RER190-39/18/2TDLOU-722

1 General

Fan type	Blower without chassis	
Rotational direction looking at rotor	clockwise	**FK**
Airflow direction	Air in axially, Air out radially	**FK**
Bearing system	Ball bearing	
Lubrication	see sectional drawing of the bearing	
Mounting position Tolerance	any	
Balancing grade	6,3	**FK**
Impeller weight	505 g	

Please note:
With the presently used software it cannot be guaranteed that the fan will start on the first attempt every time.

2 Mechanics

2.1 General

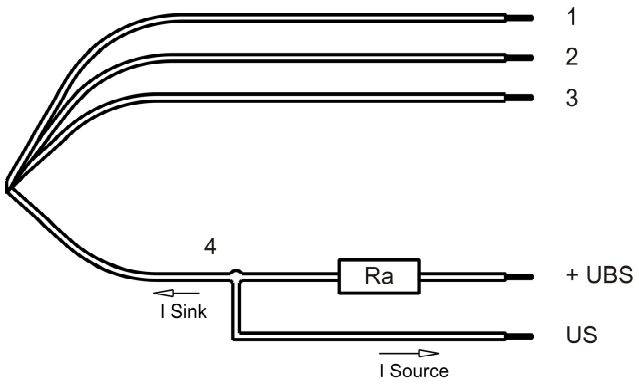
Width	0,0 mm	
Height	0,0 mm	
Depth	68,5 mm	
Diameter	190 mm	
Weight	0,858 kg	
Housing material		
Impeller material	Plastic	

2.2 Motor

Type of motor	Electronically commutated external rotor	
Diameter of the motor	54,0 mm	
Height of the motor	14 mm	
Number of phases	3	
Number of windings	3	
Operating mode	Continuous duty	
Insulation material class	E	

2.3 Connections

Electrical connection	Wires	
Length of lead wire Tolerance	1.200 mm +- 10,0 mm	
Length of tube Tolerance	115 mm +- 5 mm	
Wire gauge (AWG)	22	
Insulation diameter	1,7 mm	
Plug	see drawing	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	CONTR
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: AWG22 (Insulation diameter 1,7mm)
Lead wire 3 - 4: AWG22 (Insulation diameter 1,7mm)

3 Operating Data

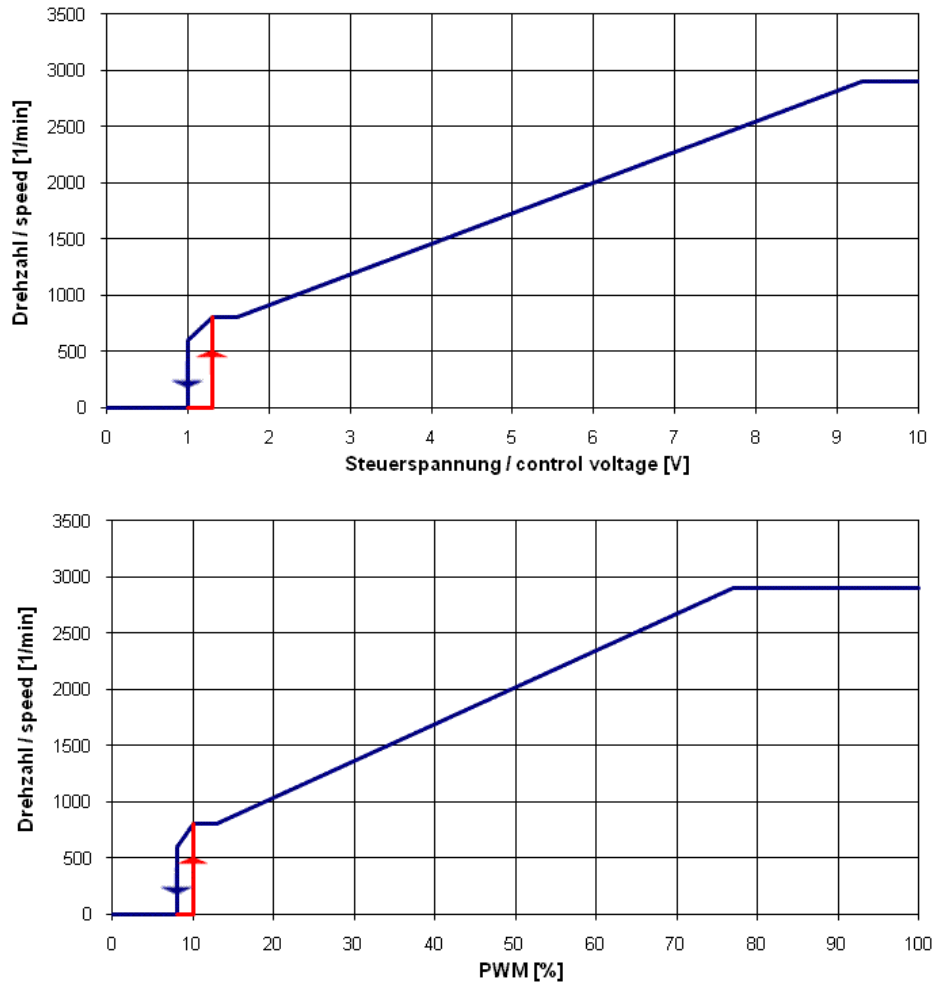
3.1 Operating Data - Electrical Interface - Input

