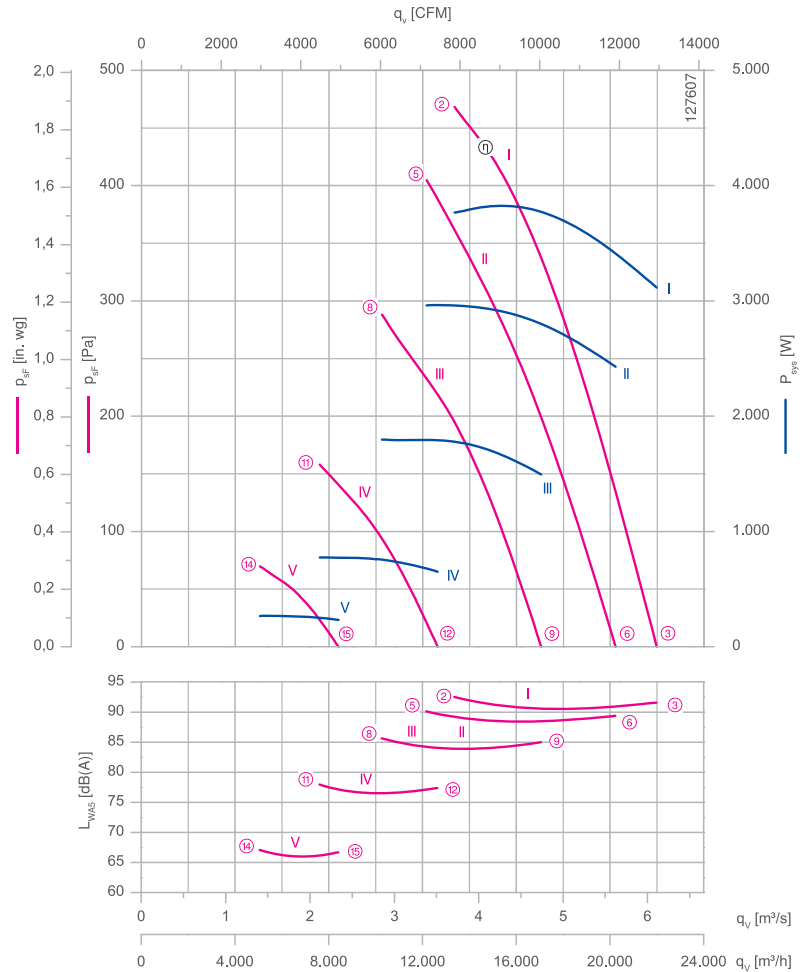
Efficiency η_{statA} : 52.9 %
 Efficiency: $N_{actual} = 55.7 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

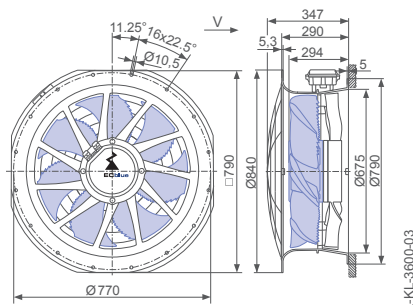
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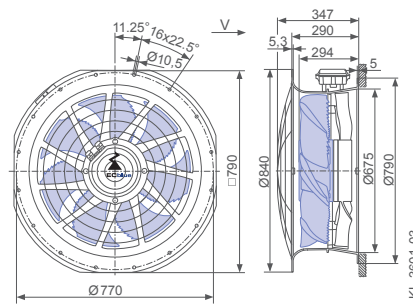
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box






Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN063-ZIL.GL.V7P3	I	1600	②	5.60	3800	93
			③	4.60	3100	92
	II	1480	⑤	4.40	2900	90
			⑥	3.60	2400	89
	III	1250	⑧	2.70	1800	86
			⑨	2.30	1500	85
	IV	930	⑪	1.25	760	78
			⑫	1.10	660	77
	V	620	⑭	0.62	260	67
			⑮	0.56	230	67

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-ZIL.GL.V7P3	ZN063-ZIL.GL.V7P3
Article no.	176065/10C4	176065/10C6
Weight kg	37.90	38.90

ZAplus attachable on both sides.

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN071



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 840 W*
 Rated current I_N : 1.40- 1.10 A*
 Rated speed n_N : 960 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 960 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 620 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 4.2 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

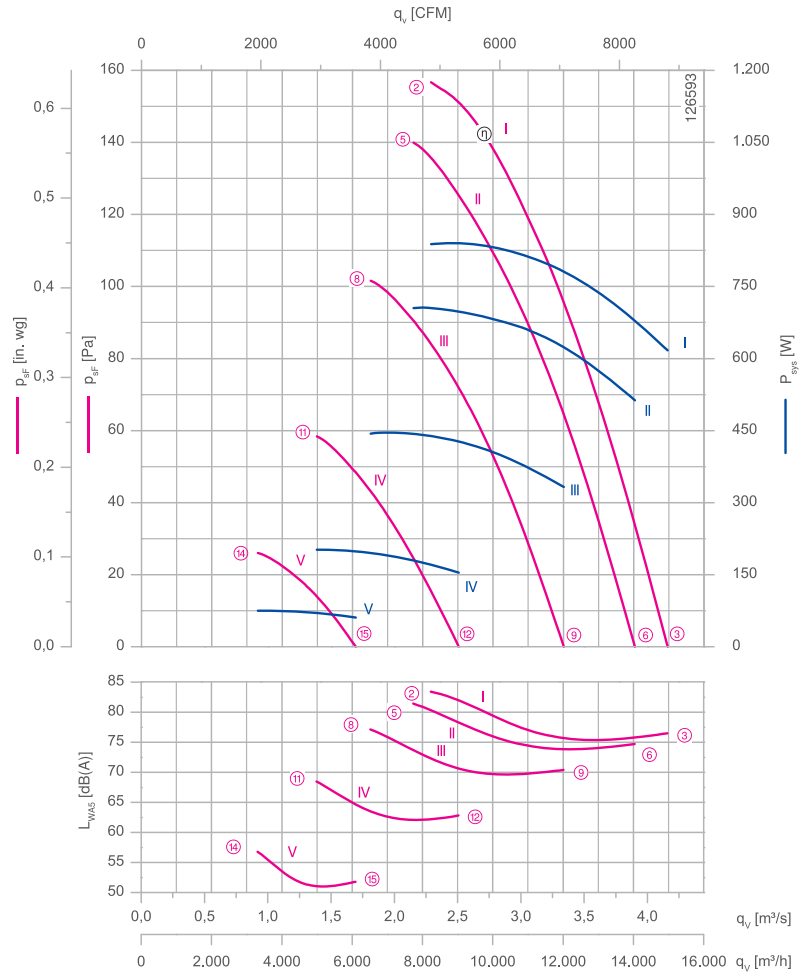
Efficiency η_{statA} : 54.5 %
 Efficiency: $N_{actual} = 61.4 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

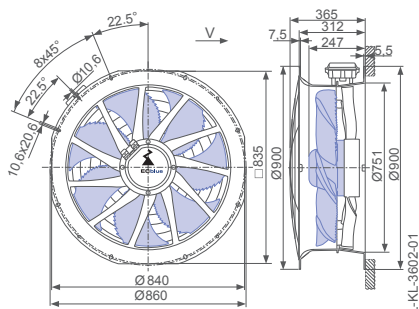
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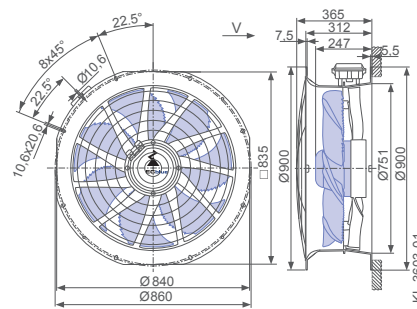
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



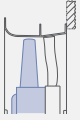
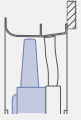
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN071-ZIL.DG.V7P3	I	960	②	1.35	840	84
			③	1.05	620	77
	II	900	⑤	1.15	700	82
			⑥	0.90	520	75
	III	770	⑧	0.82	440	77
			⑨	0.68	330	70
	IV	580	⑪	0.50	200	69
			⑫	0.44	150	63
	V	390	⑭	0.27	75	57
			⑮	0.25	60	52

Current values determined at 400V

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN071-ZIL.DG.V7P3	ZN071-ZIL.DG.V7P3
Article no.	176066/10C4	176066/10C6
Weight kg	22.40	23.70

ZAplus attachable on both sides.

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN071



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.85 kW*
 Rated current I_N : 2.90- 2.30 A*
 Rated speed n_N : 1150 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1150 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1500 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 5.6 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

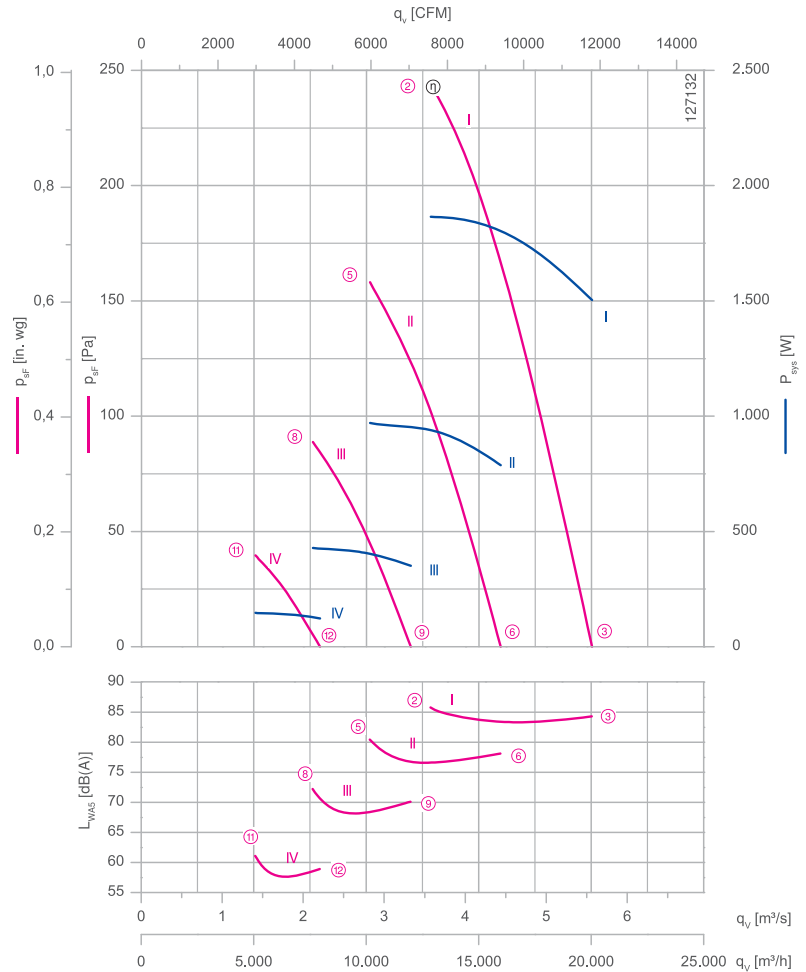
Efficiency η_{statA} : 54.8 %
 Efficiency: $N_{actual} = 59.5 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

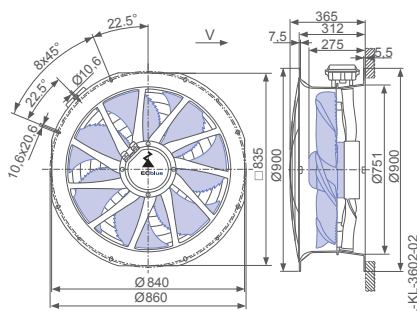
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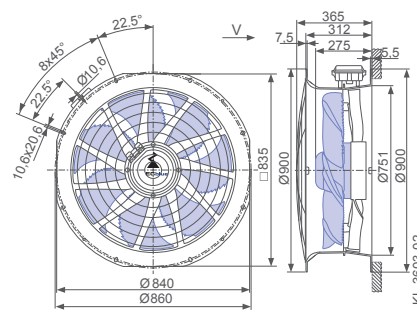
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



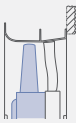
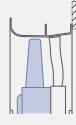
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN071-ZIL.GG.V7P4	I	1150	②	2.70	1850	86
			③	2.20	1500	84
	II	920	⑤	1.50	960	81
			⑥	1.25	780	78
	III	690	⑧	0.82	420	72
			⑨	0.72	350	70
	IV	460	⑪	0.40	150	61
			⑫	0.37	120	59

Current values determined at 400V

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN071-ZIL.GG.V7P4	ZN071-ZIL.GG.V7P4
Article no.	176067/10C4	176067/10C6
Weight kg	34.00	35.30
ZApplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
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Appendix

FE2owlet-ECblue with ZAplus

for three phase alternating current, 380-480 V

ZN071



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 3.30 kW*
 Rated current I_N : 5.20- 4.00 A*
 Rated speed n_n : 1400 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1400 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2700 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 6.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Integrated controller
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

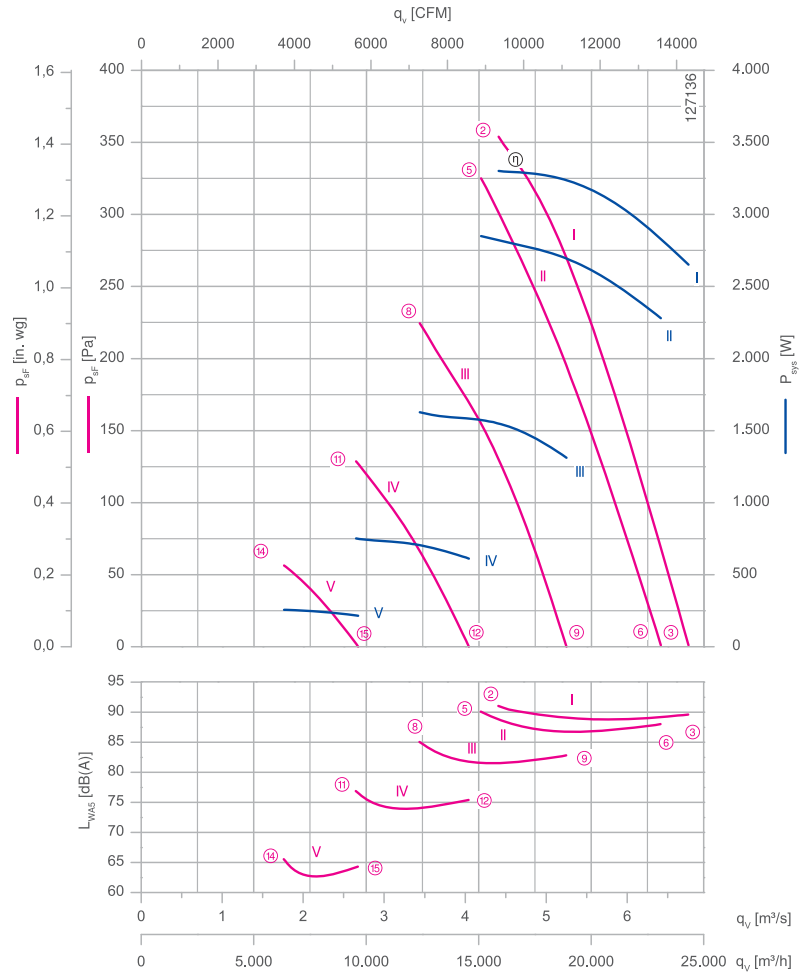
Efficiency η_{statA} : 54.4 %
 Efficiency: $N_{actual} = 57.6 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZAplus and guard grille on suction side in installation type A according to ISO 5801.

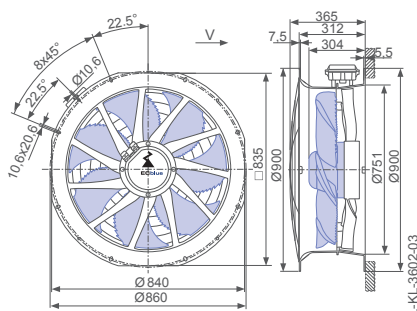
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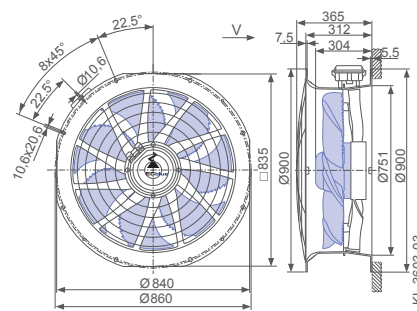
Dimensions mm

Airflow direction

Design L - ZAplus, guard grille suction side with connection box



Design L - ZAplus, guard grille two-sided with connection box



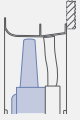
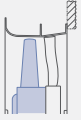
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN071-ZIL.GL.V7P4	I	1400	②	4.80	3300	91
			③	3.90	2700	90
	II	1330	⑤	4.20	2800	90
			⑥	3.40	2300	88
	III	1100	⑧	2.40	1600	85
			⑨	2.00	1300	83
	IV	840	⑪	1.25	740	77
			⑫	1.05	620	75
	V	560	⑭	0.58	250	66
			⑮	0.52	210	64

Current values determined at 400V

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN071-ZIL.GL.V7P4	ZN071-ZIL.GL.V7P4
Article no.	176068/10C4	176068/10C6
Weight kg	38.40	39.70

ZAplus attachable on both sides.

Control technology

Control modules	Add-on modules	Operating terminal
		
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FE2owlet-ECblue with ZAplus

for three phase alternating current, 380-480 V

ZN080



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 860 W*
 Rated current I_N : 1.45- 1.15 A*
 Rated speed n_n : 700 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 700 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 620 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 4.8 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

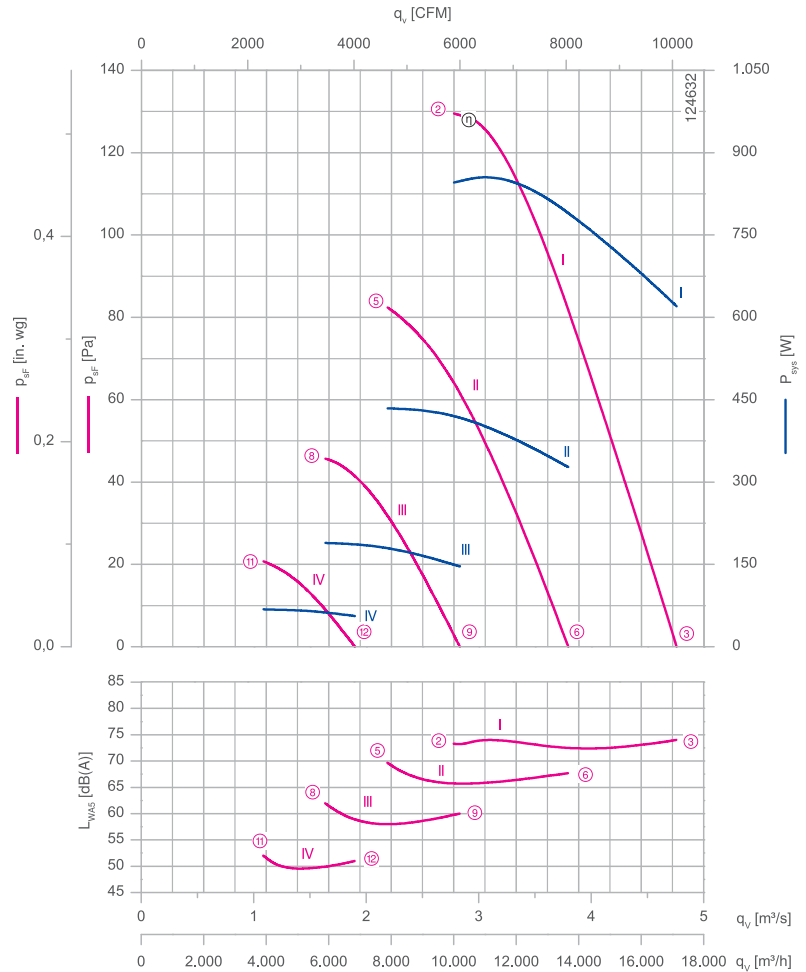
Efficiency η_{statA} : 55.3 %
 Efficiency: $N_{actual} = 62.3 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZAplus and guard grille on suction side in installation type A according to ISO 5801.

Connection diagram

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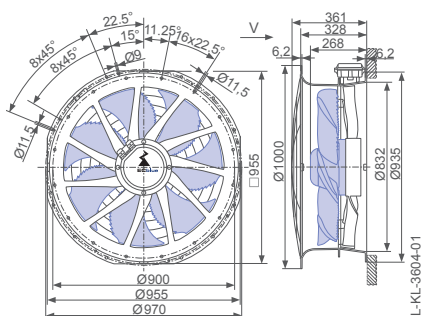
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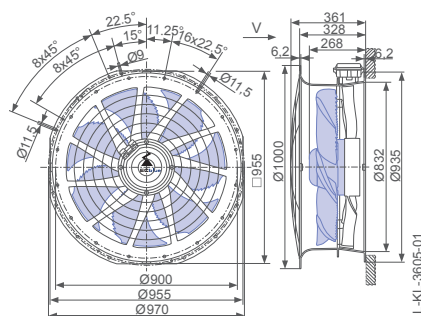
Dimensions mm

Airflow direction

Design L - ZAplus, guard grille suction side with connection box



Design L - ZAplus, guard grille two-sided with connection box




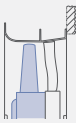

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN080-ZIL.DG.V5P4	I	700	②	1.35	840	74
			③	1.05	620	74
	II	560	⑤	0.80	440	70
			⑥	0.68	330	68
	III	420	⑧	0.46	190	62
			⑨	0.40	150	60
	IV	280	⑪	0.25	70	52
			⑫	0.23	55	51

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-ZIL.DG.V5P4	ZN080-ZIL.DG.V5P4
Article no.	175991/10C4	175991/10C6
Weight kg	27.70	29.70
ZApplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
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Appendix



FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN080



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 1.90 kW*
 Rated current I_N : 3.00- 2.40 A*
 Rated speed n_n : 950 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 950 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1550 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 6.5 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 60 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, uncoated
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

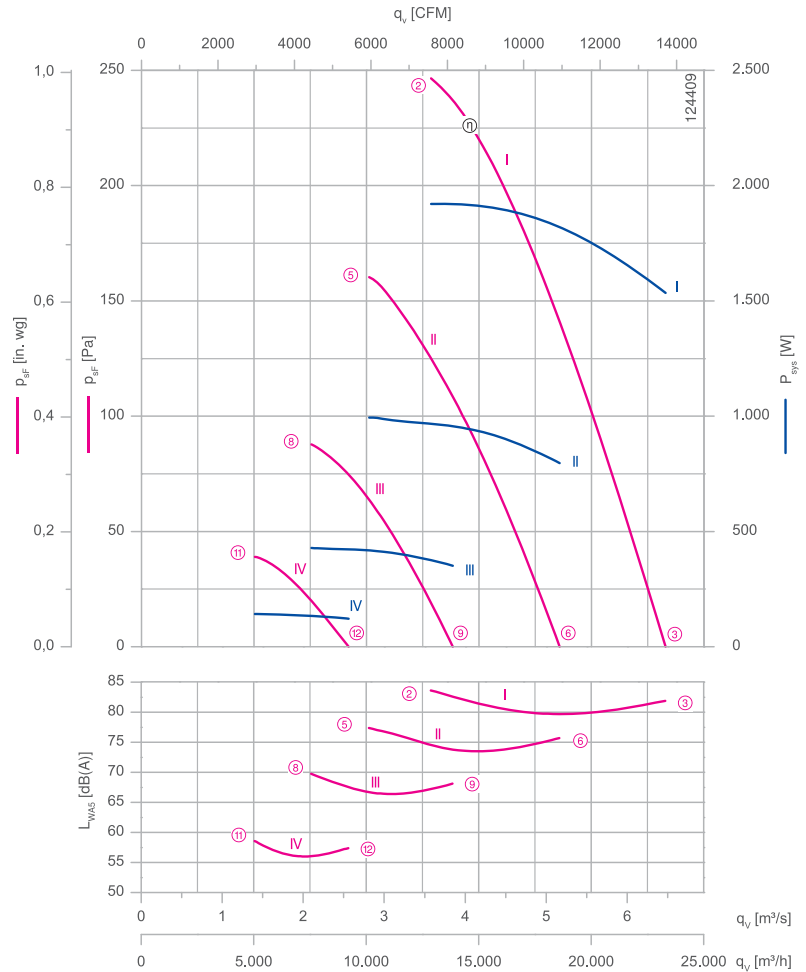
Efficiency η_{statA} : 57.4 %
 Efficiency: $N_{actual} = 62.1 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

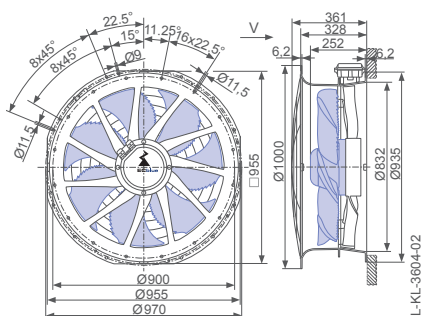
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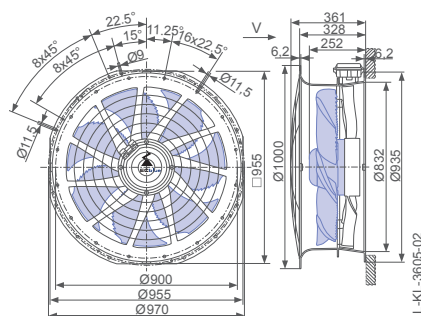
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box




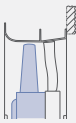

Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level	
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)	
ZN080-ZIL.GG.V7P3	I	950	②	2.80	1900	84	
			③	2.30	1550	82	
			④	1.50	980	77	
	II	760	⑤	1.25	800	76	
			⑥	0.80	420	70	
			⑦	0.70	350	68	
	III	570	⑧	0.40	140	59	
			⑨	0.37	120	57	
			⑩				
	IV	380	⑪				
			⑫				

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-ZIL.GG.V7P3	ZN080-ZIL.GG.V7P3
Article no.	175993/10C4	175993/10C6
Weight kg	40.40	41.90
ZApplus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN080



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 2.90 kW*
 Rated current I_N : 4.60- 3.70 A*
 Rated speed n_n : 1100 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1100 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2300 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 7.4 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, uncoated
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

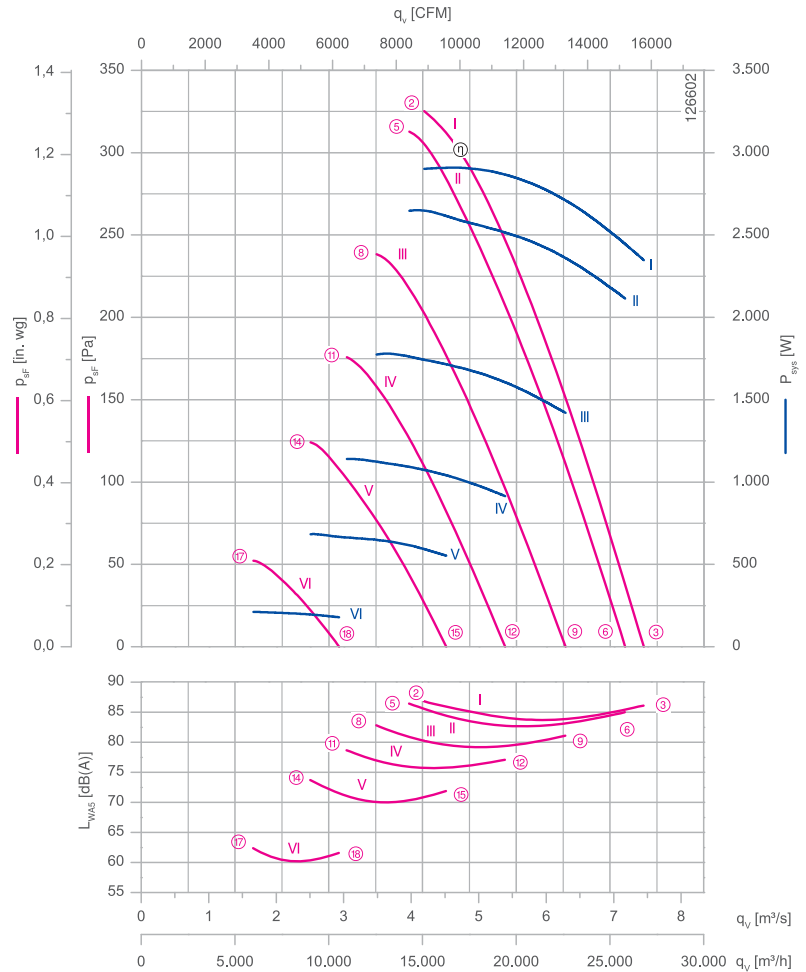
Efficiency η_{statA} : 57.6 %
 Efficiency: $N_{actual} = 61.1 / N_{target} = 40^{**}$

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

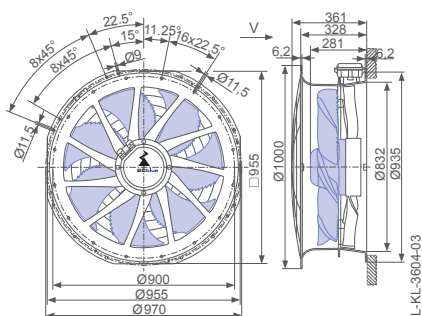
Connection diagram Page 250
1360-403

System components Page 184

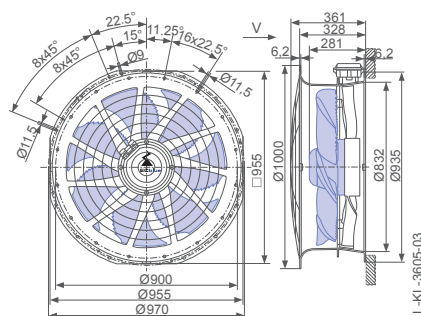
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



Performance data

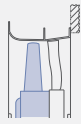
Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN080-ZIL.GL.V7P3	I	1100	②	4.40	2900	87
			③	3.60	2300	86
	II	1060	⑤	4.00	2600	86
			⑥	3.20	2100	85
	III	930	⑧	2.70	1750	83
			⑨	2.20	1400	81
	IV	800	⑪	1.80	1150	79
			⑫	1.50	920	77
	V	670	⑭	1.10	680	74
			⑮	0.98	560	72
	VI	440	⑰	0.52	210	62
			⑱	0.48	180	62

Current values determined at 400V

Fan ordering information

Airflow direction

Design L (guard grille suction side) L (guard grille two-sided)



Type ZN080-ZIL.GL.V7P3 ZN080-ZIL.GL.V7P3
Article no. 175995/10C4 175995/10C6

Weight kg 44.80 46.30
ZAplus attachable on both sides.

Control technology

Control modules



Page 226

Add-on modules



Page 238

Operating terminal



Page 240

FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN091



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 660 W*
 Rated current I_N : 1.20- 0.94 A*
 Rated speed n_n : 570 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 570 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 440 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 5.1 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 50 °C
 Electrical connection: Terminal box
 Number of blades: 4
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Steel, 2 coat paint, RAL 9005 (jet black)
 Conformity: ErP 2015, CE, UL

ErP-data

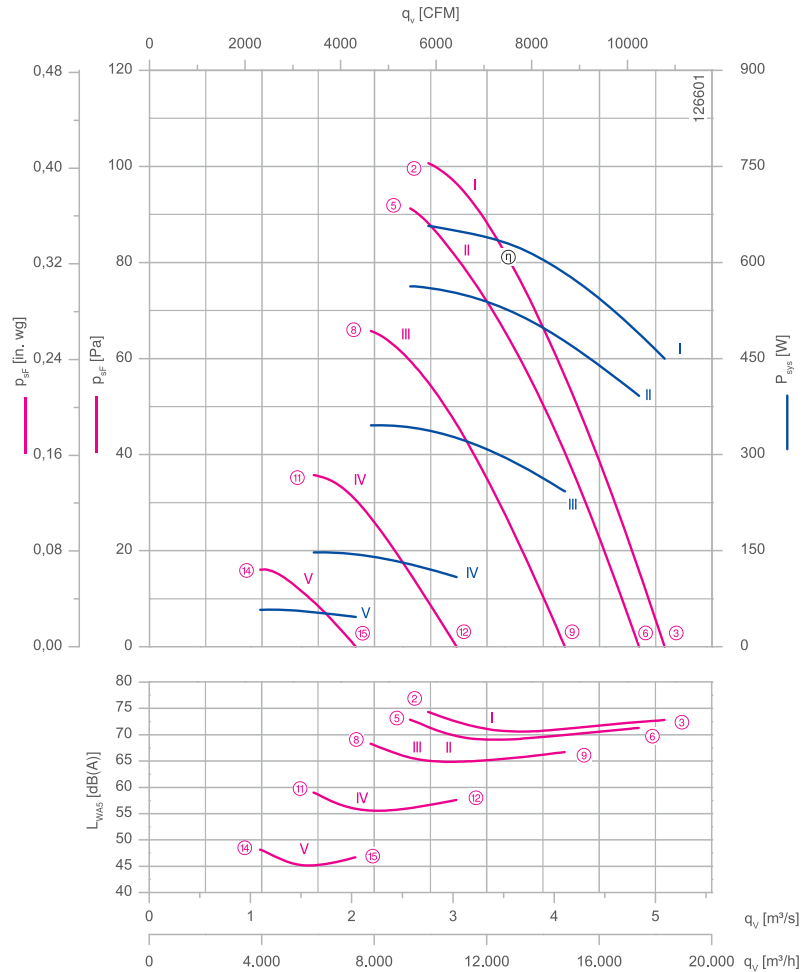
Efficiency η_{statA} : 53.0 %
 Efficiency: $N_{actual} = 60.8 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

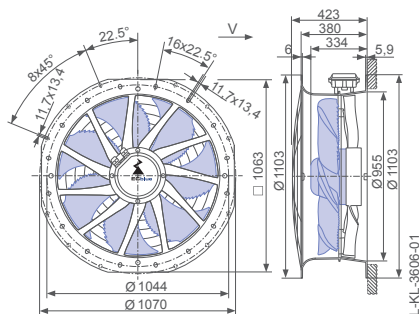
Connection diagram Page 250
1360-403

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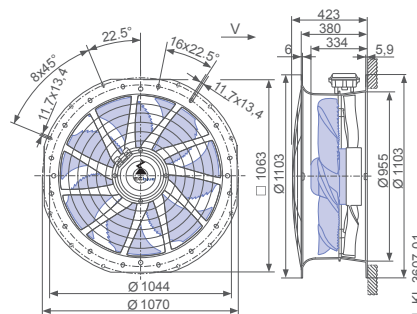
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box




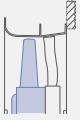
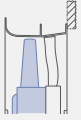
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN091-ZIL.DG.V4P3	I	570	②	1.10	660	75
			③	0.86	440	73
	II	540	⑤	1.00	560	73
			⑥	0.78	390	71
	III	460	⑧	0.72	340	68
			⑨	0.56	240	67
	IV	340	⑪	0.42	150	59
			⑫	0.35	110	58
	V	230	⑭	0.24	60	48
			⑮	0.22	46	47

Current values determined at 400V

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-ZIL.DG.V4P3	ZN091-ZIL.DG.V4P3
Article no.	175997/10C4	175997/10C6
Weight kg	31.30	33.60

ZAplus attachable on both sides.

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue with ZPlus

for three phase alternating current, 380-480 V

ZN091



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{in} : 2.00 kW*
 Rated current I_N : 3.10- 2.40 A*
 Rated speed n_n : 930 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 930 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 1400 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 7.5 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 55 °C
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Blades: Aluminium, uncoated
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

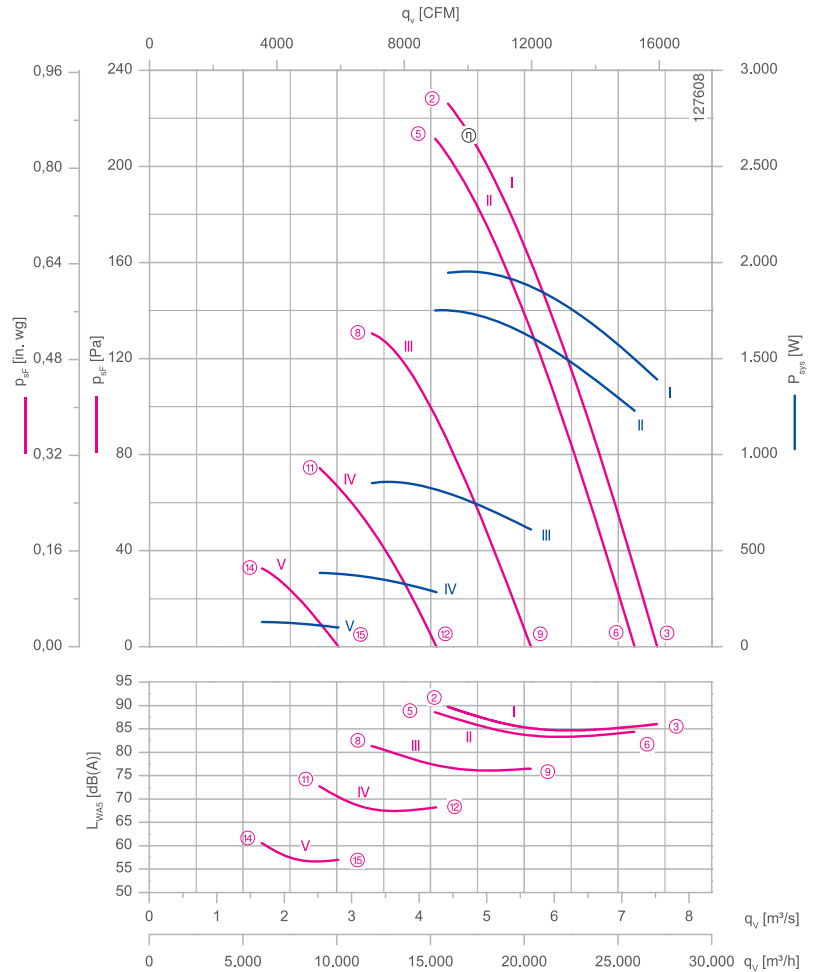
Efficiency η_{statA} : 61.8 %
 Efficiency: $N_{actual} = 66.5 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

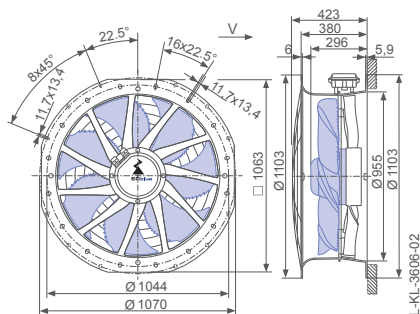
Connection diagram Page 250
1360-403

System components Page 184

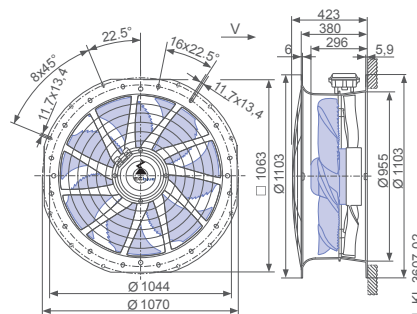
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



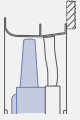
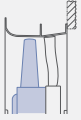
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN091-ZIL.GG.V5P1	I	930	②	2.90	1950	90
			③	2.10	1400	86
	II	890	⑤	2.70	1750	89
			⑥	1.90	1250	84
	III	700	⑧	1.40	860	81
			⑨	1.05	620	77
	IV	530	⑪	0.78	380	73
			⑫	0.64	280	68
	V	350	⑭	0.40	130	61
			⑮	0.34	100	57

Current values determined at 400V

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-ZIL.GG.V5P1	ZN091-ZIL.GG.V5P1
Article no.	175999/10C4	175999/10C6
Weight kg	42.60	44.50

ZAplus attachable on both sides.

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet-ECblue with ZAplus

for three phase alternating current, 380-480 V

ZN091



Description

Motor technology: EC
 Rated voltage U_N : 3~ 380-480 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 3.30 kW*
 Rated current I_N : 5.20- 4.00 A*
 Rated speed n_n : 1110 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa: 1110 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa: 2300 W*
 Air flow q_v at $p_{stat} = 0$ Pa: 8.9 m³/s*
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -35 °C***
 Max. permitted ambient temperature $t_{R(max)}$: 45 °C
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection : integrated active temperaturemanagement
 Blades: Aluminium, uncoated
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: ErP 2015, CE, UL

ErP-data

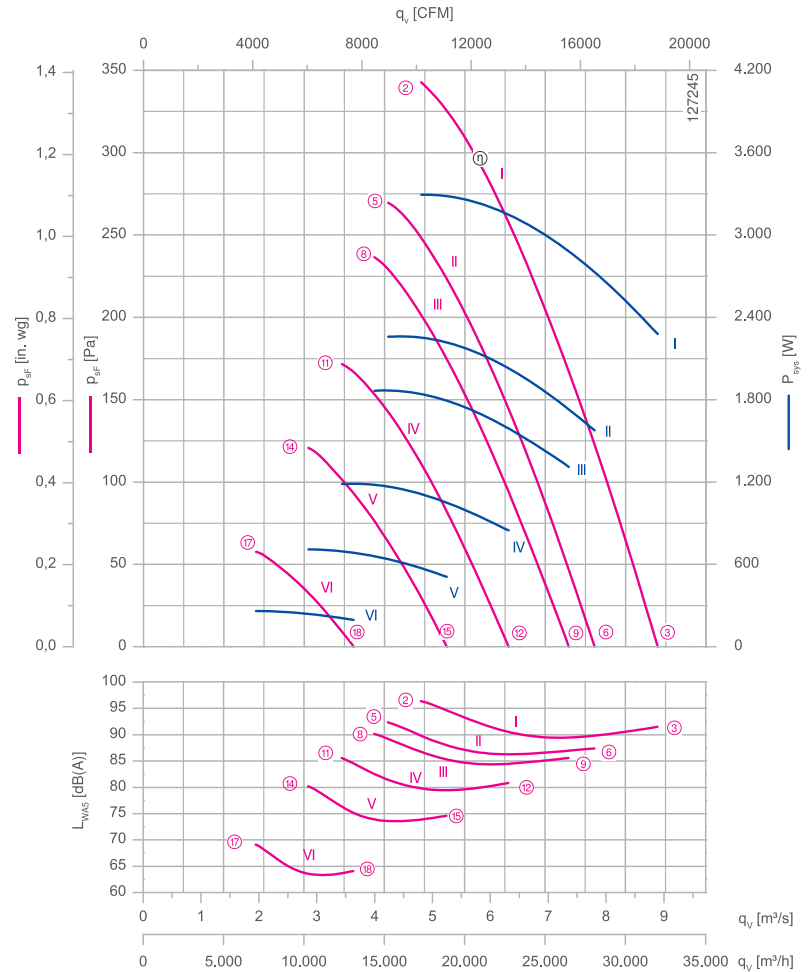
Efficiency η_{statA} : 61.5 %
 Efficiency: $N_{actual} = 64.7 / N_{target} = 40$ **

* Rated data

**ErP 2015

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -35 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in ZAplus and guard grille on suction side in installation type A according to ISO 5801.

