

8300101240
VBS0310SSPFS

EC centrifugal fan - RadiCal

backward-curved, single-intake

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Nominal data

Item	8300101240	
Motor	E09002-28	
Phase		1~
Nominal voltage	VAC	230
Nominal voltage range	VAC	200 .. 277
Frequency	Hz	50/60
Method of obtaining data		ml
Status		prelim.
Speed (rpm)	min ⁻¹	2440
Power consumption	W	500
Current draw	A	2.2
Min. ambient temperature	°C	-40
Max. ambient temperature	°C	60

ml = Max. load · me = Max. efficiency · fa = Free air · cs = Customer specification · ce = Customer equipment
Subject to change

Data according to Commission Regulation (EU) 327/2011 (prEN 17166)

		Actual	Req. 2015			
01 Overall efficiency η_{es}	%	68.3	48.3	09 Power consumption P_{ed}	kW	0.5
02 Measurement category		A		09 Air flow q_v	m ³ /h	2525
03 Efficiency category		Static		09 Pressure increase p_{fs}	Pa	442
04 Efficiency grade N		82	62	10 Speed (rpm) n	min ⁻¹	2445
05 Variable speed drive		Yes		11 Specific ratio*		1.00

Data obtained at optimum efficiency level.

* Specific ratio = $1 + p_{fs} / 100\,000\text{ Pa}$

LU-225999

The efficiency values displayed for achieving conformity with the Ecodesign Regulation EU 327/2011 has been reached with defined air duct components (e.g. inlet rings).
The dimensions must be requested from ebm-papst. If other air conduction geometries are used on the installation side, the ebm-papst evaluation loses its validity/the conformity must be confirmed again.
The product does not fall within the scope of Regulation (EU) 2019/1781 due to the exception specified in Article 2 (2a) (motors completely integrated into a product).