Control input	Analog

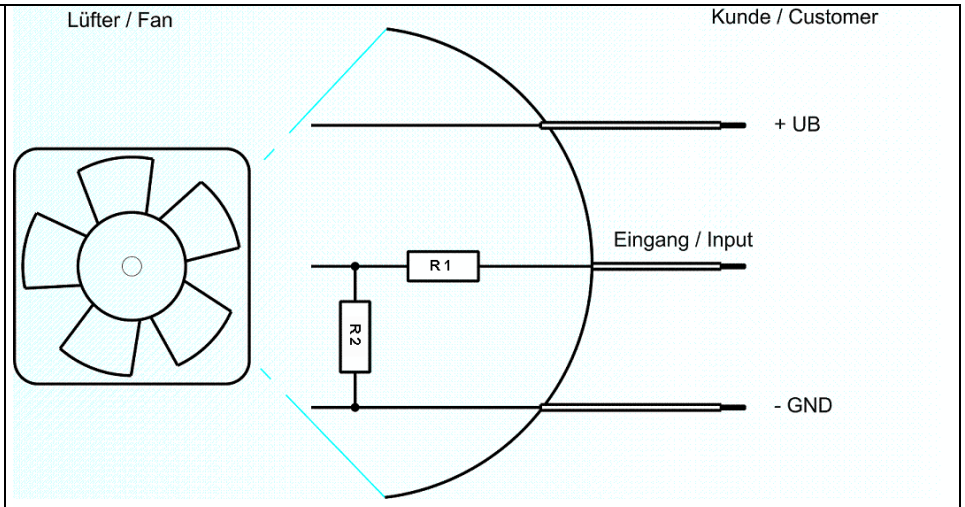
Features

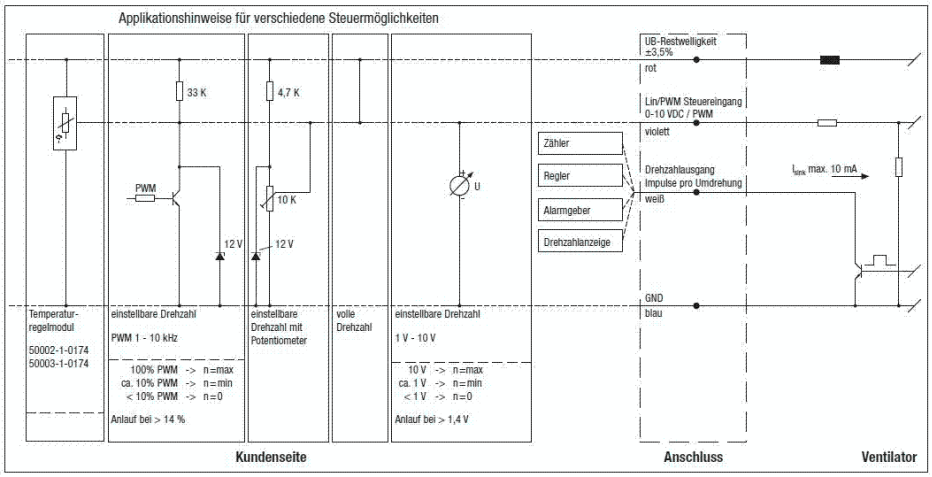
PWM - Frequency		1 kHz - 10 kHz Typical: 2 kHz
Inpute voltage range		0 V - 10 V

