

Centriflow Plus

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FläktWoods

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General description



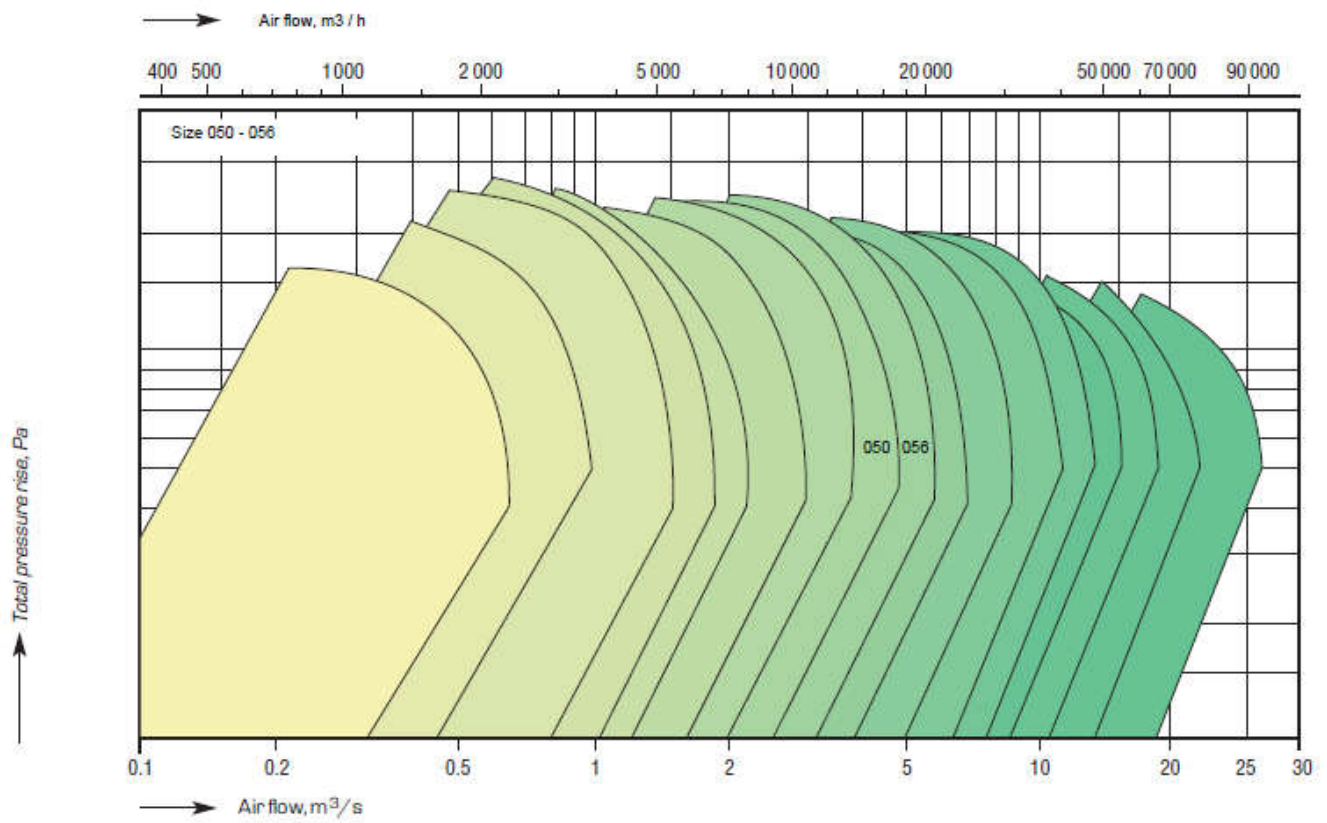
The direct driven CENTRIFLOW Plus plug fans are available in 17 sizes and cover airflows up to 25 m³/s and pressure rises up to 2300 Pa. CENTRIFLOW Plus is characterized by high efficiency. The impeller has backward

curved blades. The CENTRIFLOW Plus is available in two versions, standard and ATEX (sizes 050-056)

for Group II, Category 3G according to Directive 94/9/EC (ATEX-100). The fans are supplied with an integrated air flow sensor with two measuring points as standard.