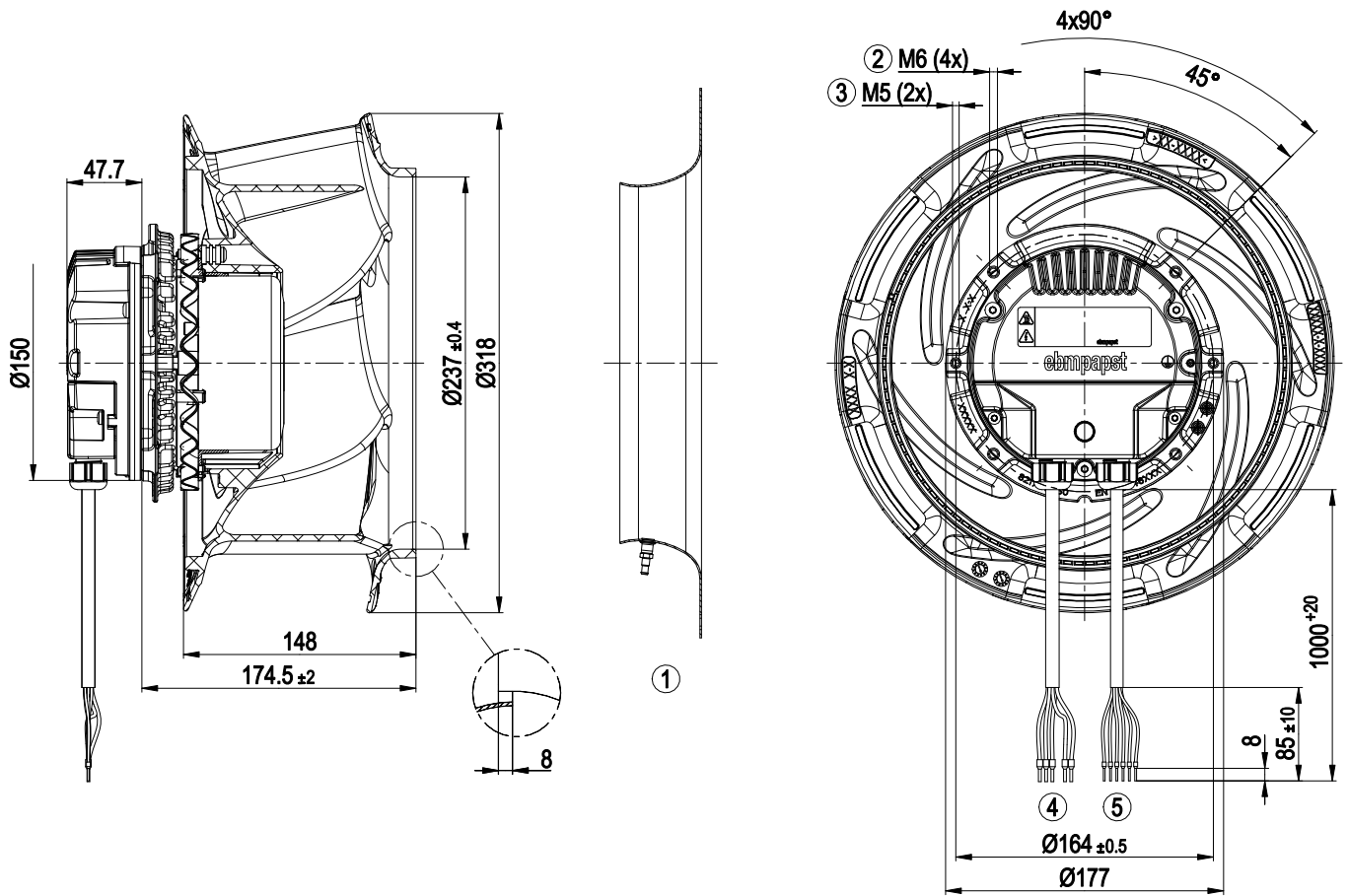
Technical description

Size	310 mm
Motor size	90
Rotor surface	Painted black
Electronics housing material	Die-cast aluminum
Impeller material	PP plastic
Number of blades	5
Direction of rotation	Clockwise, viewed toward rotor
Degree of protection	IP55
Insulation class	"F"
Moisture (F) / Environmental (H) protection class	H1 = Moist – occasional or constantly high level of humidity
Ambient temperature note	Occasional start-up at temperatures between -40°C and -25°C is permitted. For continuous operation at ambient temperatures below -25°C (such as refrigeration applications), use must be made of a fan design with special low-temperature bearings.
Max. permitted ambient temp. for motor (transport/storage)	+80 °C
Min. permitted ambient temp. for motor (transport/storage)	-40 °C
Installation position	Shaft horizontal or rotor on bottom; rotor on top on request
Condensation drainage holes	On rotor side
Mode	S1
Motor bearing	Ball bearing
Technical features	- Output 10 VDC, max. 10 mA - Operation and alarm display with LED - Locked-rotor detection - Speed control - External 15-30 VDC input (parameterization) - Alarm relay - Configurable inputs/outputs (I/O) - Power limiter - Motor current limitation - PFC, active - RS-485 MODBUS-RTU - Soft start - Control interface with SELV potential safely disconnected from the mains - Temperature derating - Thermal overload protection for electronics/motor - Line undervoltage / phase failure detection
Power Factor Correction (PFC)	Active
Touch current according to IEC 60990 (measuring circuit Fig. 4, TN system)	<= 3.5 mA
Motor protection	Electronic motor protection
With cable	Lateral
Protection class assignment	I; If a protective earth is connected. The built-in component has several local protection class assignments. The final protection class is determined by the intended installation.
Conformity with standards	EN 60335-1; EN 61800-5-1; CE; UKCA
Approval	CSA C22.2 No. 77 + CAN/CSA-E60730-1; UL 1004-7 + 60730-1

