

8300100754  
VBS0280CSPFS

# EC centrifugal fan - RadiPac

backward-curved, single-intake

## ebm-papst Mulfingen GmbH & Co. KGaA & Co. KG

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## Nominal data

Item	8300100754	
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 <sup>-1</sup>	3120
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 $\eta_{es}$	%	72.2	48.3	09 Power consumption $P_{ed}$	kW	0.49
02 Measurement category		A		09 Air flow $q_v$	m <sup>3</sup> /h	2130
03 Efficiency category		Static		09 Pressure increase $p_{fs}$	Pa	549
04 Efficiency grade N		85.9	62	10 Speed (rpm) n	min <sup>-1</sup>	3125
05 Variable speed drive		Yes		11 Specific ratio <sup>*</sup>		1.01

Data obtained at optimum efficiency level.

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

LU-219800

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).

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## Technical description

Weight	4.7 kg
Size	280 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	<ul style="list-style-type: none"><li>- Output 10 VDC, max. 10 mA</li><li>- Operation and alarm display with LED</li><li>- Locked-rotor detection</li><li>- Speed control</li><li>- External 15-30 VDC input (parameterization)</li><li>- Alarm relay</li><li>- Configurable inputs/outputs (I/O)</li><li>- Power limiter</li><li>- MODBUS</li><li>- Motor current limitation</li><li>- PFC, active</li><li>- RS-485 MODBUS-RTU</li><li>- Soft start</li><li>- Control interface with SELV potential safely disconnected from the mains</li><li>- Temperature derating</li><li>- Thermal overload protection for electronics/motor</li><li>- Line undervoltage / phase failure detection</li></ul>
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; UKCA; CE

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Approval

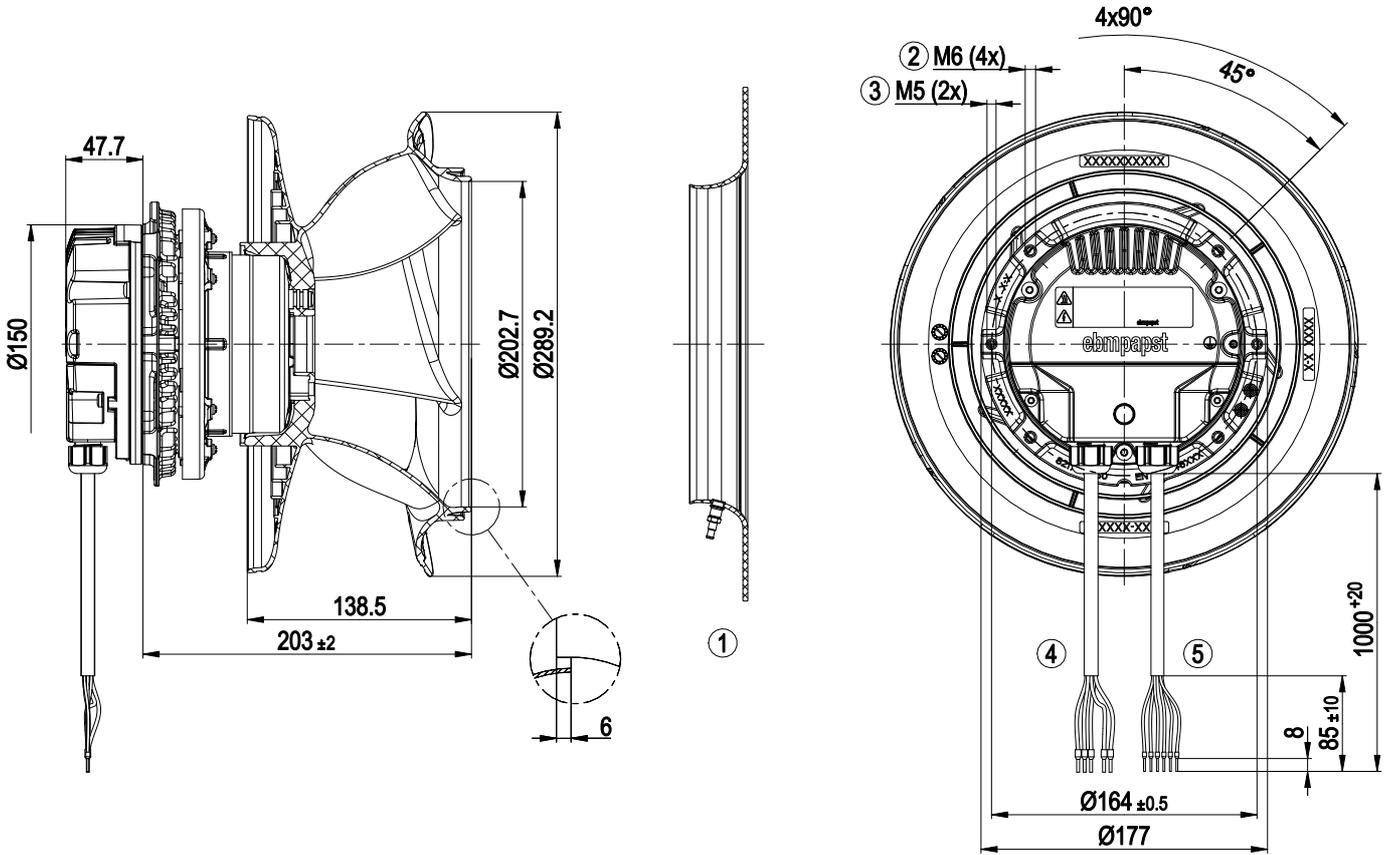
CSA C22.2 No. 77 + CAN/CSA-E60730-1; UL 1004-7 + 60730-1

