

8300100888
VBS0500CSPFS

EC centrifugal fan - RadiPac

backward-curved, single-intake

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Nominal data

Item	8300100888	
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	1050
Power consumption	W	370
Current draw	A	1.6
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}	%	67.5	46.9	09 Power consumption P_{ed}	kW	0.36
02 Measurement category		A		09 Air flow q_v	m³/h	4050
03 Efficiency category		Static		09 Pressure increase p_{fs}	Pa	196
04 Efficiency grade N		82.6	62	10 Speed (rpm) n	min ⁻¹	1050
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-224474

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

Weight	7.4 kg
Size	500 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 - MODBUS - 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

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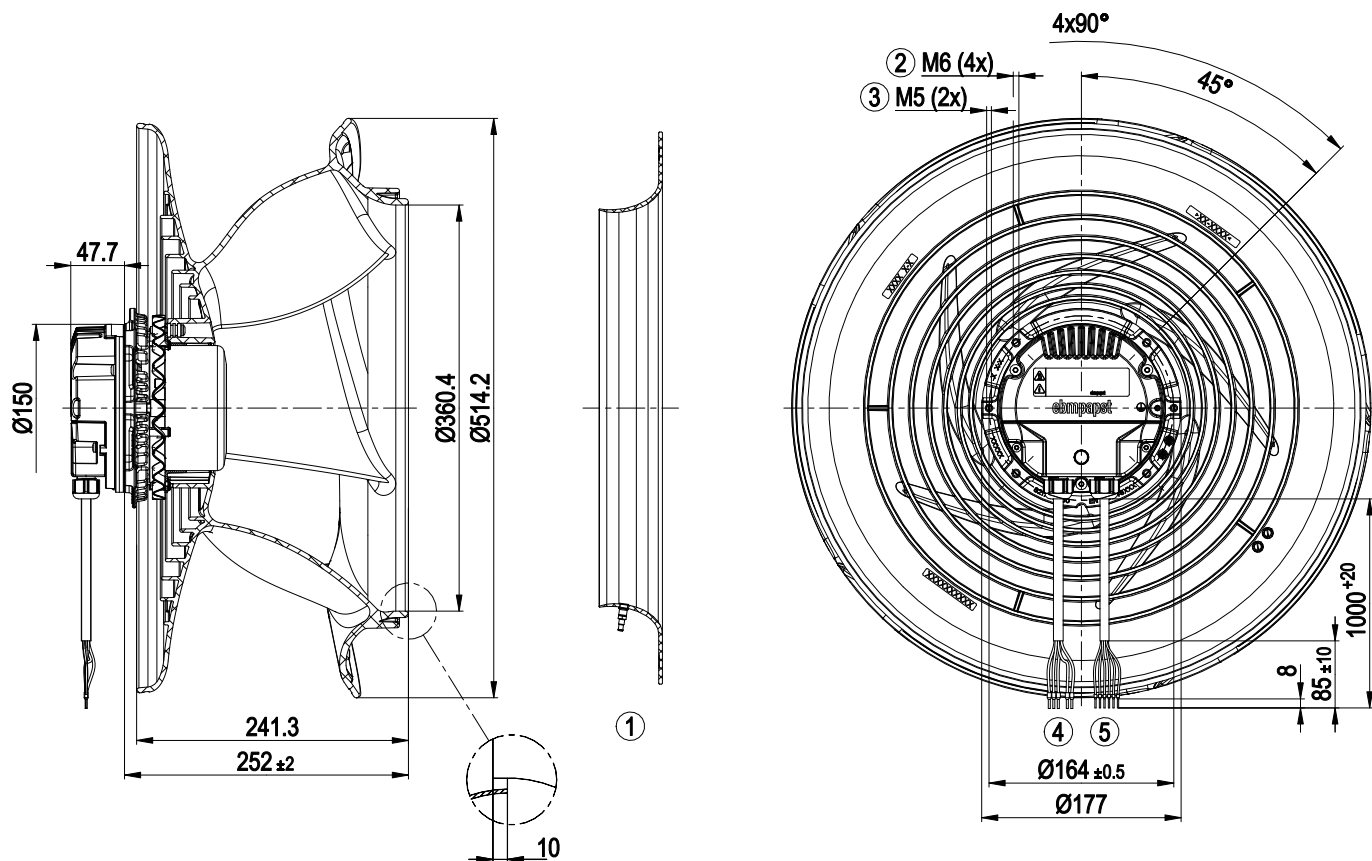
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Approval

