



Industrie Service

Herewith it is confirmed to the company

**Ziehl-Abegg SE**

in

**D-74653 Künzelsau**

based on the positive results of the completed test of the

**Software**

**„FANselect 1.01 (x)“**

**„FANselect DLL 1.01 (x)“**

**„FANselect web Version 1.01 (x)“**

that the software is suitable to configure fans of the model ranges

**„C“ size 225... 1120**

**„Cpro“ size 250 ... 630**

**„ZAbbluefin“ size 710 ... 1120**

**„ZAbbluefin-ECblue“ size 250 ... 560**

**„ZAvblue-ECblue“ size 250 ... 630**

**under consideration of annex 1 to 7**

according to the RLT-RICHTLINIE Zertifizierung:2017-11  
and is granted the right to label these with the following  
TÜV SÜD Certification Mark.



This certificate is valid until 2020-12-31

Certificate Registration Number: 11/14/100 (Revision 02)



Certification Body for Products  
Refrigeration and Air-Conditioning  
Munich, 2019-03-11



This certificate is valid only in conjunction with the following attachment, consisting of 7 pages.



Industrie Service

**list of the certified fan type C in relating to the calculation accuracy, fan size, nominal motor or overall power**

fan size <sup>1)</sup> -aa-	RH/GR/ER-aa-C-bld.-cc-.1R <sup>2)</sup>		RH/GR/ER-aa-C-bDN.-cc-.dR <sup>3)</sup>	
	calculation accuracy [B 0]			
	EC motor size -cc-	nominal power [kW]	standard motor Size -cc-	nominal power [kW]
22	-	-	071-080 / Ac-Bc	0,55 – 1,1
25	EC090 / Bc	0,5 – 0,8	080-090 / Bc-Dc	0,75 – 2,2
28	EC090 / Bc	0,5 – 0,8	080-100 / Bc-Ec	0,75 – 3,0
	EC116 / Dc	1,1	-	-
31	EC090 / Bc	0,5 – 0,8	080-112 / Bc-Fc	1,1 – 4,0
	EC116 / Dc	0,7 – 3,5	-	-
35	EC116 / Dc	1,3 – 3,6	090-112 / Cc-Fc	1,1 – 4,0
40	EC116 / Dc	1,2 – 2,0	090-132 / Cc-Gc	1,1 – 5,5
	EC152 / Gc	3,4 – 5,4	-	-
45	EC116 / Dc	1,6 – 1,9	090-132 / Cc-Gc	1,1 – 7,5
	EC152 / Gc	3,6 – 5,6	-	-
50	EC152 / Gc	3,6 – 5,8	090-160 / Cc-lc	1,5 – 11,0
56	EC152 / Gc	3,6 – 5,4	090-160 / Cc-lc	1,5 – 11,0
63	EC152 / Gc	3,6 – 5,0	100-160 / Ec-Kc	1,5 – 15,0
71	EC152 / Gc	4,2	112-180 / Fc-Lc	2,2 – 18,5
80	EC152 / Gc	3,9	132-180 / Hc-Mc	4,0 – 22,0
90	-	-	160-180 / lc-Nc	4,0 – 30,0
10	-	-	160-250 / lc-Sc	5,5 – 37,0
11	-	-	200-315 / Nc-Wc	15,0 – 75,0

**legend:**

<sup>1)</sup> size multiplied by 10 gives the standard fan size

<sup>2)</sup> with the EC-motors ECblue

-b- defines the pole number, here „6“-poles, „Z“-10-poles

-d- denote the flange position of the impeller „K“ or „D“

-cc- for ECblue the first patch defines the motor size and the second patch the overall length „A“, „Q“

<sup>3)</sup> with IEC-standard motors ZAmotpremium and ZAmotbasic of the class IE2-IE4

-b- defines the pole number „2“, „4“, „6“ & „8“-poles

-cc- for fans with standard motors the first patch defines the motor size & the length, the second patch defines the type „1“, „4“

-d- denote the variable version of the impeller size 22-11 „1“ as well as 11 „4“





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**list of the certified fan type Cpro in relating to the calculation accuracy, fan size, nominal motor or overall power**

fan size <sup>1)</sup> -aa-	RH/GR/ER-aa-C-bld.-cc-.CR <sup>2)</sup>		RH/GR/ER-aa-C-bDN.-cc-.CR <sup>3)</sup>	
	calculation accuracy [B 0]			
	EC motor size -cc-	nominal power [kW]	standard motor Size -cc-	nominal power [kW]
25	EC090 / Bc	0,5 – 0,8	080–090 / Bc-Dc	0,75 – 2,2
28	EC090 / Bc	0,5 – 0,8	080–100 / Bc-Ec	0,75 – 3,0
	EC116 / Dc	1,1	-	-
31	EC090 / Bc	0,5 – 0,8	080–112 / Bc-Fc	1,1 – 4,0
	EC116 / Dc	0,7 – 3,5	-	-
35	EC116 / Dc	1,3 – 3,6	090–112 / Cc-Fc	1,1 – 4,0
40	EC116 / Dc	1,2 – 2,0	090–132 / Cc-Gc	1,1 – 5,5
	EC152 / Gc	3,4 – 5,4	-	-
45	EC116 / Dc	1,6 – 1,9	090–132 / Cc-Gc	1,1 – 7,5
	EC152 / Gc	3,6 – 5,6	-	-
50	EC152 / Gc	3,6 – 5,8	090–160 / Cc-lc	1,5 – 11,0
56	EC152 / Gc	3,6 – 5,4	090–160 / Cc-lc	1,5 – 11,0
63	EC152 / Gc	3,6 – 5,0	100–160 / Ec-Kc	1,5 – 15,0

