Product Data Sheet | RER190-39/18/2TDPR-224



The engineer's choice

ebmpapst

RER190-39/18/2TDPR-224

INDEX

1 General 3

2 Mechanics 3

2.1 General 3
2.2 Connections 3

3 Operating Data 5

3.1 Operating Data - Electrical Interface - Input 5
3.2 Electrical Operating Data 7
3.3 Operating Data - Electrical Interface -Output 8
3.4 Electrical Features 9
3.5 Aerodynamic 10
3.6 Sound Data 11

4 Environment 11

4.1 General 11
4.2 Climatic requirements*) 11
4.3 Mechanical requirements 11

5 Safety 12

5.1 Electrical Safety 12
5.2 Approval Tests 12

6 Reliability 12

6.1 General 12

1 General

Fan type	Blower without chassis	
Rotational direction looking at rotor	clockwise	
Airflow direction	Air in axially, Air out radially	
Bearing system	Ball bearings	
Mounting position	any	

2 Mechanics

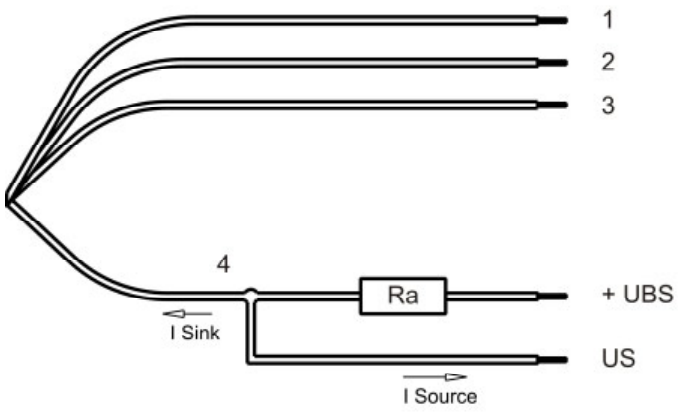
2.1 General

Depth	69 mm	
Diameter	190 mm	
Weight	0,870 kg	
Housing material	--	
Impeller material	Plastic	

2.2 Connections

Electrical connection	Wires - Plug	
Length of lead wire Tolerance	see fan drawing # 9595420224 Rev C	
Wire gauge (AWG)	20 22	
Insulation diameter	2,05mm 1,35mm	
Connector / contacts	see fan drawing # 9595420224 Rev C	





	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	white	Tacho

The auxilliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

Lead wire 1 - 2: AWG20
Lead wire 3 - 4: AWG22 (Insulation diameter 1,35mm)

3 Operating Data

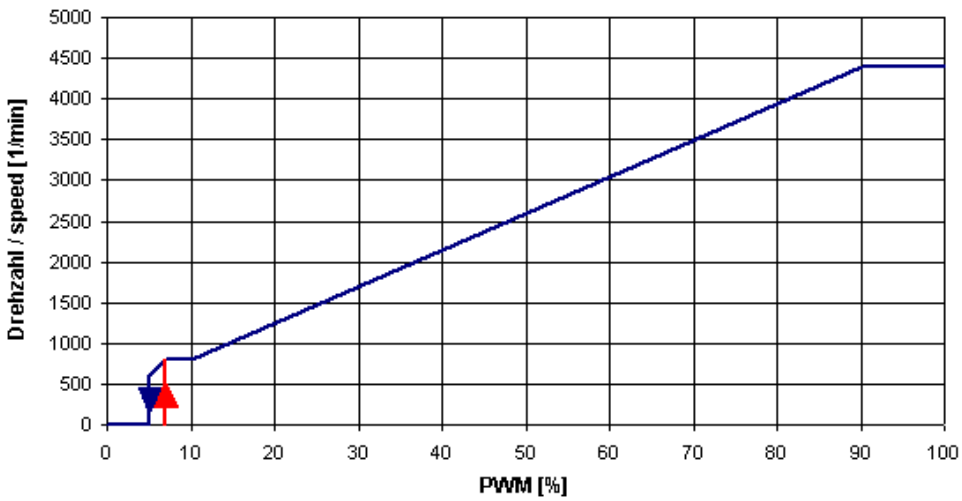
3.1 Operating Data - Electrical Interface - Input