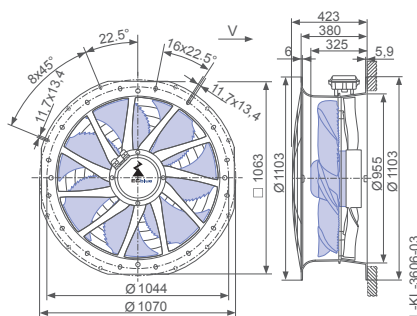
Connection diagram Page 250
1360-403

System components Page 184

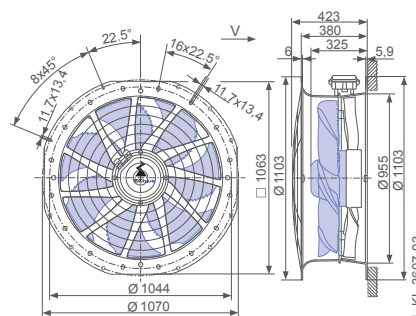
Dimensions mm

Airflow direction

Design L - ZAplus, guard grille suction side with connection box



Design L - ZAplus, guard grille two-sided with connection box



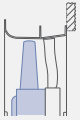
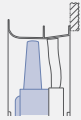
Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
ZN091-ZIL.GL.V5P1	I	1110	②	5.00	3300	96
			③	3.40	2300	92
	II	980	⑤	3.40	2300	92
			⑥	2.40	1600	87
	III	920	⑧	2.80	1850	90
			⑨	2.00	1300	86
	IV	790	⑪	1.80	1200	86
			⑫	1.35	840	81
	V	650	⑭	1.15	700	80
			⑮	0.90	500	75
	VI	450	⑰	0.58	260	69
			⑱	0.48	190	64

Current values determined at 400V

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-ZIL.GL.V5P1	ZN091-ZIL.GL.V5P1
Article no.	176001/10C4	176001/10C6
Weight kg	47.00	48.80
ZApus attachable on both sides.		

Control technology

Control modules	Add-on modules	Operating terminal
		
Page 226	Page 238	Page 240

FE2owlet with ZPlus

for three phase alternating current, 4-4 pole

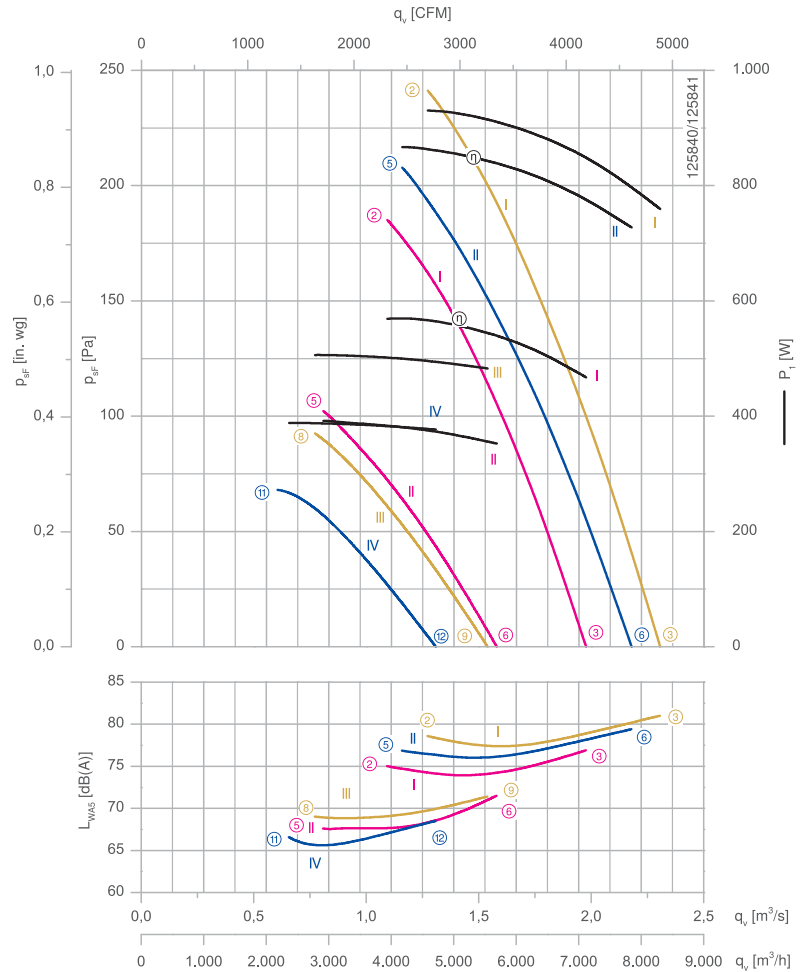
ZN045-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_i :
 560/390 W | 860/390 W | 940/500 W*
 Rated current I_N :
 1.10/0.70 A | 1.55/0.76 A | 1.45/0.84 A*
 Rated speed n_N :
 1350/1000 min^{-1} | 1430/810 min^{-1} | 1540/960 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
 1380/1110 min^{-1} | 1530/920 min^{-1} | 1610/1080 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
 460/350 W | 720/380 W | 760/480 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
 2.0/1.6 m^3/s | 2.2/1.3 m^3/s | 2.3/1.5 m^3/s *
 Starting current I_A : 4.0/1.2 A | 3.6/1.0 A | 4.2/1.2 A
 Current increase ΔI : 10 % | 0 % | 5 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: -40 °C***
 Max. permitted ambient temperature $t_{R(\text{max})}$:
 70 °C | 50 °C | 50 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency $\eta_{\text{stat}A}$: 41.6 %
 Efficiency: $N_{\text{actual}} = 49.6 / N_{\text{target}} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

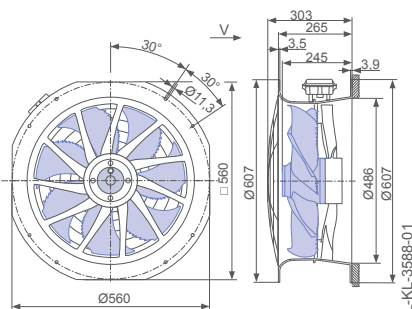
Connection diagram Page 252
1360-108XA

System components Page 184

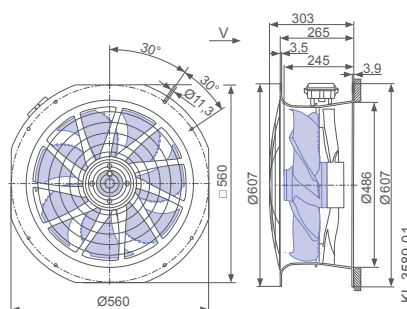
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



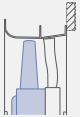
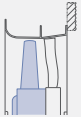
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
ZN045-VDL.4F.V7P1	Δ	I	400*	50	②	1.10*	560*	1350*	75
					③	0.96*	460*	1380*	77
					⑤	0.70*	390*	1000*	68
	Y	II	460*	60	⑥	0.62*	350*	1110*	72
					②	1.45*	940*	1540*	79
					③	1.25*	760*	1610*	81
		IV	400*	60	⑤	1.50*	860*	1430*	77
					⑥	1.30*	720*	1530*	79
					⑧	0.84*	500*	950*	69
	Y	III	460*	60	⑨	0.78*	480*	1080*	71
					⑪	0.76*	390*	810*	67
					⑫	0.72*	380*	920*	69

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN045-VDL.4F.V7P1	ZN045-VDL.4F.V7P1
Article no.	176009/10K4	176009/10K6
Weight kg	14.20	14.80
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

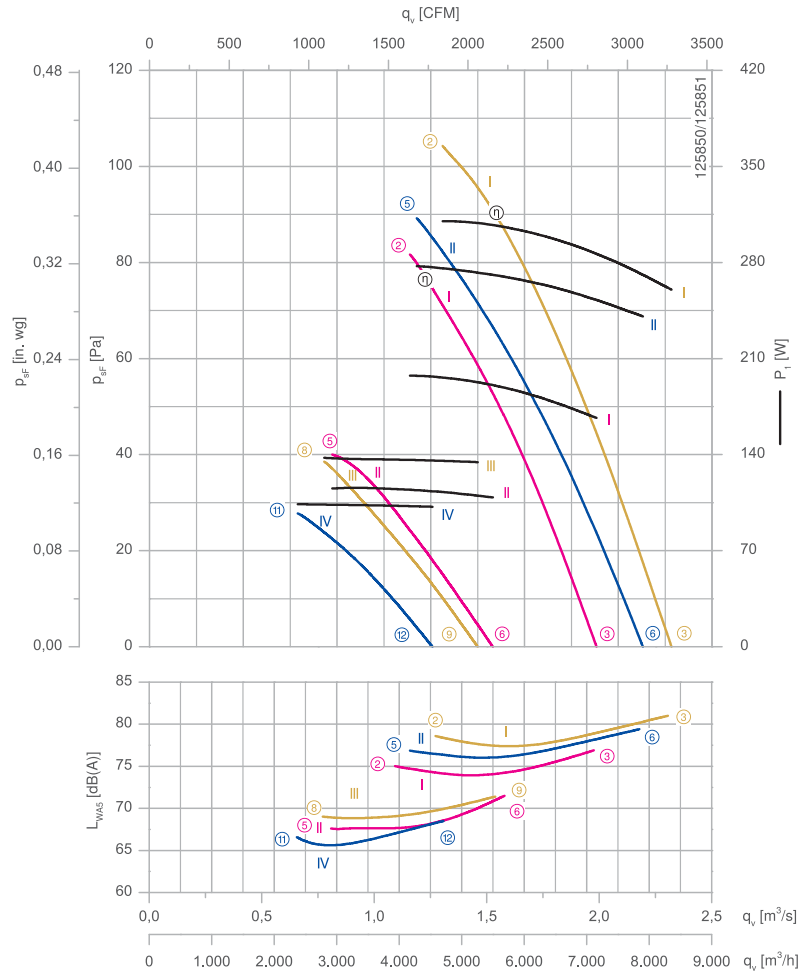
ZN045-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
200/120 W | 280/100 W | 310/140 W*
 Rated current I_N :
0.52/0.27 A | 0.64/0.27 A | 0.62/0.30 A*
 Rated speed n_n :
910/640 min⁻¹ | 950/530 min⁻¹ | 1040/620 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
930/710 min⁻¹ | 1030/590 min⁻¹ | 1080/690 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
170/110 W | 240/100 W | 260/130 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
1.3/1.0 m³/s | 1.5/0.8 m³/s | 1.5/1.0 m³/s*
 Starting current I_A : **1.1/0.32 A | 0.95/0.26 A | 1.1/0.3 A**
 Current increase ΔI : **0 % | 0 % | 5 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 36.6 %
 Efficiency: $N_{actual} = 47.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

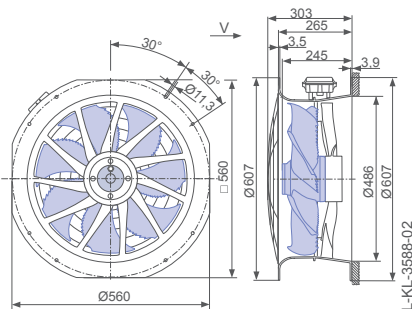
Connection diagram Page 252
1360-108XA

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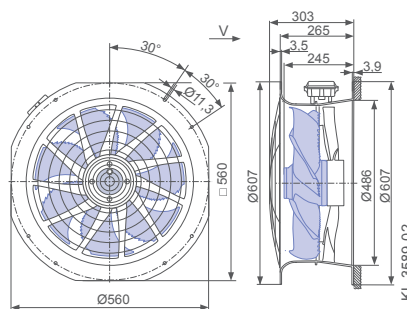
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box

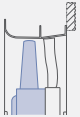
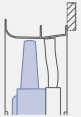


Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level	
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)	
ZN045-SDL.4F.V7P1	Δ	I	400*	50	②	0.52*	200*	910*	64	
					③	0.48*	170*	930*	67	
					⑤	0.27*	110*	650*	57	
	Y	I	460*	60	⑥	0.25*	110*	710*	60	
					②	0.62*	310*	1040*	71	
		II	400*	③	0.54*	260*	1080*	74		
				⑥	0.64*	280*	950*	66		
		Y	III	460*	60	⑥	0.56*	240*	1030*	70
						⑧	0.30*	140*	610*	56
	IV	400*	⑨	0.29*	130*	690*	60			
			⑪	0.27*	100*	530*	53			
					⑫	0.26*	100*	590*	56	

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN045-SDL.4F.V7P1	ZN045-SDL.4F.V7P1
Article no.	176010/10K4	176010/10K6
Weight kg	14.20	14.80
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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FE2owlet with ZPlus

for three phase alternating current, 4-4 pole

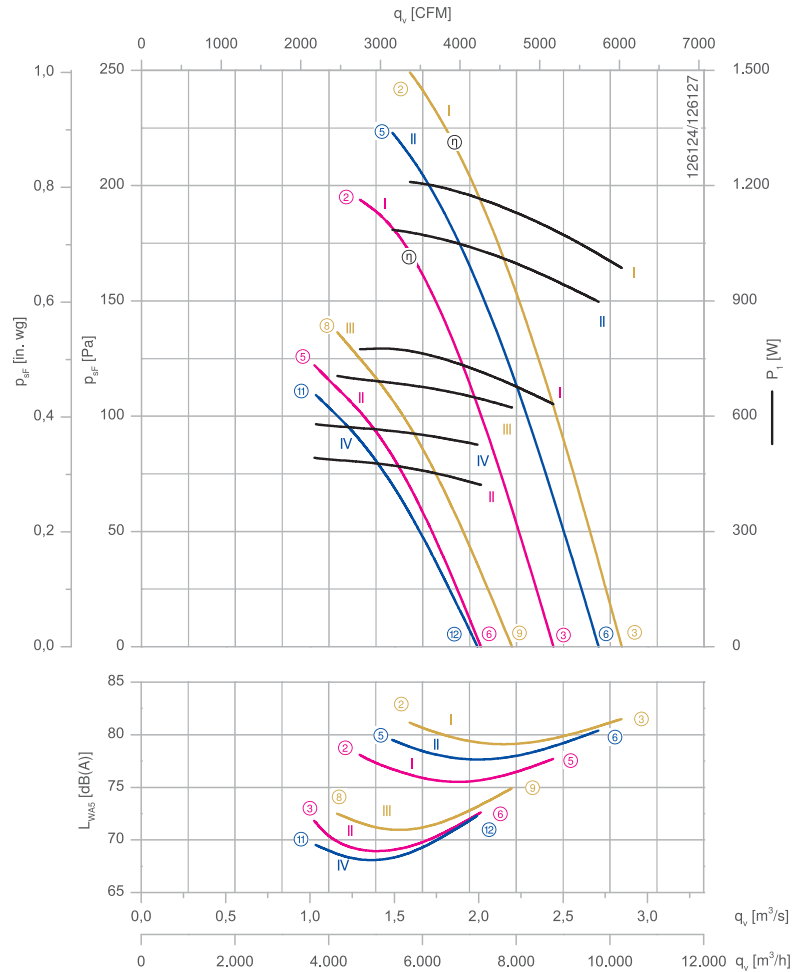
ZN050-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 780/500 W | 1.10/0.58 kW | 1.20/0.70 kW*
 Rated current I_N :
 1.70/0.82 A | 1.90/0.98 A | 1.95/1.05 A*
 Rated speed n_N :
 1290/1020 min^{-1} | 1390/980 min^{-1} | 1480/1090 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
 1340/1110 min^{-1} | 1480/1100 min^{-1} | 1560/1200 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
 640/420 W | 900/520 W | 980/620 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
 2.4/2.0 m^3/s | 2.7/2.0 m^3/s | 2.8/2.2 m^3/s *
 Starting current I_A : 5.5/1.7 A | 5.0/1.6 A | 6.0/1.8 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: -40 °C***
 Max. permitted ambient temperature $t_{R(\text{max})}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency $\eta_{\text{stat}A}$: 41.0 %
 Efficiency: $N_{\text{actual}} = 48.3 / N_{\text{target}} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

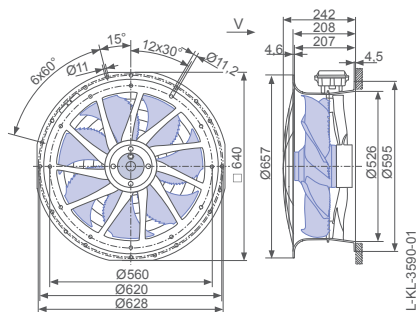
Connection diagram Page 252
1360-108XA

System components Page 184

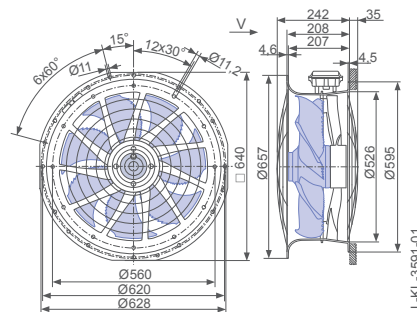
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box

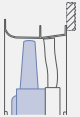
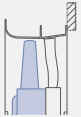


Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level	
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)	
ZN050-VDL.4I.V7P1	Δ	I	400*	50	②	1.70*	780*	1290*	78	
					③	1.60*	640*	1340*	78	
	Y	II	400*	50	⑤	0.82*	500*	1020*	72	
					⑥	0.72*	420*	1110*	73	
	Δ	I	460*	60	②	1.95*	1200*	1480*	81	
					③	1.75*	980*	1560*	82	
		II	400*	60	⑤	1.90*	1100*	1390*	80	
					⑥	1.65*	900*	1480*	80	
		Y	III	460*	60	⑧	1.05*	700*	1090*	73
						⑨	0.90*	620*	1200*	75
	IV	400*	60	⑪	0.98*	580*	980*	70		
				⑫	0.88*	520*	1100*	72		

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN050-VDL.4I.V7P1	ZN050-VDL.4I.V7P1
Article no.	176011/10K4	176011/10K6
Weight kg	16.80	18.00
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

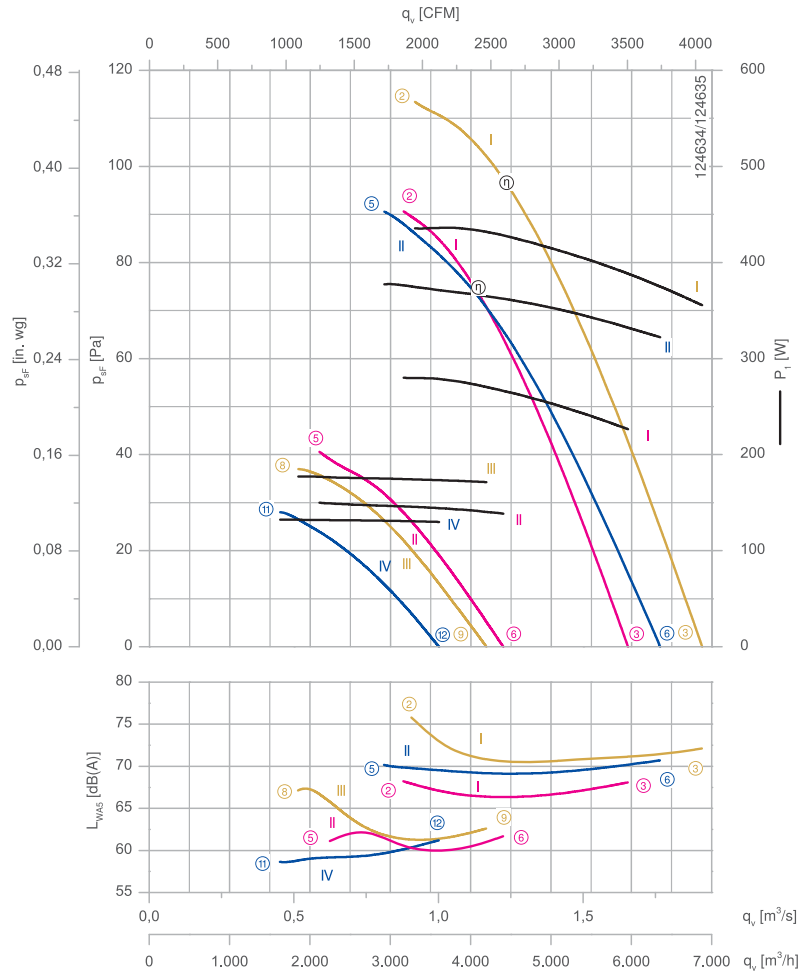
ZN050-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 280/150 W | 380/130 W | 440/180 W*
 Rated current I_N :
 0.68/0.34 A | 0.84/0.33 A | 0.86/0.37 A*
 Rated speed n_N :
 880/590 min⁻¹ | 870/480 min⁻¹ | 980/560 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 910/670 min⁻¹ | 970/550 min⁻¹ | 1050/650 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 230/140 W | 320/130 W | 360/170 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 1.7/1.2 m³/s | 1.8/1.0 m³/s | 1.9/1.2 m³/s*
 Starting current I_A : 1.5/0.4 A | 1.2/0.32 A | 1.5/0.4 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 60 °C | 60 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 33.8 %
 Efficiency: $N_{actual} = 43.8 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

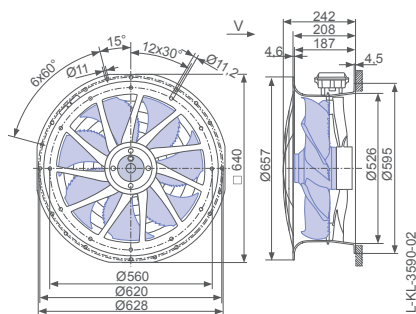
Connection diagram Page 252
1360-108XA

System components Page 184

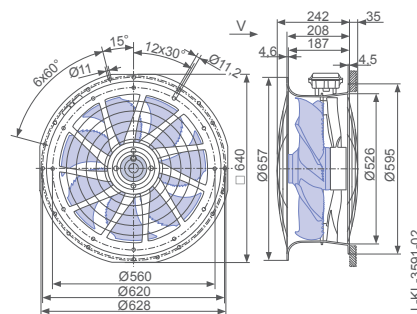
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box

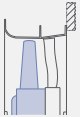
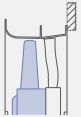


Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)	
			U V	f Hz		I A	P_1 W	n min ⁻¹		
ZN050-SDL.4F.V7P1	Δ	I	400*	50	②	0.70*	290*	880*	68	
					③	0.64*	230*	910*	68	
					⑤	0.35*	150*	590*	61	
	Y	II	460*	60	⑥	0.32*	140*	670*	62	
					②	0.86*	440*	980*	76	
		I	400*	③	0.74*	360*	1050*	72		
				⑥	0.86*	380*	870*	70		
		Y	III	460*	60	⑥	0.74*	330*	970*	71
						⑧	0.38*	180*	560*	67
	IV	400*	⑨	0.36*	170*	650*	63			
			⑪	0.34*	130*	480*	59			
					⑫	0.33*	130*	550*	61	

*rated data

Fan ordering information

Airflow direction		
Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN050-SDL.4F.V7P1	ZN050-SDL.4F.V7P1
Article no.	176012/10K4	176012/10K6
Weight kg	15.30	16.50
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~  Page 208	Motor protection units 3~  Page 206	Electronic voltage controllers 3~  Page 218
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Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix

FE2owlet with ZPlus

for three phase alternating current, 8-8 pole

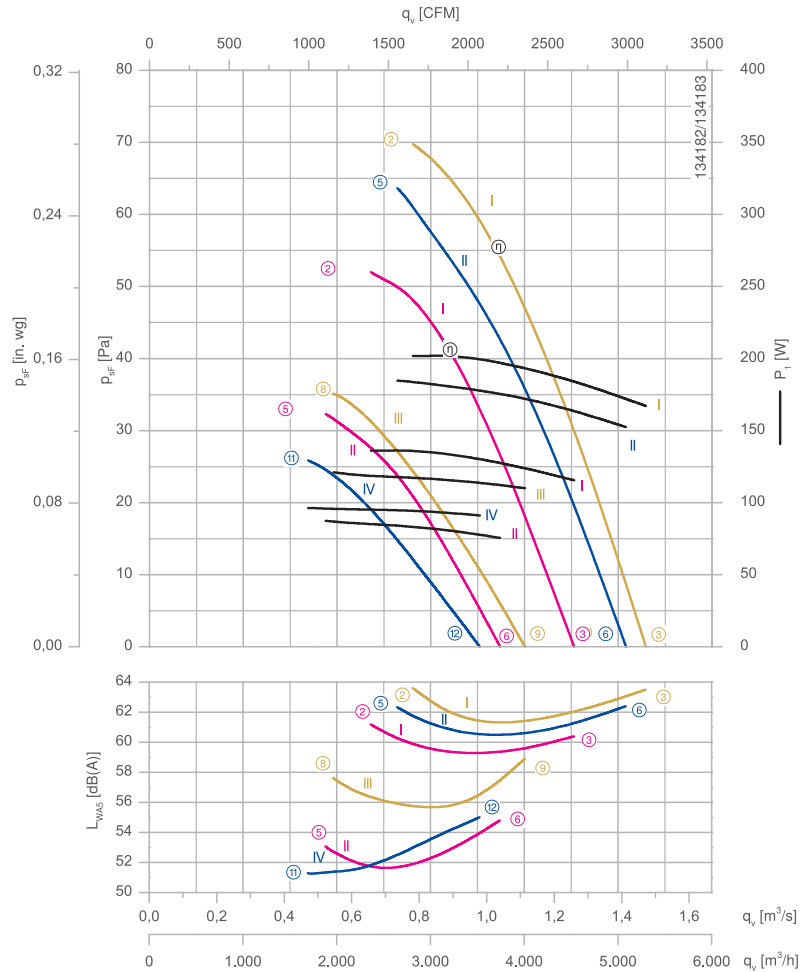
ZN050-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_i :
130/80 W | 180/90 W | 200/120 W*
 Rated current I_N :
0.32/0.155 A | 0.35/0.18 A | 0.36/0.19 A*
 Rated speed n_N :
670/530 min⁻¹ | 740/470 min⁻¹ | 780/540 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
690/580 min⁻¹ | 780/540 min⁻¹ | 810/620 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
110/70 W | 150/90 W | 160/110 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
1.25/1.05 m³/s | 1.4/1.0 m³/s | 1.45/1.1 m³/s*
 Starting current I_A : **0.8/0.26 A | 0.7/0.22 A | 0.8/0.26 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 30.6 %
 Efficiency: $N_{actual} = 42.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

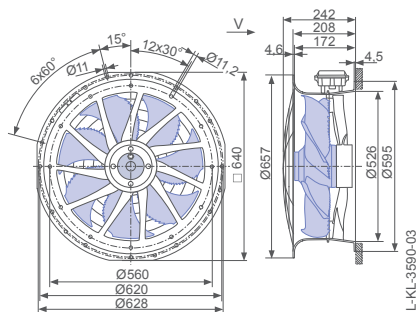
*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram Page 252
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System components Page 184

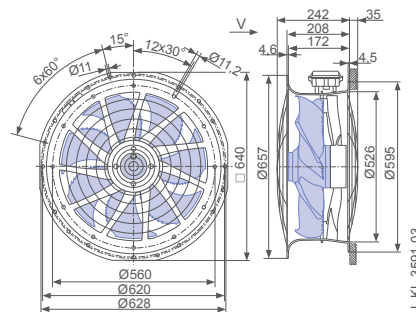
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box





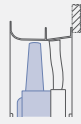
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)
ZN050-AD_4C_7P1	Δ	I	400*	50	②	0.32*	140*	670*	61
					③	0.31*	120*	690*	60
		II	⑤	0.15*	85*	530*	53		
			⑥	0.14*	75*	580*	55		
	Δ	I	460*	60	②	0.36*	200*	780*	64
					③	0.32*	170*	810*	64
		II	⑤	0.35*	180*	740*	62		
			⑥	0.31*	150*	780*	62		
	Y	III	460*	60	⑧	0.19*	120*	540*	58
					⑨	0.17*	110*	620*	59
		IV	⑪	0.18*	95*	470*	52		
			⑫	0.17*	90*	540*	55		

*rated data

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN050-ADL.4C.V7P1	ZN050-ADL.4C.V7P1
Article no.	175107/10K4	175107/10K6
Weight kg	13.60	14.80
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
Page 208	Page 206	Page 218

FE2owlet with ZPlus

for three phase alternating current, 4-4 pole

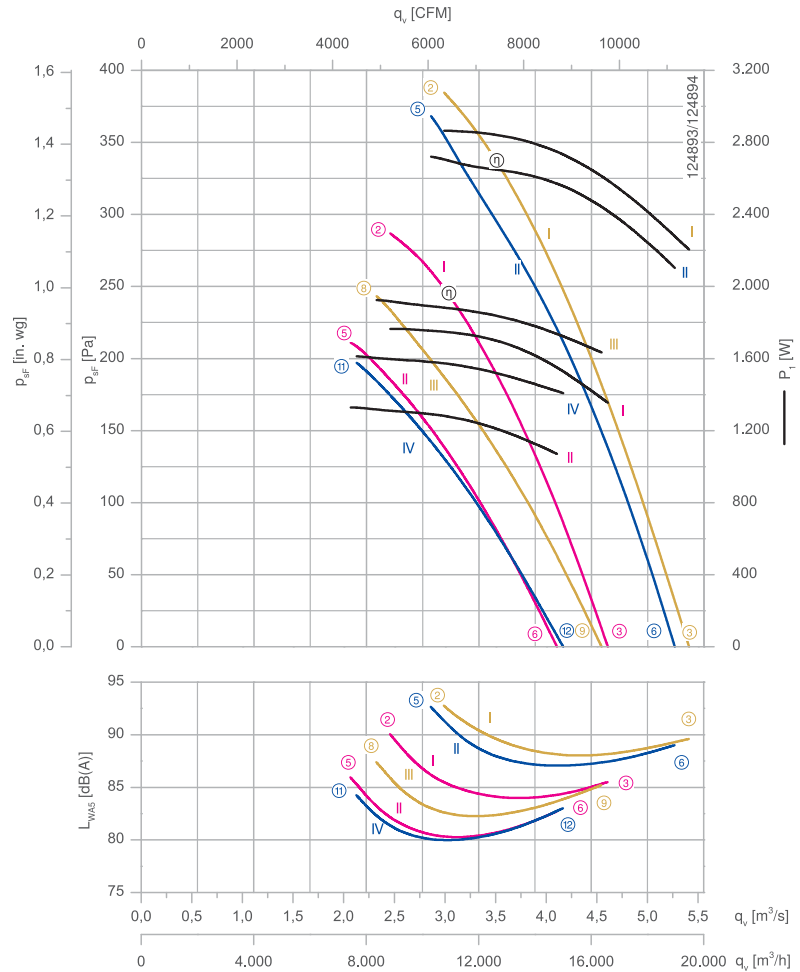
ZN063-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
1.75/1.30 kW | 2.70/1.60 kW | 2.90/1.90 kW*
 Rated current I_N :
3.80/2.30 A | 4.80/2.80 A | 4.60/2.90 A*
 Rated speed n_N :
1400/1190 min^{-1} | 1580/1170 min^{-1} | 1630/1290 min^{-1} *
 Speed n at $p_{\text{stat}} = 0$ Pa:
1420/1070 min^{-1} | 2100/1410 min^{-1} | 2200/1630 min^{-1} *
 Motor input power P at $p_{\text{stat}} = 0$ Pa:
1350/1050 W | 2100/1400 W | 2200/1650 W*
 Air flow q_v at $p_{\text{stat}} = 0$ Pa:
4.6/4.1 m^3/s | 5.3/4.2 m^3/s | 5.4/4.5 m^3/s *
 Starting current I_A : **20/6.5 A | 19/6.0 A | 22/7.0 A**
 Current increase ΔI : **5 % | 5 % | 5 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(\text{min})}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(\text{max})}$:
70 °C | 65 °C | 65 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 44.8 %
 Efficiency: $N_{\text{actual}} = 49.7 / N_{\text{target}} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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1360-108XA

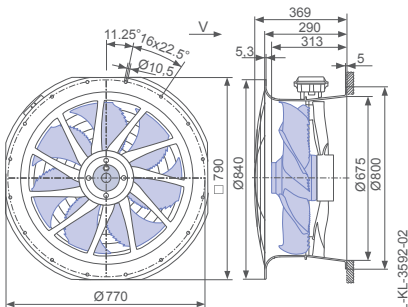
System components

Page 184

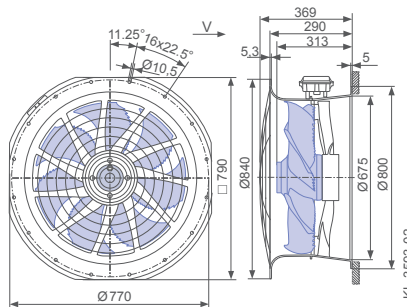
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



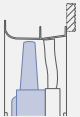
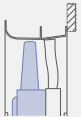
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
ZN063-VDL.6N.V7P6	Δ	I	400*	50	②	3.80*	1750*	1400*	91
					③	3.30*	1350*	1420*	86
					⑤	2.30*	1300*	1190*	86
	Y	II	460*	60	⑥	1.85*	1050*	1270*	83
					②	4.60*	2900*	1630*	93
					③	3.90*	2200*	1680*	90
		IV	400*	60	⑤	4.80*	2700*	1570*	93
					⑥	3.90*	2100*	1640*	89
					⑧	2.90*	1900*	1280*	87
	Y	III	460*	60	⑨	2.50*	1650*	1410*	85
					⑪	2.80*	1600*	1160*	85
					⑫	2.40*	1400*	1290*	83

*rated data

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-VDL.6N.V7P6	ZN063-VDL.6N.V7P6
Article no.	175948/10K4	175948/10K6
Weight kg	33.10	34.10
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix



FE2owlet with ZPlus

for three phase alternating current, 4-4 pole

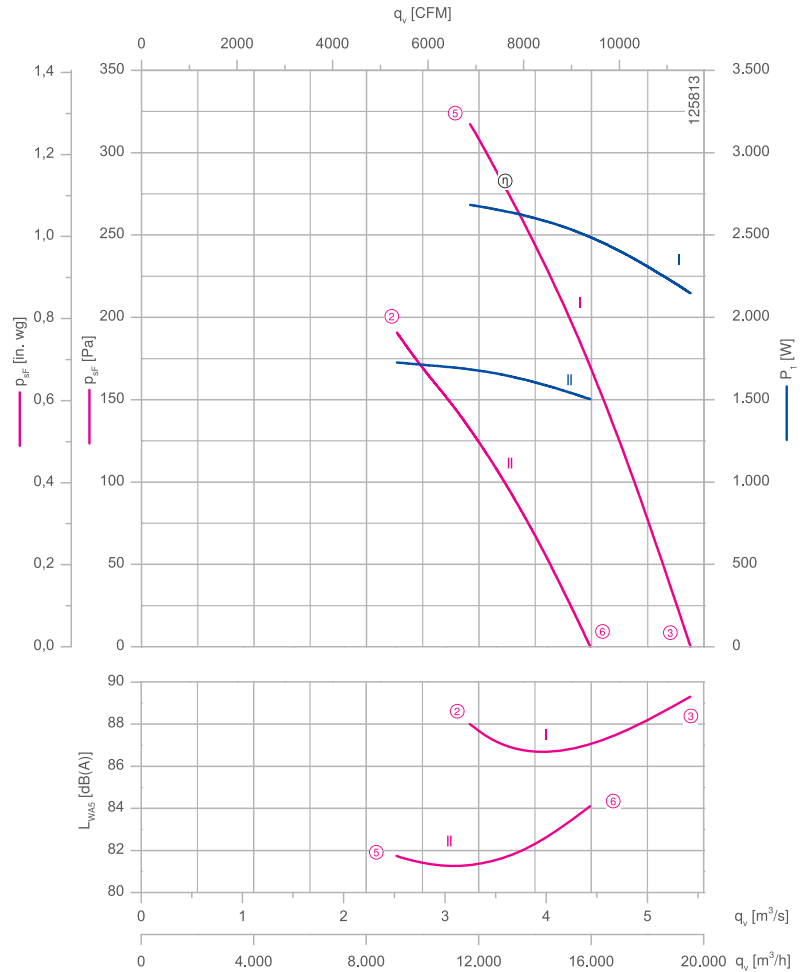
ZN063-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3- 400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
2.70/1.70 kW*
 Rated current I_N :
5.00/2.80 A*
 Rated speed n_N :
1320/1020 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
1360/1110 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
2100/1500 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
5.4/4.4 m³/s*
 Starting current I_A : **19/6.0 A**
 Current increase ΔI : **0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **55 °C**
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint, RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 44.1 %
 Efficiency: $N_{actual} = 47.8 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

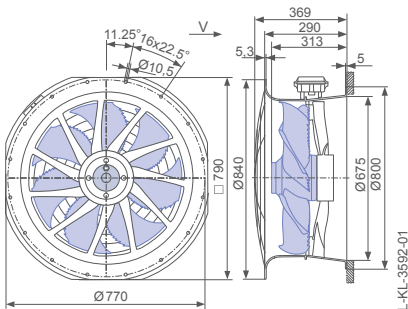
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System components Page 184

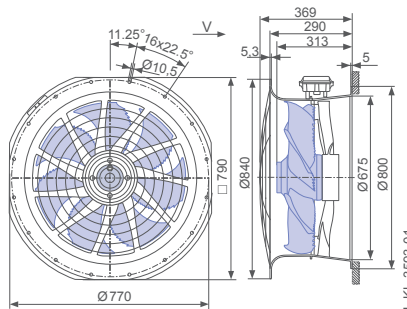
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box






Performance data

Type	Connection	Characteristic curve	Voltage	Operating point	Current	Input power	Speed	Suction side sound power level
			U V		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
ZN063-VDL.6N.V7P7	Δ	I	400*	②	5.00*	2700*	1310*	88
				③	4.20*	2100*	1360*	89
	Y	II		⑤	2.90*	1700*	1020*	82
				⑥	2.50*	1500*	1110*	84

*rated data

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-VDL.6N.V7P7	ZN063-VDL.6N.V7P7
Article no.	175947/10K4	175947/10K6
Weight kg	36.10	37.10
ZApus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

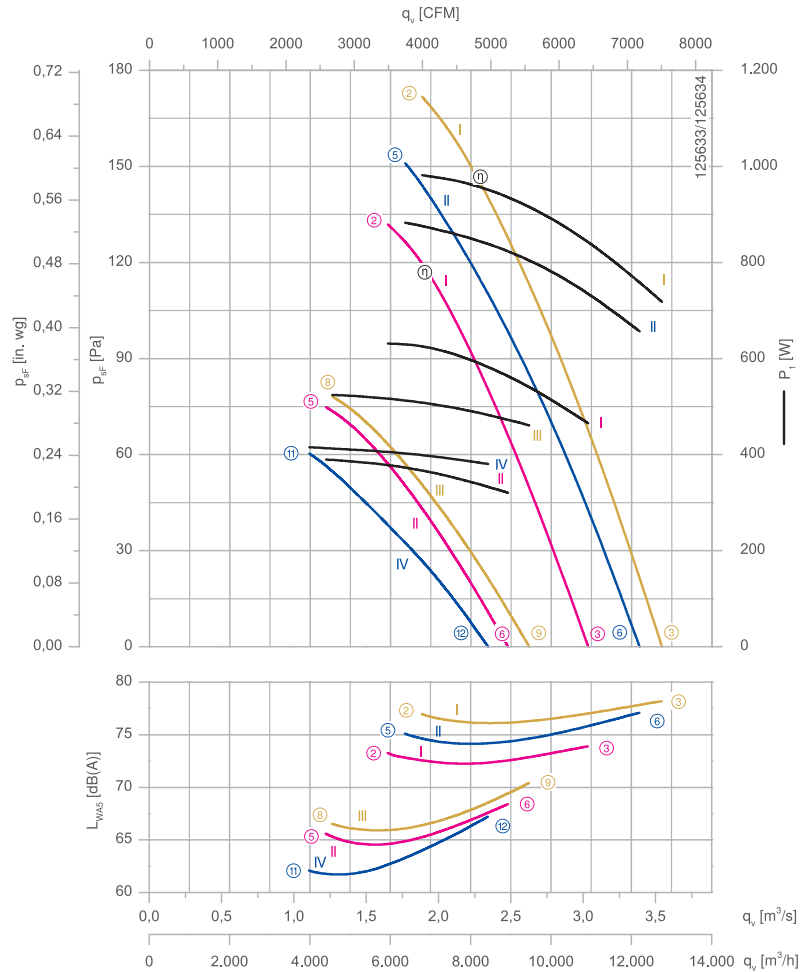
ZN063-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
640/390 W | 880/420 W | 980/520 W*
 Rated current I_N :
1.30/0.70 A | 1.60/0.78 A | 1.60/0.84 A*
 Rated speed n_N :
880/660 min⁻¹ | 940/590 min⁻¹ | 1000/670 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
920/760 min⁻¹ | 1030/710 min⁻¹ | 1070/820 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
460/320 W | 660/380 W | 720/460 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
3.0/2.5 m³/s | 3.4/2.3 m³/s | 3.5/2.6 m³/s*
 Starting current I_A : **3.6/1.1 A | 3.2/0.95 A | 3.8/1.1 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 60 °C | 60 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{stat} : 39.3 %
 Efficiency: $N_{actual} = 47.1 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

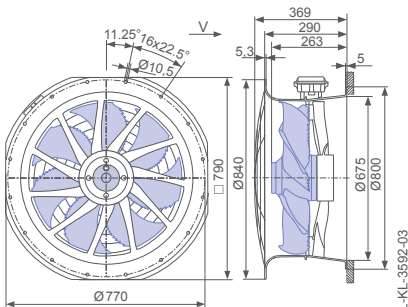
Connection diagram Page 252
1360-108XA

System components Page 184

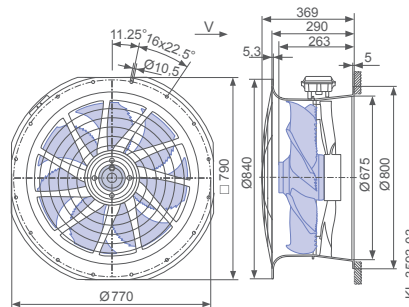
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



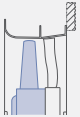
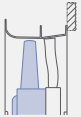
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
ZN063-SDL.4I.V7P1	Δ	I	400*	50	②	1.30*	640*	880*	73
					③	1.10*	460*	920*	74
					⑤	0.70*	390*	660*	66
	Y	II	460*	60	⑥	0.58*	320*	760*	68
					②	1.60*	980*	1000*	77
					③	1.30*	720*	1070*	78
		IV	400*	60	⑤	1.60*	880*	940*	75
					⑥	1.25*	660*	1030*	77
					⑧	0.84*	520*	670*	67
	Y	III	460*	60	⑨	0.72*	460*	820*	70
					⑪	0.78*	420*	590*	62
					⑫	0.70*	380*	710*	67

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-SDL.4I.V7P1	ZN063-SDL.4I.V7P1
Article no.	176015/10K4	176015/10K6
Weight kg	21.00	22.00
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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FE2owlet with ZPlus

for three phase alternating current, 8-8 pole

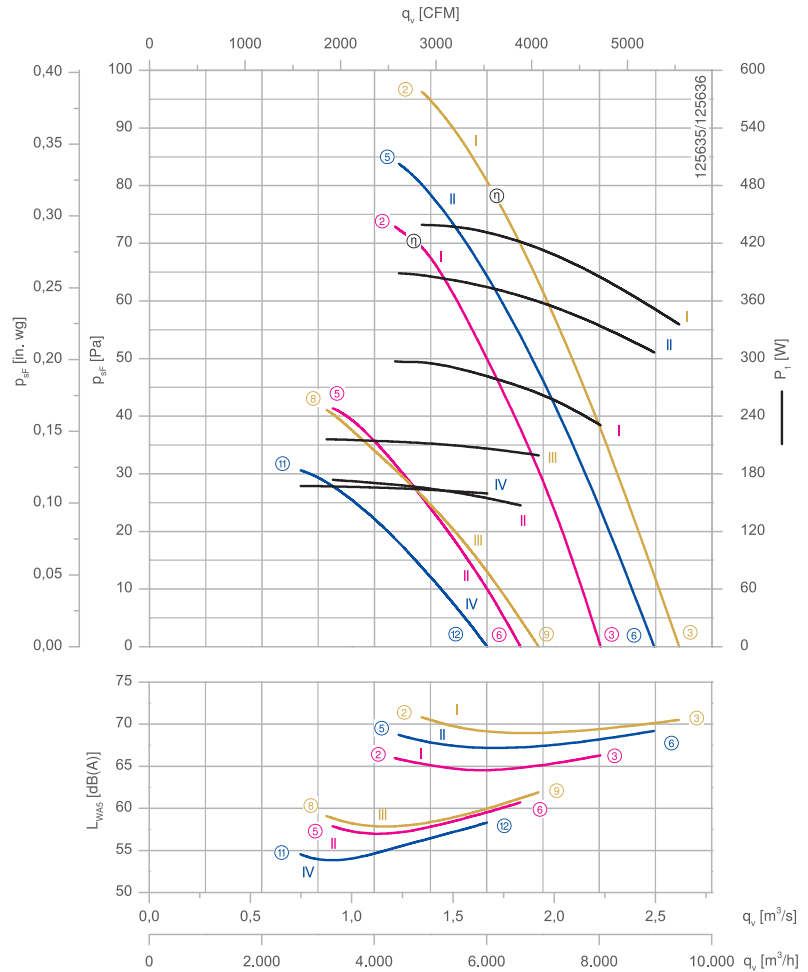
ZN063-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_i :
 300/170 W | 390/170 W | 440/220 W*
 Rated current I_N :
 0.80/0.37 A | 0.86/0.38 A | 0.90/0.42 A*
 Rated speed n_N :
 660/500 min⁻¹ | 700/430 min⁻¹ | 750/490 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 690/570 min⁻¹ | 760/520 min⁻¹ | 800/590 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 230/150 W | 310/160 W | 340/200 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 2.2/1.8 m³/s | 2.5/1.7 m³/s | 2.6/1.9 m³/s*
 Starting current I_A : 1.7/0.50 A | 1.5/0.42 A | 1.7/0.50 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 33.6 %
 Efficiency: $N_{actual} = 43.5 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

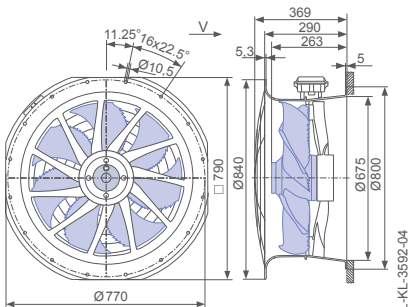
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System components Page 184

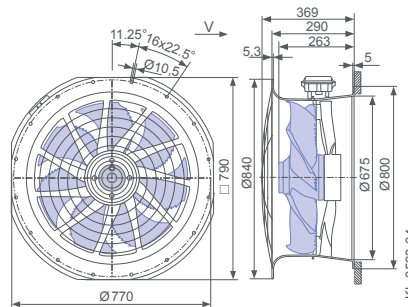
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



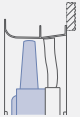
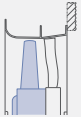
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level	
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)	
ZN063-ADL.4I.V7P1	Δ	I	400*	50	②	0.80*	300*	660*	66	
					③	0.74*	230*	690*	66	
	Y	II	400*	50	⑤	0.37*	170*	490*	58	
					⑥	0.32*	150*	570*	61	
	Δ	I	460*	60	②	0.90*	440*	750*	71	
					③	0.78*	340*	800*	71	
		II	400*	60	⑤	0.86*	390*	700*	69	
					⑥	0.72*	310*	760*	69	
		Y	III	460*	60	⑧	0.42*	220*	490*	59
						⑨	0.38*	200*	590*	62
	IV	400*	60	⑪	0.38*	170*	430*	55		
					⑫	0.36*	160*	520*	58	

*rated data

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN063-ADL.4I.V7P1	ZN063-ADL.4I.V7P1
Article no.	176016/10K4	176016/10K6
Weight kg	21.00	22.00
ZAplus attachable on both sides.		