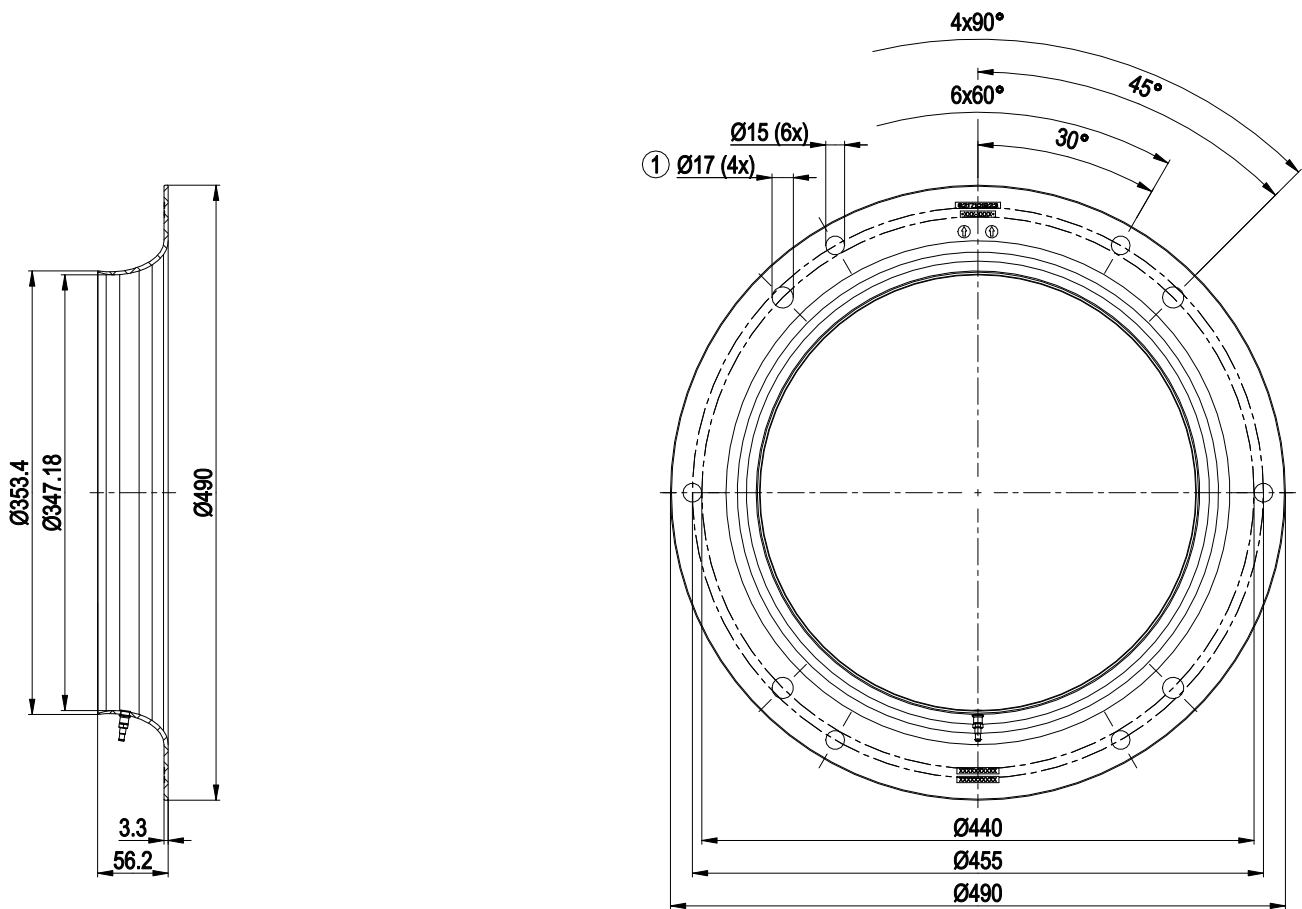
CSA C22.2 No. 77 + CAN/CSA-E60730-1; UL 1004-7 + 60730-1

Product drawing



1	Accessory part: Inlet ring 8217102238 with pressure tap (k-factor: 290) (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