Control input	PWM

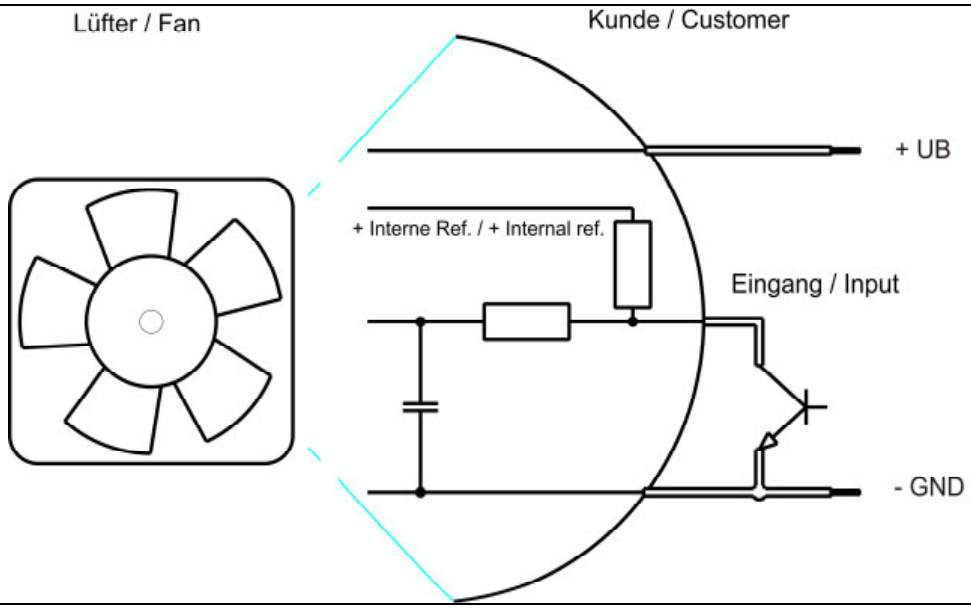
Features

PWM - Frequency		1 kHz - 10 kHz Typical: 2 kHz

Characteristics



Schematics



Transistor requirements:
Vce max.= <12 V; I sink max. = < 5 mA
Vce sat.= <0,15 V

Speed control:
By Puls width modulation (PWM) 0 ... 100%
Open collector in relation to signal-ground
f = 2kHz +-20%

Information to the curve:

0 % - 7% PWM:	0 rpm
7 % - 10% PWM:	800 rpm (corresponding to min. speed)
10 % - 90% PWM:	linear increasing curve
90 % - 100% PWM:	4.400 rpm (corresponding to max. speed)
7 % PWM:	800 rpm (fan on, comming from 0% PWM)
5 % PWM:	600 rpm or 0 rpm (fan off, comming from 100% PWM)

3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; Motor axis horizontal; warm-up time before measuring 5 minutes (unless otherwise specified).
In the intake and outlet area should not be any solid obstruction within 0,5 m.

Measurement setup:	Measured between two steel plates
Steel plate:	195 mm x 195 mm
Intake nozzle:	D: 125,5 mm; R: 10 mm
Distance between bottom and top plate:	80 mm
Overlapping impeller / nozzle:	2 mm

$\Delta p = 0$: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

Name	**Condition**		
PWM 0001	PWM: 100 %;		