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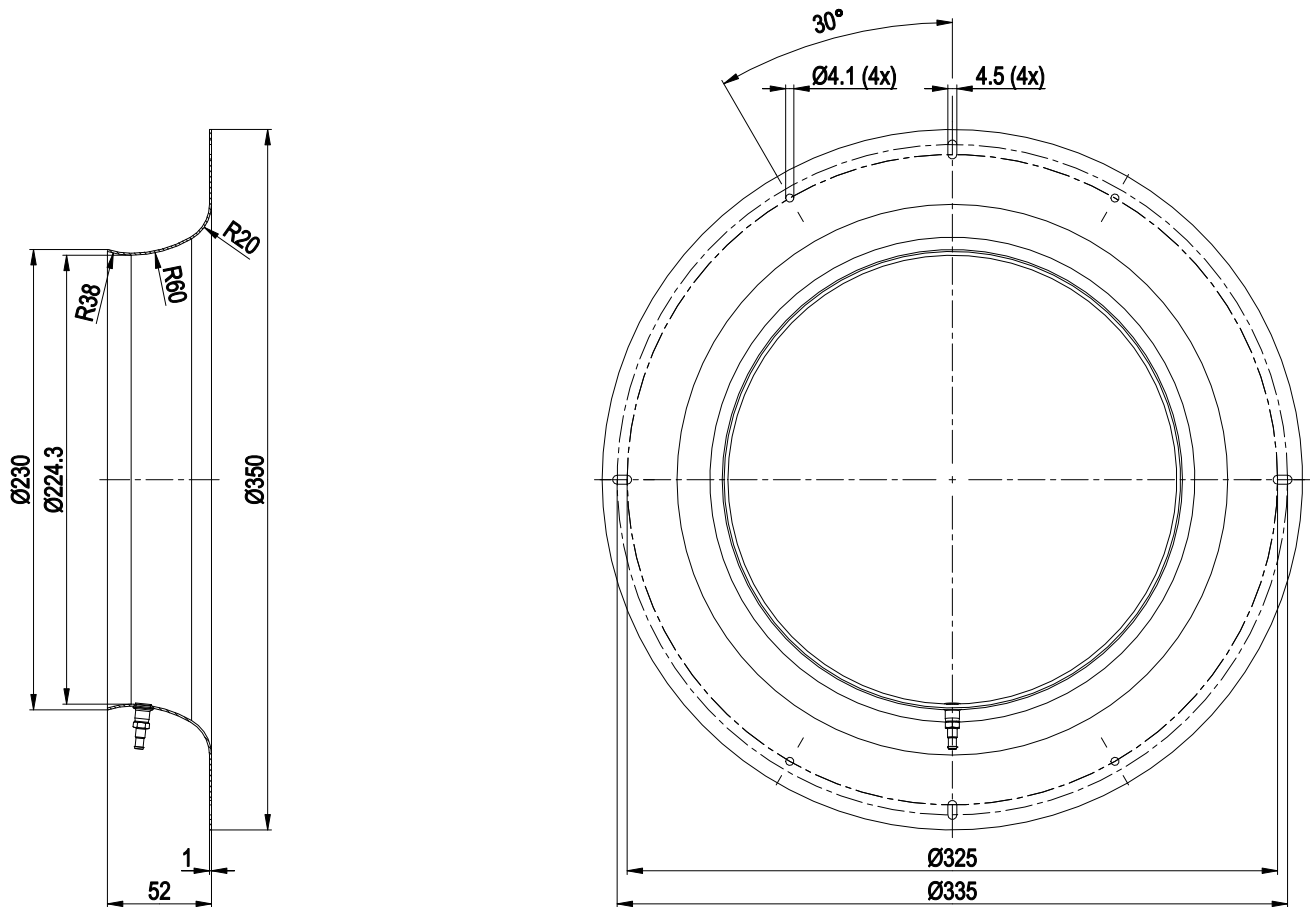
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Product drawing



1	Accessory part: Inlet ring 31555-2-4013 with pressure tap (k-factor: 128) not included in scope of delivery
2	Max. clearance for screw 10 mm
3	Max. clearance for screw 10 mm
	The M5 tapped holes (2x) can be used to attach hoisting equipment.
4	Supply line (PWR) PVC AWG18
	5x wire-end ferrule
5	Control wire (CTRL) PVC AWG22
	6x wire-end ferrule

Accessory part

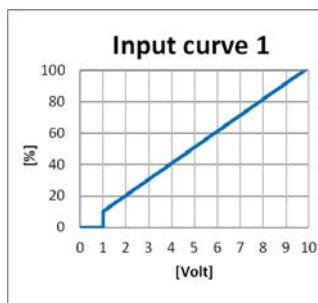


Inlet ring 31555-2-4013 with pressure tap (k-factor: 128)