Control technology

<p>Frequency inverters Fcontrol 3~</p>  <p>Page 208</p>	<p>Motor protection units 3~</p>  <p>Page 206</p>	<p>Electronic voltage controllers 3~</p>  <p>Page 218</p>
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FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

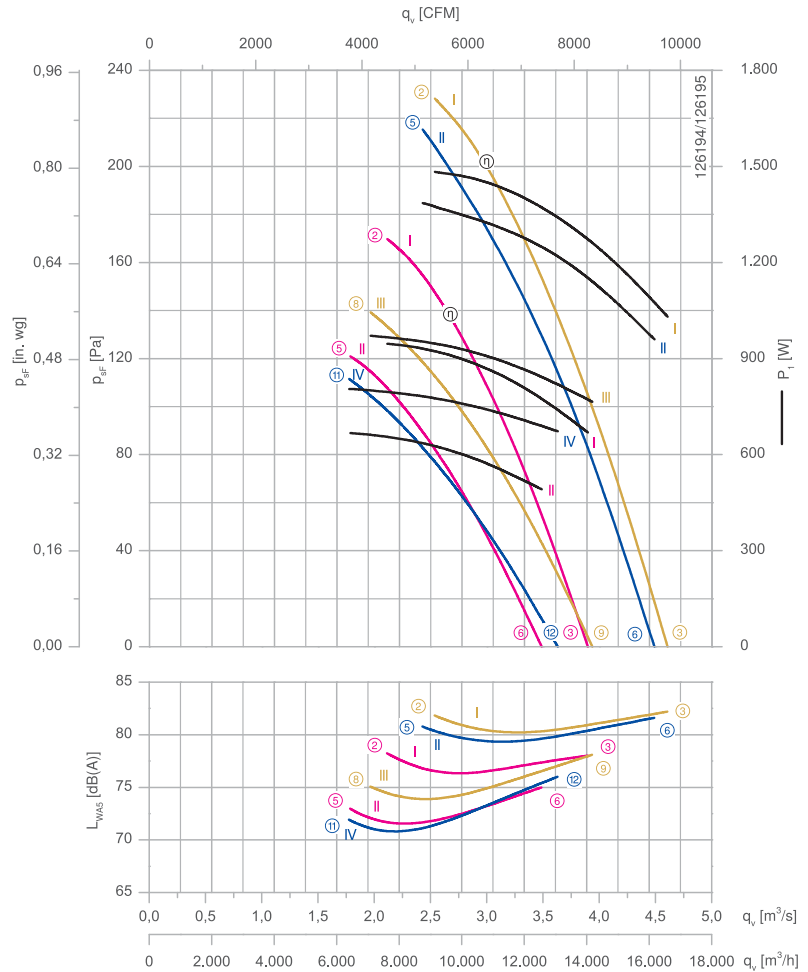
ZNO71-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 940/660 W | 1.40/0.80 kW | 1.50/0.98 kW*
 Rated current I_N :
 2.40/1.20 A | 2.60/1.50 A | 2.70/1.55 A*
 Rated speed n_N :
 920/780 min⁻¹ | 1030/750 min⁻¹ | 1070/840 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 950/850 min⁻¹ | 1090/890 min⁻¹ | 1120/960 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 660/500 W | 960/680 W | 1050/760 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 3.9/3.5 m³/s | 4.5/3.6 m³/s | 4.6/3.9 m³/s*
 Starting current I_A : 9.5/3.0 A | 9.0/2.8 A | 10/3.2 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 43.9 %
 Efficiency: $N_{actual} = 50.6 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

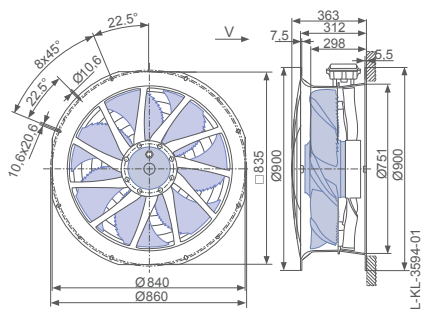
*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

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 System components Page 184

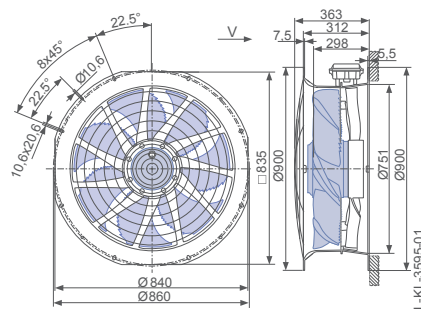
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



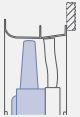
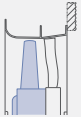
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level	
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)	
ZN071-SDL.6K.V7P1	Δ	I	400*	50	②	2.40*	940*	920*	78	
					③	2.20*	660*	950*	78	
		Y	II		⑤	1.20*	660*	780*	73	
					⑥	0.94*	500*	850*	75	
	Δ	I	460*	60	②	2.70*	1500*	1070*	82	
					③	2.20*	1050*	1120*	82	
					II	⑤	2.60*	1400*	1030*	81
						⑥	2.00*	960*	1090*	82
		Y	III		460*	⑧	1.55*	980*	840*	75
						⑨	1.20*	760*	960*	78
						⑪	1.50*	800*	750*	72
						⑫	1.20*	680*	890*	76

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN071-SDL.6K.V7P1	ZN071-SDL.6K.V7P1
Article no.	176029/10K4	176029/10K6
Weight kg	33.10	34.30
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
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FE2owlet with ZPlus

for three phase alternating current, 8-8 pole

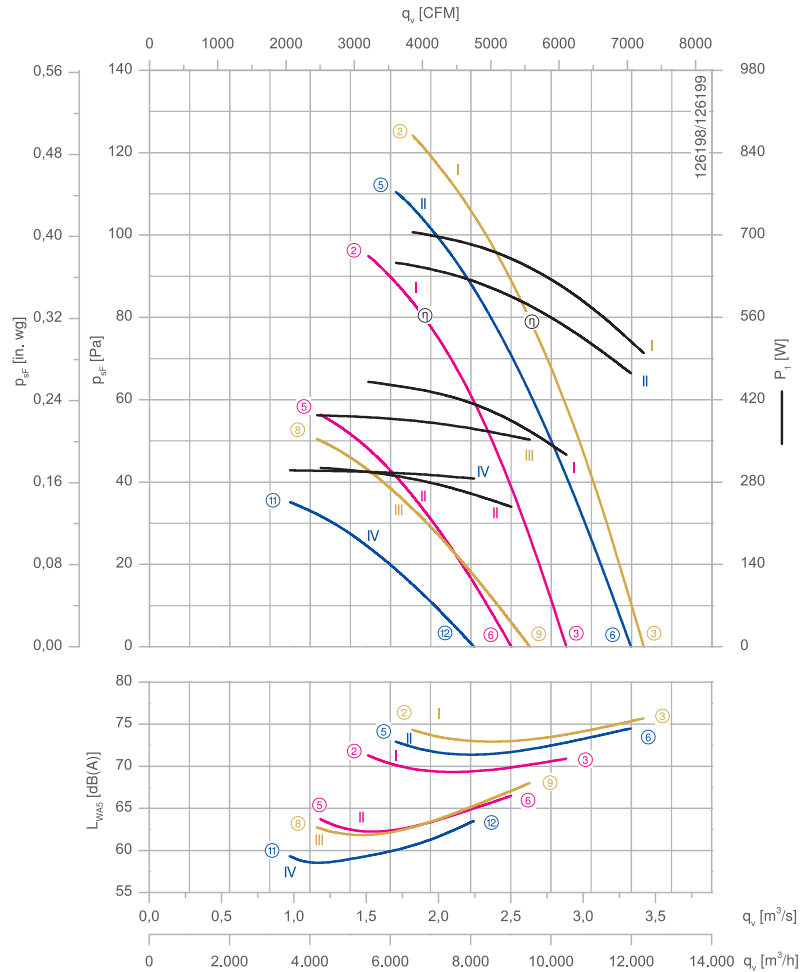
ZNO71-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~400 V (Δ /Y) | 3~400 V (Δ /Y) | 3~460 V (Δ /Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_i :
460/310 W | 660/300 W | 700/390 W*
 Rated current I_N :
1.05/0.60 A | 1.30/0.66 A | 1.25/0.74 A*
 Rated speed n_N :
680/530 min⁻¹ | 740/420 min⁻¹ | 780/500 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
710/610 min⁻¹ | 800/540 min⁻¹ | 830/640 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
330/240 W | 460/290 W | 500/350 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
2.9/2.5 m³/s | 3.3/2.2 m³/s | 3.4/2.6 m³/s*
 Starting current I_A : **3.2/0.95 A | 2.8/0.85 A | 3.2/1.0 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 38.0 %
 Efficiency: $N_{actual} = 46.7 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

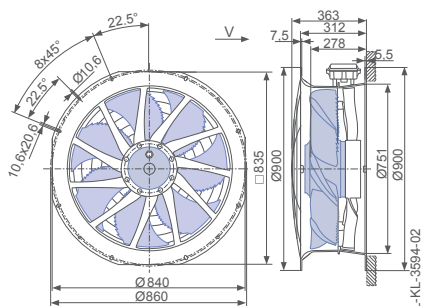
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System components Page 184

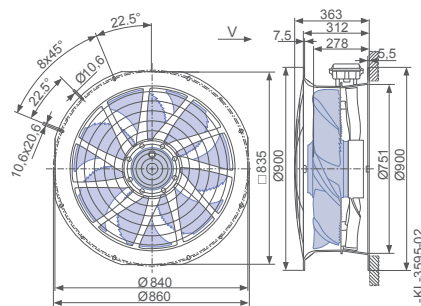
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



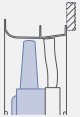
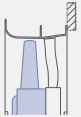
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
ZN071-ADL.6F.V7P1	Δ	I	400*	50	②	1.05*	460*	680*	71
					③	0.94*	330*	710*	71
					⑤	0.60*	300*	530*	64
	Y	II	460*	60	⑥	0.46*	240*	610*	67
					②	1.25*	700*	780*	75
					③	1.00*	500*	830*	76
		IV	400*	60	⑤	1.25*	660*	740*	73
					⑥	0.98*	460*	800*	75
					⑧	0.72*	390*	500*	63
	Y	III	460*	60	⑨	0.62*	350*	640*	68
					⑪	0.66*	300*	420*	59
					⑫	0.60*	290*	540*	64

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN071-ADL.6F.V7P1	ZN071-ADL.6F.V7P1
Article no.	176030/10K4	176030/10K6
Weight kg	29.50	30.70
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
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FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

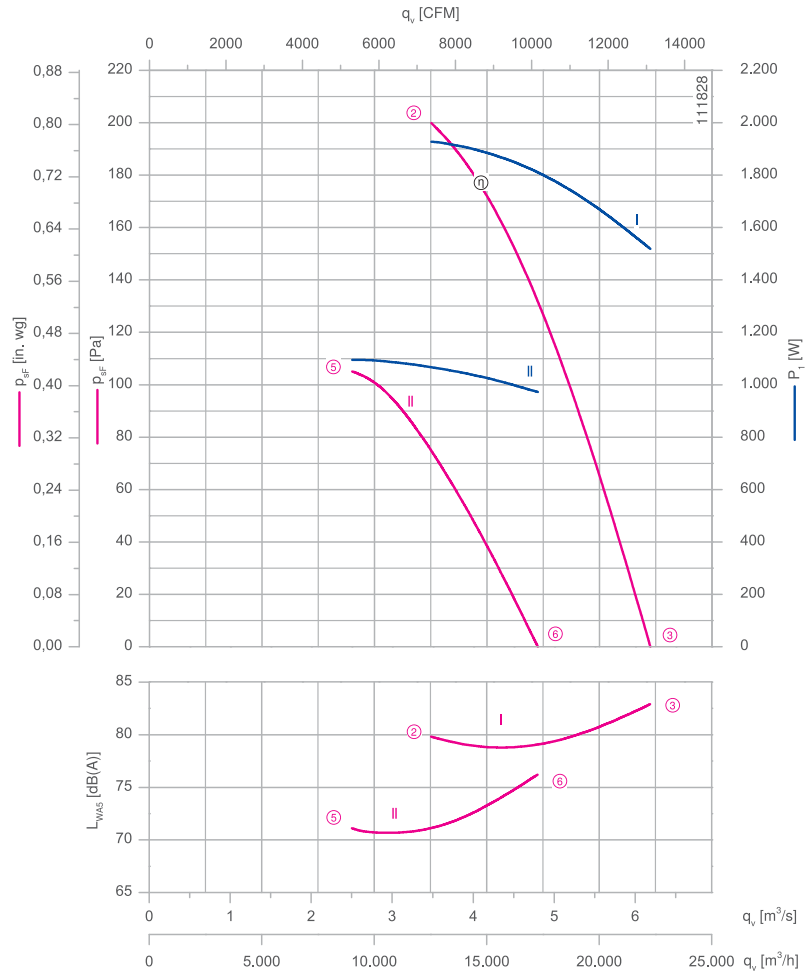
ZN080-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
1.95/1.10 kW*
 Rated current I_N :
3.80/2.00 A*
 Rated speed n_N :
870/630 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
900/700 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
1500/980 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
6.2/4.8 m³/s*
 Starting current I_A : **11/3.4 A**
 Current increase ΔI : **0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **60 °C**
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 42.7 %
 Efficiency: $N_{actual} = 47.5 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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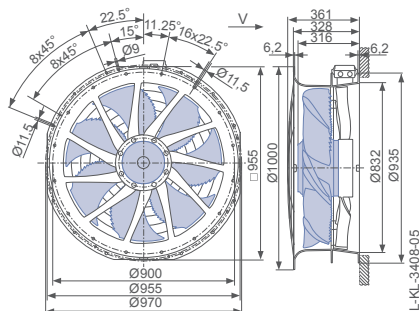
System components

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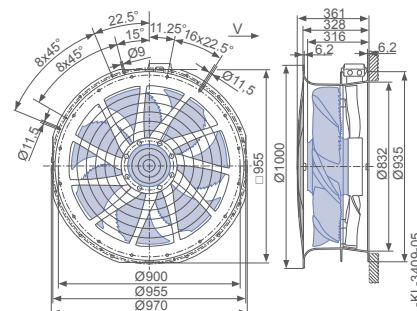
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box






Performance data

Type	Connection	Characteristic curve	Voltage U V	Operating point	Current I A	Input power P _i W	Speed n min ⁻¹	Suction side sound power level L _{WA5} dB(A)
ZN080-SDL.6N.V7P5	Δ	I	400*	②	3.80*	1950*	870*	80
				③	3.20*	1500*	900*	83
	Y	II		⑤	1.95*	1100*	630*	71
				⑥	1.75*	980*	700*	76

*rated data

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-SDL.6N.V7P5	ZN080-SDL.6N.V7P5
Article no.	176052/10K4	176052/10K6
Weight kg	42.80	44.20
ZApus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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Information
Oil transformer cooling
Dry transformer cooling
System components
Control technology
Appendix

FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

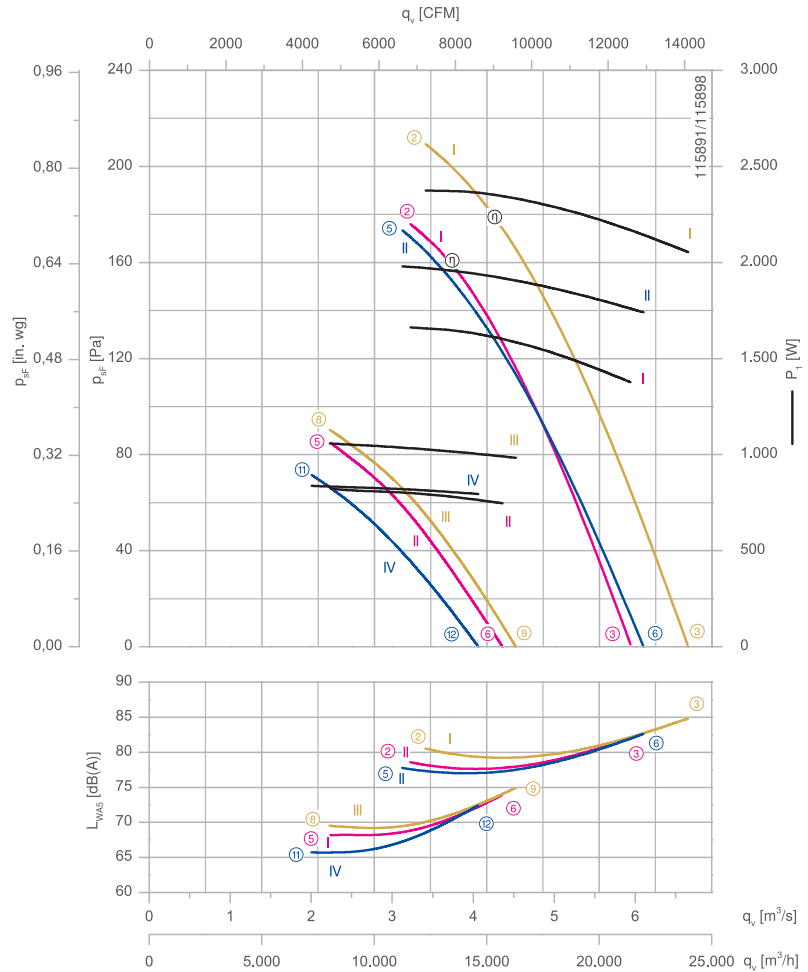
ZN080-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 1.65/0.82 kW | 2.00/0.84 kW | 2.40/1.05 kW*
 Rated current I_N :
 3.60/1.60 A | 3.90/1.60 A | 4.20/1.75 A*
 Rated speed n_N :
 800/560 min⁻¹ | 790/510 min⁻¹ | 870/570 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 840/620 min⁻¹ | 870/580 min⁻¹ | 940/640 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 1400/740 W | 1750/800 W | 2100/980 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 5.9/4.4 m³/s | 6.1/4.1 m³/s | 6.7/4.5 m³/s*
 Starting current I_A : 9.5/3.0 A | 8.5/2.6 A | 10/3.2 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 65 °C | 50 °C | 40 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 39.4 %
 Efficiency: $N_{actual} = 44.4 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

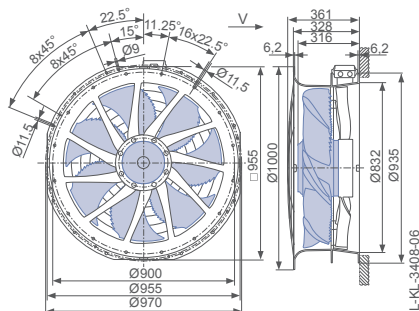
Connection diagram Page 252
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System components Page 184

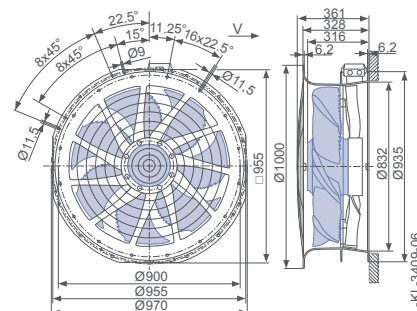
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



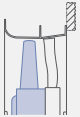
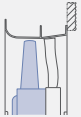
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level		
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)		
ZN080-SDL.6N.V7P5	Δ	I	400*	50	②	3.60*	1650*	800*	79		
					③	3.20*	1400*	840*	82		
					⑤	1.60*	820*	550*	68		
		II			⑥	1.45*	740*	620*	74		
					Δ	I	②	4.20*	2400*	860*	81
							③	3.70*	2100*	940*	85
	⑤	3.90*	2000*	790*			78				
	II	⑥	3.50*	1750*		870*	83				
		Y	III	⑧		1.75*	1050*	570*	70		
				⑨		1.65*	980*	640*	75		
	IV		⑪	1.60*	840*	510*	66				
			⑫	1.55*	800*	580*	72				

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-SDL.6N.V7P5	ZN080-SDL.6N.V7P5
Article no.	176053/10K4	176053/10K6
Weight kg	42.80	44.20
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
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FE2owlet with ZPlus

for three phase alternating current, 8-8 pole

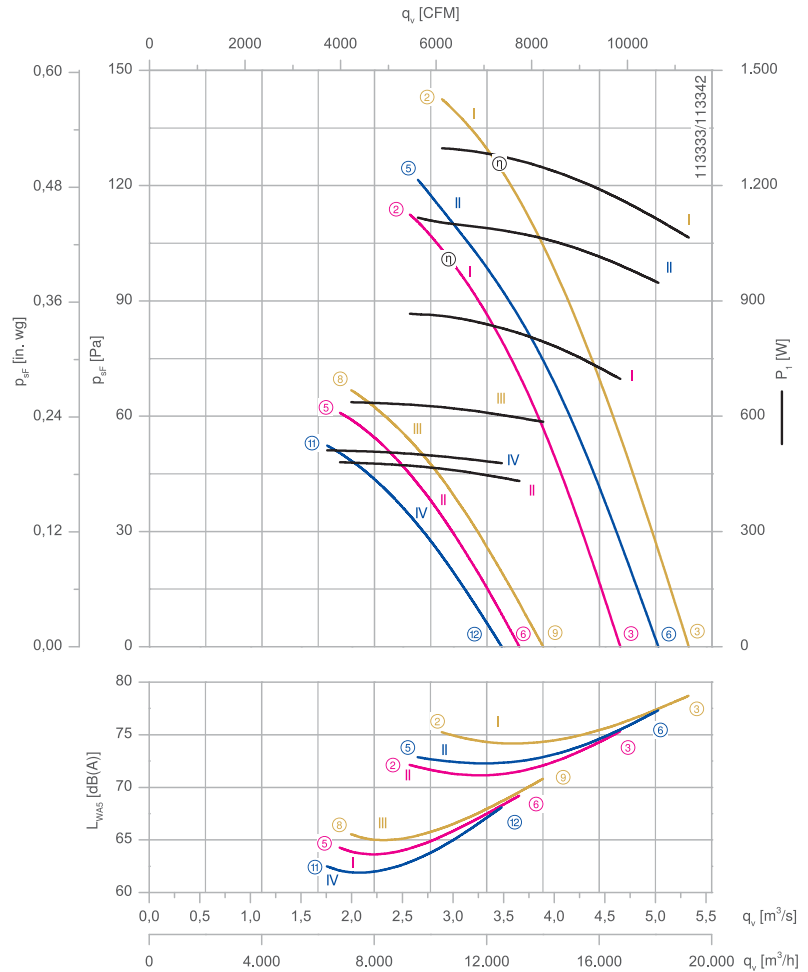
ZN080-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
860/480 W | 1.10/0.52 kW | 1.30/0.64 kW*
 Rated current I_N :
2.10/0.98 A | 2.30/1.00 A | 2.50/1.10 A*
 Rated speed n_N :
650/480 min⁻¹ | 680/450 min⁻¹ | 730/500 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
680/530 min⁻¹ | 730/510 min⁻¹ | 780/570 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
700/440 W | 940/480 W | 1050/580 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
4.7/3.7 m³/s | 5.0/3.5 m³/s | 5.3/3.9 m³/s*
 Starting current I_A : **5.5/1.6 A | 4.6/1.4 A | 5.5/1.7 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 65 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 39.4 %
 Efficiency: $N_{actual} = 46.2 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

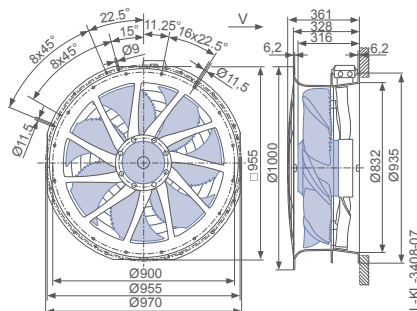
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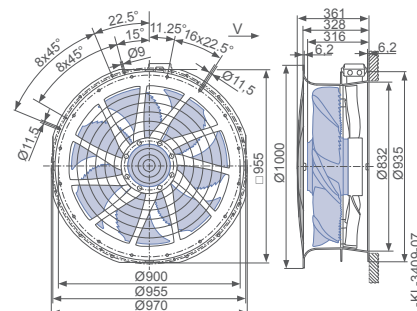
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



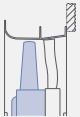
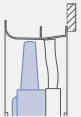
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
ZN080-ADL.6N.V7P5	Δ	I	400*	50	②	2.10*	860*	650*	72
					③	1.90*	700*	680*	75
					⑤	0.98*	480*	480*	64
	Y	II	460*	60	⑥	0.90*	440*	530*	69
					②	2.50*	1300*	730*	75
					③	2.20*	1050*	780*	79
		IV	⑤	2.30*	1100*	680*	73		
			⑥	2.10*	940*	730*	77		
			⑧	1.10*	640*	500*	66		
	Y	III	460*	60	⑨	1.05*	580*	570*	71
					⑪	1.00*	520*	450*	63
					⑫	0.96*	480*	510*	68

*rated data

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-ADL.6N.V7P5	ZN080-ADL.6N.V7P5
Article no.	176054/10K4	176054/10K6
Weight kg	42.80	44.20
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
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FE2owlet with ZPlus

for three phase alternating current, 12-12 pole

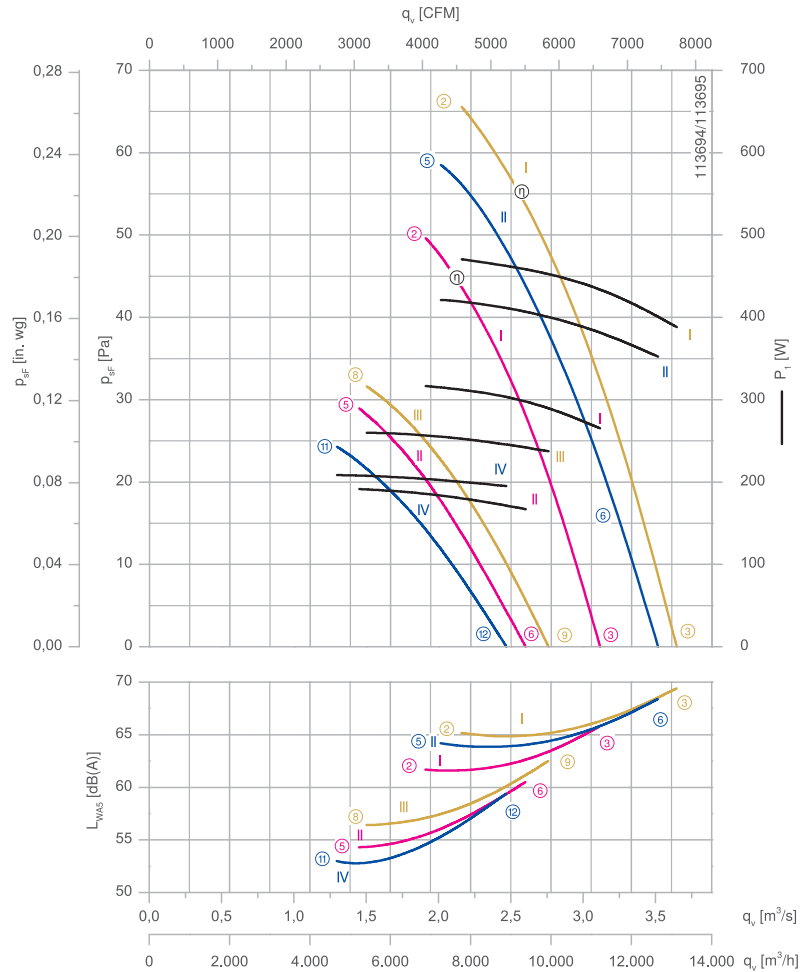
ZN080-ND



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : **50 Hz | 60 Hz | 60 Hz***
 Input power P_1 :
320/190 W | 420/210 W | 480/260 W*
 Rated current I_N :
0.78/0.38 A | 0.86/0.42 A | 0.88/0.44 A*
 Rated speed n_N :
440/340 min⁻¹ | 470/310 min⁻¹ | 500/350 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
450/370 min⁻¹ | 500/350 min⁻¹ | 530/400 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
270/170 W | 350/200 W | 390/240 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
3.1/2.6 m³/s | 3.5/2.5 m³/s | 3.6/2.8 m³/s*
 Starting current I_A : **1.8/0.6 A | 1.6/0.55 A | 1.9/0.6 A**
 Current increase ΔI : **0 % | 0 % | 0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$:
70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 34.3 %
 Efficiency: $N_{actual} = 43.9 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

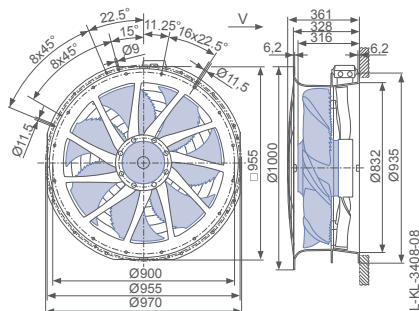
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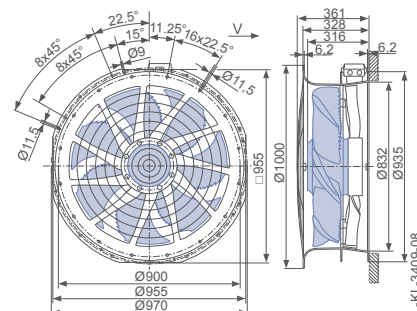
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



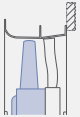

Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
ZN080-NDL.6N.V7P5	Δ	I	400*	50	②	0.78*	320*	440*	62
					③	0.74*	270*	450*	66
					⑤	0.37*	190*	340*	54
	Y	II	460*	60	⑥	0.34*	170*	370*	61
					②	0.88*	480*	500*	65
					③	0.80*	390*	530*	69
		IV	400*	60	⑤	0.86*	420*	470*	64
					⑥	0.76*	350*	500*	68
					⑧	0.44*	260*	350*	56
	Y	III	460*	60	⑨	0.40*	240*	400*	63
					⑪	0.42*	210*	310*	53
					⑫	0.38*	200*	350*	59

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN080-NDL.6N.V7P5	ZN080-NDL.6N.V7P5
Article no.	176055/10K4	176055/10K6
Weight kg	42.80	44.20
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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FE2owlet with ZAplus

for three phase alternating current, 4-4 pole

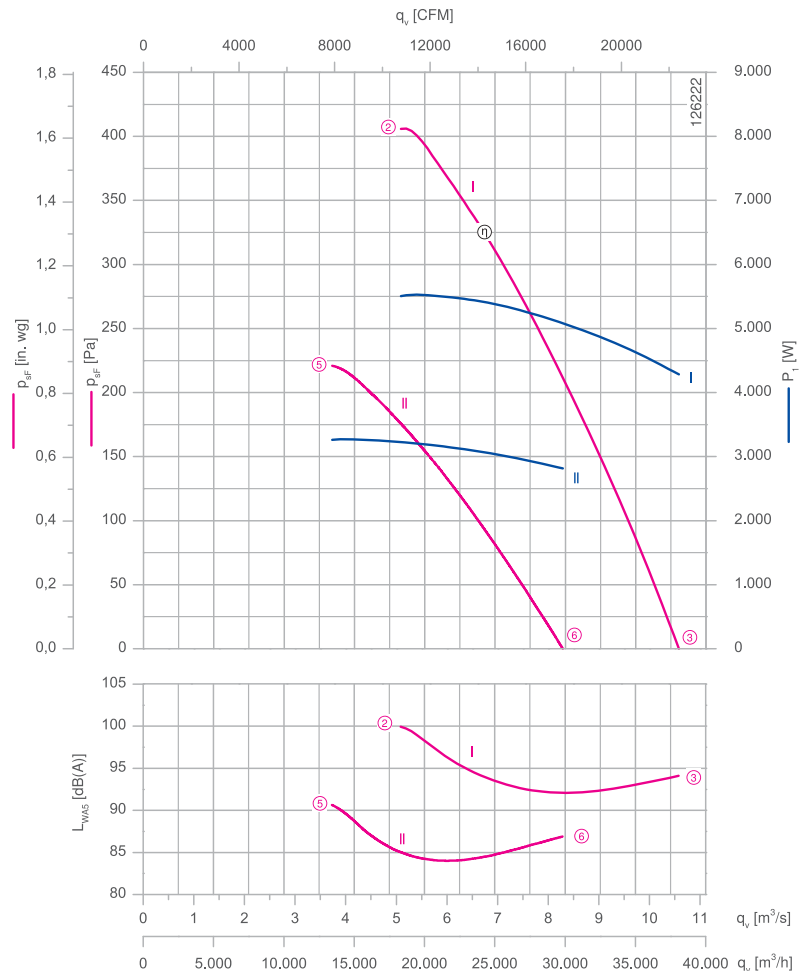
ZN09 1-VD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
3~ 400 V (Δ/Y)*
 Rated frequency f_N : **50 Hz***
 Input power P_1 :
5.60/3.30 kW*
 Rated current I_N :
9.00/5.20 A*
 Rated speed n_N :
1230/910 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
1300/1020 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
4200/2800 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
10.6/8.3 m³/s*
 Starting current I_A : **32/10 A**
 Current increase ΔI : **0 %**
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: **-40 °C*****
 Max. permitted ambient temperature $t_{R(max)}$: **45 °C**
 Electrical connection: Terminal box
 Number of blades: 5
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 45.7 %
 Efficiency: $N_{actual} = 47.6 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZAplus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

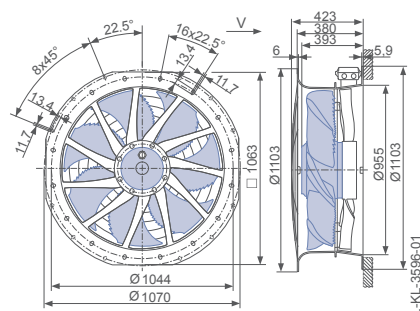
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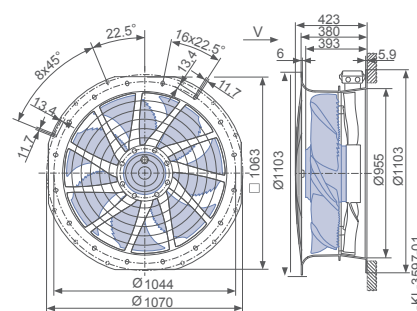
Dimensions mm

Airflow direction

Design L - ZAplus, guard grille suction side with connection box



Design L - ZAplus, guard grille two-sided with connection box





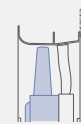
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WAS} dB(A)
			U V	f Hz		I A	P_1 W	n min ⁻¹	
ZN091-VDL.7Q.V5P1	Δ	I	400*	50	②	8.80*	5400*	1230*	100
					③	7.20*	4200*	1300*	94
	Y	II			⑤	5.20*	3300*	910*	91
					⑥	4.40*	2800*	1020*	87

*rated data

Fan ordering information

Airflow direction 

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-VDL.7Q.V5P1	ZN091-VDL.7Q.V5P1
Article no.	176058/10K4	176058/10K6
Weight kg	60.30	62.20
ZApplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
		
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- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



FE2owlet with ZPlus

for three phase alternating current, 6-6 pole

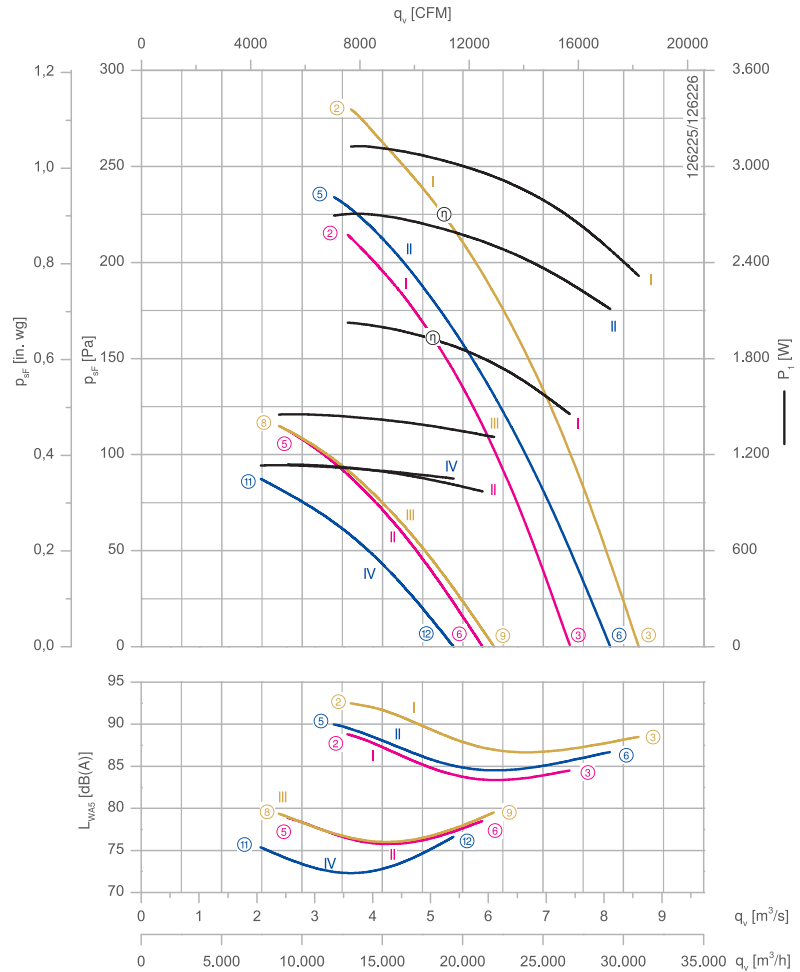
ZN091-SD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 2.00/1.15 kW | 2.70/1.15 kW | 3.10/1.45 *
 Rated current I_N :
 4.40/2.20 A | 5.20/2.30 A | 5.40/2.50 A*
 Rated speed n_N :
 880/630 min⁻¹ | 900/560 min⁻¹ | 980/640 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 930/740 min⁻¹ | 1010/680 min⁻¹ | 1070/760 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 1450/980 W | 2100/1050 W | 2300/1300 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 7.4/5.9 m³/s | 8.1/5.4 m³/s | 8.6/6.1 m³/s*
 Starting current I_A : 11/3.4 A | 10/3.0 A | 11/3.6 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 65 °C | 40 °C | 40 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 44.7 %
 Efficiency: $N_{actual} = 49.6 / N_{target} = 40$ **
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

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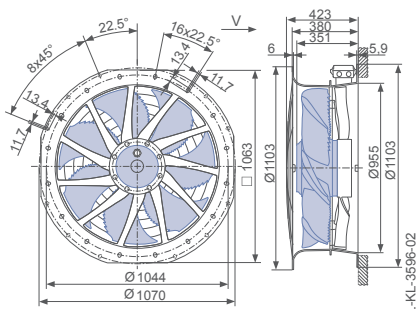
System components

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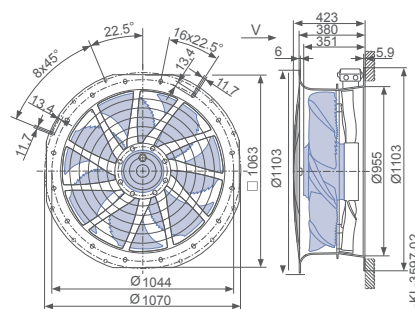
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



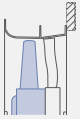

Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level		
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)		
ZN091-SDL.6N.V7P2	Δ	I	400*	50	②	4.40*	2000*	880*	89		
					③	3.50*	1450*	930*	85		
					⑤	2.20*	1150*	630*	79		
		II			⑥	1.90*	980*	740*	79		
					Δ	I	②	5.40*	3100*	980*	93
							③	4.20*	2300*	1070*	89
	⑤	5.20*	2700*	900*			90				
	II	⑥	4.20*	2100*		1010*	87				
		Y	III	⑧		2.50*	1450*	640*	80		
				⑨		2.20*	1300*	760*	80		
	IV		⑪	2.30*	1150*	560*	75				
			⑫	2.10*	1050*	680*	77				

*rated data

Fan ordering information

Airflow direction →

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-SDL.6N.V7P2	ZN091-SDL.6N.V7P2
Article no.	176059/10K4	176059/10K6
Weight kg	44.00	45.90
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
 Page 208	 Page 206	 Page 218