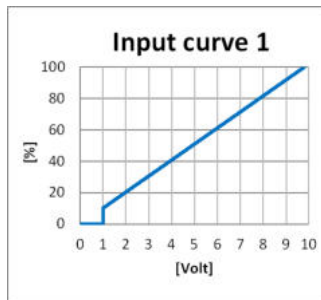
Accessory part



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Connection diagram

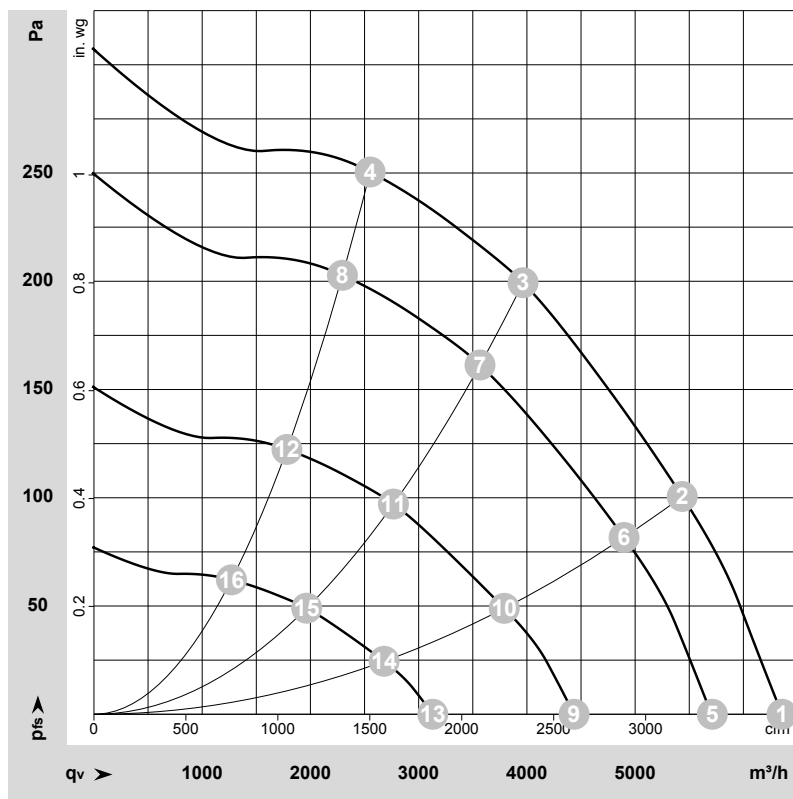


No.	Conn.	Designation	Color	Function/assignment
	PWR	PE	green/yellow	Protective earth
	PWR	L	black	Power supply, phase, see nameplate for voltage range
	PWR	N	blue	Power supply, neutral conductor, see nameplate for voltage range
	PWR	COM	orange	Status relay, floating status contact, common connection, 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		configurable IO functions: normal / inverse	
IO1	Dim1 (high active): digital input	active: applied voltage 3.5 - 50 VDC		D158 [0]		active: applied voltage 3.5 - 50 VDC		source: set value		D101 [...] source: set value	
		not active: pin open or applied voltage < 1.5 VDC		D158 [1]		not active: pin open or applied voltage < 1.5 VDC		source: sensor value		D147 [...] source: sensor value	
		active: applied voltage < 1.5 VDC		D158 [2]		not active: pin open or applied voltage 3.5 - 50 VDC, SELV		switch: parameter set: #1 / #2		D104 [...] switch: parameter set: #1 / #2	
		not active: pin open or applied voltage 3.5 - 50 VDC, SELV		D158 [3]		RI = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV		switch: control function: heating (pos.) / cooling (neg.)		D12E [...] switch: control function: heating (pos.) / cooling (neg.)	
IO2	Dim1 (low active): digital input	RI = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV		D158 [9]		RI = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV		switch: direction of rotation: cw / ccw		D148 [...] switch: direction of rotation: cw / ccw	
		active: applied voltage 3.5 - 50 VDC		D159 [0]		not active: pin open or applied voltage < 1.5 VDC, SELV		source: DCI in		D638 [...] source: DCI in	
		not active: pin open or applied voltage < 1.5 VDC, SELV		D159 [2]		RI = 100 kΩ, characteristic curve parameterizable, $f_{PWM} = 1\text{ k} - 10\text{ kHz}$, SELV		source: input pulses autoaddressing		D00C [1] source: input pulses autoaddressing	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [5]		Umax = 50 VDC, Imax = 20 mA, SELV		switch: fan enable / disable		D16A [...] switch: fan enable / disable	
IO2	Tach out (open collector)	Umax = 50 VDC, Imax = 20 mA, SELV		D159 [6]		Umax = 50 VDC, Imax = 20 mA, SELV		switch: set value source		D16C [...] switch: set value source	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [10]		Umax = 50 VDC, Imax = 20 mA, SELV		switch: tach out		signal: tach out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [11]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: diagnostics out		signal: diagnostics out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: alarm out		signal: alarm out	
IO2	Alarm out (open collector)	Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: DCI out		D61B signal: DCI out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: fan modulation level %		D130 [0] signal: fan modulation level %	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: actual speed 1/min		D130 [1] signal: actual speed 1/min	
IO2	Autoaddressing pulse output (open collector)	Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: system modulation level %		D130 [2] signal: system modulation level %	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: remote control output 0-10 V		D130 [5] signal: remote control output 0-10 V	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: run monitoring		D145 signal: run monitoring	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: status		D145 signal: status	