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Connection diagram

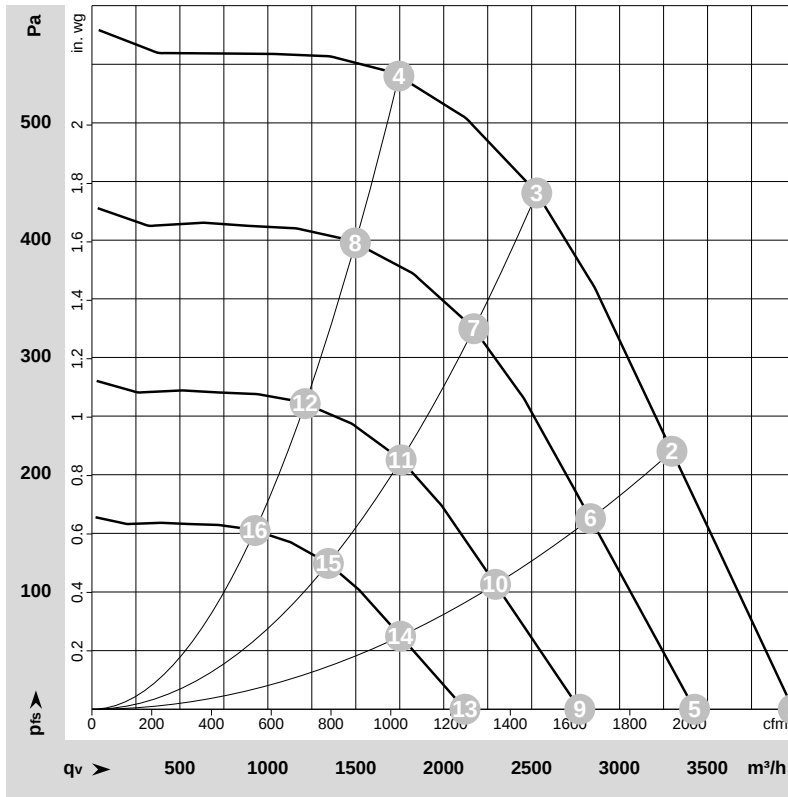


No.	Conn.	Designation	Color	Function/assignment
	PWR	PE	green/yellow	Protective earth
	PWR	L	black	Power supply, phase, see nameplate for voltage range
	PWR	N	blue	Power supply, neutral conductor, see nameplate for voltage range
	PWR	COM	orange	Status relay, floating status contact, common connection, contact rating 250 VAC / 2 A (AC1) / min. 10 mA, reinforced insulation on supply side and on control interface side
	PWR	NC	orange	Status relay, floating status contact, break for failure
	CTRL	GND	blue	Reference ground for control interface, SELV
	CTRL	Vout	red	Voltage output 10 VDC +/-3%, I _{max} =10 mA Short-circuit-proof, power supply for external devices, SELV alternative: 15-30 VDC input for parameterization via MODBUS without line voltage
	CTRL	IO1	yellow	Factory setting: Analog input 0-10 V / PWM, R _i =100 kΩ, function: set value Characteristic curve parameterizable (see input characteristic curve "Input curve 1"), SELV Function parameterizable (see table Optional interface functions)
	CTRL	IO2	white	Factory setting: Open collector output, U _{max} =50 VDC, I _{max} =20 mA, function:Tacho output 1 pulse/revolution, SELV Function parameterizable (see table Optional interface functions)
	CTRL	RSA	gray	RS-485 interface for MODBUS RSA, SELV dielectric strength to MODBUS RSB +/-14 V, dielectric strength to GND +/-7 V
	CTRL	RSB	brown	RS-485 interface for MODBUS RSB, SELV dielectric strength to MODBUS RSA +/-14 V, dielectric strength to GND +/-7 V
		LED		green: status = good, ready for operation orange: status = warning red: status = failure