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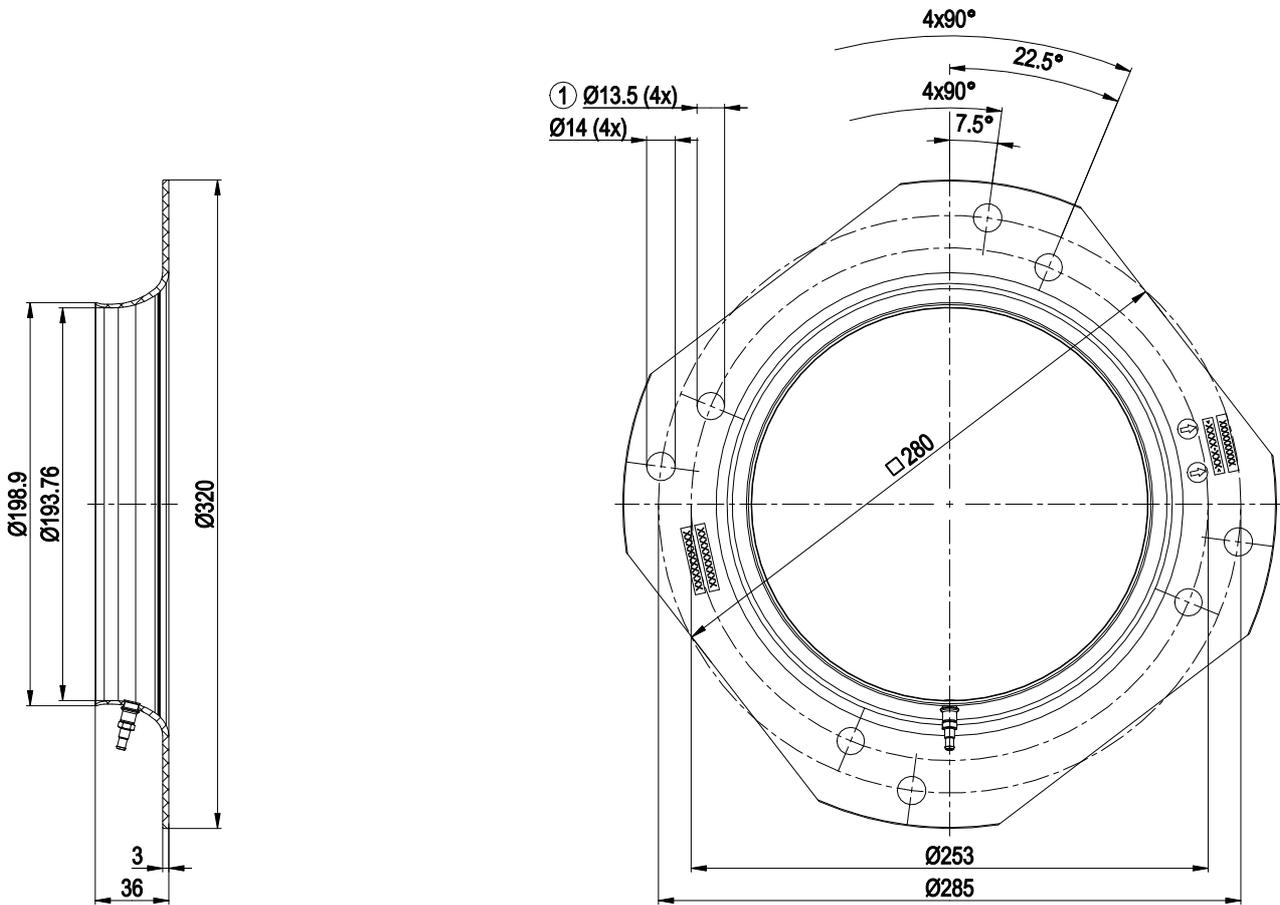
backward-curved, single-intake