FE2owlet with ZPlus

for three phase alternating current, 8-8 pole

ZN091-AD



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 920/540 W | 1.25/0.58 kW | 1.40/0.72 kW*
 Rated current I_N :
 2.20/1.10 A | 2.50/1.15 A | 2.60/1.25 A*
 Rated speed n_N :
 660/500 min⁻¹ | 690/450 min⁻¹ | 740/510 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 690/570 min⁻¹ | 760/540 min⁻¹ | 800/610 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 680/460 W | 960/520 W | 1050/640 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 5.5/4.5 m³/s | 6.1/4.4 m³/s | 6.4/4.8 m³/s*
 Starting current I_A : 5.5/1.6 A | 4.6/1.4 A | 5.5/1.7 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C

Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE

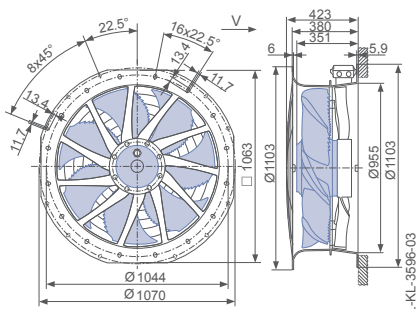
ErP-data

Efficiency η_{statA} : 43.4 %
 Efficiency: $N_{actual} = 50.1 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

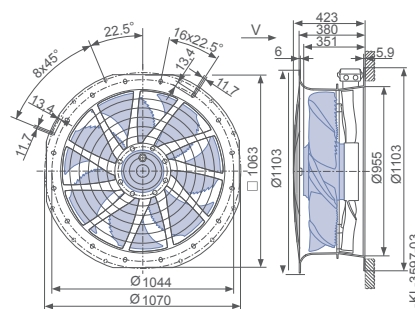
Dimensions mm

Airflow direction

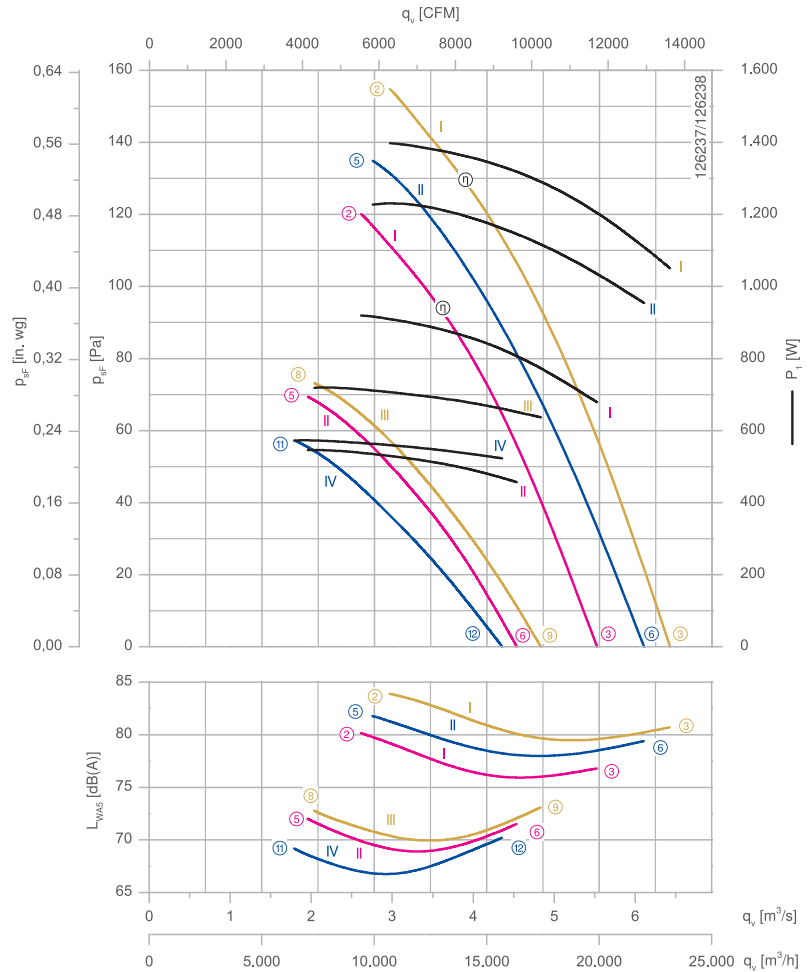
Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Connection diagram

Page 252
1360-108XA

System components

Page 184



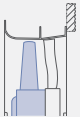

Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WAS} dB(A)
ZN091-ADL.6N.V7P2	Δ	I	400*	50	②	2.20*	920*	660*	80
					③	1.95*	680*	690*	77
					⑤	1.10*	540*	500*	72
	Δ	I	460*	60	②	2.60*	1400*	740*	84
					③	2.20*	1050*	800*	81
					⑤	2.50*	1250*	690*	82
		II	400*	60	⑥	2.10*	960*	760*	79
					⑧	1.25*	720*	510*	73
					⑨	1.10*	640*	610*	73
	Y	III	460*	60	⑩	1.15*	580*	450*	69
					⑪	1.15*	580*	450*	69
					⑫	1.05*	520*	540*	70

*rated data

Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-ADL.6N.V7P2	ZN091-ADL.6N.V7P2
Article no.	176060/10K4	176060/10K6
Weight kg	44.00	45.90
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
 Page 208	 Page 206	 Page 218

FE2owlet with ZPlus

for three phase alternating current, 12-12 pole

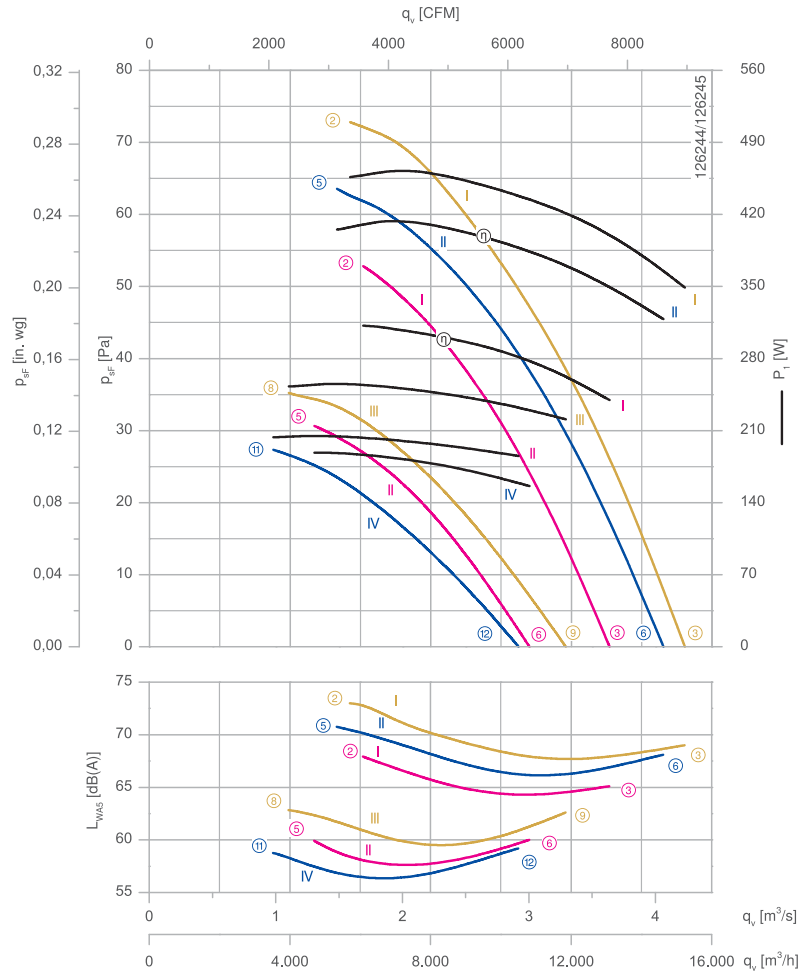
ZN091-ND



Description

Motor technology: AC
 Rated voltage $U_N \pm 10\%$:
 3~ 400 V (Δ/Y) | 3~400 V (Δ/Y) | 3~460 V (Δ/Y) *
 Rated frequency f_N : 50 Hz | 60 Hz | 60 Hz*
 Input power P_1 :
 310/190 W | 420/200 W | 460/260 W*
 Rated current I_N :
 0.76/0.37 A | 0.84/0.40 A | 0.88/0.44 A*
 Rated speed n_N :
 440/330 min⁻¹ | 470/300 min⁻¹ | 500/350 min⁻¹*
 Speed n at $p_{stat} = 0$ Pa:
 460/380 min⁻¹ | 510/370 min⁻¹ | 530/420 min⁻¹*
 Motor input power P at $p_{stat} = 0$ Pa:
 240/160 W | 320/190 W | 350/220 W*
 Air flow q_v at $p_{stat} = 0$ Pa:
 3.6/3.0 m³/s | 4.1/2.9 m³/s | 4.2/3.3 m³/s*
 Starting current I_A : 1.8/0.6 A | 1.6/0.55 A | 1.9/0.6 A
 Current increase ΔI : 0 % | 0 % | 0 %
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 70 °C | 70 °C
 Electrical connection: Terminal box
 Number of blades: 7
 Degree of protection : IP54
 Motor protection: thermal contact
 Blades: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Rotor: Aluminium, 2 coat paint,
 RAL 9005 (jet black)
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 34.9 %
 Efficiency: $N_{actual} = 44.7 / N_{target} = 40^{**}$
 * Rated data
 **ErP 2015

Characteristic curve



Measured in ZPlus and guard grille on suction side in installation type A according to ISO 5801.

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

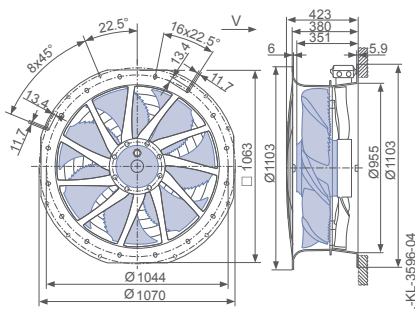
Connection diagram Page 252
1360-108XA

System components Page 184

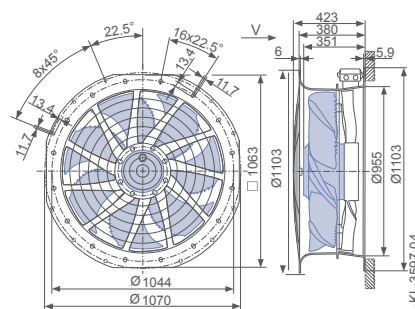
Dimensions mm

Airflow direction

Design L - ZPlus, guard grille suction side with connection box



Design L - ZPlus, guard grille two-sided with connection box



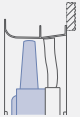
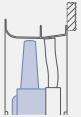
Performance data

Type	Connection	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level
			U V	f Hz		I A	P ₁ W	n min ⁻¹	L _{WA5} dB(A)
ZN091-NDL.6N.V7P2	Δ	I	400*	50	②	0.76*	310*	440*	68
					③	0.70*	240*	460*	65
					⑤	0.37*	190*	330*	60
	Y	II	460*	60	⑥	0.32*	160*	380*	60
					②	0.86*	460*	500*	73
					③	0.76*	350*	530*	69
		III	II	400*	⑤	0.84*	400*	470*	71
			⑥	0.72*	320*	510*	68		
			⑧	0.44*	250*	350*	63		
	IV	460*	60	⑨	0.38*	220*	420*	63	
				⑪	0.40*	200*	310*	59	
				⑫	0.37*	190*	370*	59	

*rated data

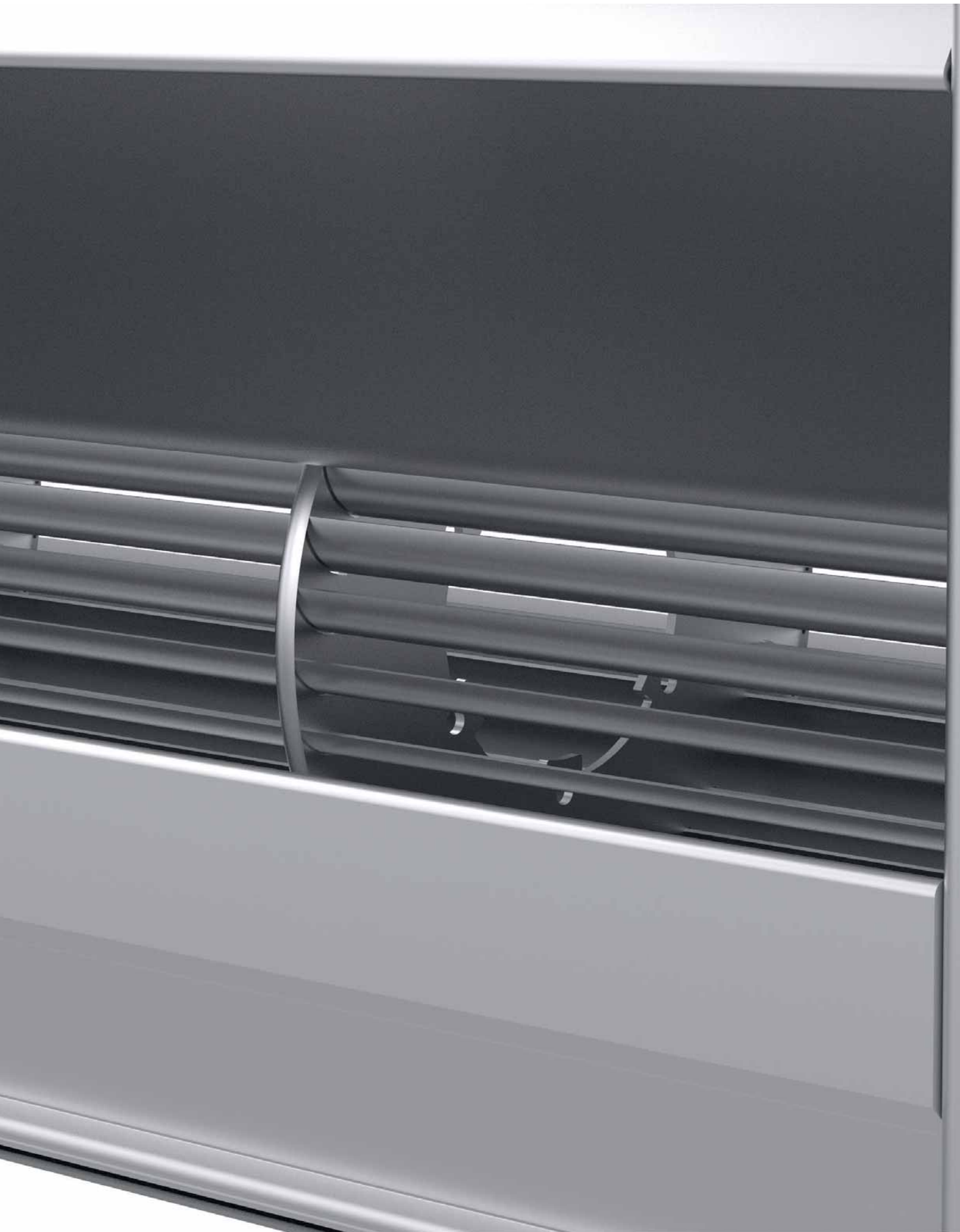
Fan ordering information

Airflow direction

Design	L (guard grille suction side)	L (guard grille two-sided)
		
Type	ZN091-NDL.6N.V7P2	ZN091-NDL.6N.V7P2
Article no.	176061/10K4	176061/10K6
Weight kg	44.00	45.90
ZAplus attachable on both sides.		

Control technology

Frequency inverters Fcontrol 3~	Motor protection units 3~	Electronic voltage controllers 3~
 Page 208	 Page 206	 Page 218



Dry transformer cooling

Product overview

Cross flow fans	Page 166
FE2owlet	Page 176
S-series	Page 180

Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix

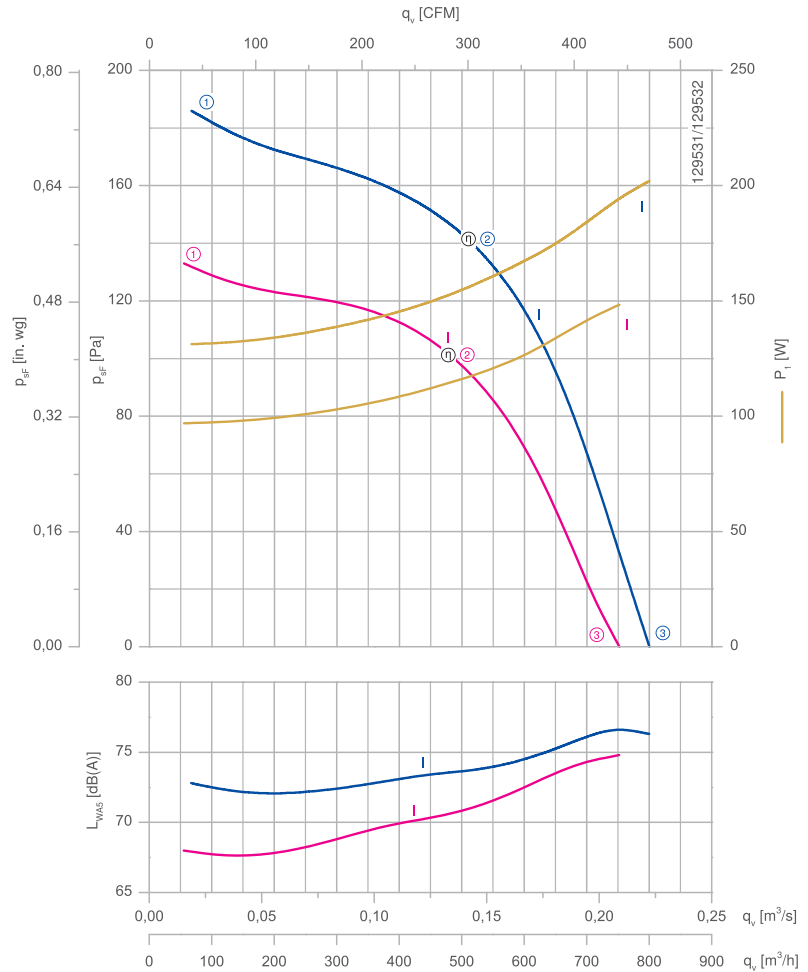
Cross flow fan

for single phase alternating current, 2 pole

QK08A-2E



Characteristic curve



Measured without guide plate 180° according to ISO 5801.

Connection diagram 1360-161XA Page 253
OHNE

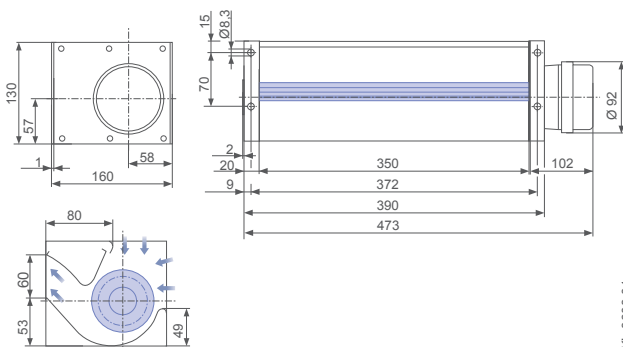
Airflow direction

Description

Motor technology: AC
 *Rated voltage U_N : 1~ 230 V $\pm 10\%$ *
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 160 W | 220 W*
 Rated current I_N :
 0,72 A | 0,94 A*
 Rated speed n_N :
 2440 min⁻¹ | 2600 min⁻¹*
 Service capacitor C_{400V} : 4,0 μ F
 Thermal class: THCL130*
 Min. permitted ambient temperature $t_{R(min)}$: -20 °C
 Max. permitted ambient temperature $t_{R(max)}$: 70 °C
 Electrical connection: Prewired to a terminal strip, capacitor fitted and connected
 Degree of protection : IP10
 Impeller : aluminium
 Housing: Side plates galvanized steel, casing profile aluminium, guide vane steel uncoated
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data; P_i , I_N determined at 180° guide plates

Dimensions mm

Crossflow fan



L-KL-3608-01

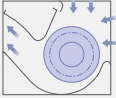
Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)	
		U V	f Hz		I A	P_1 W	n min ⁻¹		
QK08A-2EM.35.CF	I	230	50	①	0.46	95	2850	68	
		230			0.52	110	2720	70	
		230*			0.66*	150*	2440*	75	
	I	230	60	①	0.58	130	3350	73	
					②	0.68	160	3150	74
					③	0.88*	200*	2600*	76

Fan ordering information

Design QK

Installation position H



Type QK08A-2EM.35.CF
Article no. 205156

Weight kg 3.60

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix

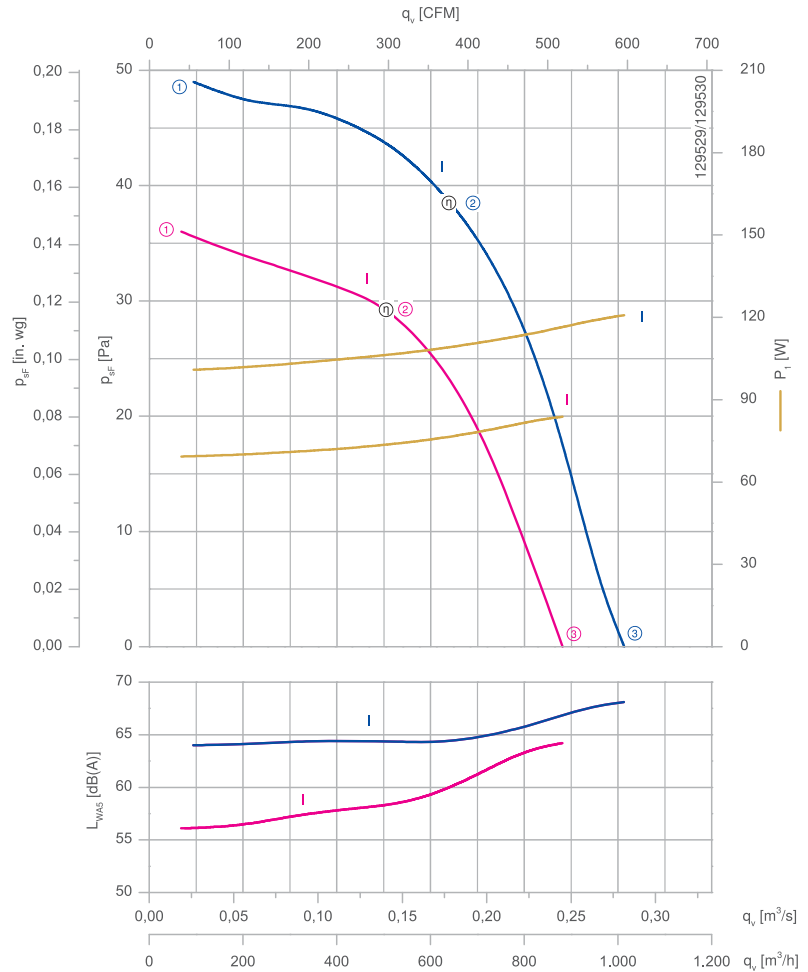
Cross flow fan

for single phase alternating current, 4 pole

QK08A-4E



Characteristic curve



Measured without guide plate 180° according to ISO 5801.

Connection diagram 1360-161XA Page 253
OHNE

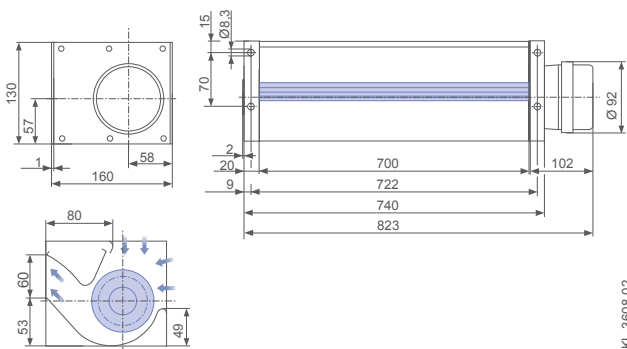
Airflow direction

Description

Motor technology: AC
 Rated voltage U_N : 1~ 230 V ±10%
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 90 W | 130 W*
 Rated current I_N :
 0,39 A | 0,56 A*
 Rated speed n_N :
 1380 min⁻¹ | 1580 min⁻¹*
 Service capacitor C_{400V} : 3,0 μF
 Thermal class: THCL130*
 Min. permitted ambient temperature $t_{R(min)}$: -20 °C
 Max. permitted ambient temperature $t_{R(max)}$: 70 °C
 Electrical connection: Prewired to a terminal strip, capacitor fitted and connected
 Degree of protection: IP10
 Impeller: aluminium
 Housing: Side plates galvanized steel, casing profile aluminium, guide vane steel uncoated
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data; P_i , I_N determined at 180° guide plates

Dimensions mm

Crossflow fan

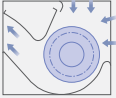


L-KL-3608-02

Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
		U V	f Hz		I A	P_1 W	n min ⁻¹	
QK08A-4EM.70.CF	I	230	50	①	0.31	70	1460	56
		230			0.33	75	1430	58
		230*			0.37*	85*	1380*	64
	I	230	60	①	0.44	100	1740	64
		230			0.48	110	1680	64
		230*			0.54*	120*	1580*	68

Fan ordering information

Design	QK
Installation position	H
	
Type	QK08A-4EM.70.CF
Article no.	205155
Weight kg	4.70

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix

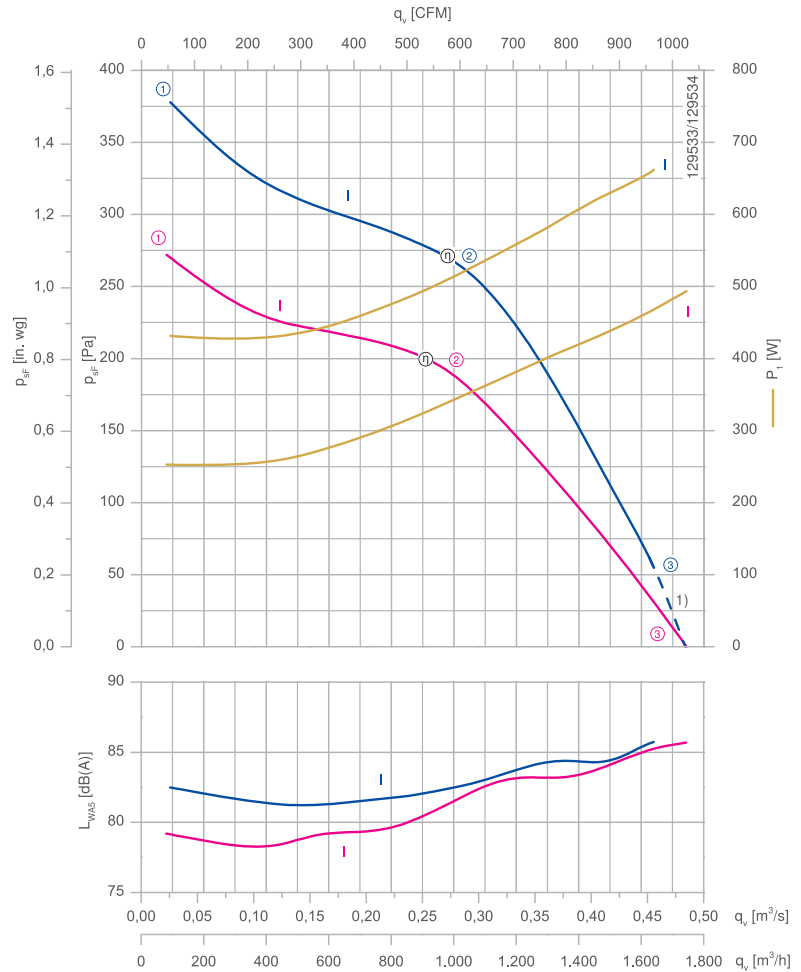
Cross flow fan

for single phase alternating current, 2 pole

QK10A-2E



Characteristic curve



Description

Motor technology: AC
 *Rated voltage U_N : 1~ 230 V $\pm 10\%$ *
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 640 W | 720 W*
 Rated current I_N :
 2,80 A | 3,10 A*
 Rated speed n_N :
 2630 min⁻¹ | 2800 min⁻¹*
 Starting current I_A : 4.60 A
 *Service capacitor C_{400V} : 10,0 μF
 Thermal class: **THCL155***
 Min. permitted ambient temperature $t_{R(min)}$: -20 °C
 Max. permitted ambient temperature $t_{R(max)}$: 70 °C
 Electrical connection: Prewired to a terminal strip, capacitor fitted and connected
 Minimum pressing $p_{SF(min)}$: 60PA
 Degree of protection : IP10
 Impeller : aluminium
 Housing: Side plates galvanised steel, casing profile aluminium, guide vane steel uncoated
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 20,8 %
 Efficiency: $N_{actual} = 24,5 / N_{target} = 21^{**}$
 **ErP 2015
 *Rated data; P_i, I_N determined at 180° guide plates

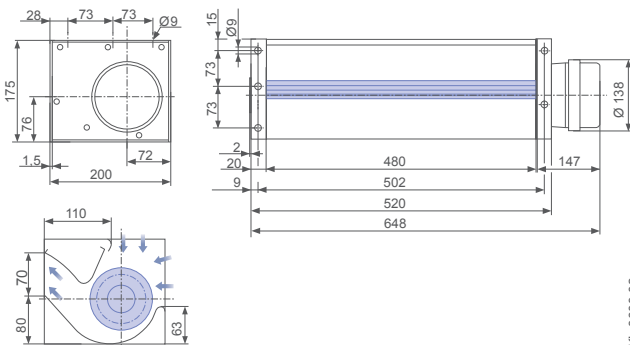
Measured without guide plate 180° according to ISO 5801.
 1) Do not operate in this area

Connection diagram 1360-104XA Page 252
 OHNE

Airflow direction

Dimensions mm

Crossflow fan



L-KL-3609-02

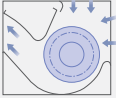
Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)	
		U V	f Hz		I A	P_1 W	n min ⁻¹		
QK10A-2EM.48.FK	I	230	50	①	1.20	250	2890	79	
		230			1.45	320	2820	81	
		230*			2.20*	500*	2630*	86	
	I	230	60	①	2.10	440	3370	83	
					②	2.30	500	3240	82
					③	3.10	720	2800	86

Fan ordering information

Design QK

Installation position H



Type QK10A-2EM.48.FK
Article no. 110179

Weight kg 9.50

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



Cross flow fan

for single phase alternating current, 4 pole

QK10A-4E



Description

Motor technology: AC

*Rated voltage U_N : 1~ 230 V $\pm 10\%$ *

Rated frequency f_N : 50 Hz | 60 Hz*

Input power P_i :

130 W | 160 W*

Rated current I_N :

0,58 A | 0,68 A*

Rated speed n_N :

1130 min⁻¹ | 1110 min⁻¹*

Service capacitor C_{400V} : 4,0 μ F

Thermal class: THCL130*

Min. permitted ambient temperature $t_{R(min)}$: -20 °C

Max. permitted ambient temperature $t_{R(max)}$: 70 °C

Electrical connection: Prewired to a terminal strip, capacitor fitted and connected

Degree of protection: IP10

Housing: Side plates galvanized steel, casing profile aluminium, guide vane steel uncoated

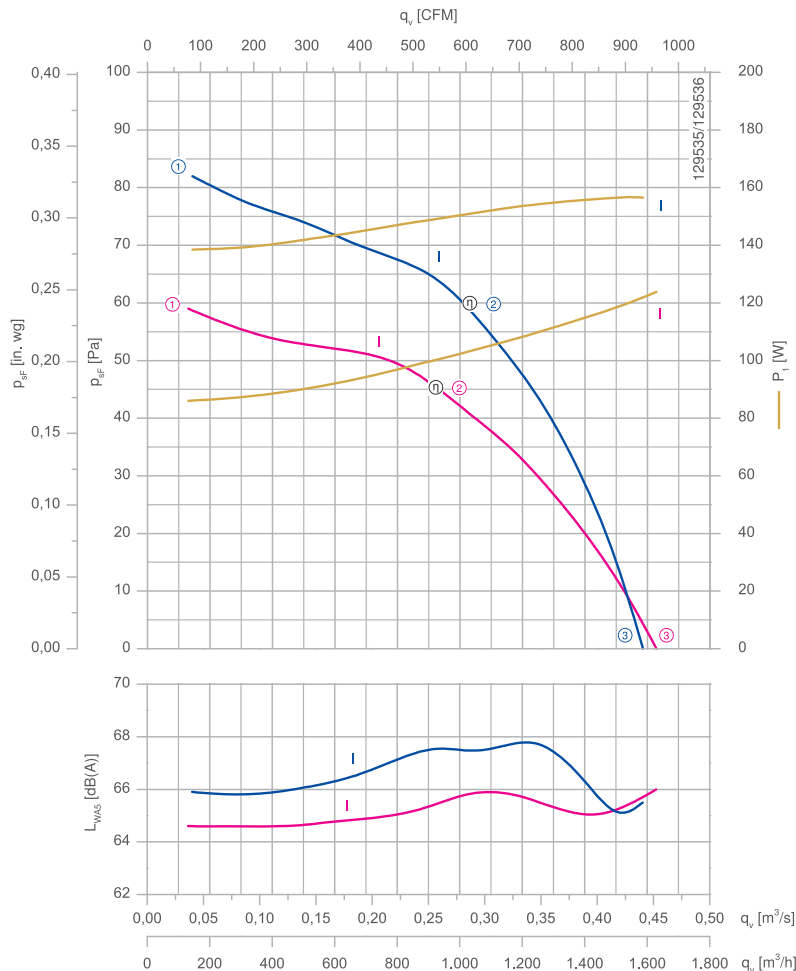
Conformity: CE

ErP-data

Not subject to the regulations of ErP directive ($P_i < 125$ W)

* Rated data; P_i , I_N determined at 180° guide plates

Characteristic curve



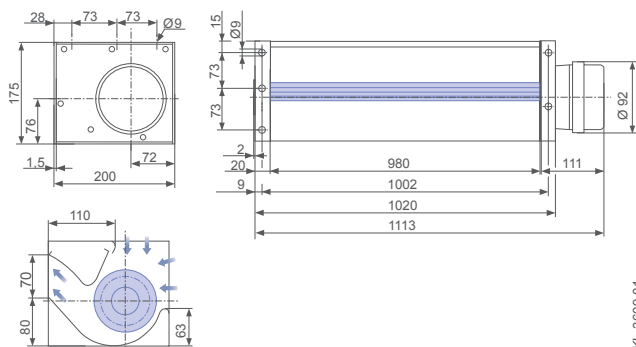
Measured without guide plate 180° according to ISO 5801.

Connection diagram 1360-161XA Page 253
OHNE

Airflow direction

Dimensions mm

Crossflow fan

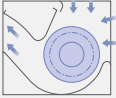


L-KL-3609-01

Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)	
		U V	f Hz		I A	P_1 W	n min ⁻¹		
QK10A-4EM.98.CH	I	230	50	①	0.39	85	1420	65	
		230			②	0.44	100	1350	65
		230*			③	0.54*	120*	1130*	66
		230	60	①	0.64	140	1660	66	
		230			②	0.68	150	1520	67
		230*			③	0.68*	160*	1110*	66

Fan ordering information

Design	QK
Installation position	H
	
Type	QK10A-4EM.98.CH
Article no.	110057
Weight kg	7.70

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



Cross flow fan

for single phase alternating current, 2 pole

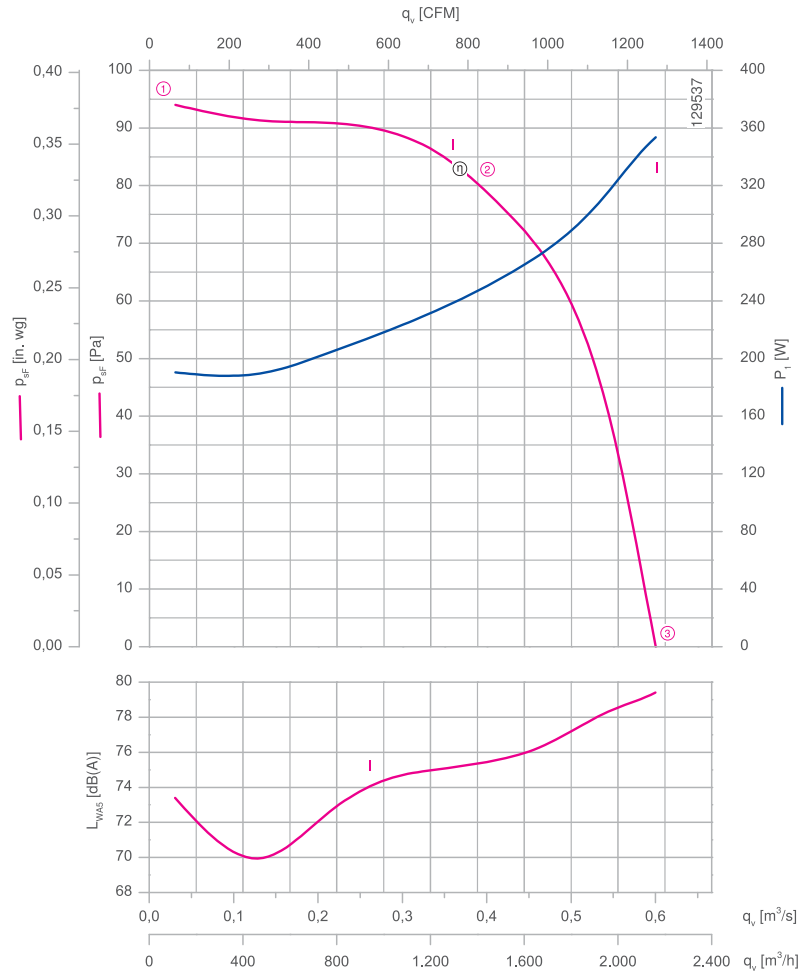
QK12A-4E



Description

Motor technology: AC
 *Rated voltage U_N : 1~230 V $\pm 10\%$ *
 Rated frequency f_N : 50 Hz*
 Input power P_i :
 400 W*
 Rated current I_N :
 1,75 A*
 Rated speed n_N :
 1320 min⁻¹*
 Service capacitor C_{400V} : 8,0 μF
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -20 °C
 Max. permitted ambient temperature $t_{R(max)}$: 70 °C
 Electrical connection: Prewired to a terminal strip, capacitor fitted and connected
 Degree of protection: IP10
 Impeller: aluminium
 Housing: Side plates galvanized steel, casing profile and guide vane aluminium uncoated
 Conformity: ErP 2015, CE
ErP-data
 Efficiency η_{statA} : 17,0 %
 Efficiency: $N_{actual} = 21,1 / N_{target} = 21$ **
 * Rated data; P_i, I_N determined at 180° guide plates
 **ErP 2015

Characteristic curve

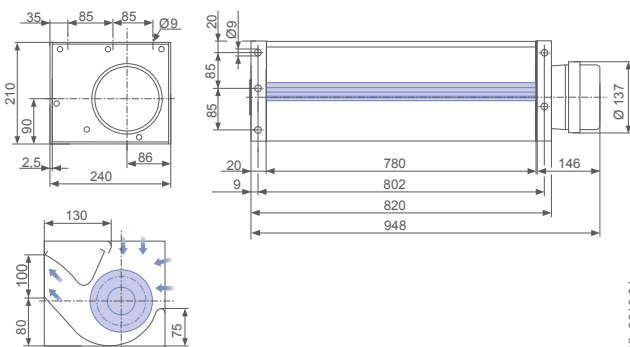


Measured without guide plate 180° according to ISO 5801.

Connection diagram 1360-104XA Page 252
 OHNE
 Airflow direction

Dimensions mm

Crossflow fan

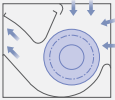


L-KL-3610-01

Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
		U V	f Hz		I A	P_1 W	n min ⁻¹	
QK12A-4EM.78.GF	I	230	50	①	0.96	190	1450	73
	I	230		②	1.60	350	1320	79
	I	230*		③	1.60*	350*	1320*	79

Fan ordering information

Design	QK
Installation position	H
	
Type	QK12A-4EM.78.GF
Article no.	204113
Weight kg	11.40

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



FE2owlet

for single phase alternating current, 2 pole

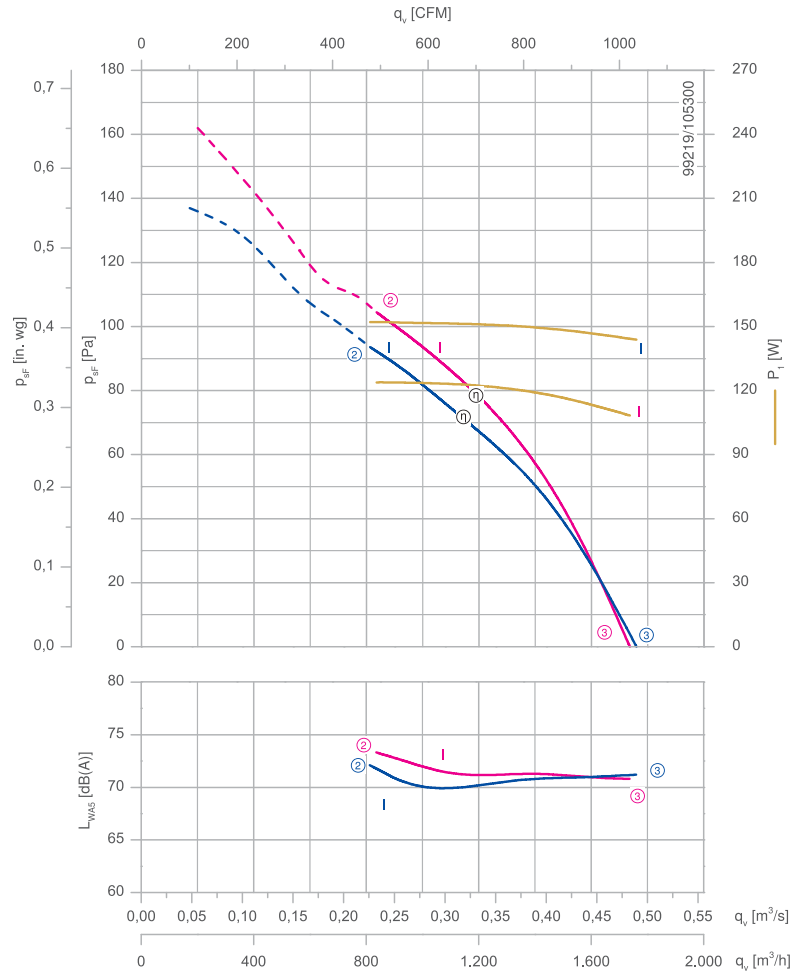
FN025-2E



Description

Motor technology: AC
 Rated voltage U_N : 1~ 230 V
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 120 W | 150 W*
 Rated current I_N :
 0.54 A | 0.66 A*
 Rated speed n_N :
 2160 min⁻¹ | 2050 min⁻¹*
 Starting current I_s : 0.75/ A
 Current increase ΔI : 0 % | 0 %
 Service capacitor C_{400V} : 3.5 μ F
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 65 °C | 60 °C
 Electrical connection: Supply cable variable 45 cm
 Number of blades: 7
 Motor protection: thermal contact
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data
 *** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in full bell mouth without guard grille in installation type A according to ISO 5801.