Terminal/plug assignment

Medium (M2)		Functions and parameter description		MODBUS V7.1	
configurable IO mode		electrical specification		MODBUS Register for IO mode configuration	
IO1	◦ Din1 (high active): digital input	active: applied voltage 3.5 - 50 VDC not active: pin open or applied voltage < 1.5 VDC, SELV active: applied voltage < 1.5 VDC not active: pin open or applied voltage 3.5 - 50 VDC, SELV Ri = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV Ri = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV	analog input	D159 [0]	configurable IO functions: normal / inverse
	◦ Din1 (low active): digital input			D158 [1]	
	◦ Ain1 0-10 V/PWM: analog input			D158 [2]	
	◦ Ain1 0-10 V/PWM (with pull up): analog input			D158 [9]	
IO2	◦ Din1 (active high): digital input	active: applied voltage 3.5 - 50 VDC not active: pin open or applied voltage < 1.5 VDC, SELV Ri = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV Umax = 50 VDC, Imax = 20 mA, SELV Umax = 50 VDC, Imax = 20 mA, SELV Umax = 50 VDC, Imax = 20 mA, SELV Umax = 50 VDC, Imax = 20 mA, SELV Umax = 50 VDC, Imax = 20 mA, SELV	digital input	D159 [0]	
	◦ Ain1 0-10 V/PWM: analog input			D159 [2]	
	◦ Tach out (open collector)			D159 [5]	
	◦ Diagnostics out (open collector)			D159 [6]	
	◦ Alarm out (open collector)			D159 [10]	
	◦ Autoaddressing pulse output (open collector)			D159 [11]	
RSA RSB	◦ DCI-output (open collector)	MODBUS RTU, parameter specification V7.1, SELV		D159 [12]	
COM NC	Relay	250 VAC / 2 A (AC1)			
Vout	Voltage output	Voltage 10 VDC, SELV			
	Alternatively: Input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	15 - 30 VDC			
configurable IO functions: normal / inverse		INPUT		OUTPUT	
D101 [...]	source: set value			signal: status	
D147 [...]	source: sensor value			signal: run monitoring	
D104 [...]	switch: parameter set: #1 / #2			signal: fan modulation level %	
D12E [...]	switch: control function: heating (pos.) / cooling (neg.)			signal: actual speed 1/min	
D148 [...]	switch: direction of rotation: cw / ccw			signal: system modulation level %	
D16C [...]	switch: set value source			signal: remote control output 0-10 V	
D16A [...]	switch: fan enable / disable			signal: output pulses autoaddressing	
D00C [1]	source: input pulses autoaddressing			signal: DCI out	
D638 [...]	source: DCI in			signal: output pulses autoaddressing	
selection direct via IO	signal: tach out			signal: alarm out	
	signal: diagnostics out			signal: fan modulation level %	
	signal: tach out			signal: actual speed 1/min	
	signal: diagnostics out			signal: system modulation level %	
D618	signal: tach out			signal: remote control output 0-10 V	
D130 [4]	signal: output pulses autoaddressing			signal: run monitoring	
D130 [0]	signal: fan modulation level %			signal: status	

Curves: Air performance 50 Hz



$$\rho = 1.15 \text{ kg/m}^3 \pm 2 \%$$

Measurement: LU-225999-1
Date: 2023-08-04
Nozzle: 31550-2-4013

Air performance measured according to ISO 5801 installation category A. For detailed information on the measurement setup, contact ebm-papst. Intake sound level: Sound power level according to ISO 13347 / sound pressure level measured at 1 m distance from fan axis. The values given are valid under the specified measuring conditions and may vary due to conditions of installation. For deviations from the standard configuration, the parameters have to be checked on the installed unit.

Measured values

	Wired	U	f	n	P _e	I	LpA _{in}	LwA _{in}	LwA _{out}	LwA	q _V	P _{fs}	q _V	P _{fs}
		V	Hz	min ⁻¹	W	A	dB(A)	dB(A)	dB(A)	dB	m ³ /h	Pa	cfm	in. wg
1	1~	230	50	2445	344	1.55	71	78	82	83	3990	0	2345	0.00
2	1~	230	50	2445	454	2.02	68	75	81	82	3300	220	1940	0.88
3	1~	230	50	2445	501	2.21	65	72	78	79	2530	440	1490	1.77
4	1~	230	50	2445	485	2.14	67	74	79	80	1745	540	1025	2.17
5	1~	230	50	2100	218	0.98	67	74	78	80	3425	0	2015	0.00
6	1~	230	50	2100	289	1.28	64	71	77	78	2835	163	1670	0.65
7	1~	230	50	2100	317	1.40	61	68	74	75	2170	325	1280	1.30
8	1~	230	50	2100	306	1.35	63	70	75	76	1500	398	880	1.60
9	1~	230	50	1700	116	0.52	62	69	73	74	2775	0	1635	0.00
10	1~	230	50	1700	153	0.68	59	66	71	72	2295	107	1350	0.43
11	1~	230	50	1700	168	0.74	56	63	69	70	1760	213	1035	0.86
12	1~	230	50	1700	163	0.72	57	65	70	71	1210	261	715	1.05
13	1~	230	50	1300	52	0.23	55	62	66	68	2120	0	1250	0.00
14	1~	230	50	1300	68	0.30	52	59	65	66	1755	62	1035	0.25
15	1~	230	50	1300	75	0.33	49	56	62	63	1345	124	790	0.50
16	1~	230	50	1300	73	0.32	51	58	63	64	925	152	545	0.61

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · P_e = Power consumption · I = Current draw · LpA_{in} = Sound pressure level intake side · LwA_{in} = Sound power level intake side
LwA_{out} = Sound power level outlet side · q_V = Air flow · P_{fs} = Pressure increase