Fans are supplied in a right-hand version (viewed from the fan inlet)

General survey chart



Design description

Fan Impeller

The impeller is made of sheet steel, welded and painted with 60 µm thick epoxy powder paint, (colour: RAL 6029, green). The impellers are dynamically balanced to ISO Standard 1940 – 1973 G 2.5 (sizes 035 – 140) and G 6.3 (sizes 022 – 031) at the maximum speed. The vibration level of the fan is below 7.1 mm/s RMS.



Fan Inlet

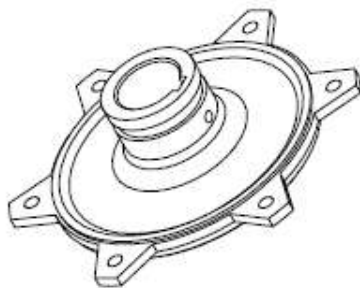
The design of the fan inlet is vitally important to the fan efficiency and the low level of sound generated by the fan. The inlet cones are deep-drawn in one piece and are fitted to the end panel. The inlet cone and end panel are made of galvanized sheet steel.

Motor base with base frame

The motor base is made of galvanized sheet steel or of welded sheet steel and painted with 60 µm thick epoxy powder paint (colour: RAL 7005, dark grey). The base frame is made of galvanized steel (size 022 - 071) or of steel, welded and hot-dip galvanized (size 080 - 140 and sizes 050 - 071 if motor is IEC 160).

Hub

The fan impeller is either equipped with a standard hub (separate for each motor size) or with a taper lock type hub. The standard hub is made of aluminium or welded steel. The taper lock hub (sizes 022-100) is made of cast iron and phosphatised.



Standard hub

Air flow sensor

The air flow sensor is used for measuring the airflow of the plug fans. The method is based on differential pressure. The pressure is measured at a specific point in the inlet cone and the reference pressure is measured upstream of the inlet cone. The air flow sensor is supplied factory mounted in the inlet cone. The airflow is calculated as a function of the coefficient k and the differential manometer reading Δp_m from the expression:

$$Q_v = \frac{1}{k} \times \sqrt{\Delta p_m}$$

Q_v = airflow (m³/s)
 k = coefficient of the fan (k-factor)
 Δp_m = measured pressure difference (Pa)

Fan size	k-factor
Centrimaster Plus	
GPEB-1-050	14,88
GPEB-1-056	11,81

Directive for Machinery

Centriflow Plus is not a product which is ready for use but it is designed for mounting in an air handling unit. The air handling unit manufacturer must follow all instructions according to Directive for Machinery, EMC Directive and Low Voltage Directive as well as use all necessary protective measures.

Design description

CENTRIMETER airflow transmitter



CENTRIMETER provides a simple and accurate means of measuring a fan's airflow. The measuring device is self-calibrating and automatically sets a reference zero point and adjusts itself for changes in ambient temperature. The device allows the user to select the displayed units of measured airflow, either in m^3/s or m^3/h , or differential pressure in Pa.

Airflow is displayed on the device by means of measuring fan differential pressure and converting it to airflow from a constant "k-factor" which varies for each individual type and size. The airflow transmitter is programmed from factory with the k-factors of CENTRIFLOW Plus and CENTRIFLOW plug fans as well as CENTRIMASTER double inlet fans. The type and size of fan connected to the Centrimeter can be easily selected by using the buttons which are located beneath the removable display fascia.

CENTRIMETER also includes two 0...10V output functions, which are proportional to the actual measured airflow or pressure. CENTRIMETER is compact (86,5 x 64,5 x 37 mm) and it is suitable for ambient temperatures of 0 ... +50 °C. Degree of protection is IP54.

Motor

The CENTRIFLOW Plus fans are normally supplied with the motor mounted. The motors used are IEC-standard, three-phase, foot mounted motors. Standard motors are of efficient class Eff2, high-efficiency motors class Eff1 are available to request. The motors are available with bimetal thermocontact or with thermistor. The motors are specified in a separate motor table for each fan size.