## Product drawing



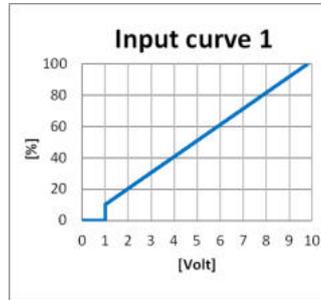
1	Accessory part: Inlet ring 8217104581 with pressure tap (k-factor: 98) (not included in scope of delivery)
2	Max. clearance for screw 10 mm
3	Max. clearance for screw 10 mm The M5 tapped holes (2x) can be used to attach hoisting equipment.
4	Supply line (PWR) PVC AWG18 5x wire-end ferrule
5	Control wire (CTRL) PVC AWG22 6x wire-end ferrule

Accessory part



	Inlet ring 8217104581 with pressure tap (k-factor: 98)
1	Fastening holes for FlowGrid 20280-2-2957 (not included in scope of delivery) are provided and must be subsequently opened as required

## 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 <sub>max</sub> =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 <sub>i</sub> =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 <sub>max</sub> =50 VDC, I <sub>max</sub> =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

IO	IO mode configuration	electrical specification	configurable IO mode	configurable IO functions: normal / inverse
101	D158 [0]	active: applied voltage 3.5 - 50 VDC not active: pin open or applied voltage < 1.5 VDC, SELV	Dir1 (high active): digital input	source: set value
	D158 [1]	active: applied voltage < 1.5 VDC not active: pin open or applied voltage 3.5 - 50 VDC, SELV	Dir1 (low active): digital input	source: sensor value
	D158 [2]	RI = 100 kΩ, characteristic curve parametrizable, $f_{PWM} = 1 \text{ k} - 10 \text{ kHz}$ , SELV	Air1 0-10 V/PWM: analog input	source: sensor value