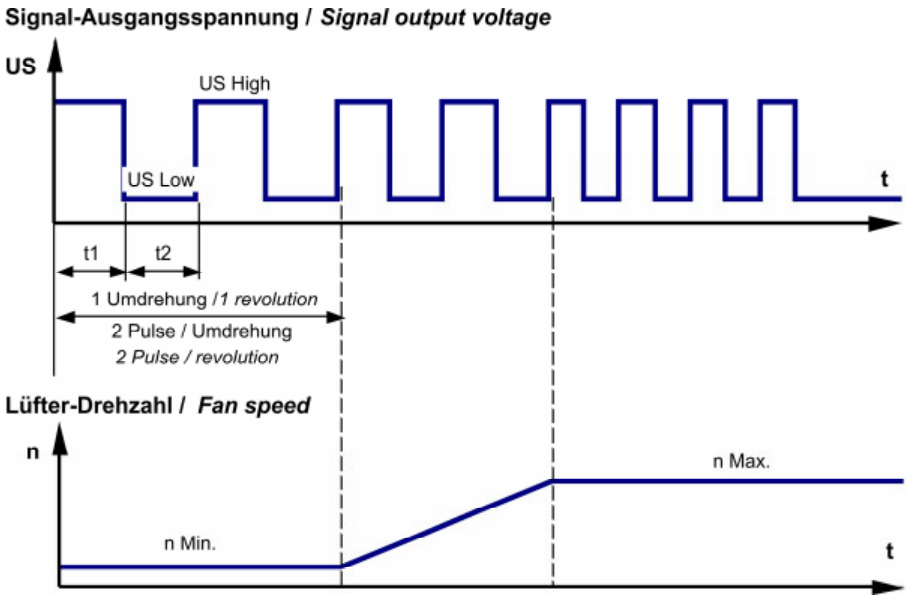
Features	**Condition**	**Symbol**	**Values**		
Voltage range	$\Delta p = 0$	U	36,0 V		72,0 V
Nominal voltage	$\Delta p = 0$	U_N		48,0 V	
Power consumption Tolerance	$\Delta p = 0$ PWM 0001	P	88,4 W +- 10,0 %	148,0 W +- 10,0 %	155,0 W +- 10,0 %
Current consumption Tolerance	$\Delta p = 0$ PWM0001	I	2.440 mA +- 10,0 %	3.080 mA +- 10,0 %	2.150 mA +- 10,0 %
Speed Tolerance	$\Delta p = 0$ PWM 0001	n	3.720 rpm +- 10,0 %	4.400 rpm +- 5,0 %	4.400 rpm +- 5,0 %
max. allowed input voltage ripple (within the specified voltage range)			+- 3 %		
max. allowed input voltage ripple (within the specified voltage range)			>= 50 Hz		

Name	Condition		
PWM 0002	PWM: 50 %;		

Features	Condition	Symbol	Values		
Voltage range	Δp = 0	U	36,0 V		72,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 PWM 0002	P	31 W +- 10,0 %	31 W +- 10,0 %	33 W +- 10,0 %
Current consumption Tolerance	Δp = 0 PWM 0002	I	880 mA +- 10,0 %	650 mA +- 10,0 %	460 mA +- 10,0 %
Speed Tolerance	Δp = 0 PWM 0002	n	2.600 rpm +- 5,0 %	2.600 rpm +- 5,0 %	2.600 rpm +- 5,0 %

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



$$Ra = \frac{UBS - US\ Low}{I\ Sink}$$

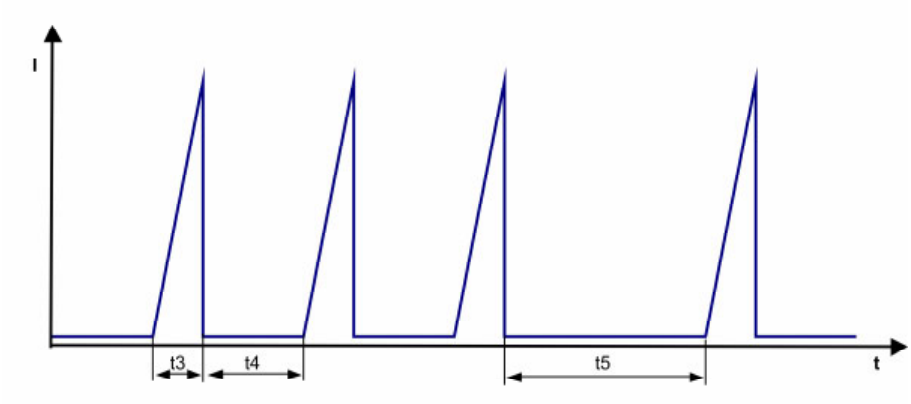
Features	Note	Values
Tacho operating voltage (UBS)		<= 60,0 V
Tacho signal Low	I sink: 2 mA	<= 0,4 V
Tacho signal High	I source: 0 mA	<= 60,0 V
Maximum sink current		<= 20 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	(2 x n) / 60	147 Hz
Tacho isolated from motor	No	
Slew rate		=> 0,5 V/us

Please note:
At zero speed the tacho signal is at a static HIGH. It will be also HIGH when the fan is still spinning, but the speed control signal is set to zero speed already.
The tacho signal is only activated after the start-up is completed.