Integral motors



The integral motors are 3-phase motors with integrated frequency converter. No separate motor cable between the frequency converter and the motor is needed because the frequency converter is mounted on the motor. An EMC filter is built into the frequency converter. Integral motors are well suited for fan operation due to the low level of sound that they generate.

The integral motors are fully programmed with the appropriate fan and motor parameters and have Degree of Protection IP55. Installation instructions together with a list of relevant parameters are included in the supply. The EMC level of the integral motors complies with EN Standard EN 61800-3 (Environmental Class 1, restricted distribution).

The integral motors do not have any thermal overload sensors in their motor windings. The frequency converter instead manages this protective motor function.

For more information please see separate leaflet "Integral motors".

Design description



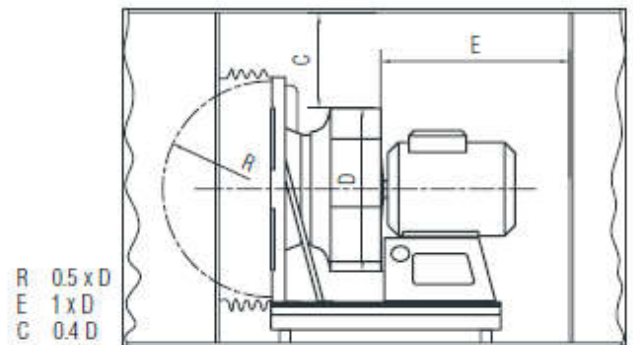
Plug fan in ATEX version

CENTRIFLOW Plus is available in ATEX version (sizes 022-100) for Group II, Category 3G according to Directive 94/9/EC (ATEX-100). Inlet cone is made of brass or copper and the gap between impeller and inlet cone is according to the Directive. ATEX version comes with a flame-proof motor type Exde IIB T4 and is suitable for potentially explosive atmospheres surrounding it also together with a frequency converter. These motors are equipped with thermistor.

If necessary an IP20 inlet protective screen should be used.

Centriflow Plus in ATEX version is not a product which is ready for use but it is designed for mounting in an air handling unit. The air handling unit manufacturer must follow all instructions according to Directive 94/9/EC, Directive for Machinery, EMC Directive and Low Voltage Directive as well as use all necessary protective measures.

Recommended distances to other components



Tolerances and quality

Tolerances

The particulars of the fans are given with the tolerance specified in DIN 24 166, Class 2. The fan curves have been plotted for the max. permissible speed of rotation (with frequency inverter) for each motor size.

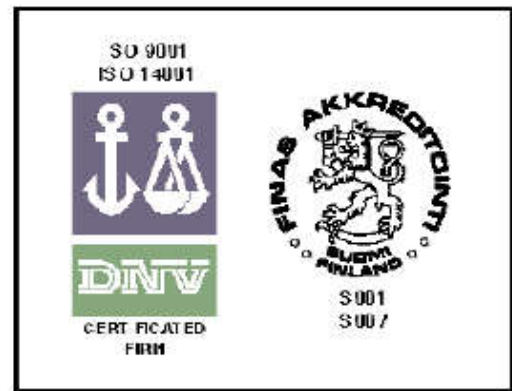
DIN 24166	Tolerance class		
	1	2	3
Air flow q_v :	±2,5%	±5,0%	±10,0%
Pressure rise, Δp_c :	±2,5%	±5,0%	±10,0%
Shaft power demand *, P:	+3,0%	+8,0%	+16,0%
Efficiency **, η :	-2,0%	-5,0%	-
A-weighted sound power level*, L_{WA} :	+3 dB	+4 dB	+6 dB

* Negative tolerance permissible

** Positive tolerance permissible

Quality to ISO 9001 and ISO 14001

The production process at Fläkt Woods Oy is certified to ISO 9001 and the responsibility for quality control is documented in every phase from product development to production, procurement and sales. Our environmental protection system is certificated to ISO 14001. Our ambition is to minimize the impact of our business operations and our products on the environment.