	D158 [9]	RI = 100 kΩ, characteristic curve parametrizable, $f_{PWM} = 1 \text{ k} - 10 \text{ kHz}$ , SELV	Air1 0-10 V/PWM (with pull up): analog input	source: sensor value
	D159 [0]	active: applied voltage 3.5 - 50 VDC not active: pin open or applied voltage < 1.5 VDC, SELV	Dir1 (active high): digital input	switch: parameter set: #1 / #2
102	D159 [2]	RI = 100 kΩ, characteristic curve parametrizable, $f_{PWM} = 1 \text{ k} - 10 \text{ kHz}$ , SELV	Air1 0-10 V/PWM: analog input	switch: control function: heating (pos.) / cooling (neg.)
	D159 [5]	Umax = 50 VDC, Imax = 20 mA, SELV	Tach out (open collector)	switch: direction of rotation: cw / ccw
	D159 [6]	Umax = 50 VDC, Imax = 20 mA, SELV	Diagnostics out (open collector)	switch: set value source
	D159 [10]	Umax = 50 VDC, Imax = 20 mA, SELV	Alarm out (open collector)	switch: fan enable / disable
	D159 [11]	Umax = 50 VDC, Imax = 20 mA, SELV	Autoaddressing pulse output (open collector)	source: input pulses autoaddressing
RSA RSB		MODBUS RTU, parameter specification V7.1, SELV	RS485 bus connection	signal: output pulses autoaddressing
	COM NC	250 VAC / 2 A (AC1)	Relay	signal: DCI out
Vout	Voltage 10 VDC, SELV	Voltage 10 VDC, SELV	Voltage output	signal: fan modulation level %
	15 - 30 VDC	15 - 30 VDC	Alternatively: input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	signal: actual speed 1/min

### Medium (M2)

Functions and parameter description  
MODBUS V7.1

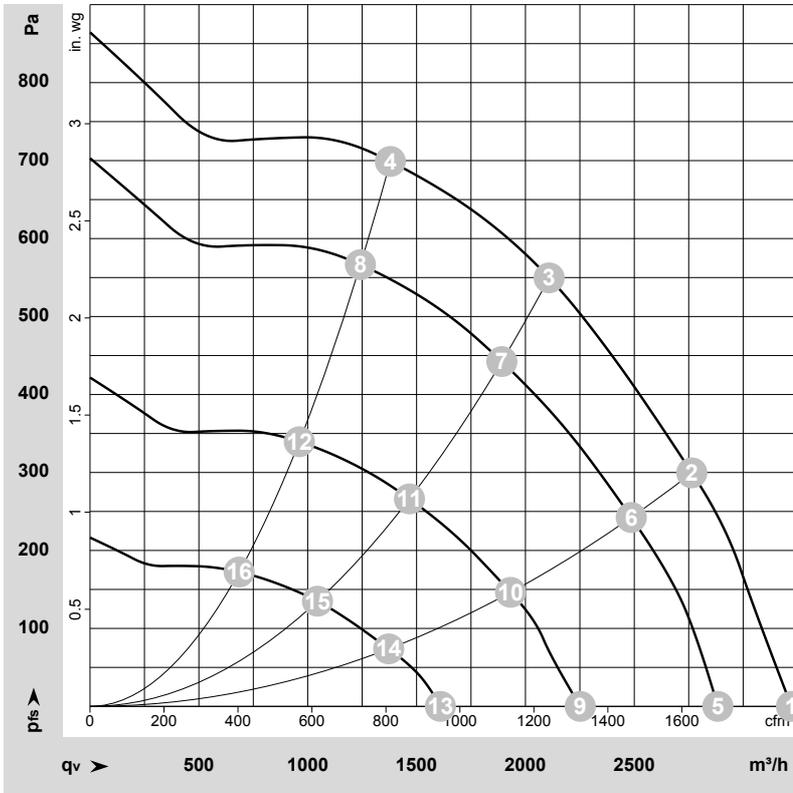
- configurable function
- (○) function to be activated via IO Mode