Characteristics



Schematics





Input voltage divider:
R1 = 47 kOhm
R2 = 36 kOhm
For protection: There is parallel to R2 a 5,1 V Z-Diode

Speed control:
By pulse-width modulation (PWM) 0 ... 100%
with switching transistor in emitter circuit and collector resistance to 12 V
Frequency = 2 kHz (1 - 10 kHz)

Information to the curve PWM:

0% - <10% PWM:	0 1/min
10% PWM:	800 1/min (Fan on, comming from 0% PWM)
10% - 13% PWM:	800 1/min (corresponding to min. speed)
13% - 78% PWM:	linear increasing curve
78% - 100% PWM:	2.900 1/min (corresponding to max. speed)
10% - >8% PWM:	linear decreasing curve (comming from 100% PWM)
8% PWM:	600 1/min or 0 1/min (Fan off, comming from 100% PWM)

or:

Speed control:
By analog voltage 0 - 10 V

Information to the curve analog:

0 V - < 1,3 V:	0 1/min
1,3 V:	800 1/min (Fan on, comming from von 0 V)
1,3 V - 1,6 V:	800 1/min (corresponding to min. speed)
1,6 V - 9,4 V:	linear increasing curve
9,4 V - 10 V:	2.900 1/min (corresponding to max. speed)
1,3 V - > 1,0 V:	linear decreasing curve (comming from 10 V)
1,0 V:	600 1/min or 0 1/min (Fan off, comming from 10 V)

The fan have no sensor break detection!

3.2 Electrical Operating Date with intake nozzel (For checking purposes)

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

Δp = 0: corresp. to free air flow (see section 3.5)
I: corresp. to arithm. mean current value

Name	**Condition**		
U Contr. 0001	U Contr.: 10,0 V		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		57,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0001	P	44,0 W +- 10,0 %	52,8 W +- 10,0 %	54,7 W +- 10,0 %
Current consumption Tolerance	Δp = 0 U Contr.0001	I	1.220 mA +- 10,0 %	1.100 mA *) +- 10,0 %	960 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0001	n	2.800 1/min +- 10,0 %	2.900 1/min *) +- 5,0 %	2.900 1/min +- 5,0 %

Name	**Condition**		
U Contr. 0002	U Contr.: 5,0 V		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		57,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0	P	12,6 W +- 10,0 %	13,0 W +- 10,0 %	14,0 W +- 10,0 %

	U Contr. 0002				
Current consumption Tolerance	Δp = 0 U Contr. 0002	I	350 mA +- 10,0 %	270 mA *) +- 10,0 %	245 mA +- 10,0 %
Speed Tolerance	Δp = 0 U Contr. 0002	n	1.750 1/min +- 5,0 %	1.750 1/min *) +- 5,0 %	1.750 1/min +- 5,0 %

Name	**Condition**		
U Contr. 0003	U Contr.: 1,5 V		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		57,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0003	P	2,0 W +- 12,5 %	2,5 W +- 12,5 %	3,2 W +- 12,5 %
Current consumption Tolerance	Δp = 0 U Contr. 0003	I	55 mA +- 12,5 %	52 mA *) +- 12,5 %	55 mA +- 12,5 %
Speed Tolerance	Δp = 0 U Contr. 0003	n	800 1/min +- 7,5 %	820 1/min *) +- 7,5 %	800 1/min +- 7,5 %

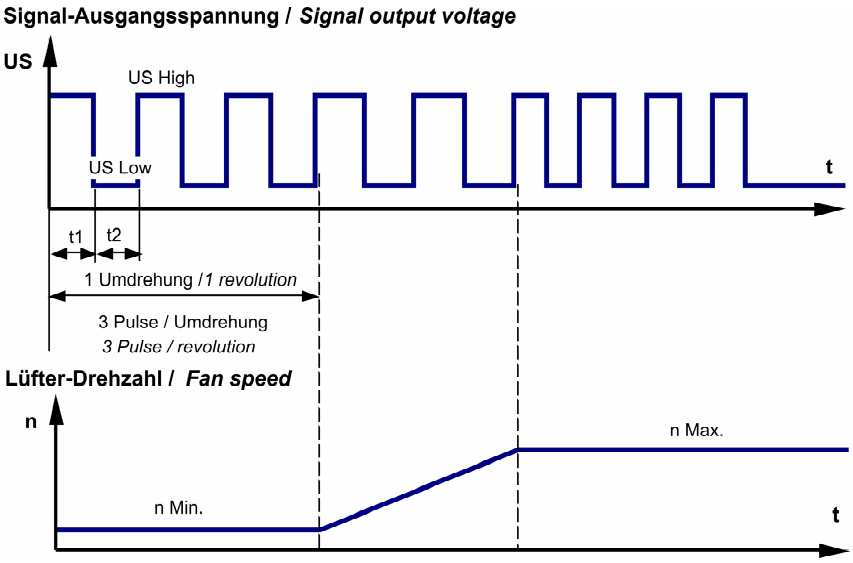
Name	**Condition**		
U Contr. 0004	U Contr.: 0 V		