Fan performance has been measured in accordance with ISO 5801 and 13347-2.

Fan charts – acoustic data – GPEB – 050

Direct-driven, Single-inlet,
backward-inclined blades

Impeller diameter: 500 mm



Flakt Woods Korea Ltd. certifies that the fans shown hereon are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program.

RPM	Pt (mmAq)	Ps (mmAq)	Q (m ³ /min)	H (kW)	etat (%)	etas (%)	LwA (dB)
1,080	8,9	5,9	111,8	0,34	48,16	31,73	82
1,080	12,4	9,7	107,4	0,38	57,86	44,91	80
1,080	21,0	18,8	95,7	0,46	71,20	63,78	78
1,080	27,0	25,3	84,8	0,50	74,10	69,38	76
1,080	30,3	28,9	77,5	0,52	73,77	70,28	76
1,080	34,2	33,2	67,0	0,52	71,97	69,73	76
1,080	37,2	36,5	54,2	0,50	65,92	64,67	76
1,180	10,6	7,0	122,1	0,44	48,16	31,73	84
1,180	14,9	11,5	117,3	0,49	57,86	44,91	83
1,180	25,1	22,5	104,6	0,60	71,20	63,78	81
1,180	32,2	30,2	92,7	0,66	74,10	69,38	79
1,180	36,2	34,5	84,7	0,68	73,77	70,28	79
1,180	40,9	39,6	73,2	0,68	71,97	69,73	79
1,180	44,4	43,6	59,3	0,65	65,92	64,67	79
1,280	12,5	8,2	132,5	0,56	48,16	31,73	86
1,280	17,5	13,6	127,3	0,63	57,86	44,91	85
1,280	29,6	26,5	113,5	0,77	71,20	63,78	83
1,280	37,9	35,5	100,5	0,84	74,10	69,38	81
1,280	42,6	40,6	91,9	0,87	73,77	70,28	81
1,280	48,1	46,6	79,4	0,87	71,97	69,73	81
1,280	52,3	51,3	64,3	0,83	65,92	64,67	81
1,380	14,5	9,6	142,8	0,70	48,16	31,73	88
1,380	20,3	15,8	137,2	0,79	57,86	44,91	87
1,380	34,4	30,8	122,3	0,96	71,20	63,78	85
1,380	44,1	41,3	108,4	1,05	74,10	69,38	83
1,380	49,5	47,1	99,1	1,09	73,77	70,28	83
1,380	55,9	54,1	85,6	1,09	71,97	69,73	83
1,380	60,8	59,6	69,3	1,04	65,92	64,67	83
1,480	16,7	11,0	153,2	0,87	48,16	31,73	89
1,480	23,4	18,1	147,2	0,97	57,86	44,91	88
1,480	39,5	35,4	131,2	1,19	71,20	63,78	87
1,480	50,7	47,5	116,2	1,30	74,10	69,38	85
1,480	56,9	54,2	106,3	1,34	73,77	70,28	85
1,480	64,3	62,3	91,8	1,34	71,97	69,73	85
1,480	69,9	68,6	74,3	1,29	65,92	64,67	85
1,580	19,0	12,5	163,5	1,06	48,16	31,73	91
1,580	26,6	20,7	157,1	1,18	57,86	44,91	90
1,580	45,0	40,3	140,1	1,45	71,20	63,78	89
1,580	57,8	54,1	124,1	1,58	74,10	69,38	87
1,580	64,9	61,8	113,4	1,63	73,77	70,28	87
1,580	73,2	71,0	98,0	1,63	71,97	69,73	87
1,580	79,6	78,1	79,4	1,57	65,92	64,67	87
1,680	21,5	14,2	173,9	1,27	48,16	31,73	93
1,680	30,1	23,4	167,1	1,42	57,86	44,91	92
1,680	50,9	45,6	148,9	1,74	71,20	63,78	90
1,680	65,3	61,1	131,9	1,90	74,10	69,38	89
1,680	73,3	69,9	120,6	1,96	73,77	70,28	89
1,680	82,8	80,2	104,2	1,96	71,97	69,73	89
1,680	90,0	88,3	84,4	1,88	65,92	64,67	89
1,780	24,16	15,92	184,2	1,51	48,10	31,70	95
1,780	33,81	26,24	177,0	1,69	57,90	44,90	94
1,780	57,16	51,20	157,8	2,07	70,90	63,50	92
1,780	73,31	68,64	139,8	2,26	73,90	69,20	91
1,780	82,31	78,42	127,8	2,33	73,80	70,30	91
1,780	92,96	90,07	110,4	2,33	71,80	69,60	91
1,780	101,08	99,17	89,4	2,24	65,80	64,60	90
1,880	27,0	17,8	194,5	1,78	48,16	31,73	96
1,880	37,7	29,3	186,9	1,99	57,86	44,91	95
1,880	63,8	57,1	166,7	2,44	71,20	63,78	94
1,880	81,8	76,6	147,7	2,66	74,10	69,38	92
1,880	91,8	87,5	135,0	2,75	73,77	70,28	92
1,880	103,7	100,5	116,6	2,75	71,97	69,73	92
1,880	112,8	110,6	94,4	2,64	65,92	64,67	92
1,980	29,9	19,7	204,9	2,08	48,16	31,73	97
1,980	41,8	32,5	196,9	2,33	57,86	44,91	96
1,980	70,7	63,4	175,5	2,85	71,20	63,78	95
1,980	90,7	84,9	155,5	3,11	74,10	69,38	94
1,980	101,8	97,0	142,2	3,21	73,77	70,28	93
1,980	115,0	111,4	122,8	3,21	71,97	69,73	93
1,980	125,1	122,7	99,4	3,08	65,92	64,67	93