### MODBUS Register for IO mode configuration

#### electrical specification

IO	IO mode configuration	electrical specification	configurable IO mode	configurable IO functions: normal / inverse
101	D158 [0]	active: applied voltage 3.5 - 50 VDC not active: pin open or applied voltage < 1.5 VDC, SELV	Dir1 (high active): digital input	source: set value
	D158 [1]	active: applied voltage < 1.5 VDC not active: pin open or applied voltage 3.5 - 50 VDC, SELV	Dir1 (low active): digital input	source: sensor value
	D158 [2]	RI = 100 kΩ, characteristic curve parametrizable, $f_{PWM} = 1 \text{ k} - 10 \text{ kHz}$ , SELV	Air1 0-10 V/PWM: analog input	source: sensor value
	D158 [9]	RI = 100 kΩ, characteristic curve parametrizable, $f_{PWM} = 1 \text{ k} - 10 \text{ kHz}$ , SELV	Air1 0-10 V/PWM (with pull up): analog input	source: sensor value
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	D159 [5]	Umax = 50 VDC, Imax = 20 mA, SELV	Tach out (open collector)	switch: direction of rotation: cw / ccw
	D159 [6]	Umax = 50 VDC, Imax = 20 mA, SELV	Diagnostics out (open collector)	switch: set value source
	D159 [10]	Umax = 50 VDC, Imax = 20 mA, SELV	Alarm out (open collector)	switch: fan enable / disable
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RSA RSB		MODBUS RTU, parameter specification V7.1, SELV	RS485 bus connection	signal: output pulses autoaddressing
	COM NC	250 VAC / 2 A (AC1)	Relay	signal: DCI out
Vout	Voltage 10 VDC, SELV	Voltage 10 VDC, SELV	Voltage output	signal: fan modulation level %
	15 - 30 VDC	15 - 30 VDC	Alternatively: input auxiliary power supply for parameterization via RS485/MODBUS RTU without line voltage	signal: actual speed 1/min

## Curves: Air performance 50 Hz



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

Measurement: LU-219800-1  
Date: 2023-03-21  
Nozzle: 8217102502

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 <sub>e</sub>	I	LpA <sub>in</sub>	LwA <sub>in</sub>	q <sub>v</sub>	P <sub>fs</sub>	q <sub>v</sub>	P <sub>fs</sub>
		V	Hz	min <sup>-1</sup>	W	A	dB(A)	dB(A)	m <sup>3</sup> /h	Pa	cfm	in. wg
1	1~	230	50	3120	343	1.54	74	82	3220	0	1895	0.00
2	1~	230	50	3120	452	2.00	68	76	2765	300	1625	1.20
3	1~	230	50	3120	500	2.20	65	72	2110	550	1240	2.21
4	1~	230	50	3120	472	2.09	70	76	1380	700	810	2.81
5	1~	230	50	2810	256	1.16	72	80	2885	0	1695	0.00
6	1~	230	50	2810	333	1.50	66	73	2485	242	1465	0.97
7	1~	230	50	2810	367	1.64	63	70	1890	443	1115	1.78
8	1~	230	50	2810	349	1.57	67	74	1240	567	730	2.28
9	1~	230	50	2190	131	0.62	65	73	2250	0	1325	0.00
10	1~	230	50	2190	168	0.77	59	67	1930	146	1135	0.59
11	1~	230	50	2190	182	0.84	57	64	1465	267	865	1.07
12	1~	230	50	2190	174	0.80	60	67	960	340	565	1.36
13	1~	230	50	1565	57	0.34	57	65	1610	0	950	0.00
14	1~	230	50	1565	71	0.39	52	59	1370	74	810	0.30
15	1~	230	50	1565	76	0.41	50	57	1045	136	615	0.55
16	1~	230	50	1565	73	0.40	51	58	685	172	405	0.69

Wired = Wiring · U = Voltage · f = Frequency · n = Speed (rpm) · P<sub>e</sub> = Power consumption · I = Current draw · LpA<sub>in</sub> = Sound pressure level intake side · LwA<sub>in</sub> = Sound power level intake side  
q<sub>v</sub> = Air flow · P<sub>fs</sub> = Pressure increase