Connection diagram

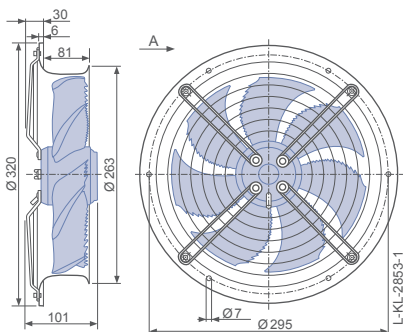
Page 253
1360-177X

Airflow direction A

Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
		U V	f Hz		I A	P_1 W	n min ⁻¹	
FN025-2EL.WA.A7	I	230*	50	②	0.54*	120*	2160*	73
	I	230*	60	③	0.48*	110*	2410*	71
	I	230*		②	0.66*	150*	2050*	72
	I	230*		③	0.64*	140*	2450*	71

*rated data

Fan ordering information

Airflow direction A 

Design L (guard grille suction side)



Type FN025-2EL.WA.A7
Article no. 161634

Weight kg 3.50

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



FE2owlet

for single phase alternating current, 4 pole

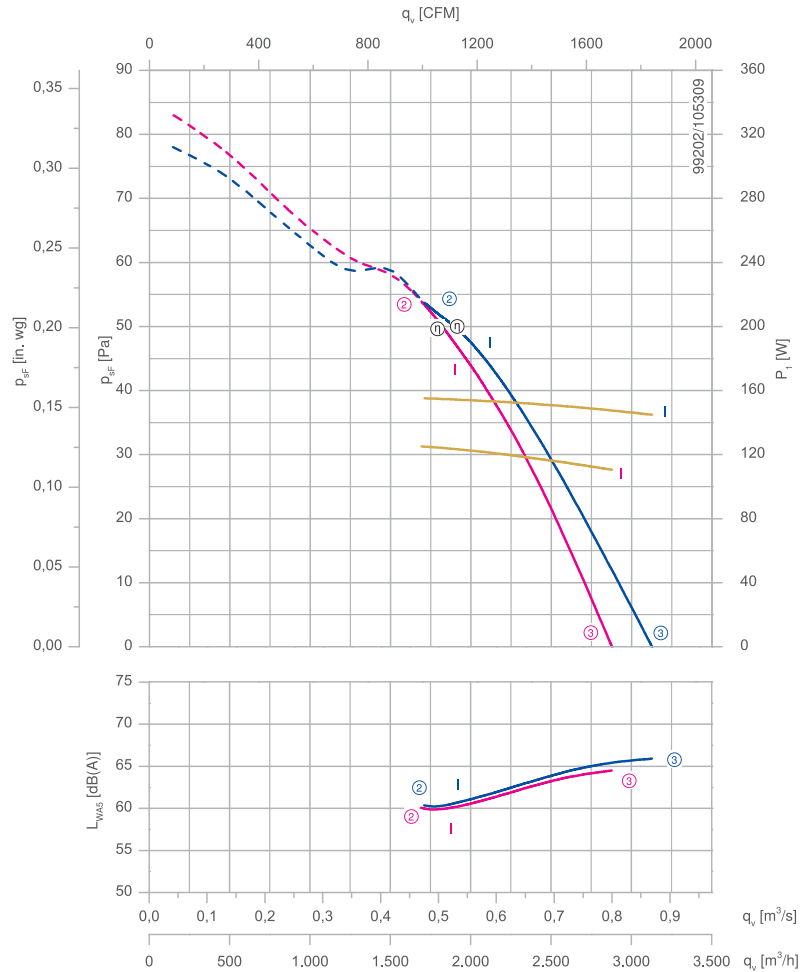
FNO35-4E



Description

Motor technology: AC
 Rated voltage U_N : 1~ 230 V
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 130 W | 160 W*
 Rated current I_N :
 0.56 A | 0.70 A*
 Rated speed n_N :
 1070 min⁻¹ | 1080 min⁻¹*
 Starting current I_s : 0.7 / A
 Current increase ΔI : 0 % | 0 %
 Service capacitor C_{400V} : 5.0 μ F
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -40 °C***
 Max. permitted ambient temperature $t_{R(max)}$:
 60 °C | 40 °C
 Electrical connection: Supply cable variable 45 cm
 Number of blades: 7
 Motor protection: thermal contact
 Blades: High Performance Composite Material, uncoated, black
 Rotor: Aluminium, 1 coat paint, RAL 5002 (ultramarine blue)
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data
 **** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -40 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve



Measured in full bell mouth without guard grille in installation type A according to ISO 5801.

Connection diagram

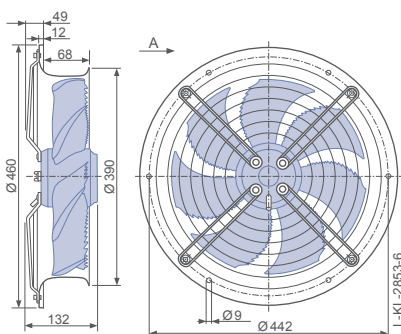
Page 253
1360-177X

Airflow direction A

Dimensions mm

Airflow direction A

Design L - round full bell mouth, guard grille suction side



Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)
		U V	f Hz		I A	P_1 W	n min ⁻¹	
FN035-4EL.WD.A7	I	230*	50	②	0.56*	130*	1070*	60
	I	230*	60	③	0.50*	110*	1220*	65
	I	230*		②	0.70*	160*	1080*	60
	I	230*		③	0.66*	140*	1320*	66

*rated data

Fan ordering information

Airflow direction A ➔

Design L (guard grille suction side)



Type FN035-4EL.WD.A7
Article no. 162548

Weight kg 6.50

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



RD..S-ECblue

for single phase alternating current, 200-240 V

RD13S-4IP



Description

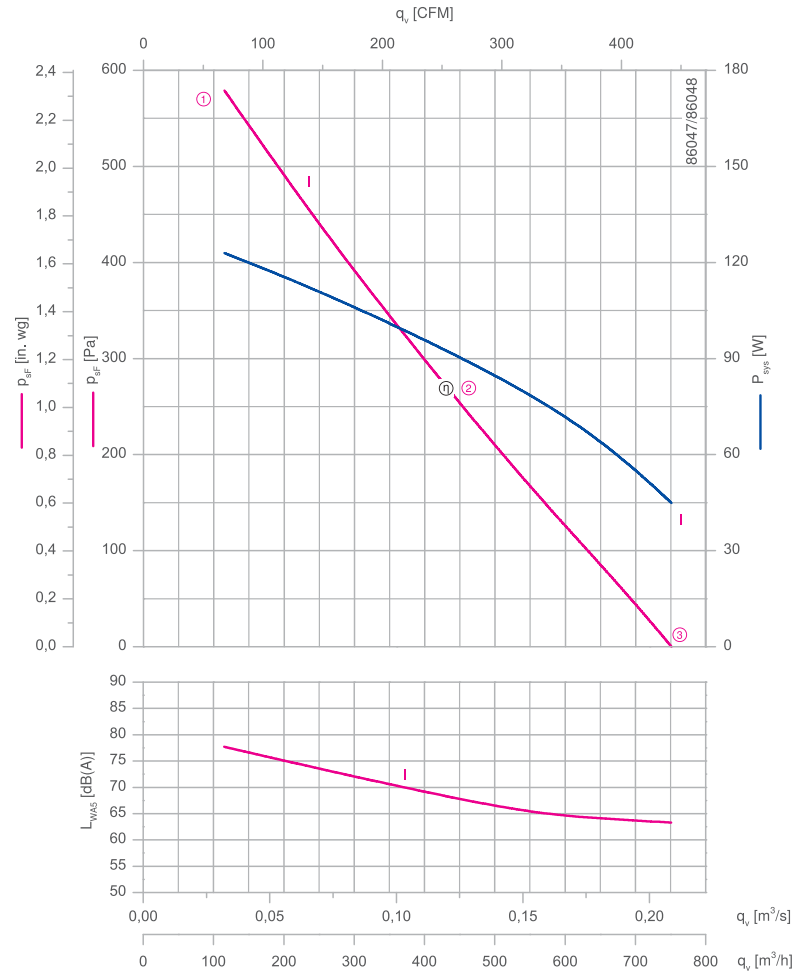
Motor technology: EC
 Rated voltage U_N : 1~200-240 V*
 Rated frequency f_N : 50/60 Hz*
 Input power P_{sys} : 150 W*
 Rated current I_N : 1.70-1.40 A*
 Rated speed n_N : 3400 min⁻¹*
 Thermal class: THCL155*
 Min. permitted ambient temperature t_{R} : -30 °C***
 Max. permitted ambient temperature t_{R} at n_{max} : 60 °C
 Electrical connection: Integrated controller with variable cable
 Balancing quality: G 6,3
 Degree of protection : IP54
 Motor protection: integrated active temperaturemanagement
 Impeller : Galvanized sheet metal, uncoated
 Conformity: CE, UL

ErP-data

Not subject to the regulations of ErP directive ($P_1 < 125$ W)
 *Rated data

*** Continuous operation with occasional starts (S1) according to DIN EN 60034-1:2011-02. Occasional starting between -30 °C and -25 °C is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Characteristic curve

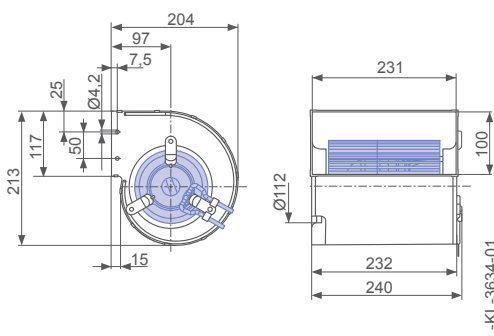


Measured in housing from ZIEHL-ABEGG.

Connection diagram 1360-404 Page 251
 Airflow direction A

Dimensions mm

Fan with housing double inlet, without flange, in installation position
 H



Performance data

Type	Characteristic curve	Speed	Operating point	Current	Input power	Suction side sound power level
		n min ⁻¹		I A	P _{sys} W	L _{WA5} dB(A)
RD13S-4IP.Z8.2R	I	3200	①	1.15	120	78
		2270	②	0.86	90	68
		1040	③	0.46	44	63

Current values determined at 230V

Fan ordering information

Design RD (without flange)

Fitting position H

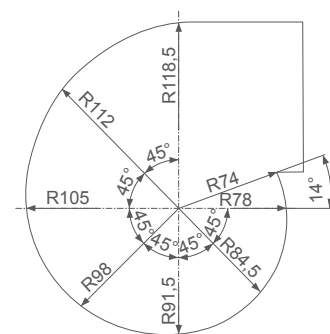


Type **RD13S-4IP.Z8.2R**

Article no. **175578**

Weight kg 3.00

- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology
- Appendix



L-KL-2950-26



S-series

for single phase alternating current, 2 pole

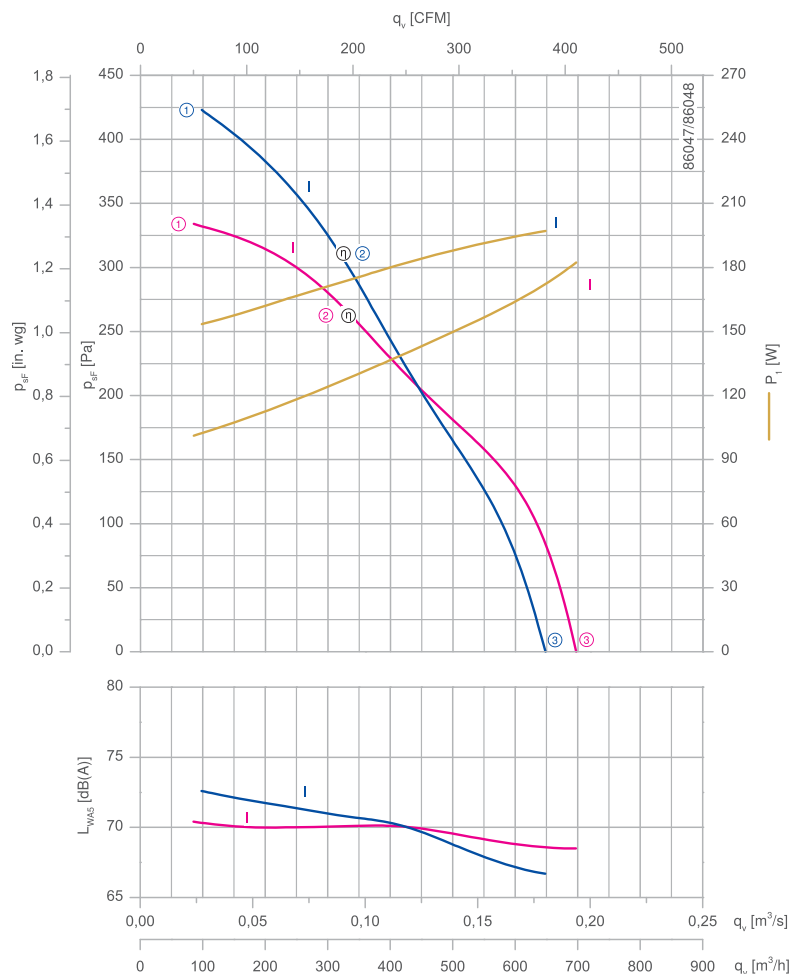
RD 13S-2E



Description

Motor technology: AC
 Rated voltage U_N : 1~ 230 V*
 Rated frequency f_N : 50 Hz | 60 Hz*
 Input power P_i :
 180 W | 200 W*
 Rated current I_N :
 0.80 A | 0.86 A*
 Rated speed n_N :
 1450 min⁻¹ | 1350 min⁻¹*
 Current increase ΔI : 0 % | 0 %
 Service capacitor C_{400V} : 4.0 μ F
 Thermal class: THCL155*
 Min. permitted ambient temperature $t_{R(min)}$: -20 °C
 Max. permitted ambient temperature $t_{R(max)}$:
 70 °C | 55 °C
 Electrical connection: Supply cable variable (axial + centrifugal) 35 cm from housing
 Motor protection: thermal contact
 Impeller : Galvanized sheet metal, unpainted
 Conformity: CE
ErP-data
 Not subject to the regulations of ErP directive ($P_i < 125$ W)
 * Rated data

Characteristic curve

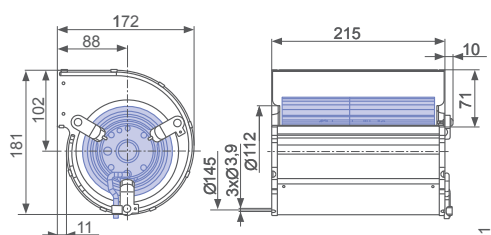


Measured in housing from ZIEHL-ABEGG.

Connection diagram 1360-177X Page 253
 Airflow direction A

Dimensions mm

Fan with housing double inlet, without flange, in installation position
 H



L-KL-2920-1

Performance data

Type	Characteristic curve	Voltage	Frequency	Operating point	Current	Input power	Speed	Suction side sound power level L_{WA5} dB(A)	
		U V	f Hz		I A	P_1 W	n min ⁻¹		
RD13S-2EP.WC.1R	I	230	50	①	0.46	100	2740	70	
		230			0.56	130	2510	70	
		230*			0.80*	180*	1450*	69	
		230	60	①	0.70	150	3080	73	
		230			②	0.76	170	2700	70
		230*			③	0.86*	200*	1350*	67

*rated data

Fan ordering information

Design RD (without flange)

Fitting position H



Type **RD13S-2EP.WC.1R**

Article no. **113143**

Weight kg 4.10

Information

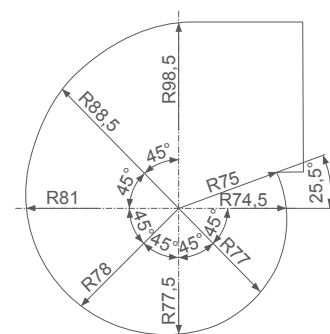
Oil transformer cooling

Dry transformer cooling

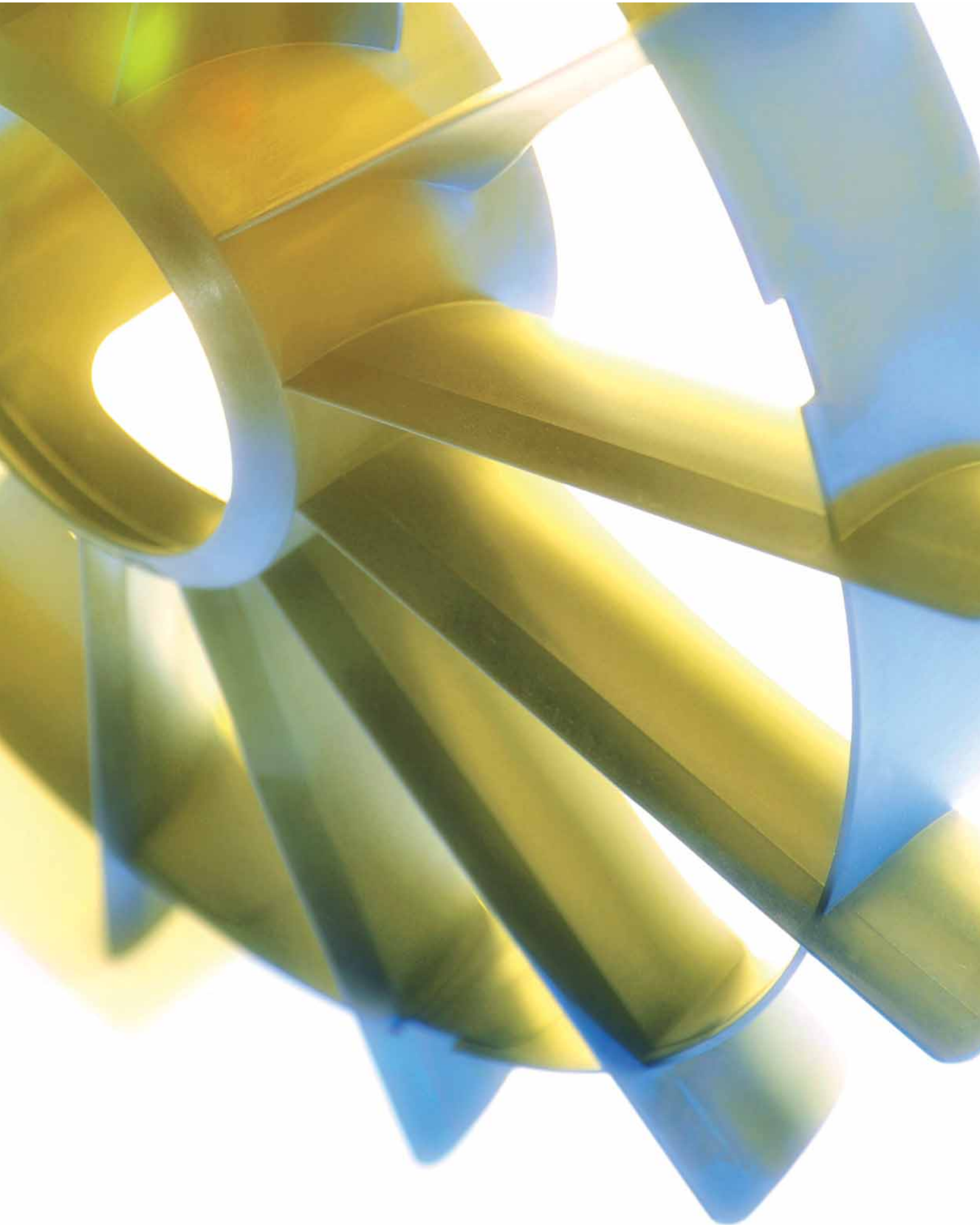
System components

Control technology

Appendix



L-KL-2950-25



System components

Product overview

Guard grille on pressure side Page 186

Fastening elements Page 188

Monitoring and protective electronics for dry transformer cooling Page 191

Information

Oil transformer cooling

Dry transformer cooling

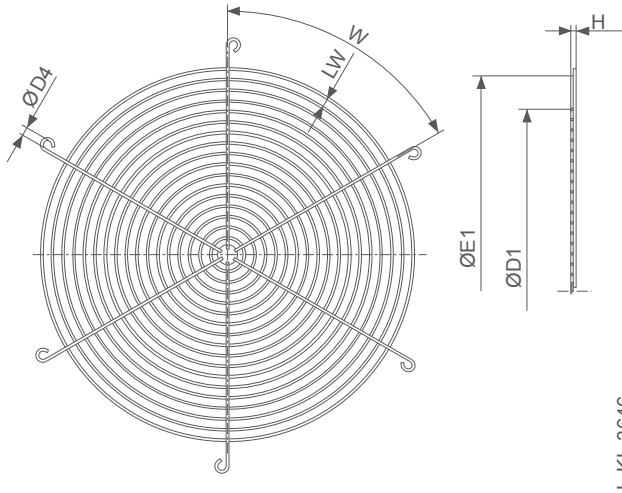
System components

Control technology

Appendix

Guard grille for FE2owlet

Outlet side



Description

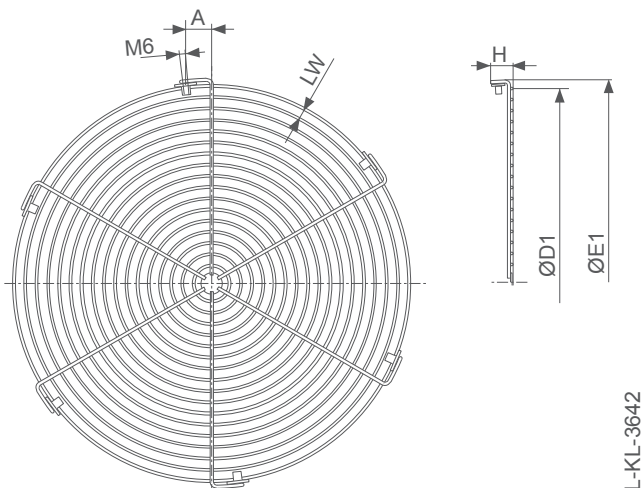
Material: Steel wire
Coating: Powder coated in resistance class 3 (BKK3)
Colour: RAL 9006; white aluminium

Guard grille on pressure side							
Size	Article no.	D1	D4	E1	H	LW	W
		mm	mm	mm	mm	mm	
450	00347389	454	9	487	9	7.5	6 x 60°
500	00286124	510	9	541	9	7.5	6 x 60°
630	00286126	630	9	674	9	7.5	8 x 45°
710	00286177	710	11.5	751	9	7.5	8 x 45°
800	00284884	790	11.5	837	11	9.5	8 x 45°
1000	00284964	982	11.5	1043	11	9.5	8 x 45°
1250	00701586	1246	11.5	1311	11	19.5	8 x 45°

Description

Material: Stainless steel 1.4301

Guard grille on pressure side							
Size	Article no.	D1	D4	E1	H	LW	W
		mm	mm	mm	mm	mm	
630	00296450	630	11.5	674	9	7.5	8 x 45°
710	00296451	710	11.5	751	9	7.5	8 x 45°
800	00296452	790	11.5	837	11	9.5	8 x 45°
1000	00296453	982	11.5	1043	11	9.5	8 x 45°
1250	00296454	1246	11.5	1311	11	19.3	8 x 45°

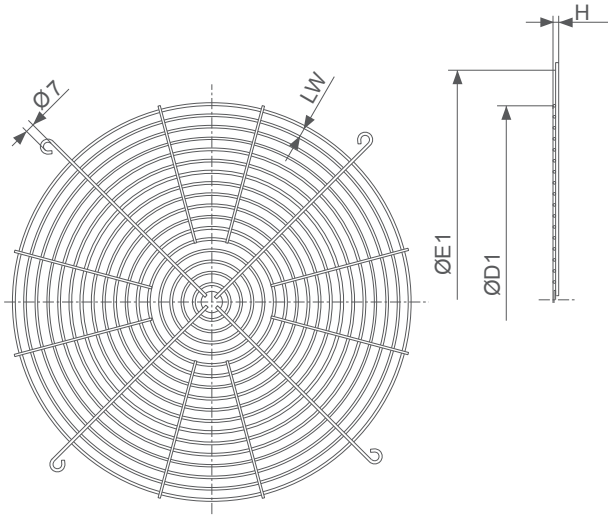


Guard grille against accidental contact, on pressure side, for FN050 construction type H								
Size	Article no.	Material	A	D1	D4	E1	H	LW
			mm	mm	mm	mm	mm	mm
500	00357292	Steel	23	490	18	501	20	7.5
500	00250240	Stainless steel	23	488	19.5	501	20	8

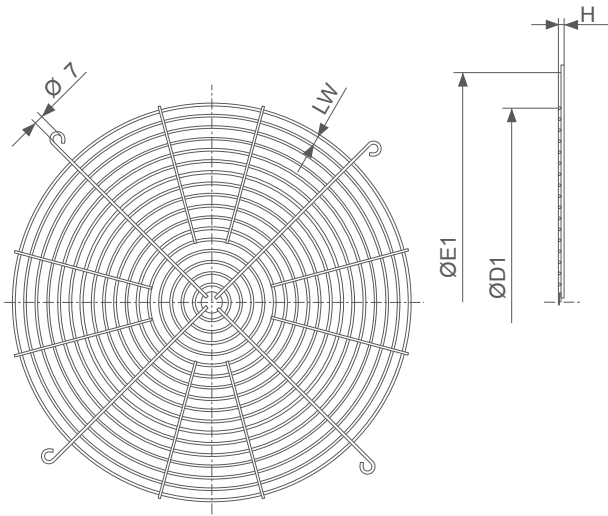
Guard grille for ZPlus

Description

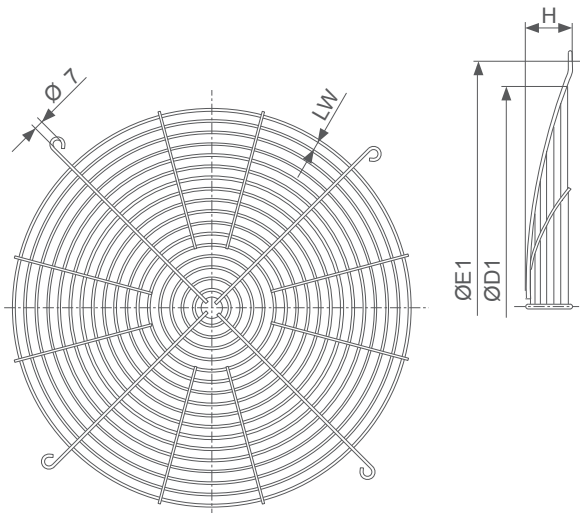
Material: Stainless steel 1.4301



L-KL-3370



L-KL-3371



L-KL-3372

Guard grille on suction side							
Motor size	Size	Article no.	Drawing	E1 mm	H mm	D1 mm	LW mm
2_/4_/BD	450	00703910	3372	510	53	475	7.5
4_/B_/D_	500	00703181	3372	560	47	529	7.5
6_/B_/D_/G_	630	00702461	3372	720	68	677	7.5
6_/BD/DG/G_	710	00703615	3372	840	53	790	7.5
6ND_/G_	800	00702902	3372	900	47	840	7.5
6_/7_/D_/G_	910	00702460	3372	1000	58	945	7.5

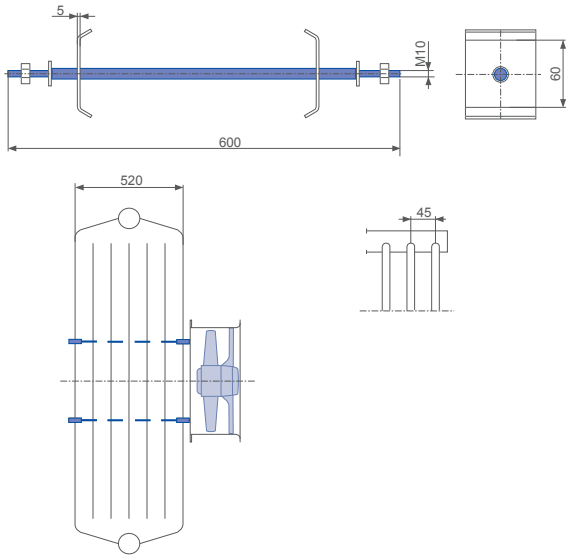
Guard grille on pressure side							
Motor size	Size	Article no.	Drawing	E1 mm	H mm	D1 mm	LW mm
2_/4_/B_	450	00702458	3370	510	8	460	19.5
4_/B_/D_	500	00702455	3372	560	47	535	7.5
4, 6, D, G	630	00702459	3370	720	8	635	19.5
6_/BD/DG/G_	710	00703615	3370	780	8	710	19.5
D	800	00702424	3371	860	8.5	810	11.5
6_/G_	800	00702453	3371	860	8	810	19.5
6_/7_/D_/G_	910	00702462	3370	1000	8	910	19.5

Fastening element for oil transformer cooling

Airflow direction horizontal

Assembly rail for one radiator

Material: Stainless steel
Compatible with FE2owlet and ZAplus
Article no. **00285377**

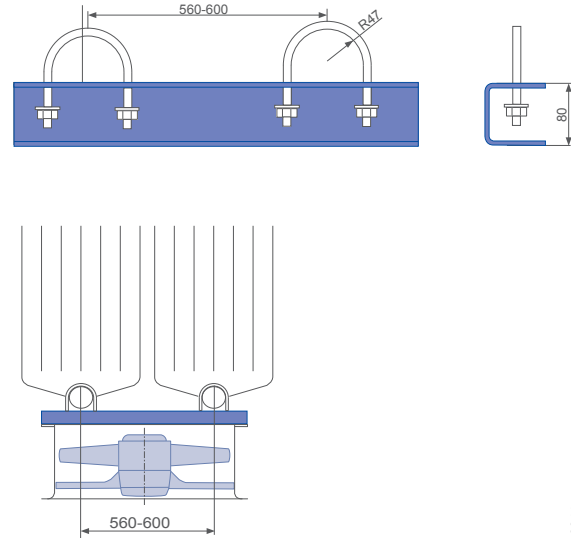


L-KL-3643

Airflow direction vertical

Assembly rail for two radiators

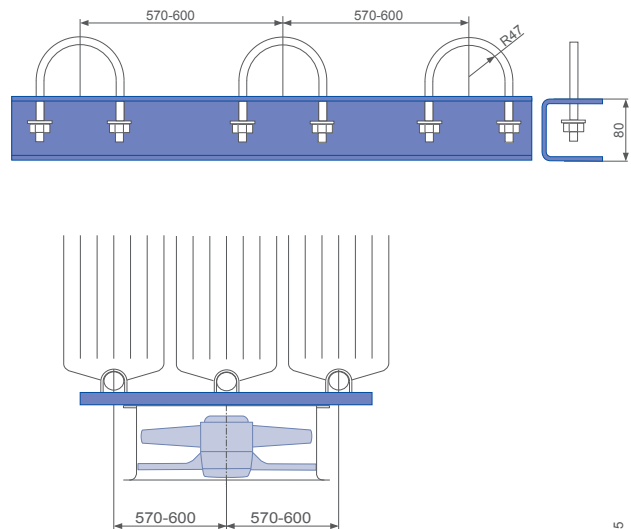
Material: Stainless steel
FE2owlet article no. **00285378**
ZAplus article no. **00373775**



L-KL-3644

Assembly rail for three radiators

Material: Stainless steel
FE2owlet article no. **00285380**
ZAplus article no. **00373792**



L-KL-3645



Terminal box

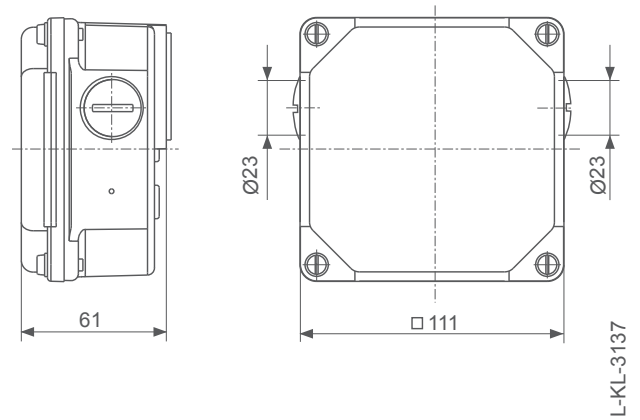
K04

Description

Material: Aluminium with terminal board
Degree of protection: IP55
Max. rated voltage: 630 V

Without capacitor.

With two dummy screwed connections:
M5 for motor wire, M4 for thermostatic switch
Article no. **00704435**



Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix

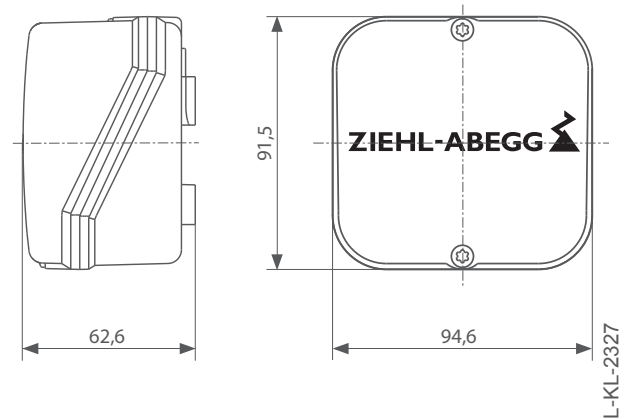
K09

Description

Material: PC/ABS-Blend
Degree of protection: IP55
Max. rated voltage: 400 V

Delivery with European terminal strip 2.5 mm² with wire protection and capacitor.
With a plastic cable glands M20 x 1.5 with seal.

Attention: Metal-cable glands must not be used for plastic terminal boxes!
The hole in the bottom must be closed / sealed by the customer



Connection box K09			
Article no.	Capacitor μ F/400V	Capacitor dimensions in mm	Capacitor article no.
00293910	3.5	30x58	02011670
00293203	5.0	30x58	02006934

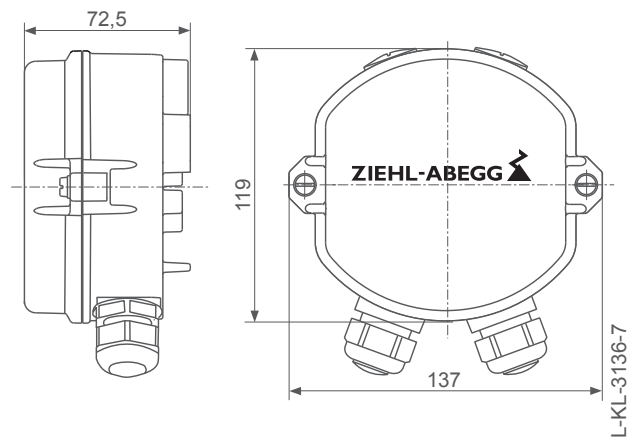
Terminal box

K07 EC

Description

Material: Aluminium with terminal block
Degree of protection: IP55
Max. rated voltage: 800 V

Two screwed connections and two dummy screwed connections.
Article no. **00704432**

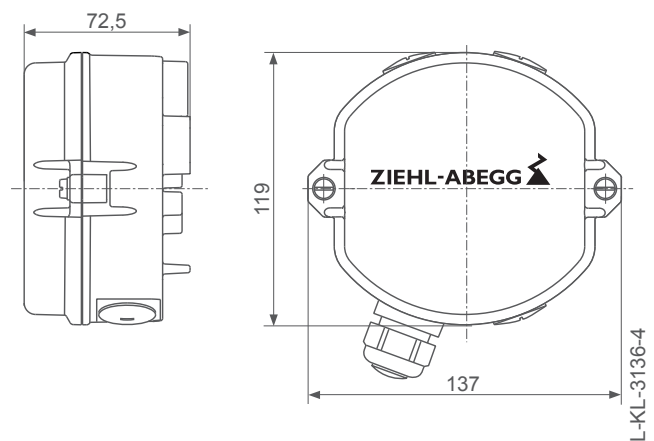


K07 AC

Description

Material: Aluminium with terminal board
Degree of protection: IP55
Max. rated voltage: 630 V

Without capacitor.
With one screwed connection and three dummy screwed connections M5 for motor wires, M4 for thermostatic switch.
Article no. **00704430**



Monitoring and protective electronics

MSF220VU PTC thermistor resistor



We supply products in cooperation with
ZIEHL industrie-elektronik GmbH + Co KG
74523 Schwäbisch Hall
www.ziehl.de

PTC thermistor relay for dry transformers, 3 PTC thermistor circuits, with intelligent fan control, no trigger pulse when switched on.

The MSF220VU is ideally suited for temperature monitoring on dry transformers. It features intelligent fan control, which automatically extends the over-running of the fan depending on the transformer load situation. Monitoring of the sensors for short-circuit and disconnection provides extended protection against false tripping.

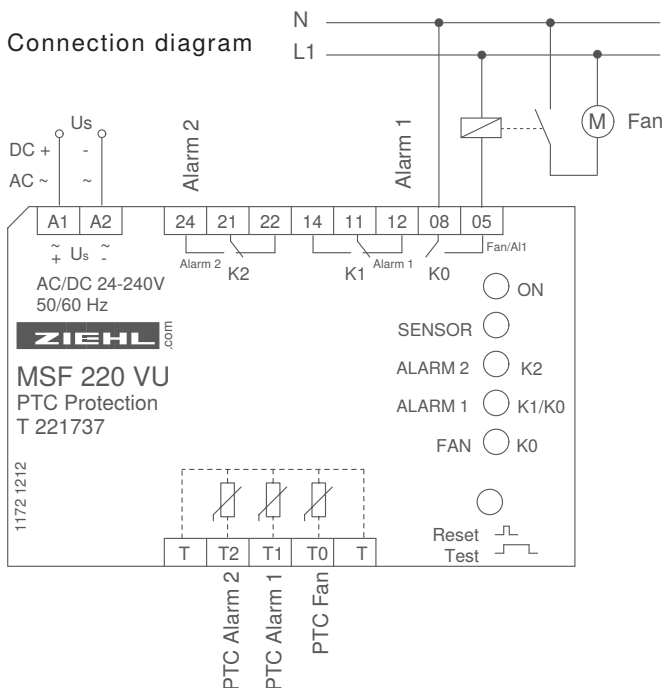
Properties:

- Supply: AC/DC 24...240 V 50/60 Hz
- 3 PTC thermistor circuits
- Connectable PTC thermistors: 3 x 1...6 in compliance with DIN 44081 or 44082 below 4,000 Ω
- 1 relay (NO contact) for fan control
- Alarm 1 in no-load current design (changeover contact) for advance warning, simultaneous function monitor
- Alarm 2 in load current design (changeover contact), no fleeting make contact
- Sensor monitoring
- LED for: ON, sensor fault, alarms, fan
- Test button for outputs
- Built-in device for mounting on top hat rail 35 mm

Monitoring and protective electronics

DC 24...240 / AC 24...240

Type	Article no.	Installation	Protection class	Minimum ambient temperature °C	Maximum ambient temperature °C	Weight kg	Dimensions (W x H x D) mm
MSF220VU	380081	Rail according to EN 60715 or screw mounting M4	IP30 / IP20	-20	55	0.25	90 x 70 x 58



Monitoring and protective electronics

Trafosafe TS1000 transformer protection relay



We supply products in cooperation with
ZIEHL industrie-elektronik GmbH + Co KG
74523 Schwäbisch Hall
www.ziehl.de

Transformer protection relay, 3 PTC thermistor circuits, with fan monitoring and control

The Trafosafe TS1000 is used on dry transformers with forced cooling. It monitors the temperature of the transformer using 3 PTC thermistor circuits, controls the cooling (up to 6 fans of max. 4A each) depending on the load, reports exceeding of an advance warning temperature and switches off the transformer if the temperature continues to rise.

When monitoring the transformer using Pt100 sensors, the TS1000 operates as a pure fan controller.

Properties:

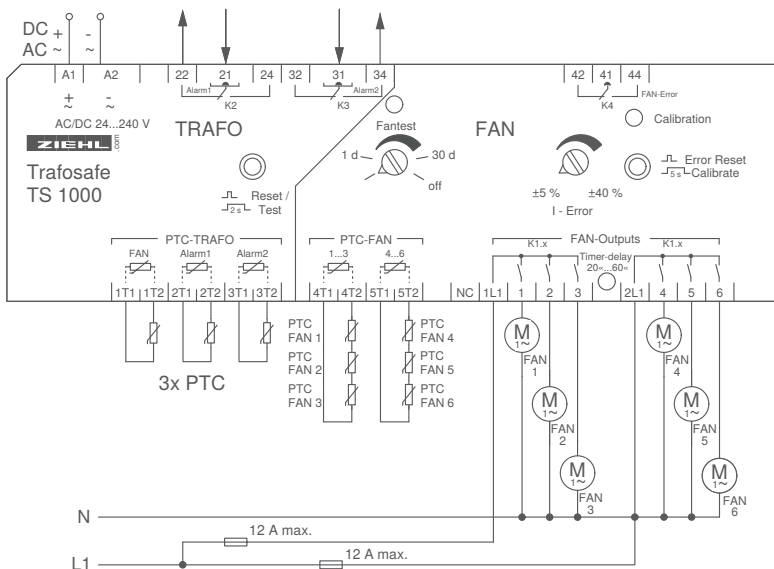
- Supply: AC/DC 24...240 V 50/60 Hz
- 1 PTC thermistor circuit for fan control / control with external contact when used only as fan controller
- Automatic extension of fan running time at high load
- Monitoring of fans for faults (excess / insufficient current adjustable)
- Adjustable, automatic fan test (1-30 days)
- Transformer temperature monitoring: 2 PTC thermistor circuits, 1x each for advance warning and switch-off, 1x with monitoring for short-circuit and disconnection
- 2 PTC thermistor circuits for PTC monitoring of fans
- Connectable PTC thermistors: 5 x 1...6 in compliance with DIN 44081 or 44082 below 4,000 Ω
- Relay (changeover contact) for advance warning in no-load current design = Function monitor and relay (changeover contact) for switch-off in load current design = No fleeting make contact
- LEDs for: ON, sensor fault, alarms, fan
- Test button for function

Monitoring and protective electronics

DC 24...240 / AC 24...240

Type	Article no.	Installation	Protection class	Minimum ambient temperature	Maximum ambient temperature	Weight	Dimensions (W x H x D)
				°C	°C	kg	mm
TS1000	380082	Rail according to EN 60715 or screw mounting M4	IP30 / IP20	-20	55	0.42	90 x 140 x 58

Connection diagram



Monitoring and protective electronics

TR250 Pt1100 temperature relay



Pt100 temperature relay, 3 Pt100/Pt1000 sensors, PTC, TKY, 3 limits, digital display

The TR250 can simultaneously monitor up to 3 sensors for up to 3 limit values. Different Pt100, Pt1000, KTY83/84 or PTC thermistor sensors can be connected and evaluated.