- Performance certified is for Installation type B-free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). Power rating (kW) does not include transmission losses.
- The A-weighted sound ratings shown have been calculated per AMCA Standard 301. Values shown are for outlet LwoA sound power levels for installation type B-free inlet, ducted outlet.

Fan charts – acoustic data – GPEB – 056

Direct-driven, Single-inlet, backward-inclined blades

Impeller diameter: 560 mm



Flakt Woods Korea Ltd. certifies that the fans shown hereon are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and 311 and comply with the requirements of the AMCA Certified Ratings Program.

RPM	Pt (mmAq)	Ps (mmAq)	Q (m³/min)	H (kW)	etat (%)	etas (%)	LwA (dB)
1,080	16,6	12,3	146,0	0,68	58,62	43,32	87
1,080	25,0	21,4	133,6	0,80	68,18	58,35	82
1,080	30,3	27,1	124,1	0,86	71,02	63,71	80
1,080	35,9	33,4	112,9	0,91	72,54	67,37	79
1,080	41,8	40,0	96,8	0,93	70,88	67,69	79
1,080	46,1	44,9	78,6	0,90	65,74	63,97	80
1,080	46,6	45,5	73,9	0,87	64,63	63,12	80
1,180	19,8	14,6	159,5	0,88	58,62	43,32	89
1,180	29,9	25,6	146,0	1,04	68,18	58,35	84
1,180	36,1	32,4	135,6	1,13	71,02	63,71	82
1,180	42,9	39,8	123,3	1,19	72,54	67,37	81
1,180	49,9	47,7	105,8	1,22	70,88	67,69	81
1,180	55,1	53,6	85,9	1,18	65,74	63,97	82
1,180	55,6	54,3	80,7	1,14	64,63	63,12	82
1,280	23,3	17,2	173,0	1,12	58,62	43,32	91
1,280	35,1	30,1	158,3	1,33	68,18	58,35	86
1,280	42,5	38,1	147,1	1,44	71,02	63,71	84
1,280	50,5	46,9	133,8	1,52	72,54	67,37	83
1,280	58,8	56,1	114,8	1,56	70,88	67,69	83
1,280	64,8	63,0	93,2	1,50	65,74	63,97	84
1,280	65,5	63,9	87,6	1,45	64,63	63,12	85
1,380	27,1	20,0	186,5	1,41	58,62	43,32	92
1,380	40,8	34,9	170,7	1,67	68,18	58,35	88
1,380	49,4	44,3	158,6	1,80	71,02	63,71	86
1,380	58,7	54,5	144,2	1,91	72,54	67,37	85
1,380	68,3	65,2	123,7	1,95	70,88	67,69	85
1,380	75,3	73,3	100,5	1,88	65,74	63,97	87
1,380	76,1	74,3	94,4	1,82	64,63	63,12	87
1,480	31,2	23,0	200,0	1,74	58,62	43,32	94
1,480	47,0	40,2	183,1	2,06	68,18	58,35	90
1,480	56,8	51,0	170,1	2,22	71,02	63,71	88
1,480	67,5	62,7	154,7	2,35	72,54	67,37	86