Alarm type	None

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	P-CH FET IF <= 5 mA	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 1.700 mA	
Clock signal t3/t4 at locked rotor	Typical: 4,6 s / 10,0 s	



Locked rotor signal t5:

After 4 failed start-ups there is an extended timeout of 40,0s.

3.5 Aerodynamic

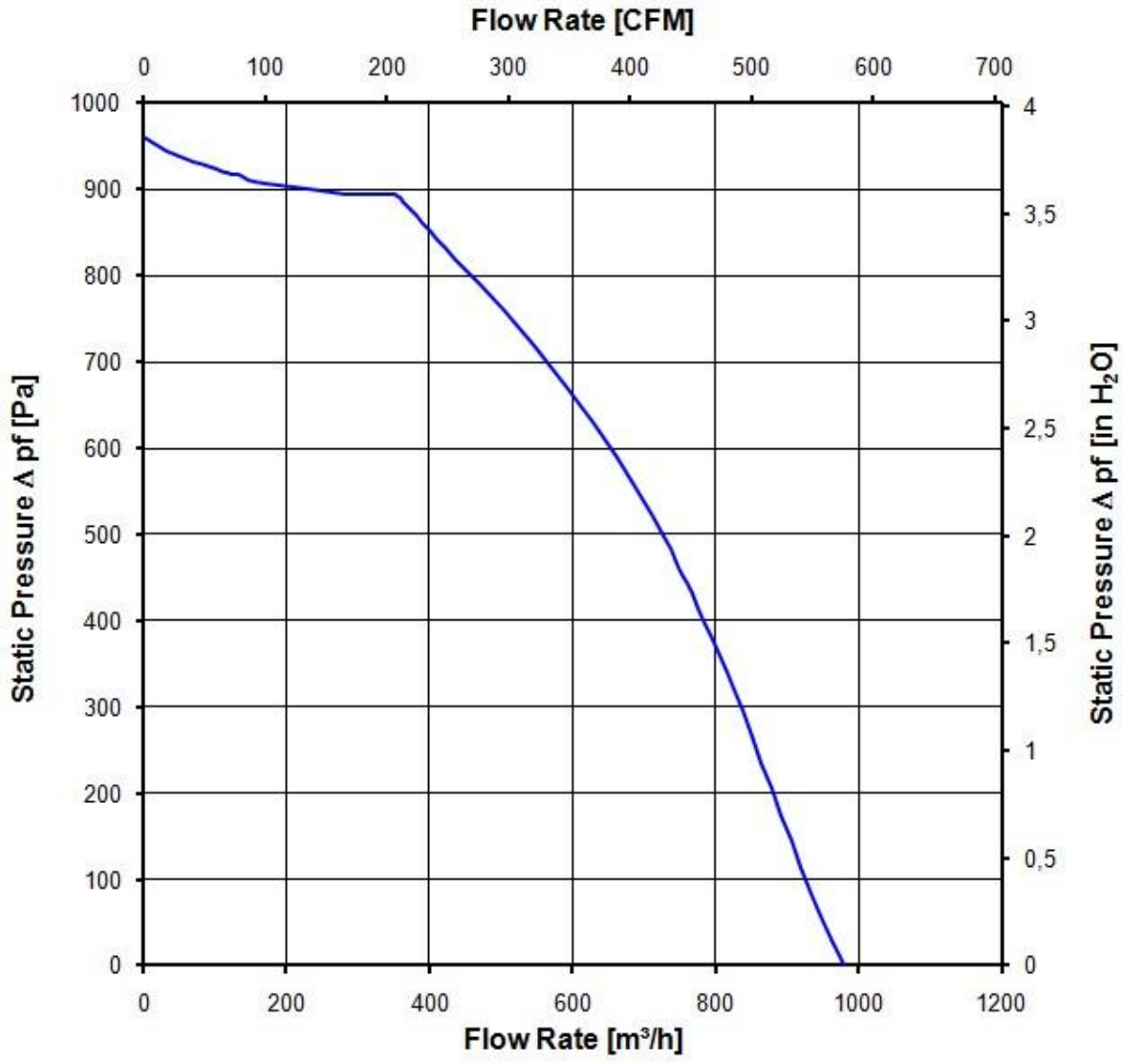
Measurement conditions:	Measured with a double chamber intake rig acc. to DIN EN ISO 5801. Normal air density = 1,2 kg/m3; Temperature 23°C +/- 3°C; In the intake and outlet area should not be any solid obstruction within 0,5 m.