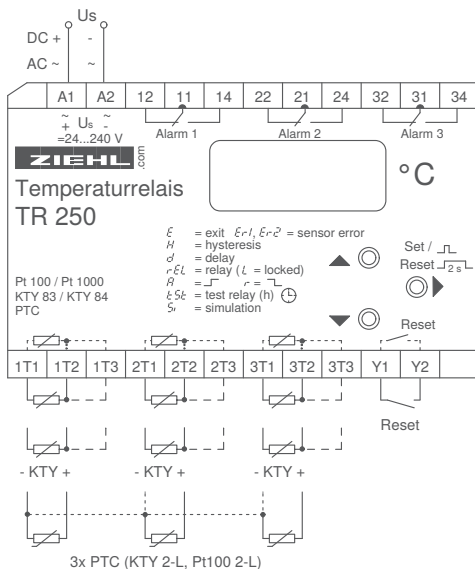
Properties:

- Supply: AC/DC 24...240 V 50/60 Hz
- Choice of 3 sensor inputs: PT100/1000 (2 or 3 wire), KTY83/84, PTC thermistor
- Sensor monitoring for disconnection and short-circuit
- 3-digit digital display for sensor temperature -199...+850 °C
- Resolution 0.1 °C programmable in range -19.9...+99.9 °C
- Storage of minimum and maximum values
- Programmable using 3 buttons
- LED for sensors, alarms, relays
- 3 relays (changeover contacts) programmable:
 - Switching functions
 - Differential temperature monitoring
 - 6 preset standard programs

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74523 Schwäbisch Hall
www.ziehl.de

Monitoring and protective electronics							
DC 24...240 / AC 24...240							
Type	Article no.	Installation	Protection class	Minimum ambient temperature	Maximum ambient temperature	Weight	Dimensions (W x H x D)
				°C	°C	kg	mm
TR250	380083	Rail according to EN 60715 or screw mounting M4	IP30 / IP20	-20	65	0.20	90 x 70 x 58

Connection diagram



Monitoring and protective electronics

TR440 Pt100 temperature relay



We supply products in cooperation with
ZIEHL industrie-elektronik GmbH + Co KG
74523 Schwäbisch Hall
www.ziehl.de

Pt100 temperature relay for protection of transformers, 4 Pt 100 sensors, 4 limits, core temperature monitoring, control panel installation

The TR440 can monitor up to 4 sensors (Pt100). For example, three windings are monitored, and the 4th sensor monitors the core. 4 relays (changeover contacts) are used for advance warning, to switch off the transformer and/or to control a fan. The room temperature in the installation room can also be controlled. Network integration possible, RS485 interface, MODBUS RTU

Properties:

- Supply: AC/DC 24...240 V 50/60 Hz
- 4 sensor inputs 4 x Pt100 in compliance with EN 60751 / IEC 60751
- Sensor monitoring for disconnection and short-circuit
- 3-digit digital display for sensor temperature -199...+850 °C
- Storage of minimum and maximum values
- Programmable using 3 buttons
- LED for sensors, alarms, relays
- 4 relays (changeover contacts) that operate according to the 4 selectable programs
- Built-in device for control panel installation

Monitoring and protective electronics

DC 24...240 / AC 24...240

Type	Article no.	Installation	Protection class	Minimum ambient temperature °C	Maximum ambient temperature °C	Weight kg	Dimensions (W x H x D) mm
TR440	380084	Panel mounting	IP20 / IP54	-40	65	0.35	96 x 96 x 85



Program overview:

P1:3 sensors in windings

- Fan control with cyclic test
- Advance warning
- Switch-off
- Fault (sensor fault)

P2:3 sensors in windings, 1 sensor in transformer core

- Fan control with cyclic test
- Advance warning (winding + core)
- Switch-off (winding + core)
- Fault (sensor fault)

Different limit values can be set for the sensors in the windings and for the sensor in the core.

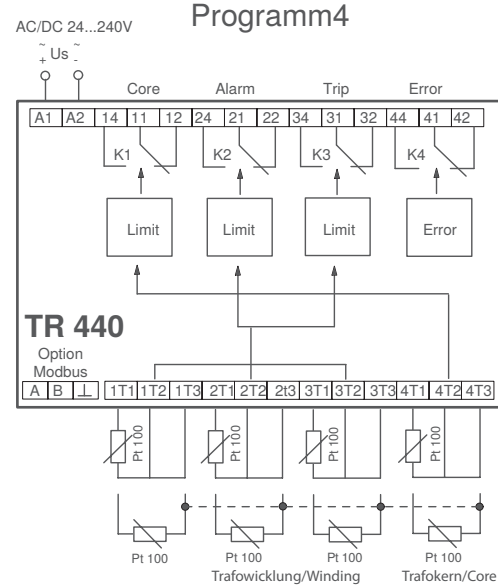
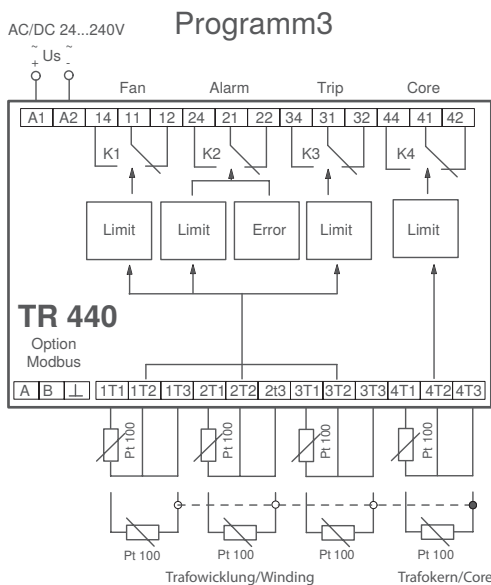
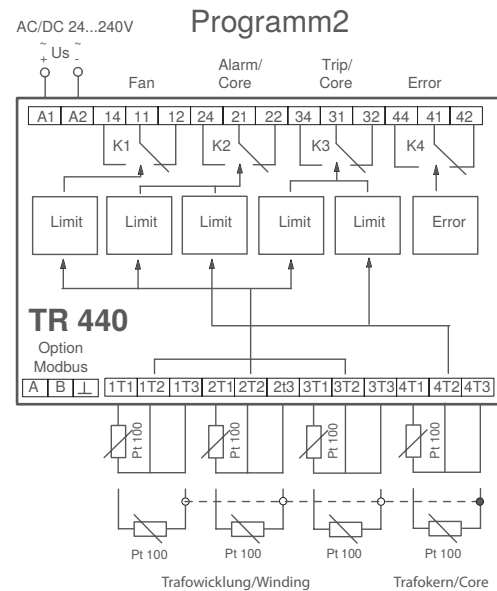
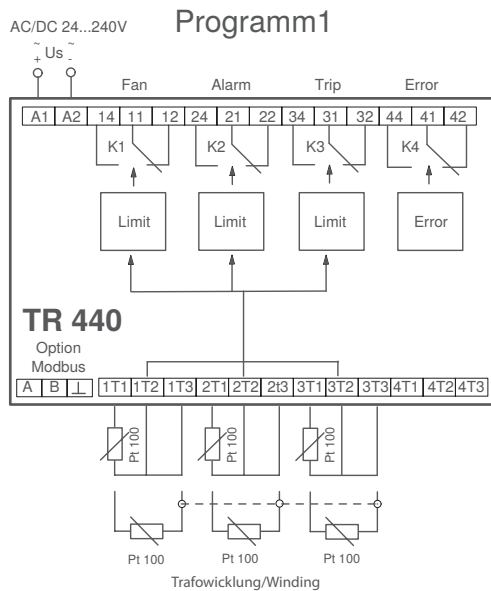
P3: 3 sensors in windings, 1 sensor in transformer core

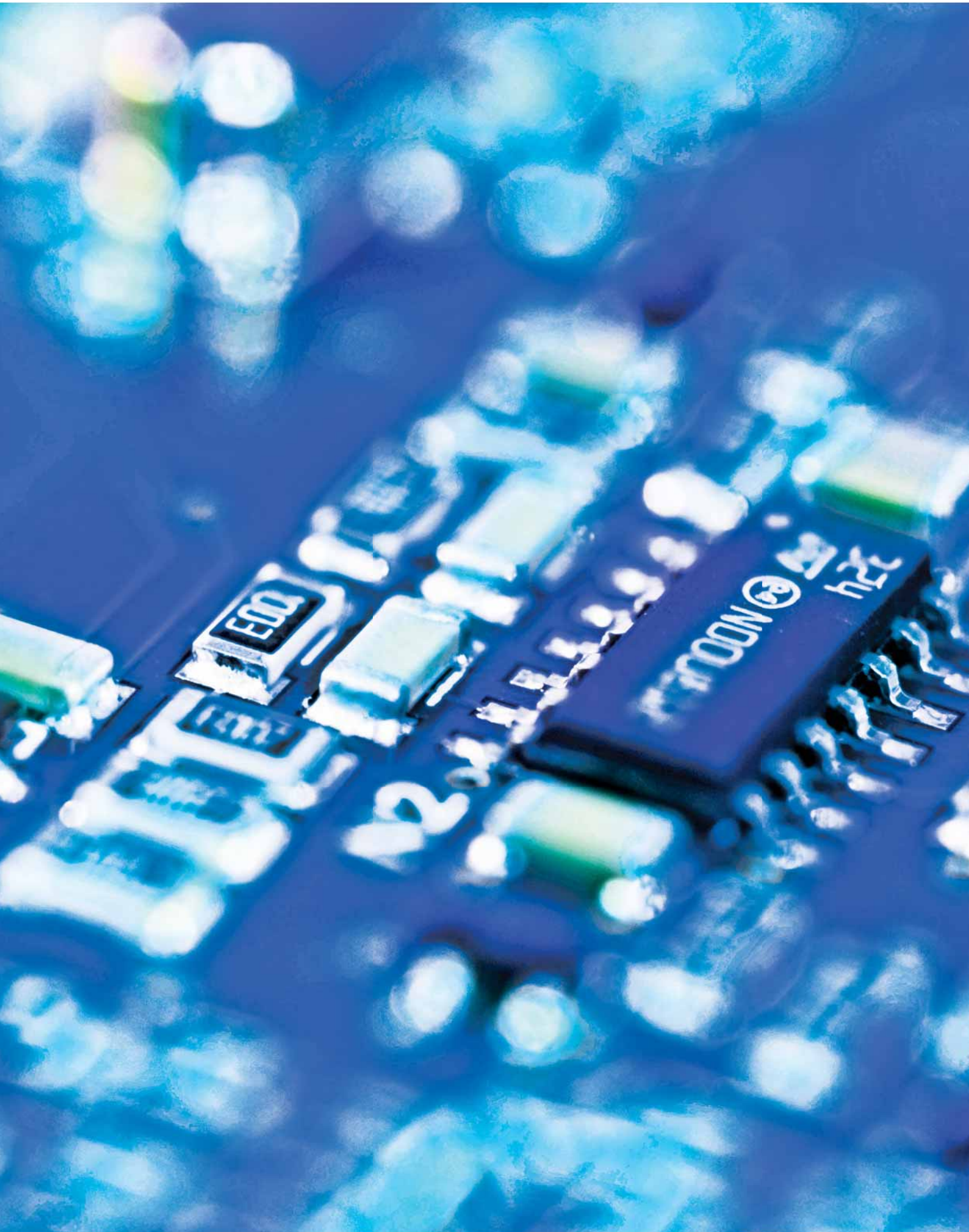
- Fan control with cyclic test
- Advance warning (winding) / fault combined
- Switch-off (winding)
- Switch-off (core)

Alarm 2 simultaneously for reaching advance warning temperature and fault signal.

P4: 3 sensors in windings, 1 sensor in transformer core

- Switch-off (core)
- Advance warning (winding)
- Switch-off (winding)
- Fault (sensor fault)





Control technology

Product overview

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Products with system competence

ZIEHL-ABEGG is the only fan manufacturer that develops methods to change the speed of fans and produces the control engineering itself.

The result for our customers is perfectly matched products which provide added value in all applications involving moving air.

Together with the fans, perfect system solutions are the result. A major advantage for our customers is the supply of a wide variety of one-stop solutions and technologies. There is a contact person for customers for planning and implementing daily challenges for all products.

A wide range of control engineering products are available to choose from:

Voltage controller



Frequency inverters



Control modules



Motor protection units



Sensors



Options for speed control

Voltage controllers

Voltage controllers have been established for many years. These are available as electronic voltage controllers, so-called phase angle controllers, or as transformer-based controllers.

Typically, voltage variable external rotor motors (asynchronous motors) are controlled using these products.

The advantage of this technology is extremely low investment costs. Electronic voltage controllers are available for rated currents up to 80 A. There are designs for all applications in ventilation technology.

Up till now, transformer-based voltage controllers have been established in simple applications. Integrated 5-step switches are standard and the products control motors and fans without producing electronic running noise.



Electronic voltage controllers and 5-step transformer-based controllers for 1~ and 3~ power supply.



Highly efficient frequency inverters

ZIEHL-ABEGG frequency inverters cover an extremely wide range of applications. To make it very easy for operators, the frequency inverters are equipped so that they can be quickly put into operation and are easy to operate in ventilation system applications. Frequency inverters are available up to an output of approx. 30 kW (rated current 50 – 62 A).

Frequency inverter Fcontrol

The integrated, all-pole sine filter makes the Fcontrol unique among frequency inverters. Comparable to the power supply, the Fcontrol controls motors, fans without increased demands on the winding insulation and motor bearings.

Operation is extremely energy-saving, efficient and without electromagnetic running noise. No shielded motor line is necessary. The cable length is not limited by the Fcontrol. Smooth parallel operation of motors and fans is guaranteed and typical frequency inverter measures are unnecessary.



Fcontrol frequency inverter for 1~ and 3~ power supply. Control of motors and fans (external rotor motors or motors according to the IEC standard).

Frequency inverters Icontrol / PMcontrol / PMIcontrol

The Icontrol standard frequency inverters for inexpensive easy control of motors and fans (internal rotor asynchronous motors according to the IEC standard).

PMcontrol are comparable, but these are designed for PM motors and fans with PM motors (PM = internal rotor motors with permanent magnets according to the IEC standard).

PMIcontrol Basic-M can control both motor types, asynchronous motors and PM motors. These are designed as PMIcontrol Basic-M for direct mounting on internal rotor motors according to the IEC standard.

Highly efficient fan drives ECblue, PMblue and AMblue

ECblue are highly efficient external rotor motors with permanent magnets and integrated power electronics. The result is a highly compact drive system for controlled operation with a variety of fans with different impeller geometries.

PMblue combines PM motor with permanent magnets and PMcontrol / PMIcontrol frequency inverter. The AMblue drive system combines an asynchronous motor with a mounted PMIcontrol Basic-M. ZIEHL-ABEGG offers an enormous range of different fan designs with a variety of motor technologies, thus covering an enormous power range for moving air.



ZACode

The unique fan control philosophy

Market challenge

Manufacturers of products which involve moving air are confronted with a variety of products and technologies.

In addition to fans with asynchronous motors, which are mainly controlled by frequency inverters, the proportion of EC motors (highly efficient motors with permanent magnets and integrated power electronics) is rising.

Solutions are increasingly available involving mounting frequency inverters on internal rotor motors according to the IEC standard.

That is why companies rely on different manufacturers and technologies to cover the power range of smaller than 1 kW to 30 kW.

This involves a great effort in terms of design, documentation and storage of parts as well as employee training.

Interface problems, e.g. the interaction of frequency inverters and fans of different manufacturers, involve effort and expenditure which may delay projects and lead to complaints.

ZIEHL-ABEGG's philosophy

Simple products and solutions.

From the planner via production to installation and maintenance - everyone involved with the system should have an easy time and be able to understand it.

ZIEHL-ABEGG has been busy with this challenge adapting products which cover the decisive power range accordingly. Products have been reduced to the essential, but can be easily expanded to meet requirements at any time.

ZIEHL-ABEGG's products are 100% matched to one another. This means ZIEHL-ABEGG fans and frequency inverters create an energy-saving, quiet and reliably functioning system. The same is true of the combination of control modules with ECblue fans and other products.

At ZIEHL-ABEGG, you have only one contact person for fans, motors and the perfectly matching one-stop control engineering.

This philosophy makes the effort involved easier in terms of planning, production, installation and maintenance.

Covering the big power range from < 1 kW up to 30 kW



ECblue Basic
Power: < 1 kW up to 6 kW



AMblue / PMblue
Power: 5,5 kW up to 22 kW



Frequenzumrichter Fcontrol Basic /
Icontrol Basic
Power: 1,1 kW up to 30 kW



ZAcode - the solution - your advantages

On a cross-product basis - ZAcode encompasses the key technologies on the market

- Axial and centrifugal fans
- EC technology and AC technology
- Integrated electronics and external electronics for speed control
- Communication and control intelligence

Simplicity

- Can be operated and understood by everyone

Uniformity

- Identical connection concept of the various products and technologies
- Identical communication (add-on modules for required bus systems)
- Identical functionality
- Modular expandability, thus providing a cost-effective basis
- Expandable on demand - sustainable
- Available in a wide power range of smaller than 1 kW to 30 kW

Safety and reliability

- courtesy of perfectly matched systems
- courtesy of error prevention during installation, start-up, operation and maintenance

Speed

- Uniformity ensures speed in relation to engineering. Hence, the short time to market in relation to product development. Fast start-up and service.

Cost savings

- Your processes will become more efficient, e.g. with regard to engineering
- Basic equipment of ZIEHL-ABEGG products = Buy basic equipment and pay, buy add-ons if necessary - buy only what you need!

Flexibility

- Modular system, expandable and customisable
- Customisable to current and future bus systems
- Basic expandability

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ZAcode

Simple, cross-product, uniform

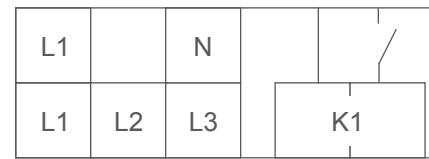
Fans with ECblue Basic
< 1 kW to approx. 6 kW

Highly efficient external rotor motors with permanent magnets and integrated power electronics



The unique fan co

Same con



Easily expandable for inte

AM-MODBUS

AM-CAN-OPEN

AM-LON



Fans with asynchronous motors

< 1 kW to approx. 30 kW

Control via mounted Fcontrol Basic or Icontrol Basic frequency inverters



Expandable and combin

AM-PREMIUM

UNIcon control modules



Control philosophy

Connectivity

E1	D1	GND	10V	24V
----	----	-----	-----	-----

Integration into bus systems

AM-PROFIBUS AM-ETHERCAT ...



Variable control intelligence



PMblue centrifugal fans with mounted PMIcontrol Basic-M

< 5.5 kW to approx. 22 kW

PMblue combines PM motor with permanent magnets and mounted frequency inverter (optionally mountable PMcontrol)



AMblue centrifugal fans with mounted MIcontrol Basic-M

< 5.5 kW to 22 kW

AMblue combines AC motor (asynchronous motor) and mounted frequency inverter



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Motor protection concept

The majority of ZIEHL-ABEGG external rotor motors (excluding ex-motors) are equipped with "TB" thermostats. Standard protective switches or bi-metal actuators in the motor feed line work dependent of current and thus offer only incomplete protection as the current does not allow conclusions to be made about the motor winding temperature under all conditions. In contrast, thermostats are bimetal switches embedded in the motor winding and they can react directly to the motor's winding temperature. They open an electrical contact, as soon as their nominal switch temperature (NST) is attained.

Fans can be securely protected by ZIEHL-ABEGG motor protection devices. Especially when they are

- speed controlled by voltage,
- operated with excessive switching frequency,
- when they are stalled,
- or exposed to high ambient temperatures.

Thermostats must be connected in the control circuit so that during a malfunction the fans are not independently reconnected after cooling off. ZIEHL-ABEGG devices meet these conditions. Mutual protection of several motors is possible with one protection device. In order to do this, the temperature protectors of the individual motors have to be connected in series. Please pay attention to the fact that all motors are disconnected at the same time in case of a temperature failure in a single motor. In real life applications, motors are grouped, so in case one motor fails it is still possible to run in emergency mode with reduced power. To ensure optimum motor protection we provide motor protection units in various designs.



Thermal contact

Motor protection units for 3~ motors

The STDT motor protection units for 3~ motors combine several functions:

The motor is protected by "TB" thermostat monitoring. This ensures direct monitoring of the winding temperature. On top of that, the STDT has an integrated overcurrent release that protects the lead to the motor from overcurrent. This feature - plus the integrated double terminals- allow the STDT to be used like a "current distribution" of sorts.

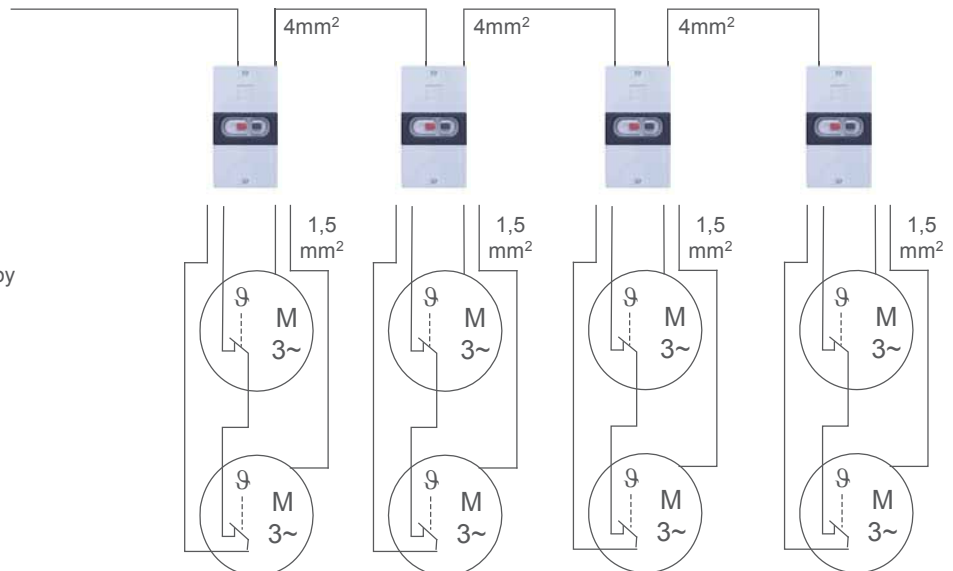


Motor protection units and system components

Application example with 3 ~ motor protection units as "current distribution"

Network or control devices output

Single fans or groups of fans protected by thermostats



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Motor protection units

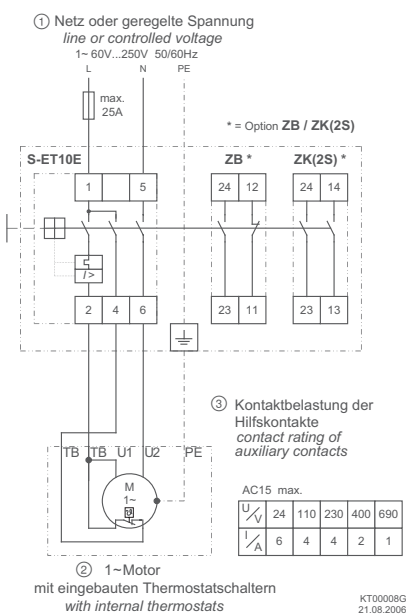
For monitoring thermostats (TB)



Complete motor protection is implemented by connecting the thermostat, which is integrated into the motor, to the motor protection unit. Most ZIEHL-ABEGG external rotor motors are equipped with thermostats (TB) in the winding. These thermostats open during high winding temperatures, facilitating the direct monitoring of the temperature in the motor, thus ensuring the direct protection of the motor. When the thermostat opens, the motor protection unit is triggered and has to be manually reset; this is done to prevent an unwanted reconnection after the motor has cooled off.

Additional functions of the 3~ STDT motor protection units:
They have an overcurrent trigger integrated. That means the device acts like a fuse and can be used for "current distribution". The adjustable overcurrent trigger protects the cable leading to the connected motors. Dual terminals located on the input and output sides of the motor protection unit facilitate simple wiring of multiple motors or fans on the output side of a powerful controller.

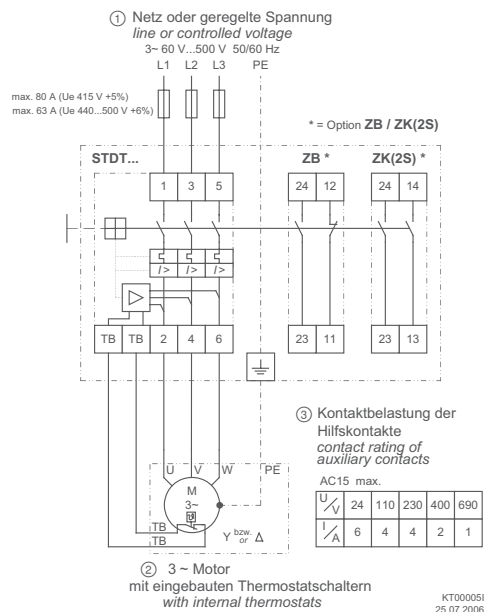
Connection diagram S-ET



- ① Line or controlled voltage
- ② 3~ motor with integrated thermostats
- ③ Contact load of auxiliary contacts

* Option ZB/ZK(2S)

Connection diagram STDT



- ① Line or controlled voltage
- ② 1~ motor with integrated thermostats
- ③ Contact load of auxiliary contacts

* Option ZB/ZK(2S)



Equipment/Characteristics

Complete motor protection

Automatic shut-off when connected thermostat „TB“ opens (direct temperature monitoring in the motor winding).

Integrated button

Switch connected motors on and off manually. Manual reset after motor fault (protection from unwanted restarting)

Optional: operating status contact

Type „ZB“ with one open contact and one close contact
Type „ZK“ with two close contacts

Optional padlock feature

Type „Zrep“ for the IP55 housing version. The motor protection unit can be locked during servicing (max. 3 locks)

Cable protection (only in 3~ STDT devices)

Via integrated overcurrent trigger, which can be adjusted to the cable cross section.

Accessories

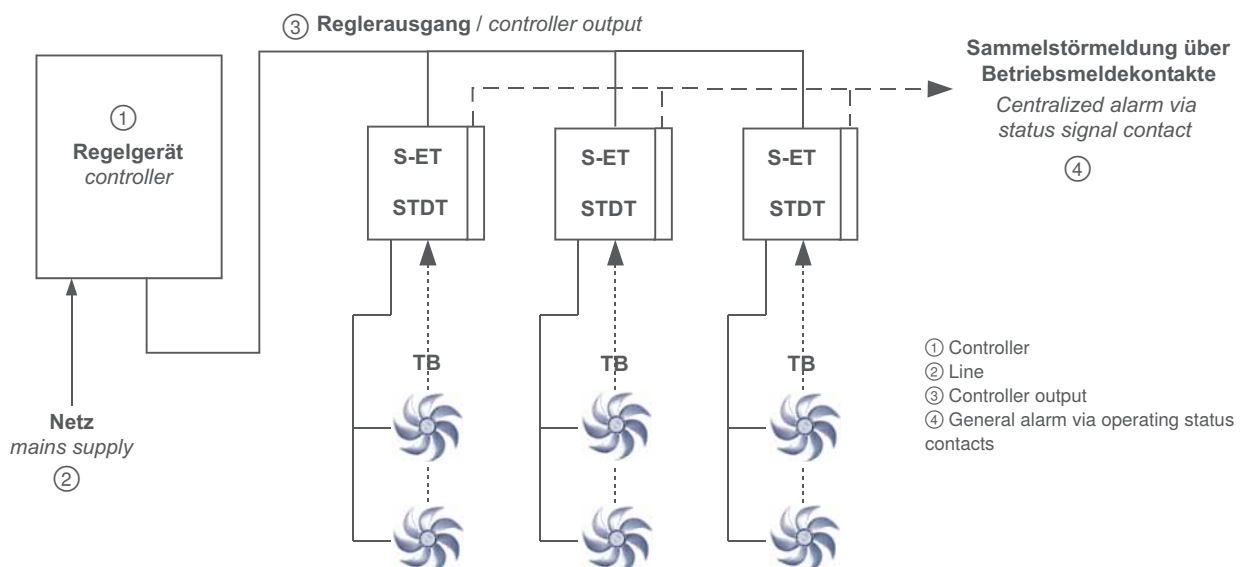
Type	Article no.	Weight kg
ZB	382013	0.03
ZK	382022	0.03
Zrep	382025	0.11

Motor protection units for monitoring thermostats (TB)

Line	Installation	Type	Article no.	Rated current A	Overcurrent trigger	Minimum ambient temperature °C	Maximum ambient temperature °C	Protection class	Weight kg	Dimensions (W x H x D) mm
1~ 60...250V 50/60Hz	Rail according to EN 60715	S-ET10E	382021	10		-25	55	IP20	0.17	45 x 80 x 85.5
1~ 60...250V 50/60Hz	Wall mounting	S-ET10	382020	10		-25	40	IP55	0.44	80 x 150 x 97.5
3~ 60...500V 50/60Hz	Rail according to EN 60715	STDT16E	382012	16	Overcurrent 10...16 A	-25	55	IP20	0.33	54 x 80 x 85.5
3~ 60...500V 50/60Hz		STDT25E	382015	25	Overcurrent 20...25 A	-25	55		0.50	54 x 80 x 85.5
3~ 60...500V 50/60Hz	Wall mounting	STDT16	382011	16	Overcurrent 10...16 A	-25	40	IP55	0.60	80 x 150 x 97.5
3~ 60...500V 50/60Hz		STDT25	382014	25	Overcurrent 20...25 A	-25	40		0.75	80 x 150 x 97.5

Application example

Motor protection units S-ET or STDT, depending on the line. With S-ET monitoring of individual fans, with STDT monitoring of several fans per motor protection unit possible. Thermostats are wired in series.



Frequency inverters

3~ Fcontrol, universal controller with display



The Fcontrol frequency inverters provide special advantages. Fcontrols have an all pole effective sine filter integrated which provides sinusoidal output voltage that is comparable with the standard mains. That means the frequency inverter enables reliable, demand-oriented and energy-saving control of asynchronous motors (external rotor motors, IEC standard motors) without having to take measures into consideration required by standard frequency inverters.

The advantages provided by the Fcontrol frequency inverter are:







- Operation without shielded motor feed lines
- The line length is not restricted by Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No risk to motors (they do not have to be frequency inverter compatible) since they are supplied with sinusoidal voltage that corresponds to the line voltage.

The benefits are especially advantageous in plants in which motors or fans are operated in parallel on a frequency inverter. Motors connected in parallel often means long cable lengths which is no problem with the Fcontrol. On top of that, unshielded cables can be used.

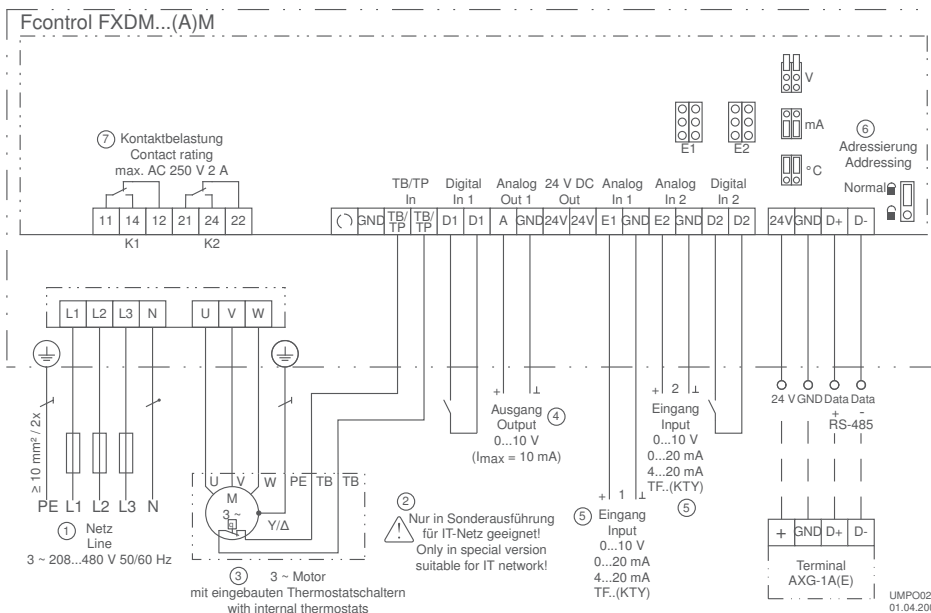
The Fcontrol universal devices are ideal for the following applications: refrigeration, air conditioning, agriculture, general air supply and ventilation tasks, clean room technology.

Fast commissioning for typical applications in the stated sectors by selecting pre-programmed operating modes possible.

Input for sensors or speed settings through

-  Setting of the desired speed through device or by external default, e.g. 0...10 V
-  Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar
-  Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..
-  Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h
-  Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s
-  Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



- ① Line
- ② Only in special version suitable for IT network!
- ③ Motor feeder cable
- ④ Output
- ⑤ Input
- ⑥ Addressing
- ⑦ Contact rating

Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/Characteristics

Integrated all pole effective sine filter

Phase to phase and phase to grounded conductor which means sinusoidal output voltage. Measures typical for frequency inverters such as shielded motor feed lines are not required.

LC-multifunction display with plain text:

Various menu languages can be selected

Simple commissioning through operating modes:

Typical operating modes, e.g. for air-conditioning, refrigeration or ventilation technology can be selected.

Easy to program:

Typical settings can be made: e.g., default a minimum speed, limit the maximum speed, inverting and limits. Setting, e.g. for 2-stage mode

2 analogue inputs for sensors or setpoint signals:

Analogue input E1 and E2: Setting through operating modes or manually programmable, e.g. 0-10 V, 0-20 mA, 4-20 mA
Analogue input E2: programmable, e.g. comparison to Sensor 1, difference to Sensor 1, average calculation, setpoint input, setpoint adjustment (e.g. dependent on outdoor temperature)

Two digital inputs. D2 and D1:

Programmable, e.g. enable, switchover Setpoint 2 or 1 switchover control or manual operation, switchover E2, or E2, reverse control function, limit output, display external fault, reset, reverse the rotary direction

2, analogue output A1:

Setting through operating modes or manually programmable, e.g., output signal proportional modulation, output signal proportional input signal, invertible, 10 V constant voltage, group control

10 digital outputs (relays) K1 and K2:

Setting through operating modes or manual programming, e.g. operating status, limits, external fault on digital input, enabling external devices, e.g. heating, dampers, group control of fans, etc.

Integrated motor protection function:

Connection facility for PTC thermistors or alternatively thermostats (TB or TP).

Interface RS485 MODBUS RTU:

Integration into bus system

Setting protection / memory for settings:

Enable settings protection from unauthorised access, restore implemented settings

Event memory:

Query events that have occurred, operating times, etc.

Optional equipment

Add-on modules for frequency inverters

- IO add-on module type Z-module, Article No. **380052**
If the integrated inputs and outputs are not sufficient, other inputs and outputs can be created with the Z-Modul-B. These are also programmable:
 - 1 analog input
 - 1 analog output
 - 3 digital inputs
 - 2 digital outputs (relays)
- LON® Add-on module type Z-Modul-L, Article No. **380086**
For integration into a bus system LON® by a two-wire

Frequency inverters

3~ Fcontrol, universal device with display

Fcontrol, universal controller with display

3~ 208...480V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)	
		V	A	°C	A	W	°C		kg	mm	
FXDM2.5AM	308099	400	2.5	40	6	50	55	IP54	3.30	240 x 284 x 115	
FXDM5AM	308138		5	50	10	100	55		7.20	250 x 302 x 195,5	
FXDM8AM	308140		8	50	10	150	55		7.90	250 x 302 x 195,5	
FXDM10AM	308142		10	55	16	210	55		8.20	250 x 302 x 195,5	
FXDM14AM	308144		14	40	16	310	55		8.70	250 x 302 x 195,5	
FXDM18AM	308174		18	40	20	400	55		9.10	250 x 302 x 195,5	
FXDM22AM	308108		22	40	25	520	55		14.50	280 x 355 x 239	
FXDM32AM	308009		32	50	35	700	55		29.60	386 x 525 x 283	
FXDM40AM	308177		40	50	50	790	55		29.60	386 x 525 x 283	
FXDM50AM	308183		50	50	63	910	55		32.80	386 x 525 x 283	
FXDM32AME	308008		IP20	32	50	35	700		55	33.14	343 x 600 x 280
FXDM40AME	308176			40	50	50	790		55	33.10	343 x 600 x 280
FXDM50AME	308182			50	50	63	910		55	36.65	343 x 600 x 280

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Fcontrol, universal controller with display, UL

3~ 208...480V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
FXDM32AM	308009-UL	400	32	50	35	700	55	IP54	28.50	386 x 525 x 283
FXDM32AME	308008-UL		32	50	35	700	55	IP20	33.10	343 x 600 x 280

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.



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Frequency inverters

3~ Fcontrol, universal device with display (2nd edition)



The Fcontrol frequency inverters offer special benefits. Fcontrol have an integrated all-pole active sine filter which ensures a sinusoidal output voltage which is comparable with the normal supply network. This means that the frequency inverters enable reliable, requirement-based, energy-saving control of asynchronous motors (external rotor motors, IEC standard motors) without needing to consider measures that must be observed with standard frequency inverters.

Advantages provided by Fcontrol frequency inverters are:

- Operation without shielded motor cables
- The cable length is not limited by the Fcontrol
- Operation without electromagnetic motor noises (ideal for noise-sensitive areas)
- No danger for motors (these need not be frequency inverter compatible) because they are supplied by sinusoidal voltage according to the line voltage.

Especially in systems in which motors or fans are operated parallel to a frequency inverter, the advantages are particularly valuable. Parallel connected motors often mean long cable lengths, this is no problem with the Fcontrol and unshielded cables can also be used.

The Fcontrol universal devices are especially suitable for the following applications: refrigeration, air-conditioning, agriculture, general airing and venting tasks, clean-room application. For typical applications in the named areas, fast commissioning by selecting pre-programmed operating modes is possible.

Frequency inverters of the 2nd edition enable modern operation by capacitive keys.

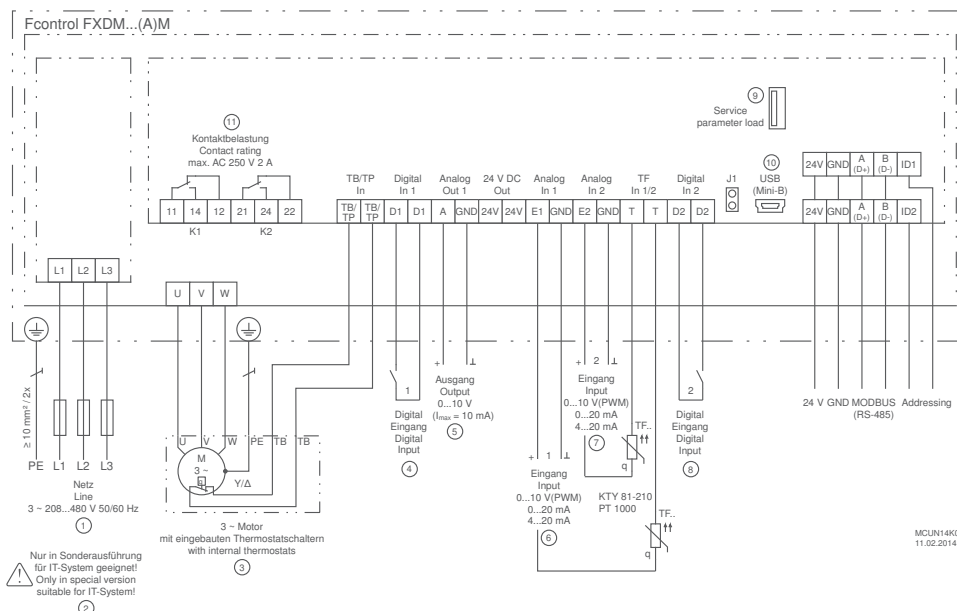
This means that no mechanical key is pressed but the operation is capacitive by touching the key surface. In addition there is a directly selectable On/Off key and two keys the functions of which depend on where you currently are in the menu (softkeys). A commissioning wizard and help texts are available for commissioning.

There is a 2nd control circuit in the device and the possibility of retrofitting a clock module as a timer.

Input for sensors or speed settings through

- Setting of the desired speed through device or by external default, e.g. 0...10 V
- Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar
- Connection of thermistors, e.g. sensors type TF.. e.g. active sensor type MTG..
- Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h
- Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s
- Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



- ① Mains 3~ 208...480 V 50/60 Hz
- ② Only suitable for IT system in special version!
- ③ 3~ motor with built-in thermostats
- ④ Digital input D1 for potential-free contact
- ⑤ Output 0...10 V (I_{max} = 10 mA)
- ⑥ Input 0...10 V
- ⑦ Input 0...10 V
- ⑧ Digital input D2 for potential-free contact
- ⑨ Parameter interface, only for manufacturer's service purposes!
- ⑩ USB interface for communication
- ⑪ Contact load max. 2A / 250 V AC

Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

Integrated all-pole effective sine filter

Phase to phase and phase to PE conductor. Thus sinusoidal output voltage. Frequency inverter typical measures such as shielded motor cables are not necessary.

LC multifunction display with clear text display:

Different menu languages are selectable

Simple commissioning by operating modes:

Typical operating modes, e.g. for air-conditioning, refrigeration or ventilation technology can be selected.

Activation of a 2nd control circuit in the selected operating mode:

By assignment of the sensor function input 2 (E2) for the 2nd control circuit.

Simple programmability:

Typical settings can be made easily: e.g. setting of a minimum speed, limitation of the maximum speed, inversions and limits. Setting, e.g. for 2-step mode

2 analog inputs for sensors or setting signals:

Analog input E1 and E2: Setting by operating modes or manually programmable, e.g. 0-10 V, 0-20 mA, 4-20 mA

Analog input E2: programmable, e.g. comparison with sensor 1, difference to sensor 1, average value formation, setpoint setting, setpoint adaptation (e.g. outside temperature-dependent), activation of 2nd control circuit.

2 digital inputs D1 and D2:

Programmable, e.g. enable, switch over setpoint 1 or 2, switch over control or manual mode, switch over E1 or E2, control function reversal, output limitation, display of external fault, reset, direction of rotation reversal

1 analog output A1:

Setting by operating modes or manually programmable, e.g. output signal proportional to modulation, output signal proportional to input signal, invertible, 10 V constant voltage, group control, activation as output for 2nd control circuit

2 digital outputs (relays) K1 and K2:

Setting by operating modes or manually programmable, e.g. operating indication, fault indication, limits, external fault at digital input, activation of external devices, e.g. heating, shutters, group control fans, etc.

Integrated motor protection function:

Connection possibility of PTC thermistors or alternatively thermostats (TB or TP).

Interface RS485 for MODBUS RTU:

Integration into bus system, addressing of the device manually or automatically possible.

Interface USB:

For software update, communication with PC, etc.

Set protection / memory for settings:

Activation of set protection against unauthorised access, restoration of made settings

Event memory:

Querying of occurred events, operating times etc.

Optional equipment

Add-on modules for frequency inverters

- IO add-on module type Z-module, Article No. **380052**

If the integrated inputs and outputs are not sufficient, other inputs and outputs can be created with the Z-Modul-B. These are also programmable:

- 1 analog input
- 1 analog output
- 3 digital inputs
- 2 digital outputs (relays)

- Clock module Z-Modul-RTC, Article No. **380056**, for retrofitting real-time clock and timer function. The switching clock can be assigned the same functions are the digital inputs (D1 and D2).

Fcontrol, universal controller with display, 2nd edition

3~ 208...480V 50/60Hz

Type	Article no.	Rated voltage V	Rated current A	Rated temperature °C	Max. line fuse A	Max. heat dissipation W	Maximum ambient temperature °C	Protection class	Weight kg	Dimensions (W x H x D) mm
FXDM25AM	308289	400	25	55	35	550	55	IP54	21.50	279 x 405 x 260
FXDM32AM	308283		32	50	35	700	55		23.10	279 x 405 x 260

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Frequency inverters

3~ Fcontrol Basic, modularly extendable speed controllers



The 3~ Fcontrol frequency inverters with integrated all-pole effective sine filter are available in the "Basic" version as speed controllers. The special feature of the Fcontrol Basic without display is the functional extendibility by pluggable add-on modules. This enables integration into different BUS networks. Functional extension as a controller is also possible with add-on modules.

In operation as a speed controller, the speed setting can be made by a master control by 0 – 10 V, e.g. by a ZIEHL-ABEGG control module of the UNIcon product series. The speed can also be set manually by connecting a potentiometer. Two-stage operation with adjustable speeds is also possible optionally.

The frequency inverters control asynchronous motors (external rotor motors, IEC standard motors) gently, requirement-based and energy saving.

Advantages achieved by Fcontrol frequency inverters are:

- High energy saving
- Operation without shielded motor cables
- The cable length is not limited by the Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No danger to motors (these must not be suitable for frequency inverters) because they are supplied with sinusoidal voltage according to the mains voltage.