IO2	DCI-output (open collector)	Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: tach out		signal: tach out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: diagnostics out		signal: diagnostics out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: alarm out		signal: alarm out	
		Umax = 50 VDC, Imax = 20 mA, SELV		D159 [12]		Umax = 50 VDC, Imax = 20 mA, SELV		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
IO2	RS485 bus connection	MODBUS RTU, parameter specification V7.1, SELV		D159 [12]		MODBUS RTU, parameter specification V7.1, SELV		signal: tach out		signal: tach out	
		MODBUS RTU, parameter specification V7.1, SELV		D159 [12]		MODBUS RTU, parameter specification V7.1, SELV		signal: diagnostics out		signal: diagnostics out	
		MODBUS RTU, parameter specification V7.1, SELV		D159 [12]		MODBUS RTU, parameter specification V7.1, SELV		signal: alarm out		signal: alarm out	
		MODBUS RTU, parameter specification V7.1, SELV		D159 [12]		MODBUS RTU, parameter specification V7.1, SELV		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
IO2	Relay	250 VAC / 2 A (AC1)		D159 [12]		250 VAC / 2 A (AC1)		signal: tach out		signal: tach out	
		250 VAC / 2 A (AC1)		D159 [12]		250 VAC / 2 A (AC1)		signal: diagnostics out		signal: diagnostics out	
		250 VAC / 2 A (AC1)		D159 [12]		250 VAC / 2 A (AC1)		signal: alarm out		signal: alarm out	
		250 VAC / 2 A (AC1)		D159 [12]		250 VAC / 2 A (AC1)		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
IO2	Voltage output	Voltage 10 VDC, SELV		D159 [12]		Voltage 10 VDC, SELV		signal: tach out		signal: tach out	
		Voltage 10 VDC, SELV		D159 [12]		Voltage 10 VDC, SELV		signal: diagnostics out		signal: diagnostics out	
		Voltage 10 VDC, SELV		D159 [12]		Voltage 10 VDC, SELV		signal: alarm out		signal: alarm out	
		Voltage 10 VDC, SELV		D159 [12]		Voltage 10 VDC, SELV		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
IO2	Vout	15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: tach out		signal: tach out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: diagnostics out		signal: diagnostics out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: alarm out		signal: alarm out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	
IO2	Alternatively: Input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: tach out		signal: tach out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: diagnostics out		signal: diagnostics out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: alarm out		signal: alarm out	
		15 - 30 VDC		D159 [12]		15 - 30 VDC		signal: output pulses autoaddressing		D130 [4] signal: output pulses autoaddressing	

Curves: Air performance 50 Hz



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

Measurement: LU-224474-1
Date: 2022-12-12
Nozzle: 8217101923

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	m³/h	Pa	cfm	in. wg
1	1~	230	50	1050	228	1.03	64	73	77	78	6355	0	3740	0.00
2	1~	230	50	1050	310	1.39	59	67	71	73	5435	100	3200	0.40
3	1~	230	50	1050	370	1.60	54	61	66	67	3965	200	2335	0.80
4	1~	230	50	1050	340	1.52	55	61	66	67	2550	250	1500	1.00
5	1~	230	50	945	169	0.77	62	71	75	76	5715	0	3365	0.00
6	1~	230	50	945	226	1.03	56	65	69	71	4895	82	2880	0.33
7	1~	230	50	945	264	1.19	51	58	64	65	3565	161	2100	0.65
8	1~	230	50	945	247	1.11	52	58	63	64	2295	203	1350	0.81
9	1~	230	50	735	84	0.43	58	66	70	71	4435	0	2610	0.00
10	1~	230	50	735	109	0.53	52	60	64	65	3790	49	2230	0.20
11	1~	230	50	735	126	0.60	47	53	58	60	2765	97	1630	0.39
12	1~	230	50	735	118	0.57	46	52	57	58	1785	122	1050	0.49
13	1~	230	50	525	36	0.27	48	56	63	64	3130	0	1840	0.00
14	1~	230	50	525	45	0.30	41	50	56	57	2680	24	1580	0.10
15	1~	230	50	525	50	0.31	37	46	54	55	1965	49	1155	0.20
16	1~	230	50	525	48	0.31	37	44	49	50	1270	62	745	0.25

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