Measurement setup:	Measured between two steel plates
Steel plate:	195 mm x 195 mm
Intake nozzle:	D: 125,5 mm; R: 10 mm
Distance between bottom and top plate:	80 mm
Overlapping impeller / nozzle:	2 mm

a.) Operation condition:

4.400 rpm at free air flow	PWM 100 %		

Max. free-air flow (Δp = 0 / V̇ = max.)	980,0 m3/h	
Max. static pressure (Δp = max. / V̇ =0)	960 Pa	



3.6 Sound Data

Measurement conditions:	Sound pressure level: 1 Meter distance between microphone and the air intake. Sound power level: Acc. to DIN 45635 part 38 (ISO 10302) Measured in a semianchoic chamber with a background noise level of Lp(A) < 5 dB(A) For further measurement conditions see section 3.5

a.) Operation condition:

4.400 rpm at free air flow	PWM 100 %		

Optimal operating point	640,0 m3/h @ 550 Pa	
Sound power level at the optimal operating point	8,0 bel(A)	

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	65 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic requirements*)

Humidity requirements	humid heat, cyclic; according to DIN EN 60068-2-30, 6 cycle	
Water exposure	None	
Radiation exposure	None	
Dust requirements	Dust check; according to DIN EN 60068-2-68, 6g/m2d, 1 day	
Salt fog requirements	None	
Harmful gas requirements	None	

*) Permittet application area:
The product is for the use in sheltered rooms with limited controlled temperature. Occasionally condensed water is allowed. Directly exposure to water must be avoid. Saline ambient conditions must be avoid.

Pollution degree 2 (according DIN EN 60664-1)
It occurs only non-conductive pollution. Occassionally, temporary conductivity caused by condensation occurs.

4.3 Mechanical requirements

See fan drawing # 9595420224 Rev C.

5 Safety

5.1 Electrical Safety

Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	1000 VAC / 1 Min. 1000 VAC / 1 Sec.	
Isolation resistance Measuring conditions: After 48h of storage at 95% R.H. and 25°C measured with U=500 VDC for 1 min.	RI > 10 MOhm	
Air and leakage distances	1,0 mm / 1,5 mm	
Protection class	I	

5.2 Approval Tests

CE	Yes
UL (approved at UL testhouse)	Yes
UL (approved at CSA testhouse)	Yes / UL audited by CSA according to UL507, Electric Fans
VDE	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment - Part 1 Safety - Connection to a SELV circuit.
CSA	Yes / C22.2 No. 113-M1984 Fans and Ventilators
CCC	Yes

The approval tests are observed to:
Maximal permitted operating voltage (see section 3.1) and max. permitted ambient temperature TU max.