**legend:**

<sup>1)</sup> size multiplied by 10 gives the standard fan size

<sup>2)</sup> with the EC-motors ECblue

-b- defines the pole number, here „6“-poles, „Z“-10-poles

-d- denote the flange position of the impeller „K“ or „D“

-cc- for ECblue the first patch defines the motor size and the second patch the overall length „A“-„Q“

<sup>3)</sup> with IEC-standard motors ZAmotpremium and ZAmotbasic of the class IE2-IE4

-b- defines the pole number „2“, „4“, „6“ & „8“-poles

-cc- for fans with standard motors the first patch defines the motor size & the length, the second patch defines the type „1“-„4“





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**list of the certified fan types ZBluefin-ECblue and ZBluefin in relating to the calculation accuracy, fan size, nominal motor or overall power**

fan size <sup>1)</sup> -aa-	RH/GR/ER-aa-l-bld.-cc-.CR <sup>2)</sup>		RH/GR/ER-aa-l-bDN.-cc-.1R
	calculation accuracy [B 0]		
	EC motor size -cc-	nominal power [kW]	impeller without motor
25	EC090 / Bc	0,5 – 0,8	-
28	EC090 / Bc	0,5 – 0,8	-
31	EC090 / Bc	0,5 – 0,8	-
	EC116 / Dc	0,7 – 3,9	-
35	EC116 / Dc	1,5 – 3,3	-
40	EC116 / Dc	1,2 – 3,0	-
	EC152 / Gc	3,0 – 3,9	-
45	EC116 / Dc	1,0 – 2,9	-
	EC152 / Gc	3,6 – 5,2	-
50	EC152 / Gc	3,5 – 5,6	-
56	EC152 / Gc	3,4 – 5,2	-
63	-	-	-
71	-	-	✓
80	-	-	✓
90	-	-	✓
10	-	-	✓
11	-	-	✓

**legend:**

<sup>1)</sup> size multiplied by 10 gives the standard fan size

<sup>2)</sup> with the EC-motors ECblue

-b- defines the pole number, here „6“-poles, „Z“-10-poles

-d- denote the flange position of the impeller „K“ or „D“

-cc- for ECblue the first patch defines the motor size and the second patch the overall length „A“-„Q“





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list of the certified fan type ZAvblue-ECblue in relating to the calculation accuracy, fan size and or overall power		
RH/GR/ER-aa-V-b-IK.-cc-.VR <sup>2)</sup>		
calculation accuracy [B 0]		
fan size <sup>1)</sup> -aa-	EC motor size -cc-	nominal power [kW]
25	EC090 / Bc	0,4 – 0,7
28	EC090 / Bc	0,3 – 0,5
31	EC090 / Bc	0,4 – 0,6
35	EC090 / Bc	0,4 – 0,5
	EC116 / Dc	1,0 – 1,7
40	EC090 / Bc	0,2 - 0,4
	EC116 / Dc	0,9 -1,7
45	EC090 / Bc	0,3 - 0,5
	EC116 / Dc	0,6 - 1,3
	EC152 / Gc	3,3 - 3,4
50	EC090 / Bc	0,2 - 0,3
	EC116 / Dc	0,2 - 1,5
	EC152 / Gc	2,9 - 3,1
56	EC116 / Dc	0,6 - 1,3
	EC152 / Gc	1,7 - 3,5
63	EC152 / Gc	2,0 - 4,6

**legend:**

<sup>1)</sup> size multiplied by 10 gives the standard fan size

<sup>2)</sup> with the EC-motors ECblue

-b- defines the pole number, here „6“-poles, „Z“-10-poles

-cc- for ECblue the first patch defines the motor size and the second patch the overall length „A“-„Q“





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The following specific values of the software were verified

C, Cpro, ZAbbluefin-ECblue, ZAbbluefin and ZAvblue-ECblue			
definition according to the standard DIN EN ISO 5801	definition used in „FANselect“	symbol	unit
volume flow rate	airflow volume	qv	[m <sup>3</sup> /h]
static fan pressure	static pressure	p <sub>sf</sub>	[Pa]
rotational speed	fan speed	n	[min <sup>-1</sup> ]
input power	sys electrical power input <sup>1)</sup>	P <sub>sys</sub>	[W]
input power	electrical power input <sup>2)</sup>	P <sub>1</sub>	[W]
fan shaft power	shaft power <sup>3)</sup>	P <sub>L</sub>	[W]
overall static efficiency fan/motor/drive	system efficiency grade static <sup>1)</sup>	η <sub>sF,sys</sub>	[%]
overall static efficiency fan/motor	efficiency grade static <sup>2)</sup>	η <sub>sF</sub>	[%]
static fan shaft efficiency	impeller efficiency grade static <sup>3)</sup>	η <sub>sF,L</sub>	[%]

legend:

- <sup>1)</sup> certificated value for the fan types C, Cpro, ZAbbluefin-ECblue and ZAvblue-ECblue with EC motor
- <sup>2)</sup> certificated value for the fan types C und Cpro with IE2 and IE4 motor without converter.
- <sup>3)</sup> certificated value for the fan types ZAbbluefin without motor

Table of calculation accuracy

value	deviations of the classes		
	B0	B1	B2
volume flow	± 1 %	± 2,5 %	± 5 %
pressure increase	± 1 %	± 2,5 %	± 5 %
power input	+ 2 %	+ 3 %	+ 8 %
efficiency	- 1 %	- 2 %	- 5 %





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Regarding to the RLT-RICHTLINIE Zertifizierung:2017-11, the correction values listed below must be included into the air handling unit design software.

**Installation losses and fan walls of the fan types and impellers C, Cpro, ZBluefin, ZBluefin-ECblue and ZAvblue-ECblue:**

The certification of the fan design software FANselect 1.01. (x) included the verification of the installation losses according to the RLT-RICHTLINIE Zertifizierung:2017-11, for the fan types and impellers listed in Annex 1 to 4.

If the correction values for the installation losses, of the design software FANselect 1.01., according to the RLT-RICHTLINIE Zertifizierung:2017-11, are used for the fan types specified in Annex 1 to 4, **no** further correction values for the installation losses in the RLT design software must be taken into account.

If the correction values for the installation losses of the design software FANselect 1.01. are not used, the standard correction factors of the RLT-RICHTLINIE Zertifizierung:2017-11 must be used for the fan types and impellers listed in Annex 1 to 4.

**Efficiency of the control equipment of the fan types C, Cpro with standard motor and impellers ZBluefin [f<sub>R</sub>]:**

The measurements carried out to certify the design software of the fan models and impellers mentioned above includes **not** the efficiency of the control device. For the fan models and impellers mentioned above the correction factor of the control device shall be applied to **f<sub>R</sub>=0,97**.

**Efficiency of the control equipment of the fan types C, Cpro with EC motor, ZAvblue-ECblue and ZAvblue-ECblue [f<sub>R</sub>]:**

The measurements carried out to certify the design software of the fan models mentioned above includes the efficiency of the control device. For the fan models mentioned above in combination with the EC motors listed in Annex 1 to 4 the correction factor of the control device shall be applied to **f<sub>R</sub>=1,00**.

**Nominal motor efficiency of the impeller type ZBluefin [f<sub>m</sub>]:**

The measurements carried out to certify the design software of the impellers mentioned above were carried out on bar shaft fan. For impellers mentioned above the correction factor of the nominal motor efficiency shall be applied to **f<sub>m</sub>=0,98**.

**Nominal motor efficiency of the fan types C, Cpro with EC motor, ZAvblue-ECblue and ZAvblue-ECblue [f<sub>m</sub>]:**

The measurements carried out to certify the design software of the fan models mentioned above were carried out with fan and motor combinations. For the fan models mentioned above in combination with the fan and motor combinations listed in Annex 1 to 4 the correction factor of the nominal motor efficiency **f<sub>m</sub>=1,00** shall be applied.





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**Part load efficiency of the impeller type ZBluefin [f<sub>TL</sub>]:**

The measurements carried out to certify the design software of the impeller model mentioned above were not carried out in part load. For the impeller models mentioned above correction factor of the part load efficiency f<sub>TL</sub> shall be calculated as shown below.

**Part load efficiency of asynchronous machines:**

The efficiency in the part load area is calculated with the following correction factors:

In the complete load range (LR) in % with  $f_{TL} = -0.00004 \times (LR)^2 + 0.008 \times (LR) + 0.6$

**Part load efficiency of synchronous machines:**

The efficiency in the part load area is calculated with the following correction factors:

In the load range (LR) < 50% with  $f_{TL} = 0.056 \times \ln (LR) + 0.78$

In the load range ≥ 50% with  $f_{TL} = 1.00$

With:

(LR) load range [%]

**Part load efficiency of the fan types C und C Pro ZAvblue-ECblue and ZAvblue-ECblue [f<sub>TL</sub>]:**

The measurements carried out to certify the design software of the fan models mentioned above were carried out in part load. For the fan models mentioned above the correction factor of the part load f<sub>TL</sub> = 1,0 shall be applied.

**Accuracy class of the fan and impeller types C, Cpro, ZBluefin and ZAvblue-ECblue [f<sub>G</sub>]:**

Due to the accuracy class specified by the manufacturer, the correction class shall be applied to f<sub>G</sub>=1.00.