Input for sensors or speed settings through



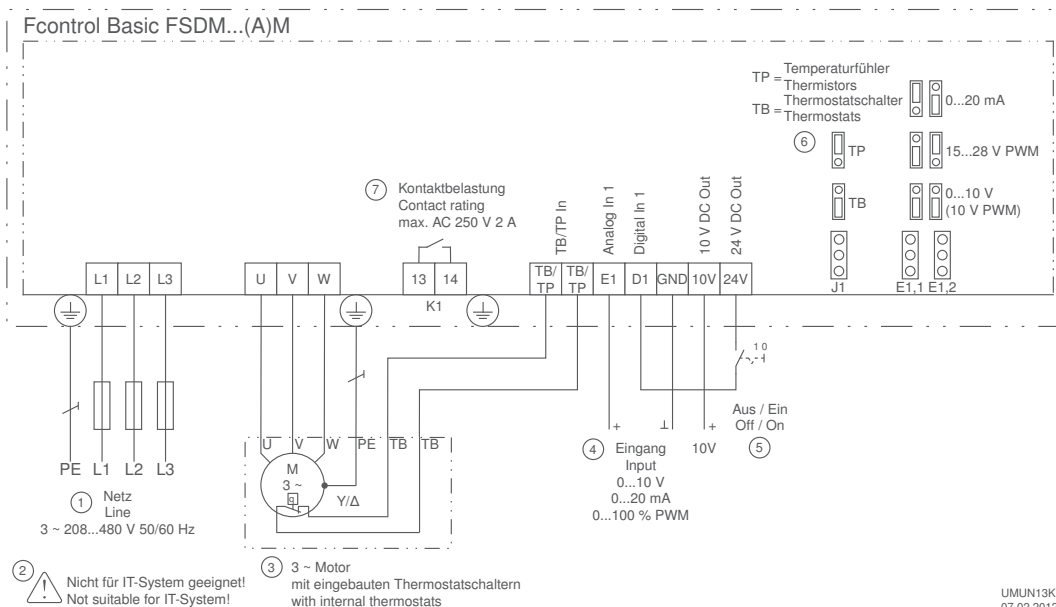
Setting of the desired speed through device or by external default, e.g. 0...10 V



Add-on modules for functional extension

The 3~ Fcontrol Basic inverters are universally suitable for many different applications: E.g. refrigerant technology, air conditioning, agriculture, general ventilation tasks, clean room technology.

Connection diagram



- ① Line
- ② Only suitable for IT line in special version!
- ③ 3~ motor with built-in thermostats
- ④ Input
- ⑤ Off / On
- ⑥ TP = thermistor TB = thermostat
- ⑦ Contact load

Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

Integrated all-pole effective sinefilter

Phase to phase and phase to protective earth. Thus sinusoidal output voltage. Frequency inverter typical measures such as shielded motor cables are not necessary.

1 analog input for speed setting:

Analog input E1: Setting by jumper to desired setting signal: 0-10 V, 0-20 mA or PWM

1 digital input:

D1 - 24 V: Enable function On/Off

1 potential-free fault indication contact:

The contact drops out in case of a fault. Max. load 250 V, 2 A.

Integrated motor protection function:

Connection possibility for thermostats "TB" or thermistors "TP".

Optional equipment

Add-on modules for functional extension:

Article No.	Type
349045	AM-MODBUS
349050	AM-MODBUS-W
349046	AM-PREMIUM
349051	AM-PREMIUM-W
349065	AM-AMPsignal
349071	AM-ETHERCAT
349064	AM-CAN-OPEN
349049	AM-LON
349063	AM-PROFIBUS

Information

Oil transformer cooling

Dry transformer cooling

System components

Control technology

Appendix

Fcontrol Basic without display										
3~ 208...480V 50/60Hz										
Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
FSDM2.5M	308251	400	2.5	40	6	50	55	IP54	2.70	240 x 284 x 115
FSDM5M	308238		5	55	10	90	55		5.40	250 x 302 x 195,5
FSDM8M	308239		8	40	10	140	55		6.30	250 x 302 x 195,5
FSDM10M	308262		10	55	16	200	55		6.80	250 x 302 x 195,5
FSDM16M	308302		16	40	20	360	55		7.00	250 x 302 x 195,5
FSDM22M	308314		22	40	25	520	55		14.30	280 x 355 x 239
FSDM32M	308316		32	50	35	700	55		29.40	386 x 525 x 283
FSDM40M	308318		40	50	50	790	55		29.40	386 x 525 x 283
FSDM50M	308320		50	50	63	910	55		32.60	386 x 525 x 283

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Frequency inverters

3~ Fcontrol Basic, Speed controller with display



The 3~ Fcontrol frequency inverters with all-pole effective sine filter are available in the "Basic" version with integrated display as speed controllers.

The speed setting can be made by a master control by 0 – 10 V, e.g. by a ZIEHL-ABEGG control module of the UNIcon product series. The speed can also be set manually by connecting a potentiometer. Two-stage operation with adjustable speeds is also possible optionally.

The frequency inverters control asynchronous motors (external rotor motors, IEC standard motors) gently, requirement-based and energy saving.

Advantages achieved by Fcontrol frequency inverters are:

- High energy saving
- Operation without shielded motor cables
- The cable length is not limited by the Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No danger to motors (these must not be suitable for frequency inverters) because they are supplied with sinusoidal voltage according to the mains voltage.

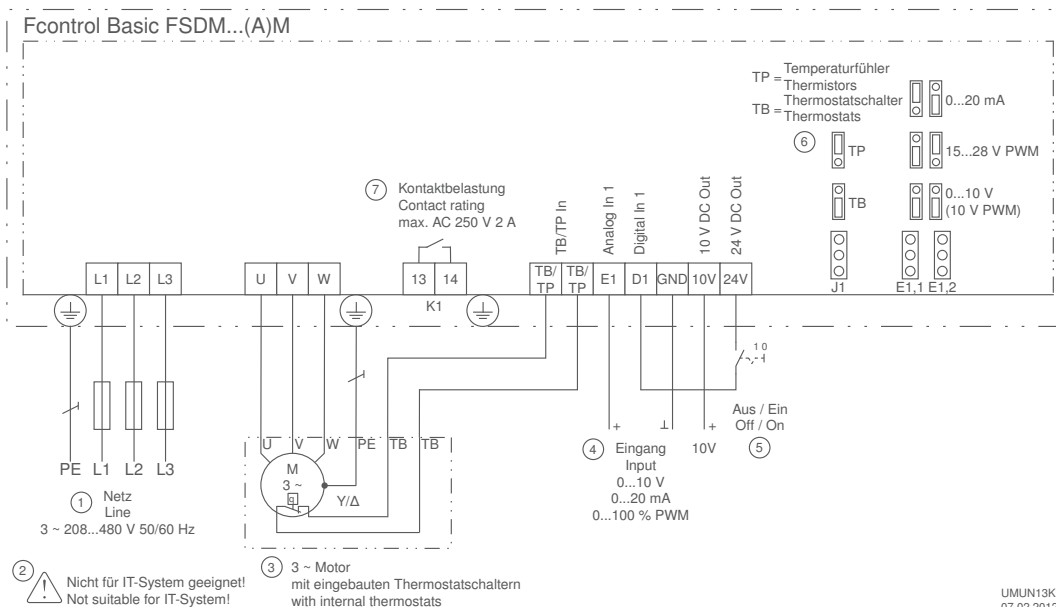
Input for sensors or speed settings through



Setting of the desired speed through device or by external default, e.g. 0...10 V

The 3~ Fcontrol Basic inverters are universally suitable for many different applications: E.g. refrigerant technology, air conditioning, agriculture, general ventilation tasks, clean room technology.

Connection diagram



Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

Integrated all-pole sinefilter

Phase to phase and phase to protective earth. Thus sinusoidal output voltage. Frequency inverter typical measures such as shielded motor cables are not necessary.

LC multi-function display with plain text display:

Setting of desired values: speeds, motor parameters. Display of modulation, operating states etc.

1 analog input for speed setting:

Analog input E1: Setting by jumper to desired setting signal: 0-10 V, 0-20 mA or PWM

1 digital input:

D1 - 24 V: Enable function On/Off

1 potential-free fault indication contact:

The contact drops out in case of a fault. Max. load 250 V, 2 A.

Integrated motor protection function:

Connection possibility for thermostats "TB" or thermistors "TP".

Fcontrol Basic, Speed controller with display										
3~ 208...480V 50/60Hz										
Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
FSDM2.5AM	308252	400	2.5	40	6	50	55	IP54	2.90	240 x 284 x 115
FSDM5AM	308240		5	55	10	90	55		5.60	250 x 302 x 195.5
FSDM8AM	308241		8	40	10	140	55		6.50	250 x 302 x 195.5
FSDM10AM	308260		10	55	16	200	55		7.00	250 x 302 x 195.5
FSDM16AM	308303		16	40	20	360	55		7.20	250 x 302 x 195.5
FSDM22AM	308315		22	40	25	520	55		14.50	280 x 355 x 239
FSDM32AM	308317		32	50	35	700	55		29.60	386 x 525 x 283
FSDM40AM	308319		40	50	50	790	55		29.60	386 x 525 x 283
FSDM50AM	308321		50	50	63	910	55		32.80	386 x 525 x 283

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Electronic voltage controllers

3~ Ucontrol, universal controller with display









Most ZIEHL-ABEGG external rotor motors are voltage controllable. For simple and cost-effective speed control of these motors or fans, electronic voltage controllers can be supplied.

For the various applications in refrigeration, air-conditioning and general ventilation technology we supply universal devices from the Ucontrol product family.

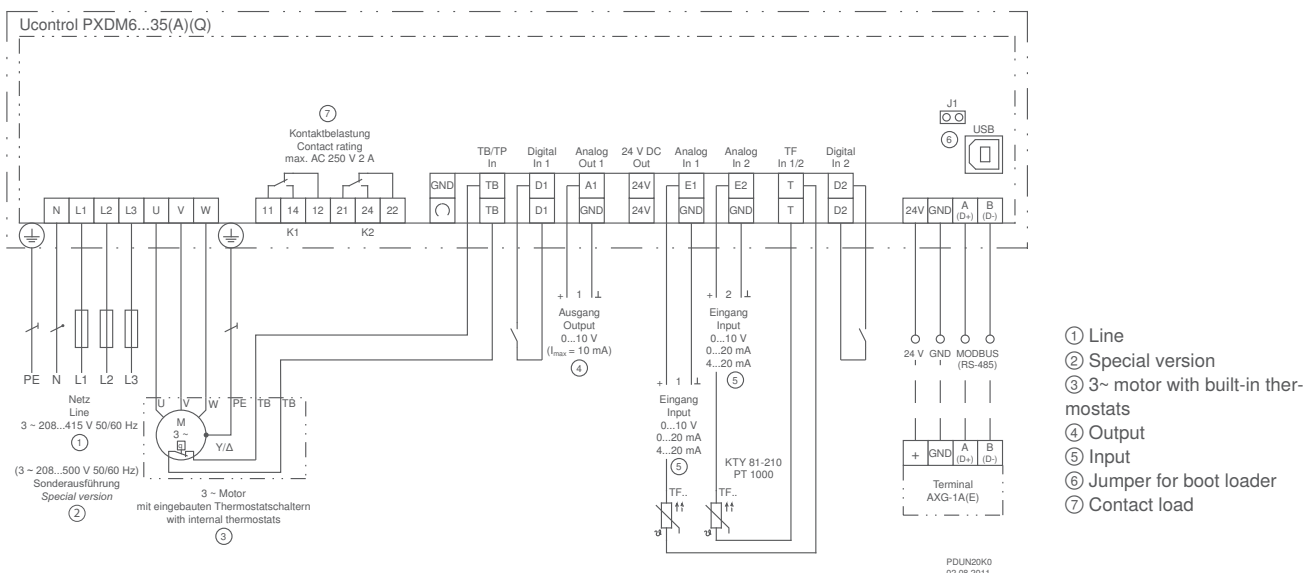
These universal control devices also provide an option to control based on temperature, pressure (for example refrigerant pressure in cooling equipment), differential pressure in ventilation systems, or other physical factors.

The Ucontrol universal devices are ideal for following applications: refrigeration, air conditioning, agriculture, general air supply and ventilation jobs, clean room technology. By selecting pre-programmed operating modes, fast commissioning for typical applications in the stated sectors is possible.

Input for sensors or speed settings through

- 
Setting of the desired speed through device or by external default, e.g. 0...10 V
- 
Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar
- 
Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..
- 
Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h
- 
Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s
- 
Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

LC multi-function display with plain text display:

Different menu languages can be selected

Simple start-up by operating modes:

Typical operating modes, e.g. for air conditioning, refrigerant or ventilation technology can be selected.

Simple programmability:

Typical settings can be made easily: e.g. minimum speed setting, limitation of the maximum speed, inversions and limits. Setting, e.g. for 2-step mode

2 analog inputs for sensors or setting signals:

analog input E1 and E2: Setting by operating modes or manually programmable, e.g. 0-10 V, 0-20 mA, 4-20 mA

analog input E2: programmable, e.g. comparison with sensor 1, difference to sensor 1, average value formation, setpoint setting, setpoint adaptation (e.g. outdoor temperature-dependent)

2 digital inputs D1 und D2:

Programmable, e.g. enable, switch over setpoint 1 or 2, switch over control or manual mode, switch over E1 or E2, invert control function, output limitation, display external fault, reset

1 analog output A1:

Setting by operating modes or manually programmable, e.g. output signal proportional to modulation, output signal proportional to input signal, invertible, 10 V constant voltage, group control

2 digital outputs (relays) K1 and K2:

Setting by operating modes or manually programmable, e.g. operating indication, fault indication, limits, external fault at digital input, activation of external devices, e.g. heating, shutters, group control, fans, etc.

Integrated motor protection function:

Connection possibility for PTC thermistors or alternatively thermostats (TB or TP).

Interface RS485 MODBUS RTU:

Integration into bus system

Interface USB:

For e.g. software update, communication with PC

Set protection:

Activation set protection against unauthorised access, restoration of made settings

Event memory:

Querying of occurred events, operating times, etc.

Optional equipment

IO add-on module type Z-Modul-B, Article No. **380052** if the integrated inputs and outputs are not sufficient other inputs and outputs can be created with the Z-Modul-B. These are also programmable:

- 1 analog input
- 1 analog output
- 3 digital inputs
- 2 digital outputs (relays)

LON® Add-on module type Z-Modul-L, Article No. **380086**

Ucontrol, universal controller with display

3~ 208...415V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
PXDM6A	304594	400	6	40	10	30	55	IP54	2.25	240 x 284 x 115
PXDM10A	304595		10	45	16	50	55		2.75	240 x 284 x 115
PXDM12A	304596		12	40	16	75	55		3.65	270 x 323 x 146
PXDM15A	304597		15	40	20	100	55		4.95	270 x 323 x 146
PXDM20A	304598		20	45	25	200	55		5.50	250 x 302 x 195.5
PXDM25A	304599		25	45	35	270	55		11.10	280 x 355 x 239
PXDM35A	304600		35	50	50	440	55		11.15	280 x 355 x 239
PXDM25AE	304624		25	50	35	260	55	IP20	7.65	246 x 362 x 180
PXDM35AE	304625		35	50	50	430	55		7.75	246 x 362 x 180
PXDM50A	304639		50	40	63	170	55	IP54	20.00	386 x 525 x 283
PXDM80A	304640		80	40	100	270	55		21.00	386 x 525 x 283
PXDM50AE	304649		50	50	63	160	55	IP20	13.80	336 x 471 x 220
PXDM80AE	304650		80	50	100	255	55		15.40	336 x 471 x 220

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Ucontrol, universal controller for increased ambient temperature with display

3~ 208...415V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
PXDM6AZ	304607	400	6	50	10	25	55	IP54	2.25	240 x 284 x 115
PXDM10AZ	304608		10	50	16	45	55		2.75	240 x 284 x 115
PXDM12AZ	304609		12	50	16	70	55		3.65	270 x 323 x 146
PXDM15AZ	304610		15	50	20	95	55		4.95	270 x 323 x 146
PXDM20AZ	304611		20	50	25	190	55		5.50	250 x 302 x 195.5
PXDM25AZ	304612		25	50	35	260	55		11.10	280 x 355 x 239
PXDM35AZ	304613		35	55	50	430	55		11.15	280 x 355 x 239
PXDM50AZ	304645		50	50	63	160	55		18.60	386 x 525 x 283
PXDM80AZ	304646		80	50	100	255	55		19.60	386 x 525 x 283

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.



Electronic voltage controllers

3~ Ucontrol, universal controller with display and bypass main switch



Most ZIEHL-ABEGG external rotor motors are voltage controllable. For simple and cost-effective speed control of these motors or fans, electronic voltage controllers can be supplied.

For the various applications in refrigeration, air-conditioning and general ventilation technology we supply universal devices from the Ucontrol product family.

These universal control devices also provide an option to control based on temperature, pressure (for example refrigerant pressure in cooling equipment), differential pressure in ventilation systems, or other physical factors.

The Ucontrol universal devices are ideal for following applications: refrigeration, air conditioning, agriculture, general air supply and ventilation jobs, clean room technology. By selecting pre-programmed operating modes, fast commissioning for typical applications in the stated sectors is possible.

These versions have an additionally integrated bypass main switch. This offers the possibility of bypassing the internal device electronics. In the bypass position, the applied line voltage is switched directly to the output.

Input for sensors or speed settings through



Setting of the desired speed through device or by external default, e.g. 0...10 V



Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar



Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..



Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h



Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s



Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Ucontrol, universal controller with display and bypass main switch

3~ 208...415V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
PXDM6AQ	304614	400	6	40	10	30	55	IP54	2.55	240 x 284 x 132
PXDM10AQ	304615		10	45	16	50	55		3.05	240 x 284 x 132
PXDM12AQ	304616		12	40	16	75	55		4.00	270 x 323 x 162
PXDM15AQ	304617		15	40	20	100	55		5.30	270 x 323 x 162
PXDM25AQ	304618		25	45	35	270	55		11.40	280 x 355 x 256
PXDM35AQ	304619		35	50	50	440	55		11.45	280 x 355 x 256
PXDM50AQ	304641		50	40	63	170	55		20.70	386 x 525 x 299.5
PXDM80AQ	304642		80	40	100	270	55		22.80	386 x 525 x 299.5

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.


Electronic voltage controllers


3~ Dcontrol, speed controller or pressure/temperature controller




These versions are primarily used as speed controllers. This is beneficial for upstream control applications or when the devices are combined with control modules from the ZIEHL-ABEGG UNIcon product family. Alternatively, speeds can be pre-set. They can also be set to second stage operation with external switchover, or implemented via an external potentiometer. The Dcontrol voltage controllers also provide an option to control based on temperature or pressure (for example, refrigerant pressure in cooling equipment).

Input for sensors or speed settings through

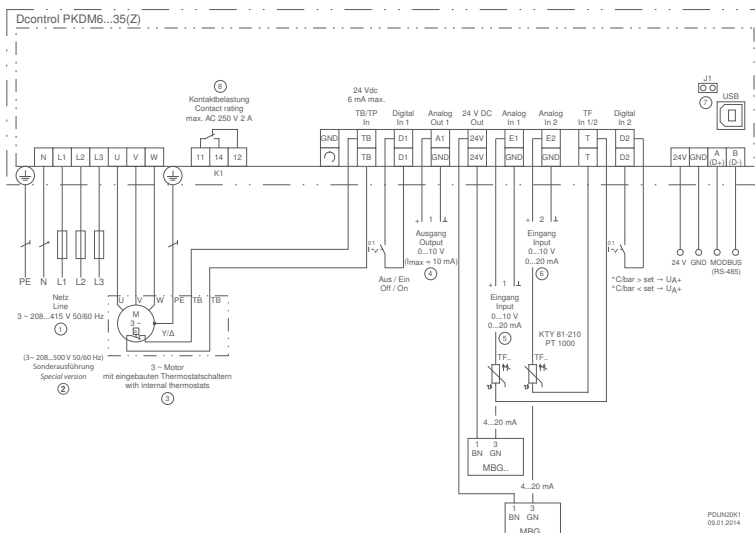
- 

Setting of the desired speed through device or by external default, e.g. 0...10 V
- 

Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar
- 

Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..

Connection diagram



- ① Netz 3~ 208..415 V 50/60 Hz
- ② Special version UL 3~ 208...500 V 50/60 Hz
- ③ 3~ motor motor with built-in thermostats
- ④ Output
- ⑤ Input
- ⑥ Input
- ⑦ USB interface
- ⑧ Contact load



Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/Characteristics

Simple commissioning with dip switch and potentiometer:

The controls are accessible directly in the device terminal compartment. Set the dip switch to select the desired device function (operating modes: speed controller, temperature, or pressure controller). The setpoint preset is set with the potentiometer.

Two analogue inputs for sensors or default signal

Analogue input E1 and E2: Set/enable by selecting the operating mode (dip switch), e.g., 0-10 V, 4-20 mA. When operating as a controller, e.g. connection of two sensors for controlling the higher value (e.g., two-loop condenser)

2 digital inputs D1 and D2

For connecting an external, floating contact.

D1: Enable function On/Off

D2: Reverse the control function, e.g. heating, cooling

1 analogue output A1:

Output signal proportional modulation or constant voltage +10 V (max. 10 mA) to connect an external potentiometer for speed prese

1 floating alarm relay K1:

During a fault, the relay drops out. Max. load 250 V, 2 A.

Integrated motor protection function

Connection facility for thermostat "TB" or thermistor "TP"

Interface RS485 MODBUS RTU

Connection to bus system

Interface USB

e.g. for software update, communication with PC
(not on 50, 80 Ampere devices)

Dcontrol, speed controller or pressure/temperature controller

3~ 208...415V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
PKDM6	304587	400	6	40	10	30	55	IP54	2.20	240 x 284 x 115
PKDM10	304588		10	45	16	50	55		2.70	240 x 284 x 115
PKDM12	304589		12	40	16	75	55		3.60	270 x 323 x 146
PKDM15	304590		15	40	20	100	55		4.90	270 x 323 x 146
PKDM20	304591		20	45	25	200	55		5.45	250 x 302 x 195.5
PKDM25	304592		25	45	35	270	55		11.05	280 x 355 x 239
PKDM35	304593		35	50	50	440	55		11.10	280 x 355 x 239
PKDM25E	304622		25	50	35	260	55	IP20	7.40	246 x 362 x 180
PKDM35E	304623		35	50	50	430	55		7.50	246 x 362 x 180
PKDM50	304631		50	40	63	170	55	IP54	19.50	386 x 525 x 283
PKDM80	304632		80	40	100	270	55		20.50	386 x 525 x 283
PKDM50E	304635		50	50	63	160	55	IP20	13.80	336 x 471 x 220
PKDM80E	304636		80	50	100	255	55		15.40	336 x 471 x 220

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Dcontrol, speed controller or pressure/temperature controller for increased ambient temperature

3~ 208...415V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
PKDM10Z	304601	400	10	50	16	45	55	IP54	2.70	240 x 284 x 115
PKDM12Z	304602		12	50	16	70	55		3.60	270 x 323 x 146
PKDM15Z	304603		15	50	20	95	55		4.90	270 x 323 x 146
PKDM20Z	304604		20	50	25	190	55		5.45	250 x 302 x 195.5

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.



Information

Oil transformer
cooling

Dry transformer
cooling

System
components

Control
technology

Appendix



Control modules


UNIcon universal control module (with MODBUS Master function)





All ZIEHL-ABEGG sensors can be combined with the UNIcon CXE/AV(E) universal control module. The actual value measured at the sensor is compared with the setpoint. This results in the 0-10 V output signal. Two 0-10 V outputs are integrated. These serve to activate EC fans, frequency inverters or other devices. Optionally, connected field devices (frequency inverters/EC fans with plugged MODBUS add-on module) can be activated by the integrated MODBUS-RTU interface (MODBUS Master function). Groups of frequency inverters or ECblue fans can be conveniently addressed quickly and automatically. The device also contains two separate control circuits, a real time clock and timer functions. UNIcon universal control modules are especially suitable for the following applications: Refrigeration, air conditioning, general ventilation tasks, clean room technology. For typical applications in the areas mentioned, fast start-up is possible by selecting pre-programmed operating modes.


We supply special control modules for agriculture.


Input for sensors or speed settings through


- 

Setting of the desired speed through device or by external default, e.g. 0...10 V
- 

Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar
- 

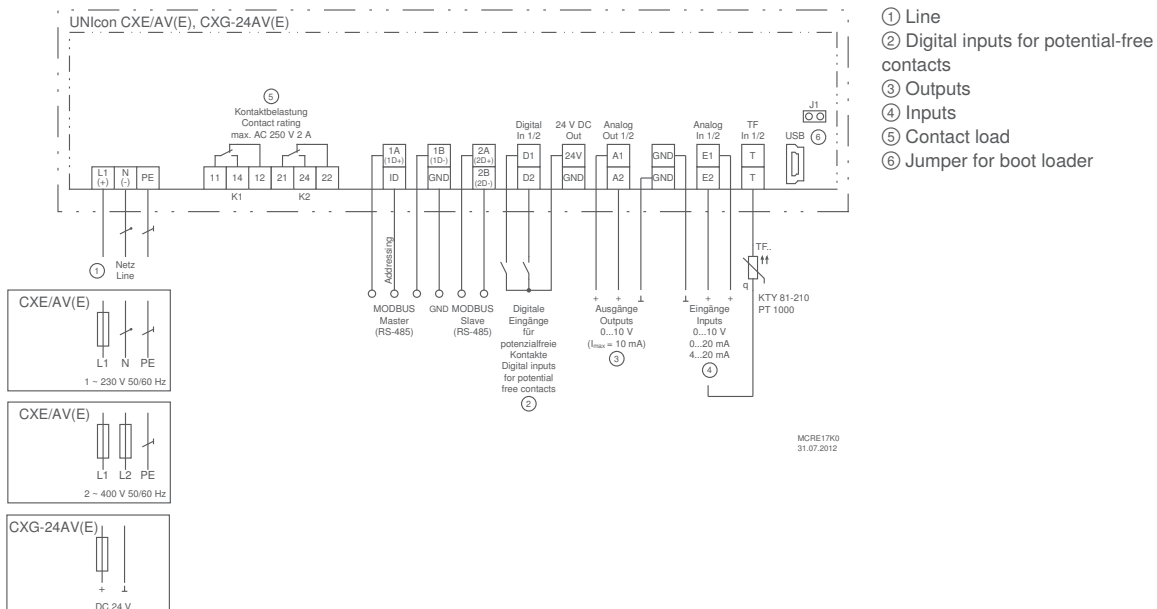
Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..
- 

Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h
- 

Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s
- 

Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

Multifunction display with clear text display:

Different menu languages are selectable

Simple commissioning by operating modes:

Typical operating modes, e.g. for air-conditioning, refrigeration or ventilation technology can be selected.

Simple programmability:

e. g. setting of a minimum speed, limitation of the maximum speed, inversions and limits.
Setting, e.g. for 2-step mode

2 analog inputs for sensors or setting signals:

Analog input E1 and E2: Setting by operating modes or manually programmable, e.g. 0-10 V, 0-20 mA, 4-20 mA
Analog input E2: programmable, e.g. comparison with sensor 1, difference to sensor 1, average value formation, setpoint setting, setpoint adaptation (e.g. outside temperature-dependent)

2 digital inputs D1, D2:

Programmable, e.g. enable, switch over setpoint 1 or 2, switch over control or manual mode, switch over E1 or E2, control function reversal, output limitation, display of external fault

2 analog outputs for controlling external speed controllers, EC fans, other devices:

Analog output A1 and A2: Setting by operating modes or manually programmable, e.g. output signal proportional to modulation, output signal proportional to input signal, invertible, 10 V constant voltage, group control

2 digital outputs (relays) K1 and K2:

Setting by operating modes or manually programmable, e.g. operating indication, fault indication, limits, external fault at digital input, activation of external devices, e.g. heating, group control fans, etc.

2 interfaces RS485:

a) For connecting ZIEHL-ABEGG field devices with MODBUS RTU interface (e.g. field devices with integrated add-on module "AM-MODBUS"). With the possibility of automatic addressing of these field devices.

b) MODBUS Slave function of the UNIcon, for connection to a master control station (GLT).

Set protection/memory for settings:

Activation of set protection against unauthorised access, restoration of made settings

Event memory:

Query of occurred events, operating times etc.

Integrated real-time clock with timer:

The timer function behaves like a digital input, the desired function can be selected accordingly. Up to four switching times per day can be set for the desired function.

Optional equipment

Z-Modul-B02, article no. 380099, as additional I/O expansion.

- Two additional inputs E3 + E4 (0-10 V), option to program as digital inputs (see inputs D1,D2)
- One additional analog output (0-10 V), adjustable (see output A1, A2)

UNIcon universal control module								
Line	Type	Article no.	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
			A	W	°C		kg	mm
1~ 230V 50/60Hz	CXE/AV	320053	10	5	55	IP54	0.90	223 x 200 x 115
1~ 230V 50/60Hz	CXE/AVE	320056	10	5	55	IP00	0.65	166 x 106 x 55 mm / mounting depth: max. 105
2~ 400V 50/60Hz	CXE/AV	320055	10	5	55	IP54	0.90	223 x 200 x 115

Panel-mounting (front side IP54)

UNIcon universal control module								
Line voltage	Type	Article no.	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
			A	W	°C		kg	mm
	CXG-24AV	320057	10	5	55	IP54	0.75	223 x 200 x 115
24VDC	CXG-24AVE	320058	10	5	55	IP00	0.50	166 x 106 x 55 mm / mounting depth: max. 105

Panel-mounting (front side IP54)

Add-on modules

AM-PREMIUM (-W) for Basic Frequency inverter and ECblue



Pluggable add-on modules for function extension of the "Icontrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans.

With the AM-PREMIUM/-W add-on modules, the devices can be functionally extended as a control unit. In addition, it is possible to link to MODBUS networks or connect operator terminals (A-G-247NW / AXG-1A / AXG-1AE). Radio parameterization and data polling (with AM-PREMIUM-W) is also possible as an option.

Input for sensors or speed settings through



Setting of the desired speed through device or by external default, e.g. 0...10 V



Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar



Connection of thermistors, e.g. sensors type TF.. e.g. active sensor type MTG..



Connecting differential pressure sensors (air conditioning), e.g. type DSG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h

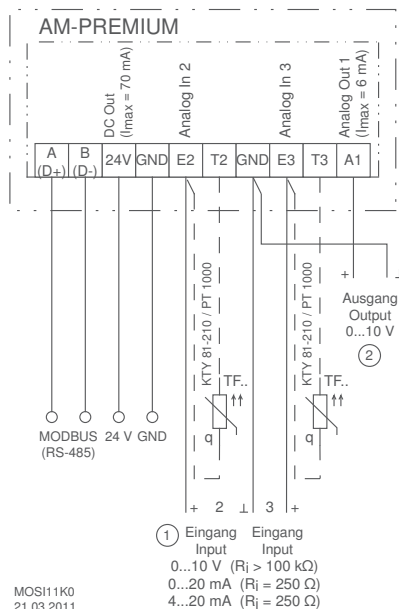


Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s



Connecting additional sensors, e.g. combination sensors, CO₂, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



MOSI1K0
21.03.2011

Equipment/properties

Simple start-up by operating modes:

When an operator terminal is connected to the AM-PREMIUM add-on module plugged into the frequency inverter (for AM-PREMIUM-W via radio), typical operating modes, e.g. for air conditioning, refrigerant or ventilation technology can be selected.

2 analog inputs for sensors or setting signals:

analog input E2 and E3: Setting by operating modes or manually programmable, e.g. 0-10 V, 0,20 mA, 4-20 mA

analog input E3: Programmable, e.g. comparison with sensor E2, difference to sensor E2, average value formation, setpoint setting, setpoint adaptation (e.g. outdoor temperature-dependent) connection of passive thermistors: On E2 and T2, E3 and T3.

1 analog output A1:

Setting by operating modes or manually programmable, e.g. output signal proportional to modulation, output signal proportional to input signal, invertible, 10 V constant voltage, group control.

Functional extension: Digital input D1 in the basic device:

programmable, e.g. enable, switch over setpoint 1 or 2, switch over control or manual mode, switch over E1 or E3, control function inversion, output limitation, external fault, reset, reversal of direction of rotation.

Functional extension: Digital output K1 in the basic device:

setting by operating modes or manually programmable, e.g. operating indication, fault indication, limits, external fault at digital input, activation of external devices, e.g. heating, shutters, group control fans, etc.

1 x interface RS485:

For linking to a MODBUS RTU network (MODBUS Slave). Manual addressing of the devices in the network

Add-on module AM-PREMIUM (-W)		
Type	Article no.	Weight kg
AM-PREMIUM	349046	0.03
AM-PREMIUM-W	349051	0.04

Add-on modules

AM-MODBUS (-W) for Basic Frequency inverter and ECblue



Pluggable add-on modules for function extension of the "Icontrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans.

With the AM-MODBUS/-W add-on modules, the devices integrated into MODBUS networks or the A-G-247NW operator terminal can be connected. Parameterization and data polling by radio (with AM-MODBUS-W) are optionally possible.

Whole groups of frequency inverters or ECblue motors and fans that are equipped with these AM-MODBUS add-on modules can be addressed quickly and automatically by a ZIEHL-ABEGG UNIcon control module with MODBUS-Master function. These devices are then controlled conveniently by the UNIcon "master" device.

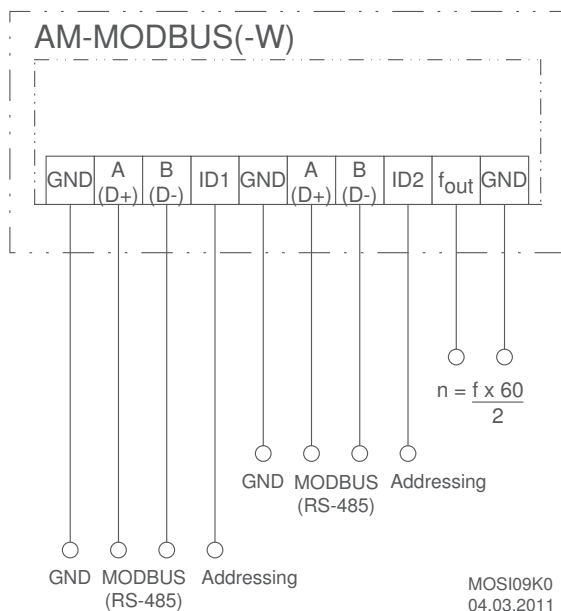
Equipment/properties

2 x interface RS485:

For integration into a MODBUS RTU network (MODBUS Slave). With the possibility of automatic addressing by a UNIcon control module with MODBUS-Master function.

Add-on module - AM-MODBUS (-W)		
Type	Article no.	Weight kg
AM-MODBUS	349045	0.03
AM-MODBUS-W	349050	0.03

Connection diagram



Add-on modules

AM-AMPsignal for Basic Frequency inverter and ECblue fans



Pluggable add-on modules for function extension of the "Iconrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans.

The add-on module AM-AMPsignal transforms a current signal (0-20 mA, 4-20 mA) into a voltage signal (0-10 V). Several basic frequency inverters or ECblue fans can then be controlled by one current signal.

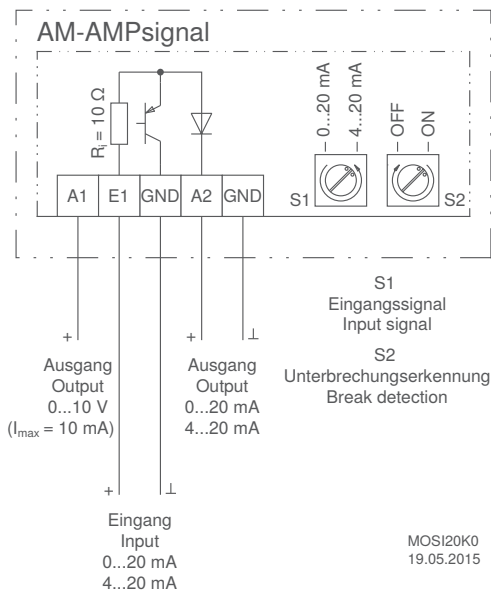
Equipment/properties

2 integrated rotary switches

Setting input signal (4-20mA, 0-20mA) by rotary switch "S1".
Setting fractured wire detection (detection active, not active) by rotary switch "S2".

Add-on module AM-AMPsignal

Type	Article no.	Weight kg
AM-AMPsignal	349065	0.03



Add-on modules

AM-ETHERCAT for Basic Frequency inverter and ECblue



Pluggable add-on modules for function extension of the "Icontrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans.
With the AM-ETHERCAT add-on modules the frequency inverters or ECblue fans can be integrated into EtherCat networks.

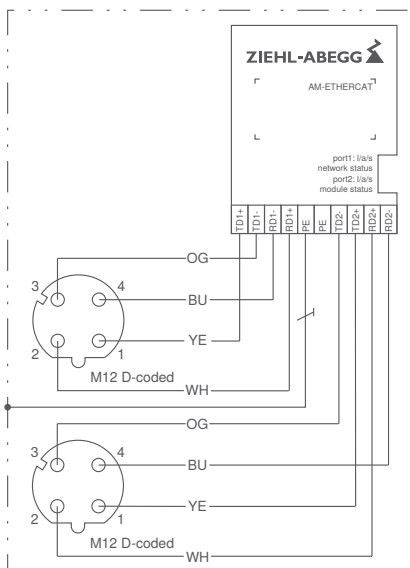
A device master data file (ESI file) is required for integration of the device into an EtherCat network. If there is any doubt about the use or procurement of the ESI file for this add-on module, our Control Technology Support Department will be very glad to help.

Equipment/properties

4 integrated LED

For status display and error message:
Network status, status module, status port 1 / port 2.

Add-on module AM-ETHERCAT		
Type	Article no.	Weight kg
AM-ETHERCAT	349071	0.03



KT00048C
12.08.2015

Add-on modules

AM-CAN-OPEN for Basic Frequency inverter and ECblue



Pluggable add-on modules for a function extension of the "Icontrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans. With the AM-CAN-OPEN add-on modules the devices can be integrated into CANopen networks.

An Electronic Datasheet (EDS file) is required for a device integration into the CANopen network. This file is provided free of charge by our Control Engineering Support Department.

Equipment/properties

3 integrated LEDs

For status display and error message.

3 integrated rotary switches

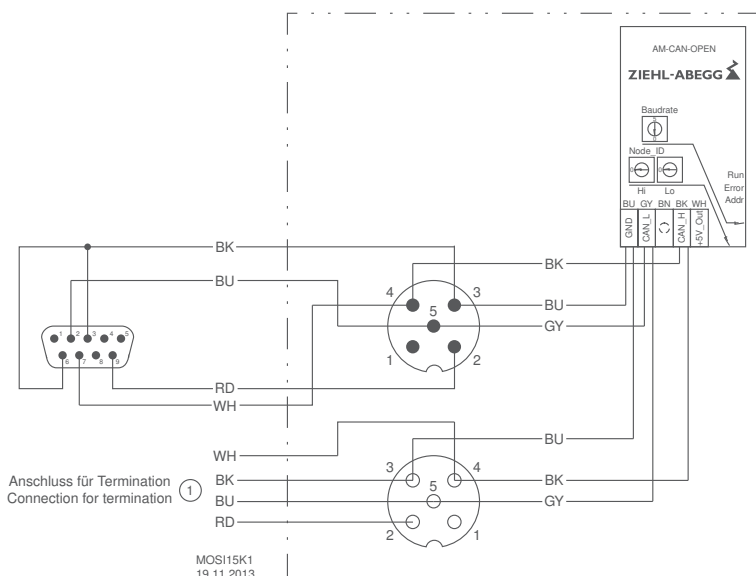
2 rotary switches for manual address setting.
1 rotary switch for setting the baud rate



Add-on module - AM-CAN-OPEN

Type	Article no.	Weight kg
AM-CAN-OPEN	349064	0.03

Connection diagram



Add-on modules

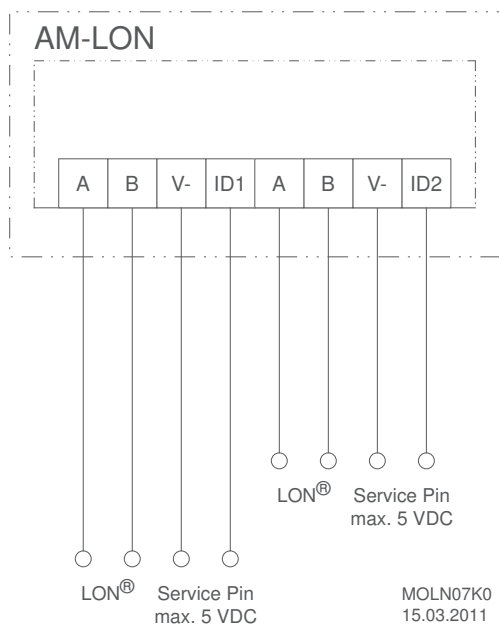
AM-LON for Basic Frequency inverter and ECblue



Pluggable add-on modules for function extension of the "lcontrol Basic" and "Fcontrol Basic" frequency inverters without integrated display as well as ECblue motors and fans. With AM-LON add-on modules the devices can be integrated into LON networks.

Add-on module - AM-LON		
Type	Article no.	Weight kg
AM-LON	349049	0.03

Connection diagram



Add-on modules

AM-PROFIBUS for Basic Frequency inverter and ECblue



Pluggable add-on modules for function extension of the "lcontrol Basic" and "Fcontrol Basic" without integrated display as well as ECblue motors and fans.

With the AM-PROFIBUS add-on modules the devices can be integrated into PROFIBUS networks.

A device master data file (GSD file) is required for integration of the device into the PROFIBUS network. This is provided free by our Control Engineering Support Department.

Equipment/properties

3 integrated LEDs

For status display and error message.

2 integrated rotary switches

For manual address setting.

Automatic baud rate detection

Optionally available connectors

Plug with connecting wires 80 mm:

5-pole, M12, wall installation M16, Article No. 00161258

5-pole, M12, wall installation M20, Article No. 00161263

Socket with connecting wires 80 mm:

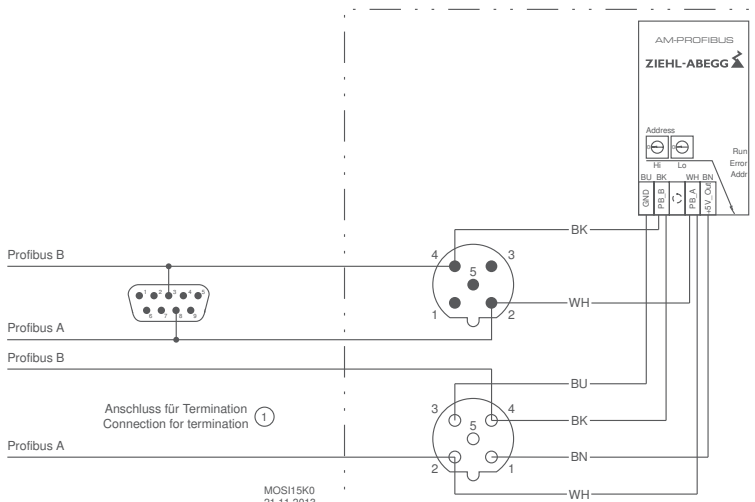
5-pole, M12, wall installation M16, Article No. 00161259

5-pole, M12, wall installation M20, Article No. 00161264

Add-on module AM-PROFIBUS

Type	Article no.	Weight kg
AM-PROFIBUS	349063	0.03

Connection diagram



Add-on modules

AM-PROFINET for Basic Frequency inverter and ECblue fans



Pluggable add-on modules for function extension of the “Icontrol Basic” and “Fcontrol” and “Fcontrol Basic” without integrated display (also for functional extension of ECblue fans). With the AM-PROFINET add-on modules the frequency inverters or ECblue fans can be integrated into PROFINET networks.

A device master data file (GSD file) is required for integration of the device into the PROFINET network. If there is any doubt about the use or procurement of the GSD file for this add-on module, our Control Engineering Support Department will be very glad to help.

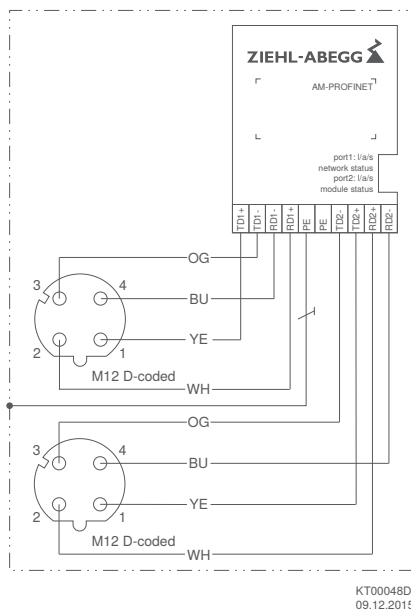
Equipment/properties

4 integrated LED

For status display and error message:
Network status, status module, status port 1 / port 2.