6 Reliability

6.1 General

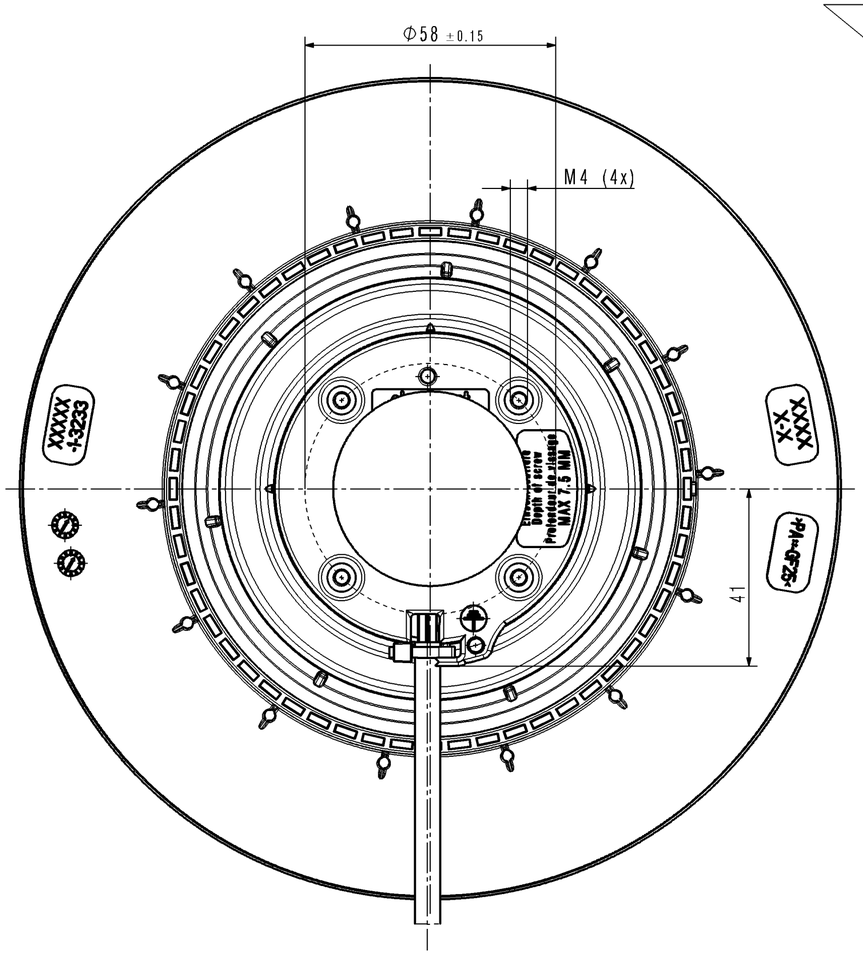
Life expectancy L10 at TU = 40 °C	60.000 h	
Life expectancy L10 at TU max.	32.500 h	
Life expectancy L10 delta (40 °C)	115.000 h	

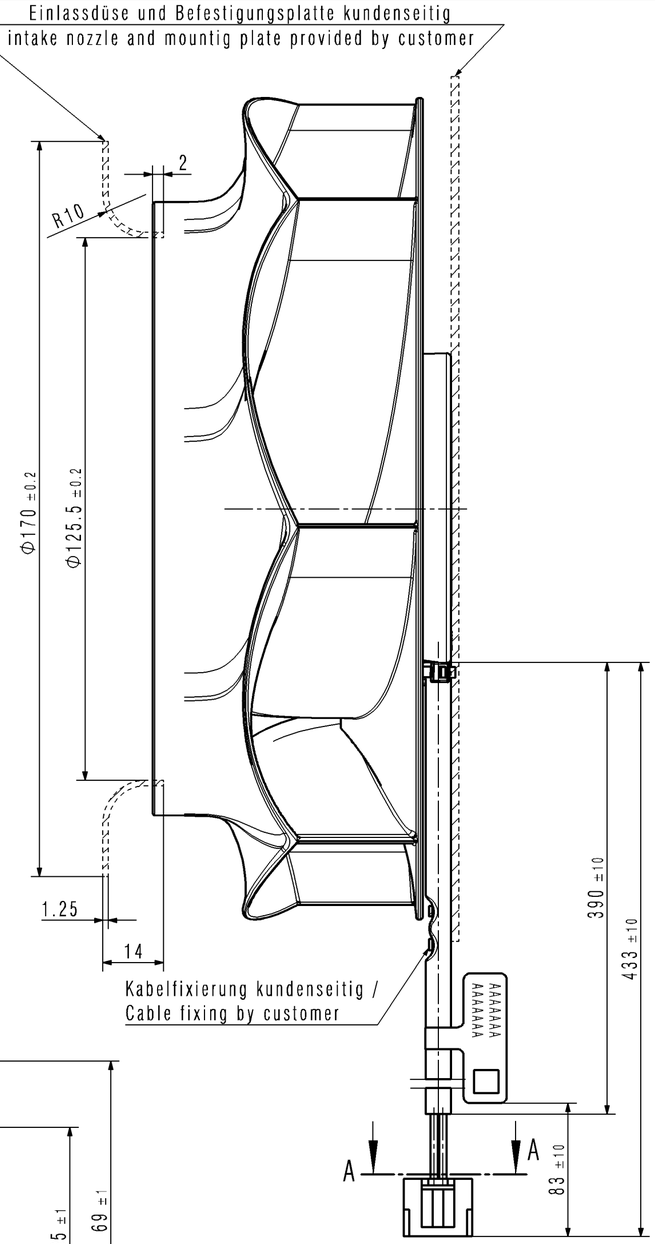
6.2 ABB Temperature Map (25% each of: 20°C – 30°C – 40°C – 50°C)