1,480	78,6	75,0	132,7	2,40	70,88	67,69	86
1,480	86,6	84,3	107,8	2,32	65,74	63,97	89
1,480	87,5	85,5	101,3	2,24	64,63	63,12	90
1,580	35,5	26,2	213,6	2,11	58,62	43,32	96
1,580	53,5	45,8	195,5	2,51	68,18	58,35	92
1,580	64,8	58,1	181,6	2,71	71,02	63,71	89
1,580	76,9	71,4	165,1	2,86	72,54	67,37	88
1,580	89,6	85,5	141,7	2,92	70,88	67,69	88
1,580	98,7	96,1	115,0	2,82	65,74	63,97	92
1,580	99,8	97,4	108,1	2,73	64,63	63,12	92
1,680	40,1	29,7	227,1	2,54	58,62	43,32	98
1,680	60,5	51,8	207,8	3,01	68,18	58,35	93
1,680	73,2	65,7	193,1	3,25	71,02	63,71	91
1,680	86,9	80,7	175,6	3,44	72,54	67,37	90
1,680	101,2	96,7	150,6	3,52	70,88	67,69	90
1,680	111,6	108,6	122,3	3,39	65,74	63,97	94
1,680	112,8	110,1	115,0	3,28	64,63	63,12	95
1,780	45,06	33,30	240,6	3,02	58,60	43,30	99
1,780	67,93	58,14	220,2	3,59	68,00	58,20	95
1,780	82,21	73,75	204,6	3,87	70,90	63,60	92
1,780	97,60	90,64	186,0	4,09	72,30	67,20	92
1,780	113,66	108,55	159,6	4,18	70,50	67,40	91
1,780	125,29	121,92	129,6	4,04	65,40	63,70	96
1,780	126,62	123,65	121,8	3,90	64,20	62,80	97
1,880	50,3	37,1	254,1	3,56	58,62	43,32	100
1,880	75,8	64,9	232,6	4,22	68,18	58,35	96
1,880	91,7	82,3	216,1	4,56	71,02	63,71	94
1,880	108,9	101,1	196,4	4,82	72,54	67,37	93
1,880	126,8	121,1	168,6	4,93	70,88	67,69	93
1,880	139,8	136,0	136,9	4,76	65,74	63,97	97
1,880	141,2	137,9	128,6	4,59	64,63	63,12	98
1,980	55,8	41,2	267,6	4,16	58,62	43,32	101
1,980	84,1	71,9	244,9	4,93	68,18	58,35	97
1,980	101,7	91,3	227,6	5,33	71,02	63,71	95
1,980	120,8	112,2	206,9	5,63	72,54	67,37	94
1,980	140,6	134,3	177,5	5,76	70,88	67,69	94
1,980	155,0	150,9	144,2	5,56	65,74	63,97	98
1,980	156,7	153,0	135,5	5,37	64,63	63,12	99

- Performance certified is for Installation type B-free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). Power rating (kW) does not include transmission losses.
- The A-weighted sound ratings shown have been calculated per AMCA Standard 301. Values shown are for outlet LwoA sound power levels for installation type B-free inlet, ducted outlet.

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