Features	**Condition**	**Symbol**	**Values**		
Voltage range	Δp = 0	U	36,0 V		57,0 V
Nominal voltage	Δp = 0	U_N		48,0 V	
Power consumption Tolerance	Δp = 0 U Contr. 0004	P	<= 0,3 W	<= 0,4 W	<= 0,5 W
Current consumption Tolerance	Δp = 0 U Contr. 0004	I	<= 7 mA	<= 8 mA *)	<= 9 mA
Speed Tolerance	Δp = 0 U Contr. 0004	n	0 1/min	0 1/min *)	0 1/min

*) Attention: Marked values are "FK" features

3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)



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

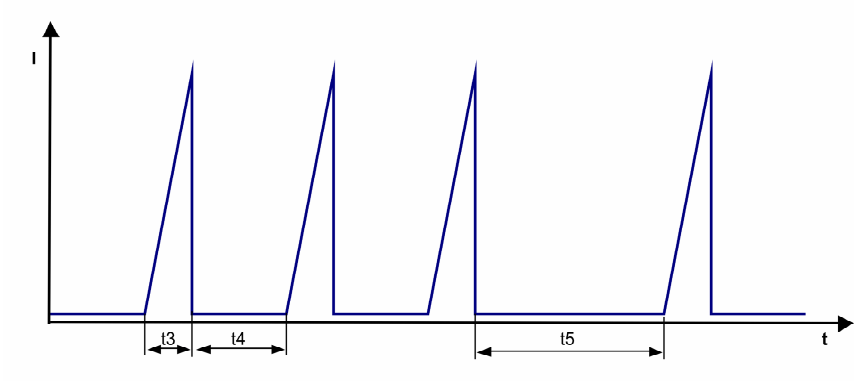
Features	Note	Values
Tacho operating voltage (UBS)		<= 57 V
Tacho signal Low *)	I sink: 2 mA	<= 0,4 V
Tacho signal High *)	I source: 0 mA	<= 57 V
Maximum sink current		<= 20 mA
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency *)	(3 x n) / 60	200 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.

*) Attention: Marked values are "FK" features

3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection Max. residual current at Un	Rectifying diode IF <= 5 mA	**A**
Locked rotor protection	Auto restart	**A**
Locked rotor current at Un	approx. 1.200 mA	
Clock signal t3/t4 at locked rotor	Typical: 2,4 s / 10,0 s	



Locked rotor signal t5:

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

4 Environment

4.1 General

Min. permitted ambient temperature TU min.	-20 °C	
Max. permitted ambient temperature TU max.	60 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

4.2 Climatic requirements*)

Humidity requirements	humid temperature, cyclic; according to DIN EN 60068-2-38, 10 cycle and condensation water check; according to DIN EN ISO 6270-2, 14 days	
Water exposure	Splash water check IPX4; according to DIN EN 60529 VDE 0470, not certified	
Radiation exposure	Solar radiation; according to DIN EN 60068-2-5	
Dust requirements	Dust check IP5X; according to DIN EN 60529 VDE 0470, not certified	
Salt fog requirements	None	
Harmful gas requirements	None	

*) Permittet application area:
The product is for the use in partial sheltered rooms or open, roofed areas. Directly exposure to water is allowed in so far as this doesn´t prevent the normal operation. Saline ambient conditions must be avoid.

Pollution degree 3 (according DIN EN 60664-1)
It occurs conductive pollution or dry non-conductive pollution occurs that becomes conductive due to condensation.

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.	500 VAC / 1 Min. 500 VAC / 1 Sec.	**A**
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	III	