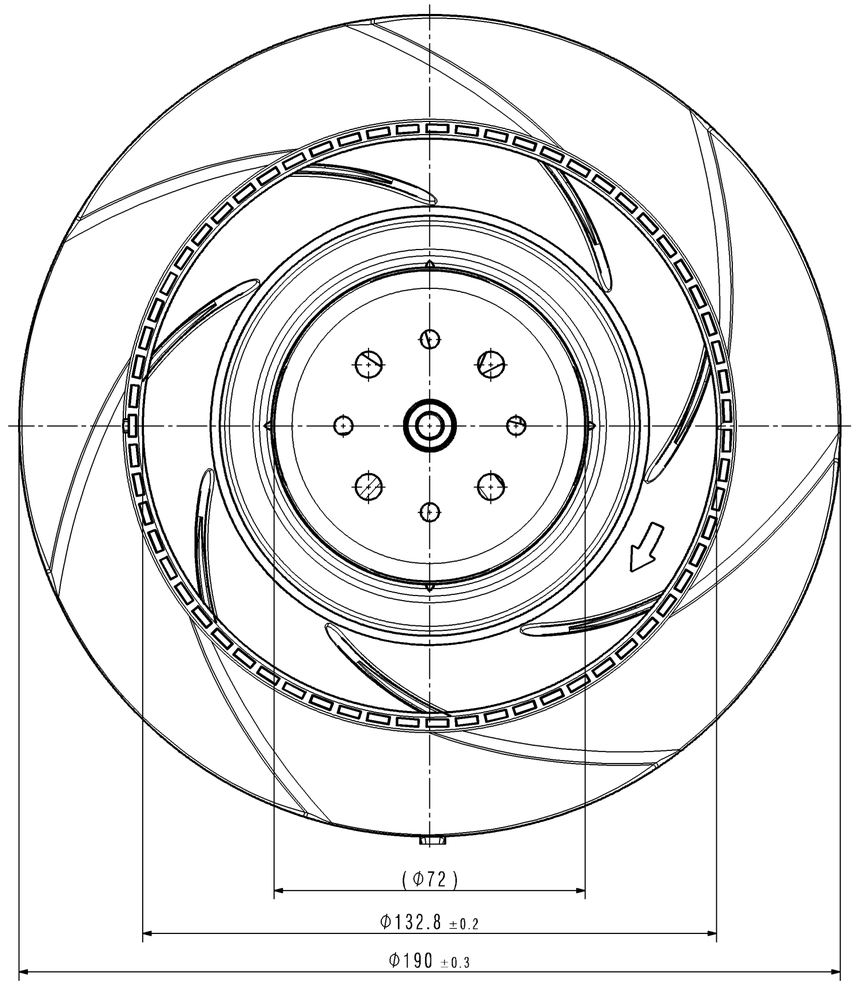
Life expectancy L10 at OP ~ 700m3/h @ 400-450Pa	87.500 h	
Life expectancy L5 at OP ~ 700m3/h @ 400-450Pa	70.000 h	
Life expectancy L3 at OP ~ 700m3/h @ 400-450Pa	52.500 h	