Add-on module AM-PROFINET		
Type	Article no.	Weight kg
AM-PROFINET	349072	0.03

Connection diagram



- Information
- Oil transformer cooling
- Dry transformer cooling
- System components
- Control technology**
- Appendix



Display and operator terminal

For frequency inverter without integrated display and ECblue



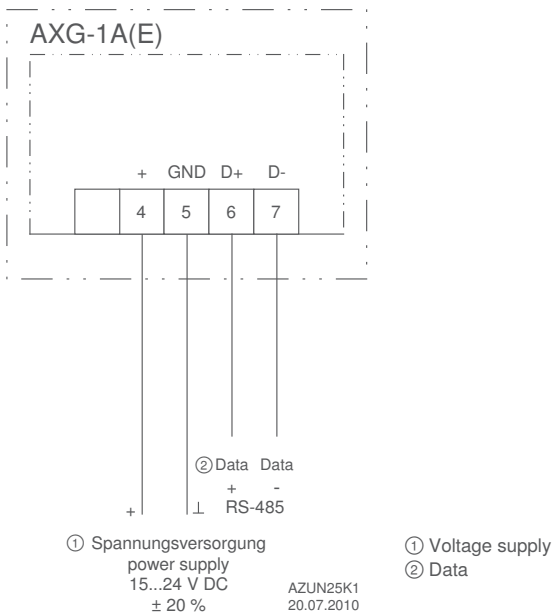
Display and operator terminal for parameterization and operation of the basic frequency inverters “Icontrol Basic” and “Fcontrol Basic” as well as ECblue motors an fans.

The basic frequency inverters without integrated display and ECblue motors have a slot for the AM-PREMIUM add-on modules. By plugging the add-on modules, the AXG-1A(E) operator terminal or the A-G-247NW hand held terminal can be connected.

The display and operator terminal AXG-1A can be installed flexibly in plants or machines in the IP54 housing. Alternatively, a unit for control panel integration is available (AXG-1AE).

The + 24 V voltage supply comes from the frequency inverter, a separate mains supply is not required.

Connection diagram



Technical data

- Voltage supply: 15-24 VDC (I_{max} 24 V: 50 mA / 14 V: 80mA)
- Maximum ambient temperature: + 40 °C

Equipment/properties

LC multi-function display with plain text display:

Different menu languages can be selected. Display of the connected frequency inverter menu.

1 interface RS485:

for connection to an AM-PREMIUM add-on module. Frequency inverters as well as ECblue motors and fans can be parameterized and operated with this.

Display and operator terminals					
24VDC					
Type	Article no.	Mounting type	Protection class	Weight	Dimensions (W x H x D)
				kg	mm
AXG-1A	349034	Wall mounting	IP54	0.60	166 x 160 x 87
AXG-1AE	349008	Panel mounting	IP54	0.55	166 x 106 x 57 mm / mounting depth: max. 75

Hand held terminal

Parameterization of the basic frequency inverters and ECblue



Hand held terminal for parameterization and operation of the "Icontrol Basic" and "Fcontrol Basic" frequency inverters as well as ECblue motors and fans.

The basic frequency inverters without integrated display and ECblue motors can be extended with AM-MODBUS or AM-PREMIUM add-on modules. The A-G-247NW operator terminal can be connected to this by plugging add-on modules.

When using the AM-MODBUS-W or AM-PREMIUM-W add-on modules, communication with this operator terminal can take place without cables, wirelessly, by radio.

The hand held terminal enables storing of data records and transmission of these to other devices.

Application example

Optional connection of the hand held terminal by cable (connection by interface RS485, MODBUS RTU) or radio communication.



Technical data

- External voltage supply:
by plug power pack (1~ 230 V, 50/60 Hz)
- Internal voltage supply:
3 x Mignon rechargeable batteries (NiMH 1.2 V)

Equipment/properties

LC multi-function display with plain text display:
Different menu languages can be selected

1 x Mini USB interface:
voltage supply / data transfer with a PC

1 x interface RS485:
for connection to an AM-MODBUS or AM-Premium add-on module.
Frequency inverters, ECblue motors and fans can be parameterized and operated with this. It is possible to save data records and transfer them to these devices.

Data transmission by radio:
for communication with AM-MODBUS-W or AM-Premium-W add-on module.

Hand held terminal		
Type	Article no.	Weight kg
A-G-247NW	380090	0.42

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General notes

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Explanation of technical details

Symbols, Units of Measure

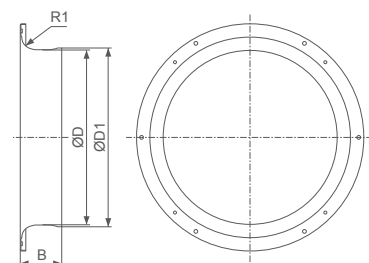
Symbol	Unit	Description
p_{sF}	Pa	Static pressure increase
p_{fd}	Pa	Dynamic pressure
q_v	m ³ /h	Air flow
n_N	min-1	Rated speed
P_1	kW	Input power
P_{sys}	kW	Input power system (including controller)
U_N	V	Rated voltage
f_N	Hz	Rated frequency
I_N	A	Rated current
I_A	A	Starting current
ΔI	%	Percentage increase of current based on rated current for speed control by voltage reduction
C_{400V}	μF	Capacity
$t_{R(min)}$	°C	Minimum permitted ambient temperature
$t_{R(max)}$	°C	Maximum permitted ambient temperature
L_{WA5}	dB(A)	A-rated suction-side sound power level
η_{statA}	%	Overall efficiency, static according to measurement category A at optimum duty point without losses of electronic speed control according to calculation method ErP-commission regulation No. 327/2011 annex II
N_{actual}	-	Actual efficiency grade of the fan based on an electrical input power of 10 kW at its point of optimum energy efficiency
N_{target}	-	Target efficiency grade at motor input power 10 kW
L_{pA}	dB(A)	A-weighted suction-side or pressure-side acoustic pressure level related to a certain measurement distance
P_{spez}	Wh/1000m ³	Specific power

Notes pertaining to the ErP evaluation

The identifier ErP2015 indicates that a fan meets the minimum efficiency factors of the respective level according to the ErP directive or the fan is not subject to the regulations of ErP directive ($P_1 < 125$ W). The actual efficiency in the efficiency optimum of the fan which is used for the ErP evaluation is called η_{statA} . In order to meet ErP requirements, this efficiency must reach a certain minimum value (target energy efficiency). The efficiency N is a parameter in the calculation of the target energy efficiency of the ErP directive. As a reference value for the required efficiency N_{nom} we also specify the actual efficiency N_{act} based on a motor input power of 10 kW.

All ErP-relevant data refers to measured data according to measurement category A, which was determined in the long housing from ZIEHL-ABEGG with inlet ring without guard grille, as per ISO 5801.

Size	B	D	D1	R1
200	52	200		13,5
250	85	254	257	10
300	80	306	326	16
315	80	316,5	327	27
350	87	356	367	35
400	100	400	410	35
450	110	451	463	45
500	118	503	517	45
560	135	559	576	45
630	150	634	653	55
710	167	711	728	95
800	195	797	814	100
910	205	914	930	100
1000	205	1000	1016	105
1250	340	1260	1347	105



L-KL-3017



Conversion factors Pressure

		SI-unit	Additional units		
		Pa (N/m ²)	mbar	in.wg	psi (lbs./in ²)
SI-unit	Pa (N/m ²)	1	0.01	0.004015	0.000145
Additional units	mbar	100	1	0.401463	0.014503
	in.wg	249.10	2.49	1	0.036127
	psi (lbs./in ²)	6894.76	68.95	27.68	1

Air flow

		SI-unit	Additional units		
		m ³ /s	m ³ /h	l/s	cfm
SI-unit	m ³ /s	1	3600	1000	2118.9
Additional units	m ³ /h	0.000277	1	0.277777	0.588583
	l/s	0.001	3.6	1	2.1189
	cfm	0.000472	1.698994	0.471943	1

Temperature

		SI-unit	Additional units
		°C	°F
SI-unit	°C	1	(°C × 1.8) + 32
Additional units	°F	(°F – 32) / 1.8	1

Dynamic pressure

Calculation of the dynamic pressure:

$$p_{fd} = k \cdot q_v^2$$

- p_{fd} Dynamic pressure at fan outlet in Pa
- k Constant
- q_v Air flow in m³/h

Example:

Type FN050-4EQ.4I.A7P1

Size	Constant
020	4,7 · 10 ⁻⁵
025	1,7 · 10 ⁻⁵
030	8,6 · 10 ⁻⁶
031	7,5 · 10 ⁻⁶
035	4,7 · 10 ⁻⁶
040	2,9 · 10 ⁻⁶
042	2,4 · 10 ⁻⁶
045	1,8 · 10 ⁻⁶
050	1,2 · 10⁻⁶
056	7,7 · 10 ⁻⁷
063	4,6 · 10 ⁻⁷
071	2,9 · 10 ⁻⁷
080	1,9 · 10 ⁻⁷
081	1,1 · 10 ⁻⁷
100	7,5 · 10 ⁻⁸
125	3,0 · 10 ⁻⁸

$$p_{fd} = 1,2 \cdot 10^{-6} \cdot q_v^2$$

Aerodynamics and Acoustics

Measurement method

The 'characteristic curve' diagram shows the pressure increase Δp_{sF} in Pa as a function of the volume flow rate q_v in m^3/h .

Technical conditions of supply

The specified performance data meet the requirements for accuracy class **3** for AC fans and accuracy class **2** for ECblue fans in line with **DIN 24 166** and apply to the rated data and air performance curves at the rated voltage. The continuous line in the characteristic map represents the optimum reliable operating range for axial fans.

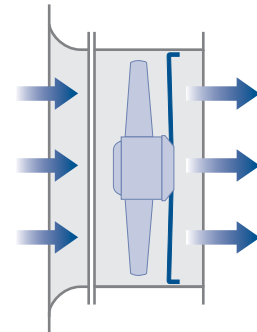
Fan test bench

The fan characteristic curves are determined on a combined test bench for acoustics and air performance. The characteristic curves are measured in compliance with **DIN EN ISO 5801** and **AMCA 210-99**. The sound power levels are measured in compliance with **DIN EN ISO 3745** and **ISO 13347-3** using the enveloping surface measuring method

The figure below shows an example of the measuring setup. The fan intake is installed in the measuring chamber at free intake and free exhaust (installation type A as per **DIN EN ISO 5801** or **AMCA 210-99**).

Air density

The air density and humidity are conditioned during the measurement using heat exchangers and kept largely constant. The characteristic curves shown refer to the measuring density. The mean measuring density is 1.16 kg/m^3 .

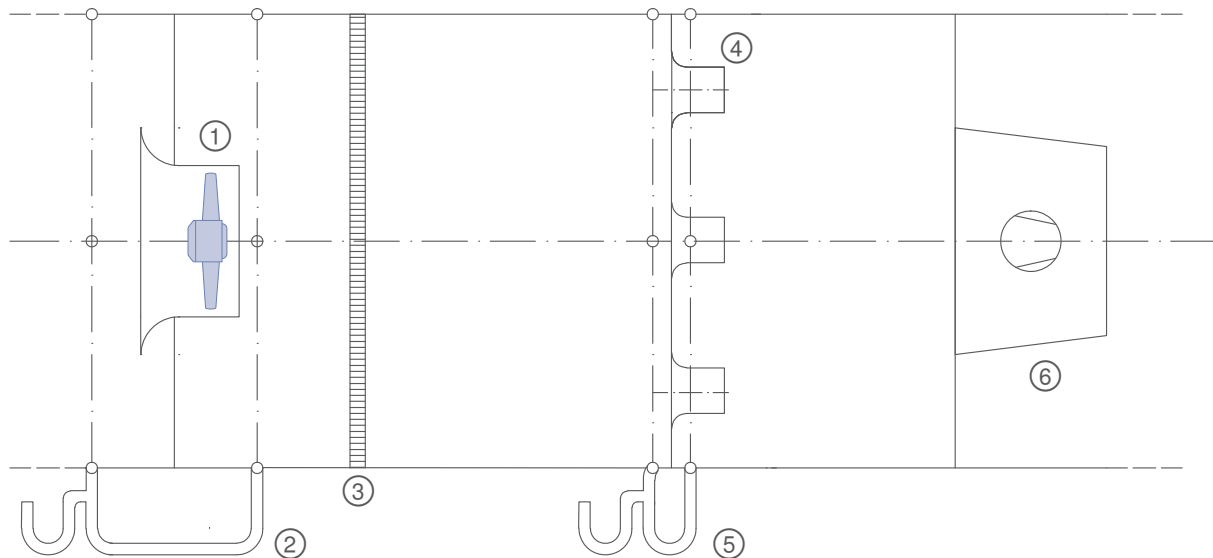


KL-1290a

Installation type A according to ISO 5801



Technology Centre (InVent)



- ① Test fan
- ② p_{sF}
- ③ Flow straightener
- ④ Nozzles
- ⑤ Δp Differential pressure
- ⑥ Auxiliary fan



Noise level data

Unless otherwise indicated, this catalogue **fans and control technology for transformer cooling** specifies the intake side, A-evaluated sound power levels L_{WA} . The sound power levels are determined by using the enveloping surface method in compliance with ISO 13347-3, accuracy class 1 and/or DIN EN ISO 3745.

This is done by measuring the sound pressure level L_p of the individual third-octave bands at 12 points on the enveloping surface (Fig. 1a). The measured sound pressure levels for the third-octave bands are initially used to calculate the sound power level for the third-octave bands and then the intake side sound power level L_W . To do this, the fans are installed with a free intake (from the measuring chamber) and (air) outlet (into the surrounding area). The measuring equipment used complies with DIN EN 61672.

Because of the different weighting of the third-octave sound power level, the A-evaluation, which is typically carried out, takes into account the subjective nature of human sound perception. The A-tested sound power level is the standard variable used to assess the sound characteristics of technical equipment.

Calculation of pressure side sound power level and total sound power level

For axial fans, the pressure side sound power level is approximately equal to the intake side level. The total sound power level is calculated by adding up the power from the sound power levels of both the intake and the pressure side (see DIN 45 635 Part 1, Appendix F, DIN EN ISO 3745). Thus, it is approximately 3 dB higher than the intake side sound power level specified in the catalogue.

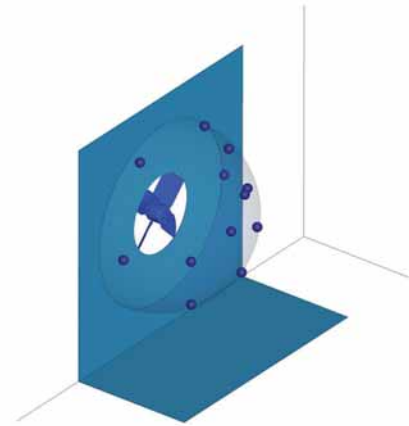


Fig.1a: Position of microphones in relation to axial fans



Fig. 1b: Fan test-bench

Determination of total sound power level during the interaction of several sound sources

The total sound power level of several individual sound sources operating concurrently is calculated by adding the power of the individual levels in compliance with **DIN EN ISO 3745**. This equation is the basis for the diagrams in Fig. II and III.

To add up several sound sources with the same level, please see diagram (Fig. II) for complete level information; e.g. 6 identical sound sources operating concurrently results in a total level that is approx. 8 dB higher.

The total sound power level of two sound sources with different levels can be seen in diagram Fig. III. For example, two sound sources whose sound power levels differ by 4 dB produce a total sound power level that is around 1.5 dB higher than that of the louder sound source.

Determination of sound pressure level

The A-tested sound pressure level L_{pA} for rooms with average absorption capacity for a distance of 1m from the fan axis is calculated by subtracting 7 dB from the A sound power level L_{WA} . In most cases, this assumption is correct and provides a sufficient level of accuracy. However, the sound characteristics can be hugely influenced by the individual installation situation. Absorption of the sound pressure level, depending on the distance with partial reflection, is shown in Fig. IV.

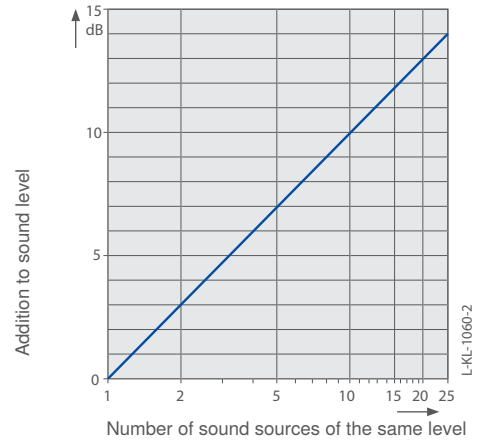


Fig. II: Addition of several sound sources

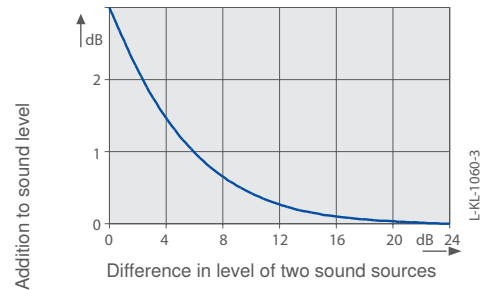


Fig. III: Sound sources of different levels

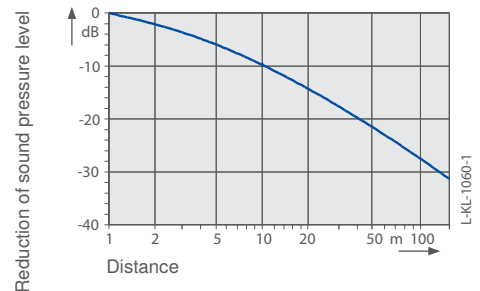


Fig. IV: Reduction of sound pressure level



Electrical connection and motor

Fan drive

The three-phase or single-phase AC external rotor motor integrated into the fan hub meets the requirements for circulating electrical machines set out in **DIN EN 60 034-1**

(VDE 0530 Part 1).

AC technology:

The rated voltage for three-phase current is 400 V,
for single-phase AC motors 230 V.

EC technology:

The FE2owlet-ECblue axial fans are powered by a highly efficient EC motor with integrated commutation electronics. Depending on the version, the ECblue motors have a broad voltage range.

1~ 200-277 V, 50/60 Hz

3~ 200-240 V, 50/60 Hz

3~ 380-480 V, 50/60 Hz

Operation with frequency inverter

ZIEHL-ABEGG axial fans are suitable for operation with frequency inverters if the following requirements are met:

All-pole sine filters - as supplied by some inverter manufacturers - must be installed between the inverter and the motor (sinusoid output voltage - phase to phase, phase to protective earth). Request our technical information L-TI-0510 for more details.

du/dt filters (also known as motor or attenuation filters) may not be used instead of sine filters.

When using sine filters, there may be no need for screened motor power cables, metal terminal boxes or a second earth connection on the motor (consult the sine filter supplier).

Electrical connection

Voltage

The single-phase or three-phase AC motors are suitable for 400 V or 230 V and are continuously voltage controllable. Please pay attention to the data sheet.

Current

Motor current is dependent on the installation (i.e. flow situation and nozzle) and operation (i.e. operating point in connection with air density). For the definition of electrical installations, the following value is recommended: $I_{\max} = I_N + \Delta I + \approx 30\%$

Motor connection

Mains connection via terminal box or connecting cable implemented as per dimensional drawings. Cable length tolerance ± 3 cm.

Terminal box

Terminal boxes are made of impact resistant and weather resistant plastic or die-cast aluminium.

For FE2owlet and FE2owlet-ECblue axial fans in F design without guard grille, the terminal box is located on the outside on the flange ring. In the F design with guard grille, the terminal box is mounted on the front on the motor.

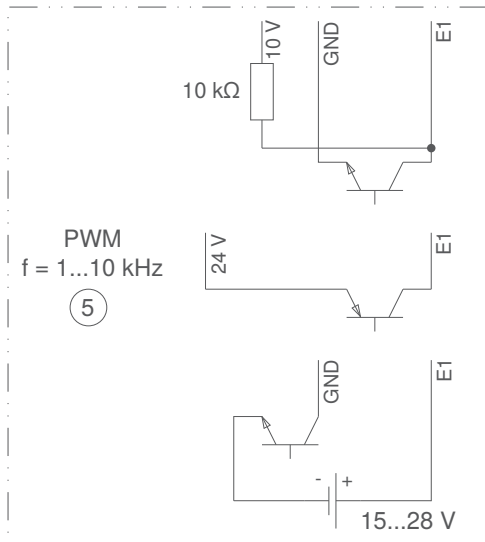
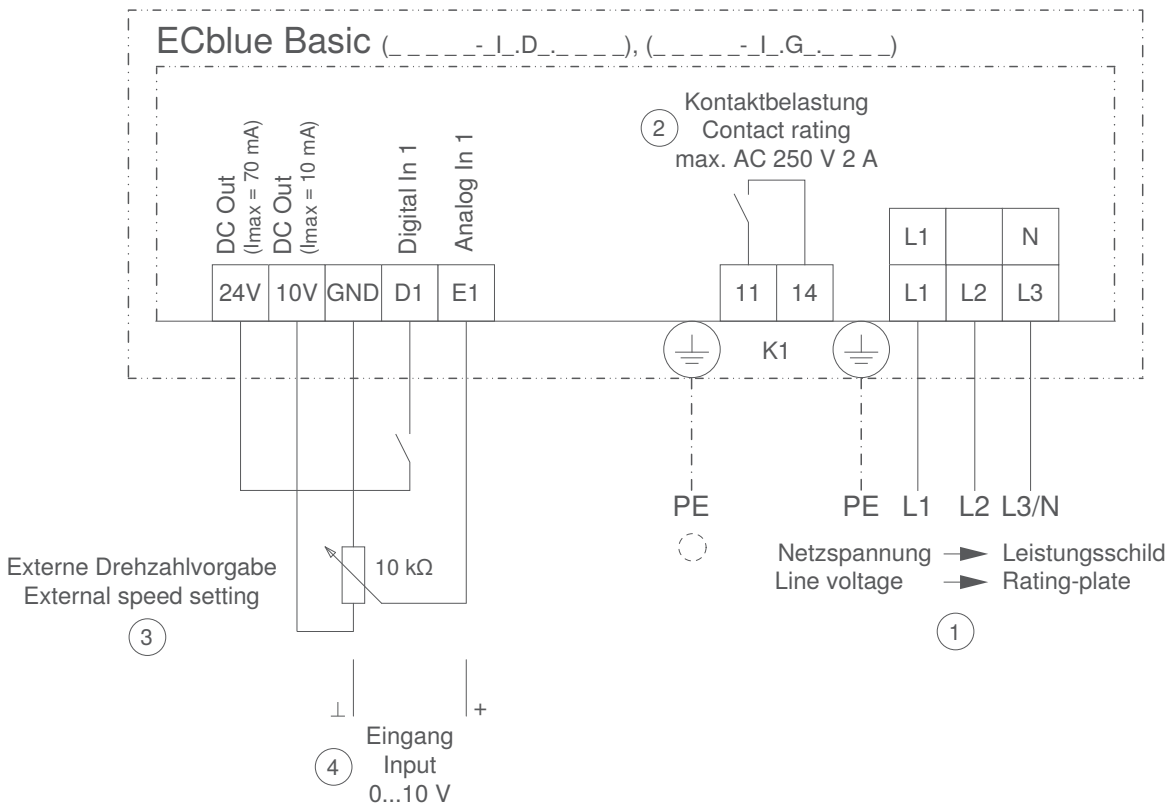
Service capacitor

See system components chapter.

Connection diagrams

EC technology

1360-403 (EC116 / EC152)

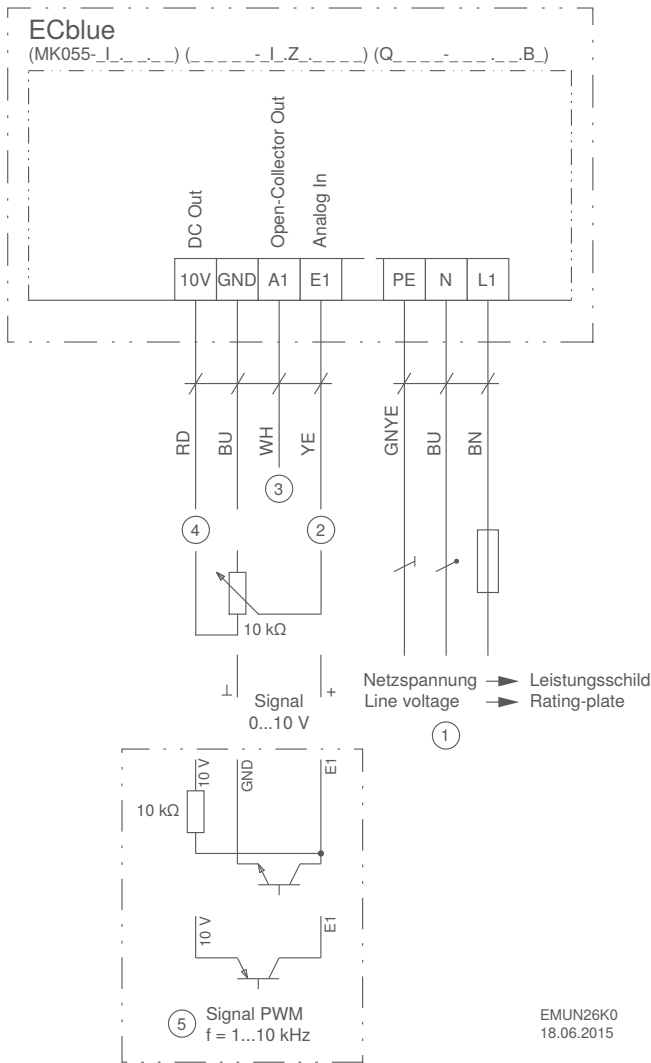


MOEA03K1
 25.05.2012

- ① line voltage
- ② contact load
- ③ external speed setting
- ④ input
- ⑤ PWM

Connection diagrams

1360-404 (EC055)



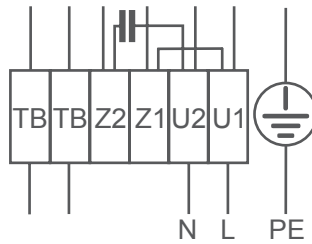
- ① Mains voltage, see rating plate
- ② Input for speed setting via 0...10 V signal / potentiometer ($R_i > 200 \text{ k}\Omega$)
- ③ Tachometer output, open collector ($I_{\text{max}} 10\text{mA}$)
- ④ Voltage supply 10 V DC ($I_{\text{max}} 50 \text{ mA}$)
- ⑤ Speed setting via PWM signal ($f = 1 \dots 10 \text{ kHz}$)

Connection diagrams

AC-Technology

104XA

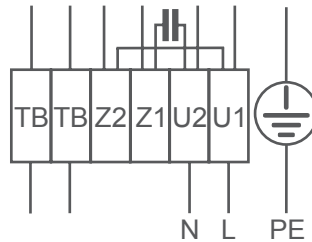
For 1~motor with capacitor and thermostatic switch (if built in).
Airflow direction: V
Direction of rotation: clockwise



Cable colours:
U1 brown
U2 blue
Z1 black
Z2 orange
TB white

104XB

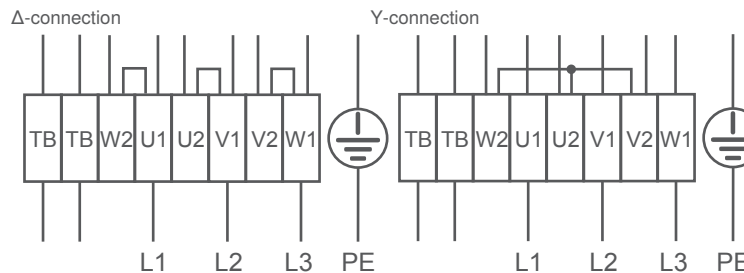
For 1~motor with capacitor and thermostatic switch (if built in).
Airflow direction: A
Direction of rotation: counter clockwise



Cable colours:
U1 brown
U2 blue
Z1 black
Z2 orange
TB white

106XA

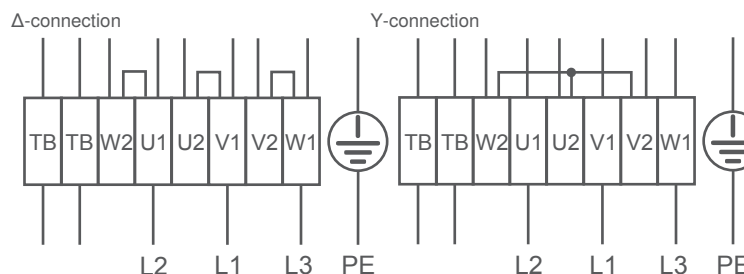
For 3~motor with one speed and thermostatic switch (if built in).
Airflow direction: V
Direction of rotation: clockwise



Cable colours:
U1 brown
V1 blue
W1 black
U2 red
V2 grey
W2 orange
TB white

106XB

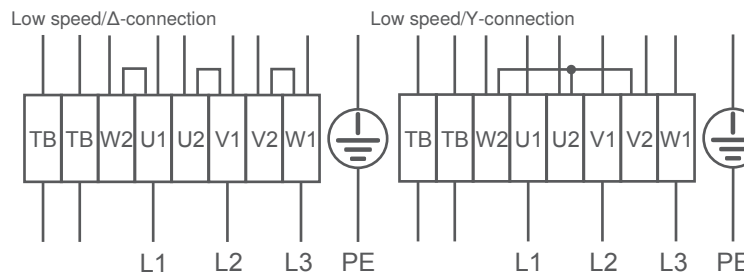
For 3~motor with one speed and thermostatic switch (if built in).
Airflow direction: A
Direction of rotation: clockwise



Cable colours:
U1 brown
V1 blue
W1 black
U2 red
V2 grey
W2 orange
TB white

108XA

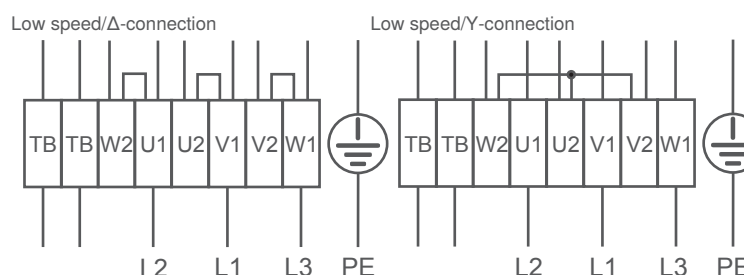
For 3~Motor with 2 speeds (Δ-/Y switch over) and thermostatic switch (if built in). Without bridge when using speed change-over switch.
Direction of air flow: V
Direction of rotation: Clockwise



Cable colours:
U1 brown
V1 blue
W1 black
U2 red
V2 grey
W2 orange
TB white

108XB

For 3~ motor with 2 speeds (Δ-/Y switch over) and thermostatic switch (if built in). Without bridge when using speed change-over switch.
Direction of airflow: A
Direction of rotation: Counter clockwise



Cable colours:
U1 brown
V1 blue
W1 black
U2 red
V2 grey
W2 orange
TB white



Connection diagrams

AC-Technology

177X

1~ Motor with condenser and thermostat switch.

FN Series

Airflow direction: A

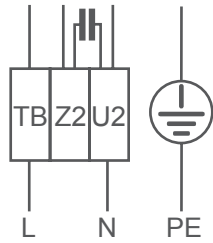
Direction of rotation: Counter-clockwise rotation (looking at rotor)

FB Series

Airflow direction: A

Direction of rotation: clockwise rotation (looking at rotor)

Other speeds possible with capacitors connected in series.



Cable colours:
U2 blue or grey
Z2 black
TB brown

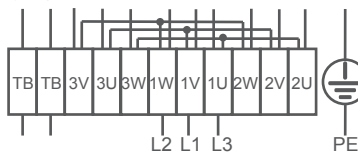
170XB

For 3~ motor with 3 speeds (Dahlander high and low speed, medium speed using $\Delta\Delta/YY$ connection) and thermostat switch (if installed). Without bridge when using pole changing switch.

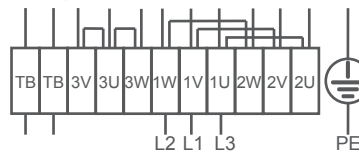
Airflow direction: A

Turning direction: Anticlockwise
Store connection diagram in junction box.

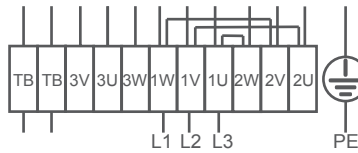
High speed/ $\Delta\Delta$ connection



Medium speed/ YY connection



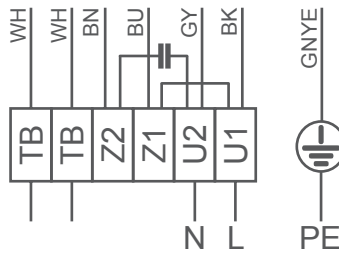
Cable colours:
1U brown
2U black
3U blue
TB white



Low speed/ Δ connection

161XA

For 1~-motor with capacitor and thermostatic switch (if built in).



Cable colours:
U1 black
U2 grey
Z1 blue
Z2 brown
TB white

Installation and usage information

Materials and corrosion protection

Axial fans have an impeller made of high performance composite material or aluminium.

Rotor and stator flange are made of sea water resistant aluminium alloy using a die-casting method.

The fan nozzles are made of hot-dipped thin sheet. ZPlus nozzles consist of high performance composite material.




Additional painting possible upon request and at an extra charge.

Depending on the fan size, motor suspensions are produced as wire support grids or a welded structure with flat steel struts.

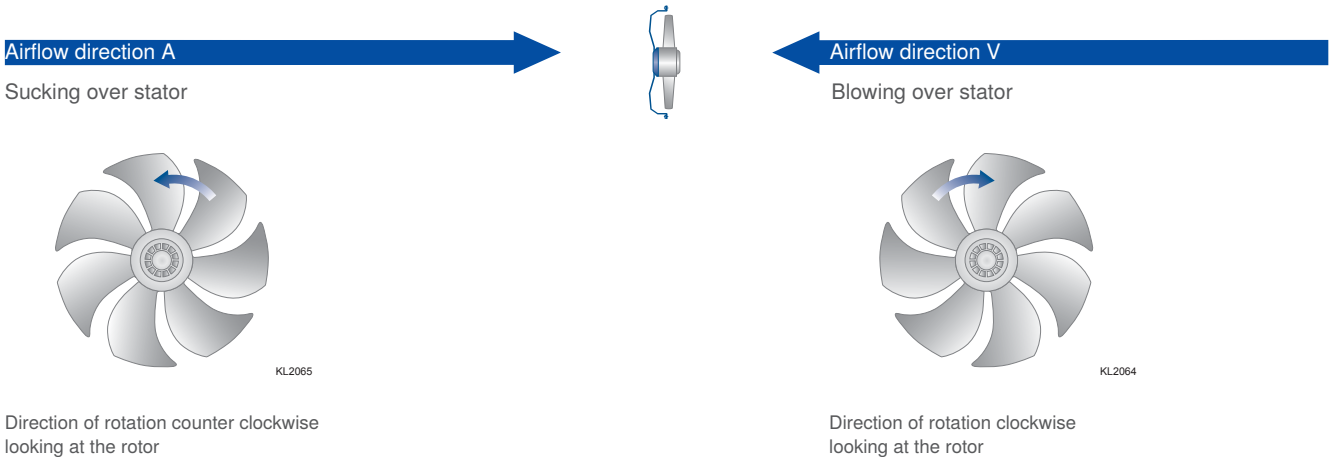
The wire carrying grille and welded structure with flat steel struts are provided with weather resistant plastic coating. Guard grilles for ZPlus are made of stainless steel.

Installation position

The axial fans are usually suitable for all installation positions. For details please see the part-specific documentation.

Shaft horizontal	Shaft vertical Rotor above	Shaft vertical Rotor below
H	Vo	Vu
		

Airflow direction



Installation and usage information

Conditions for use and lifetime

Protective device

The fans may only be operated if installed appropriately for their purpose and when safety is ensured through protective devices as per **DIN EN 13857** or ISO 13852 (**DIN EN ISO 12100**) or by other construction protection measures.

Condensation holes

According to the installation position V_0 (rotor upwards) or V_u (rotor downwards), the condensation hole beneath must be open. In installation position H, condensation can flow through the seal gap between the stator and the rotor.

Operating mode

Continuous operation with occasional starts (S1) according to **DIN EN 60034-1:2011-02**. If the defined temperature $t_{R(\min)}$ of the product is less than -25 °C an occasional starting between -25 °C and the defined minimum temperature is permissible. Continuous operation below -25 °C only with special bearings for refrigeration applications on request.

Permissible minimum and maximum ambient temperature for operation

Please refer to the technical documentation of the product for the minimum and maximum ambient temperature valid for the respective fan. Operation below -25 °C as well as partial load operation for refrigeration applications is only possible with special bearings for refrigeration applications on request. If special bearings for refrigeration applications are installed in the fan, please observe the permissible maximum temperatures in the technical documentation of the product.

Ball-bearing service life

The according to standard calculation methods determined bearing service life expectation of the motor-integrated ball bearings is mainly determined by the grease service life F10h and amounts for standard application to approx. 30.000 – 40.000 operating hours. The fan is maintenance-free due to the use of ball bearings with „lifetime lubrication“. Once the grease operating life F10h has been reached, it may be necessary to replace the bearing. The bearing service life expectation may change compared to the specified value, if operating conditions such as increased vibrations or shocks, increased or too low temperatures, humidity, dirt in the ball bearing or unfavourable control modes are present. A service life calculation for special applications can be provided on request.

Installation and usage information

Guard grille

A guard grille can be included in the scope of delivery if the fan includes a motor suspension or motor suspension with wall ring. The guard grille is on the suction or pressure side of the fan, depending on airflow direction.

The chapter on system components contains separate guard grilles, which can be installed on the exhaust or suction sides of the fan as required, depending on installation position and complying with the safety requirements as per **DIN EN ISO 13857:2008 (tab.4)**. Please observe the section "Influence of guard grilles".



Influence on guard grille

Safety distances set forth to keep out of reach of hazardous areas

DIN EN 13857:2008 (Tab. 4) sets forth the required safety distances to prevent upper limbs from getting into hazardous areas.

The preferred "protective construction" used on axial fans is a guard grille. As a standard feature, the vast majority of our axial fans (S, K, D, W, Q designs) are equipped with a guard grille integrated into the suspension. For fan types featuring a suspension without integrated guard grille, a separate guard grille is available as an optional accessory.

The guard grille results in a resistance to the conveyed airflow, which manifests itself in the pressure loss Δp_{VG} .

The pressure loss Δp_{VG} increases in a linear relationship with a coefficient of resistance ζ_G or squared with the conveyed volume flow rate q_v .

$$\Delta p_{VG} = \zeta_G \cdot \frac{\rho}{2} \cdot \frac{16 \cdot q_v^2}{\pi^2 \cdot d_n^4}$$

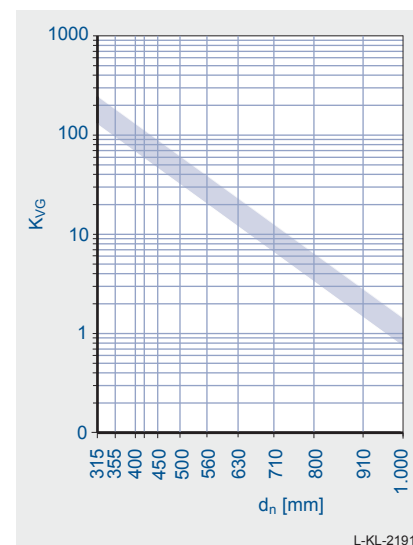
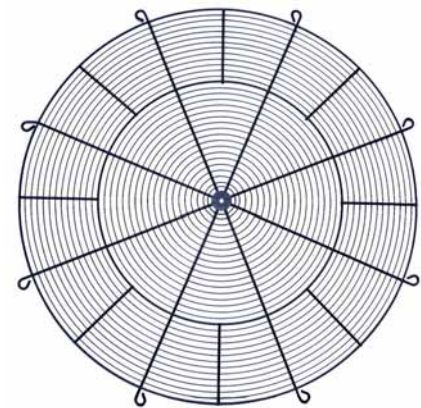
The coefficient of resistance ζ_G is largely determined by the screen design (mesh size, ring spacing), which is set forth in **DIN EN 13857:2008 (Tab. 4)**. The coefficient of resistance for the ZIEHL-ABEGG guard grilles, which was obtained in a series of tests, is within the following range: $\zeta_G = 0.2-0.4$. This covers installation of the guard grille on the intake side as well as the pressure side. The following numerical equation provides an approximate estimate of the pressure loss caused by the guard grille in [Pa]:

$$\Delta p_{VG} = K_{VG} \times 10^{-8} \times q_v^2$$

The loss factor K_{VG} depends on the nominal fan diameter d_n and can be seen in the above diagram. The volume flow rate q_v is inserted in [m³/h].

Note:

FANselect selection program supplies characteristic curves, also including the influence of the guard grille. See <http://www.fanselect.net/>.



L-KL-2191

Factor for loss attributable to the grating K_{VG} as a function of the nominal diameter d_n of the fan



Installation and usage information

Installation instructions

Airflow conditions

When installing fans in the devices, favourable airflow conditions must be maintained; this also applies to compact designs.

The following installation recommendations (Fig. I and II) indicate the required minimum distances.

Fig. I free air intake, connected to outlet side

Fig. II free air outlet, connected to intake side

Fig. III Air inlet nozzles

Please observe recommended gap s between fan blade and inner edge of nozzle

Fig. IV Influence of nozzle shape, comparison of characteristic curves (Fig. IV)

- ① Full nozzle (Design Q)
- ② Short nozzle, see Accessories

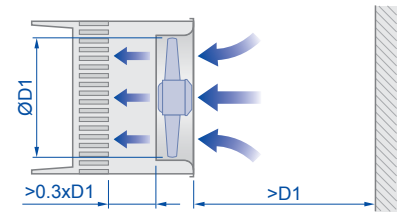


Fig. I

L-KL-2508

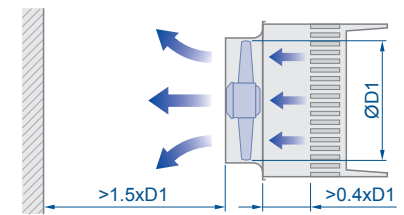


Fig. II

L-KL-2508/1

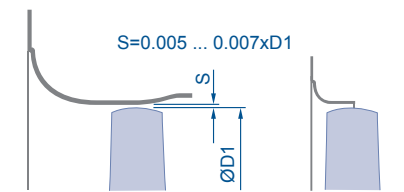


Fig. III

L-KL-2507

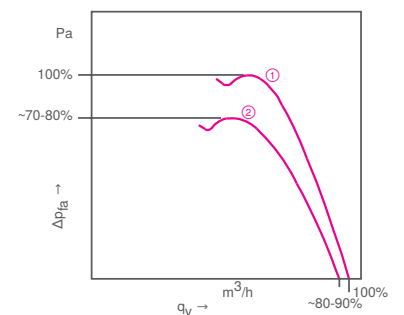


Fig. IV

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General notes

The information and data contained in this catalogue were composed to the best of our best ability and do not absolve the user from its duty to check the suitability of the products with respect to its intended application.

The customer is obligated to inform the supplier about general information concerning the intended use, the type of installation, the operating conditions and any other conditions that need to be taken into consideration if the order is not based on catalogue information.

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The Royal League

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