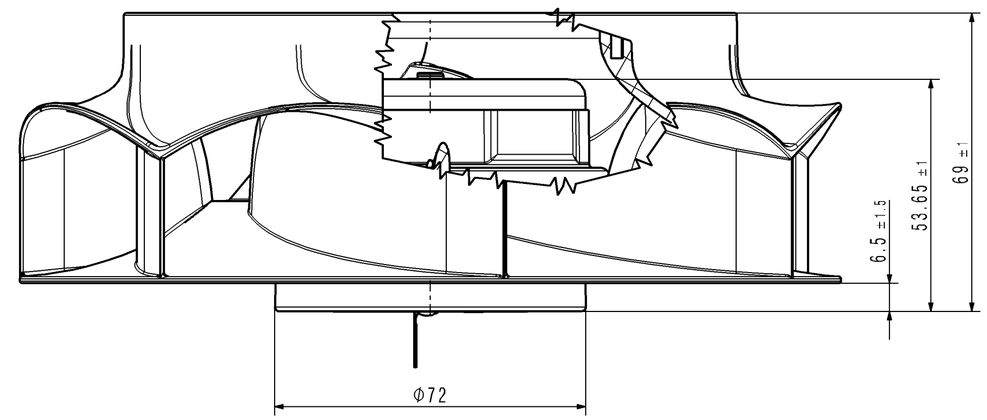
Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages. All rights are reserved in the event of the grant of a patent or the registration of a utility model or design.

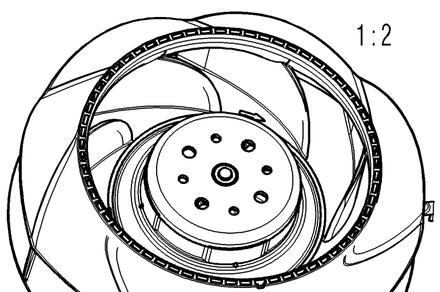
Schutzvermerk nach DIN ISO 16016 beachten!
Refer to protection notice DIN ISO 16016!

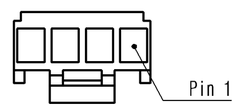












A-A
2:1

Steckergehäuse
plug housing
J.S.T. VHR-4N
Kontakt / contact
J.S.T. SVH-21T-P1.1

Pin	Pin Belegung pin configuration	
1	rot / red	+ UB
2	bau / blue	-GND
3	weiß / white	Tacho
4	violett / violet	PWM

--- Axialspiel der Kugellaeger mit Feder spielfrei verspannt.

--- without axial clearance by a pre-loaded spring.

FR	122378	V5R19	PAPST
SAP-Status/State	Aend.-Nr./ Change-No.	CATIA-System-Version/ CATIA-System-Version	CAD-Umgebung/ CAD-Environment

9595420020 CFR000 -
42222010588 CPA001 -

3D-Referenzmodell / 3D-Referencemodel

Tolerierung / Tolerances:
Size ISO 14405 Ⓔ

Allgemeintoleranzen / Gen. Tolerances:
DIN ISO 2768-mK

	Datum	Name
Bearb./ Drawn	22.07.2013	LAUFER
Gepr./ Checked	24.07.2013	LAUFER
Freig./ Releas.	30.07.2013	KIENINGER

ebmpapst
ebm-papst St.Georgen GmbH & Co KG

Werkstoff / Material:
-

Volumen / Volume (mm^3):

Gewicht / Mass (g):

Artikel / Title:
Radialgebläse RER190-39
Radial Blower

Zchg.-Nr./ Drawing No:
9595420224

Ers.f.Zchg. / Replaces:

Dokumenttyp / Type of Document	Teildokument (Blatt/Page)	Index / Index	Format / Size:	Massstab/Scale
C2D	002	C	A2	1:1

Vertraulich / Confidential Information 04.11.2013